Regional Science Inquiry

Regional Science Inquiry
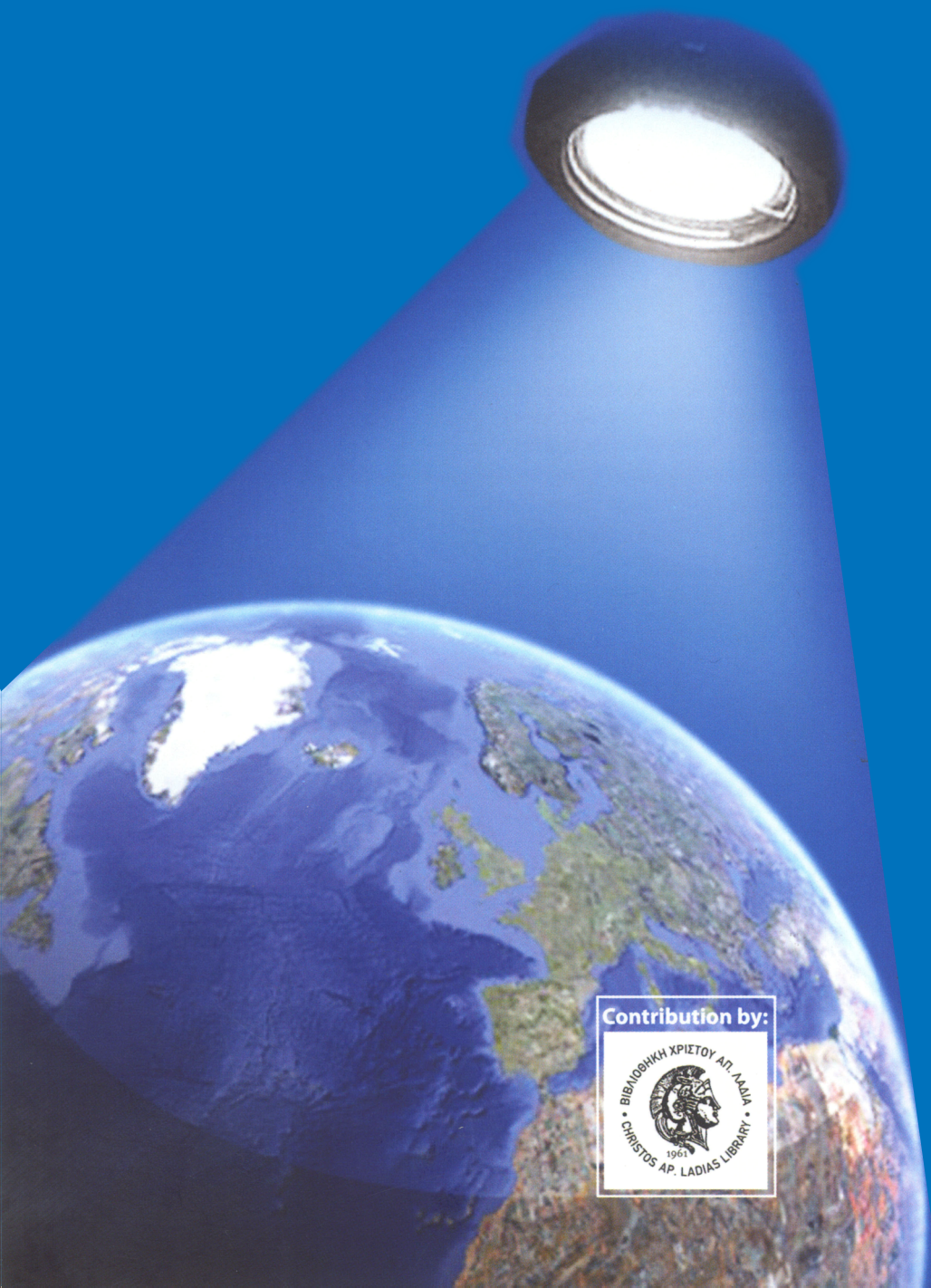
Regional Science Inquiry

THE JOURNAL OF THE
Hellenic Association of Regional Scientists

June 2013 Volume V Number 1

Contribution by:
ΒΙΒΛΙΟΘΗΚΗ ΧΡΙΣΤΟΥ ΑΠ. ΛΑΔΙΑ
1961
CHRISTOS AP. LADIAS LIBRARY

THE REGIONAL SCIENCE INQUIRY JOURNAL (RSI J)
Instructions to Authors

Review process

Each suitable article is blind-reviewed by two members of the editorial review board. A recommendation is then made by the Editor-in-Chief. The final decision is made by the Editor-in-Chief. If a revision is recommended, the revised article is sent for a final approval to one of the Editors.

The journal will reserve the copyright over all the material published therein. However, the authors may personally use their work elsewhere after publication without prior permission, provided that acknowledgement is given to the Journal as well as notification for such an action. Any views expressed in the journal are the views of the authors and not the views of the Journal. Obtaining the permission to reproduce any material copyrighted by third holders and the right to use it is the responsibility of the authors.

Style and Format of the Article

In order for a article to be submitted to the Regional Science Inquiry Journal (RSIJ) for publication, the following should be taken into consideration:
1. All submitted articles should report original work, previously unpublished and not under consideration for publication elsewhere and they are subject to both review and editing.
2. Articles should be in good technical English with a length normally between 6,500-8,000 words, while all other texts should not exceed 2,500 words, apart from the references, tables and illustrations.
3. The first page of the manuscripts should contain the article title, the name and the affiliation of the authors with sufficient contact details (the corresponding author should be properly identified here).
4. Articles should have a set of Keywords (up to 7) and an Abstract (under 250 words, without references), followed by the Introduction, Methodology and Data, Results, Discussion, Conclusions and References.
5. Manuscripts should be submitted in one single electronic file, an MS Word file, to the registered electronic address of the editors. It is also possible, for review purposes only, to submit the manuscript as a PDF file (or other similar format). The books for review are sent in two copies to the seat of the Journal.
6. Manuscripts should be typewritten with margins 2.5 cm x 2.5cm on A4 size article. Margins should be consistent on all pages.
7. All pages should be numbered consecutively.
8. Titles and subtitles should be short.
9. The text should be set in Times New Roman, size 11pt, normal, in a single column. Texts that do not comply with the specified formation will be returned to the authors for proper adjustment.
10. Tables and illustrations should be titled, consecutively numbered, embedded in the manuscript in one single electronic file, properly cited and placed in the main text. Tables are numbered separately from the illustrations. If you have original drawings or photos you must scan them and embed them in the file as above. Tables and illustrations should not appear on the opening page (first page) or after the references and must fit within the page margins.
11. Colour texts or illustrations are accepted for online publishing; however hard copies should only be black and white.
12. Footnotes should be kept to a minimum, numbered consecutively throughout the text with superscripts and should appear at the bottom of each page.
13. Authors are encouraged to include a concise literature survey. References to published literature within the text should be cited by the name of the author followed by the consecutive number in square bracket, and should be presented in a numerical list at the end of the text.
14. Full references should be given in the following form:
Author(s) (Name and Initials), "Title of Article", in Title of Book or Title of Journal or Title and Place of Conference, Editor(s) (Name and Initials), Volume (Vol.) Nr/Issue Nr, Place of Publication, Publisher, Year, Pages (pp.).

<u>Contents</u>

The articles published in RSI Journal are in accordance with the approving dates by the anonymous reviewers.

RSI Journal, Volume V, Issue 1 – Editorial

Milieu a 'cognitive engine' for regional development

Contemporary methodological – and especially empirical – research takes for granted that innovation and entrepreneurship are endogenous forces, driven by various actors in open regional economic systems. Entrepreneurship has been increasingly considered as a crucial factor in determining the economic growth of a territory Entrepreneurial action typically takes the form of innovation and profit opportunities are created by entrepreneurial innovation, or in words of Schumpeter (1942) '[…] the new commodity, the new technology, the new source of supply, the new type of organization'. It is possible to add critical success factors, such as competition, vested interests, research and development, knowledge spillovers, the quantity and quality of human capital, industrial structure and culture, regional networks, entrepreneurial ability and the like. Entrepreneurship does not take place in a wonderland of business-neutral places. Instead, it is deeply rooted in supporting geographical locational conditions, such as favourable urban incubation systems, venture capital support conditions, accessibility and openness of urban systems, diversity of economic activities, heterogeneous and highly skilled labour force, communication and information infrastructures, collective learning mechanisms, etc. Of particular significance is a process of learning. This process can be described in various ways. At the firm level, for instance, Maggioni and Roncari (2009) argue that each firm builds up a map of its neighbourhood in order to choose the agent to get in touch with, and hopefully learn something from this interaction. Having established a connection, the firm compares its knowledge endowment with its fellow's and, if it discovers a significant gap in at least one knowledge type, then the learning process may take place. In this respect, this is a process of knowledge transfer. Its efficiency, however, depends on the interest of both actors, therefore two different types of 'interactive learning' can be identified: knowledge barter exchange and pure knowledge spillovers. Modern sophisticated communication and network structures, the action radius of entrepreneurs has significantly increased. Clustering of firms and spatial concentration of economic activities together with agglomeration economies, network effects and knowledge spillovers influence the growth of a territory and perceived as key engines of cluster development in the economic literature. Consequently, the geography of entrepreneurship and innovation has become an important issue in modern regional analysis, in which the dynamics of firms is receiving prominent attention. Two major drivers of entrepreneurship can be identified and distinguished in a spatial context. The first one, which naturally springs to mind, is the knowledge-based capacity of a region to innovate, i.e. creativity. In the globalizing economy, even regional competitiveness – and consequently regional growth – is no longer dependent on the traditional production resource endowment, capital and labour. The hyper-mobility that nowadays characterizes these factors reduces their geographical concentration, and shifts the elements on which competitiveness rests from the availability of material resources to the presence of immobile local resources like local culture, competence, innovative capacity; in general knowledge. On the one hand, it appears evident that the knowledge-based economy does not have a unique interpretative paradigm, but has been defined on the basis of different approaches ranging from the earliest sectoral, through a more recent functional to the latest relation-based one. On the other hand, it appears quite evident the different approaches to the concept share one common element, that of the central role played by spatial elements in the creation and diffusion of knowledge, both evidenced by empirical analyses or deductively derived from theoretical elements (Camagni and Capello, 2009, p. 145). Some policy implications can be proposed. For example, policies to enhance the innovation and learning process can be designed in order to increase the adoptive ability of the lagging regions.

Such policies can be implemented through territorial systems of production and innovation (TSPI), which enhance learning spillovers. The way of organising policy research activities within the TPSI strongly influences the costs of transferring the knowledge that has been produced. Moreover, the institutional setting – experienced by norms, rules and standards – dramatically affects the 'epistemic communities of researchers' at work producing R&D (Bramanti and Fratesi, 2009, p. 86). Of particular importance are the knowledge flows and information channels and hence, the role of the local milieu becomes clear: abstract space becomes real territory, a relational space where functional and hierarchical, economic and social interactions take place and are embedded into geographical space. The local milieu – a 'territory' identified by both geographical proximity (agglomeration economies, district economies) and cognitive proximity (shared behavioural codes, common culture, mutual trust and sense of belonging) – supplies the socio-economic and geographical substrate on which collective learning processes can be incorporated, mainly due to two main processes (Camagni and Capello, 2002): First, the hug mobility of professionals and skilled labour – between firms but internally to the local labour market defined by the district or the city, where this mobility is maximal, and second, the intense co-operative relations among local actors, and in particular consumer-supplier relationships in production, design, research and finally knowledge-creation. The milieu becomes therefore a 'cognitive engine' and possibly an innovation place: its characteristics enhance interaction and co-operation, reduce uncertainty (especially concerning the behaviour of competitors and partners), reduce information asymmetries (therefore reducing mutual suspicion among partners) and reduce probability of opportunistic behaviour under the threat of social sanctioning, all elements that are confirmed by many regional economics schools (Bellet et al, 1993; Cappellin, 2003). In a simplified scheme, some functional preconditions are needed for knowledge creation and diffusion, namely: competence ('civilisation matérielle'), general education and higher education of human capital, R&D investment and investment in science, dynamic entrepreneurship. But more importantly, these preconditions, which are embedded in the three main sub-system of society – the education system, the research system and the economic system – have to integrate and interact with each other, giving rise to three crucial 'relational' preconditions: Integration between R&D institutions and the higher-education system, efficient trans-coding and transfer system to translate the research output into a language that firms can understand and use, knowledge-oriented entrepreneurship and a learning oriented labour market. In the policy share, the recent French experience of the 'pôles de compétitivité' (competitiveness poles) is in our opinion the best example of a policy intervening on our three relational preconditions, namely the integration area between the three subsystems, and not directly on each subsystem: public resources are allocated to projects developed on local territories through cooperative agreement between universities, research centres and firms, with general monitoring by local public authorities (Camagni and Capello, 2009). Mere investment in R&D activities, in general education or in entrepreneurial activity alone is not expected to give much impetus to the development of a knowledge society. The latter is instead more dependent upon the development of integrated activities between society, the scientific world and the economy for knowledge development. Policy interventions should therefore be devoted to the support of learning-oriented entrepreneurship, learning labour markets, efficient trans-coding and transfer systems, and integrated R&D and higher education institutes. These policies, coupled with a strategy of increasing local synergy and cooperation among local actors, could be useful in helping a local economy more towards a knowledge society, and therefore towards more competitive conditions for growth.

References
Bellet, M., Colletis, G. and Lung, Y. (1993) 'Introduction au numéro spécial sur économie et proximité', Revue d'Economie Régionale et Urbaine, Vol. 3, pp. 357-361

Camagni, R. and Capello, R. (2002) 'Milieux innovateurs and collective learning: From concepts to measurement', in Acs, Z., de Groot, H. and Nijkamp, P. (eds.) Urban Dynamics and Growth: Advances in Urban Economics, Amsterdam, Elsevier, pp. 121-152

Camagni, R. and Capello, R. (2009) 'Knowledge-based economy and knowledge creation: The role of space', in Fratesi, U. and Senn, L. (eds.) Growth and Innovation of Competitive Regions: The Role of Internal and External Connections, Springer, pp. 145-165

Cappellin, R. (2003) 'Networks and technological change in regional clusters', in Bröcker, J., Dohse, D. and Soltwedel, R. (eds.) Innovation Clusters in Interregional Competition, Springer, Berlin, pp. 53-78

Maggioni, M. and Roncari, S. (2009) 'Learning, innovation and growth within interconnected clusters: An agent-based approach', in Fratesi, U. and Senn, L. (eds.) Growth and Innovation of Competitive Regions: The Role of Internal and External Connections, Springer, pp. 117-144

Schumpeter, J. (1942) Capitalism, Socialism and Democracy, New York, Harper and Row

In the 1st Issue of Volume V of the RSI Journal

This issue includes eleven papers, all written by academics and policy-makers from all over the world. It is the intention of the editorial board of the Regional Science Inquiry Journal to present in this issue a wide range of topics, such as economics, environmental, politics, theoretical aspects of regional development, empirical case studies.

Hiroshi Sakamoto introduces a methodology for estimating the transition probability matrix of the Markov chain using least-squares optimization. This methodology is applied to the prefectures of Japan. The political and economical transformation of Croatia is the topic of the paper by Joel I. Deichmann and Shivam Senjalia. The conclusions of this study are of particular importance given the Croatia's imminent entry to the European Union. A team work by Cristina Linkaru, Vasilica Ciucă, Speranţa Pîrciog and Draga Atanasiu introduces Independent Component Analysis. Using Beyoglu, one of the most important historical centers in Istanbul, Funda Yirmibesoglu and Nilgun Ergun analyze street crime. What is the relation between local development and tourism? Margherita Pedrana attempts to shed some light in this issue. Some ideas on designing policies for depressed regions are outlined by Argentino Pessoa. Government labs, innovation systems and technological policy in Canada are examined in the paper by Rashid Nikzad. Chrysanthi Balomenou and Marianthi Maliari examine the consequences of the crisis on enterprises using the Regional Unity of Serres as a case study. Anastasia Stratigea offers a methodological approach to Participatory Policy Making at the regional level. A systemic analysis of the Greater Middle East is the topic of the paper by Ioannis Th. Mazis. Georgios Xanthos, Christos Ap. Ladias and Christos Genitsaropoulos forecast population changes in the lowland settlements of the Epirus Region. The present issue of the RSI Journal concludes with presenting general news and announcements related to regional science research undertake, academic profiles of worldwide distinguished academic scholars in regional science together with the presentation of selected books, useful to regional scientists.

Dr. Alexiadis Stilianos
Dr. Kokkinou Aikaterini
RSI Journal

<u>Articles</u>

PREDICTION OF THE PREFECTURAL ECONOMY IN JAPAN USING A STOCHASTIC MODEL

Dr. Hiroshi SAKAMOTO◆

Research Associate Professor, The International Centre for the Study of East Asian Development (ICSEAD) 11-4 Otemachi, Kokurakita, Kitakyushu, 803-0814 JAPAN
Tel: +81 93 583 6202; Fax: +81 93 583 4602, e-mail: sakamoto@icsead.or.jp

Abstract:

This study develops a simple forecasting model using Japanese prefectural data. The Markov chain, known as a stochastic model, corresponds to a first-order vector auto-regressive (VAR) model. If the transition probability matrix can be appropriately estimated, a forecasting model using the Markov chain can be constructed. This study introduces a methodology for estimating the transition probability matrix of the Markov chain using least-squares optimization. The model is used first to analyze economy-wide changes encompassing all Japanese prefectures up to 2020. Second, a shock emanating from one prefecture is inserted into the transition probability matrix to investigate its influence on the other prefectures. Finally, a Monte Carlo experiment is conducted to refine the model's predicted outcomes. Although this study's model is simple, we provide more sophisticated forecasting information for prefectural economies in Japan through the complicated extension.

Keywords: Prefectural economy, Japan, Stochastic model, Markov chain
JEL classification: C15, C53, C61, O53, R12

1. Introduction

Since 1990, the Japanese economy has experienced neither extreme growth nor downturns. Factors such as Japan's low birthrate, rising longevity, and decline in population have been noted since 2000, and the concentration of power and population in Tokyo that began before the bubble has persisted. On the other hand, economic growth has been reported in local areas. A tool to quantitatively analyze such information is needed, although it is essential to understand how economic resources, including people, material, capital, and information, are distributed. That is the starting point of this study.

It is preferable to create an economic model that captures the distribution of economic resources between regions.[1] Nonetheless, a model based on changes in the macro index of GDP for all prefectures merits consideration. To explain nationwide economic changes, this study employs a stochastic model created using a Markov chain. It is a simple forecasting model that derives the next term in a numerical sequence from information in its predecessor term. Moreover, it is a form of vector auto-regressive (VAR) model advocated by Sims (1980).[2]

Forecasting models using a Markov chain have existed for many years, and researchers have advocated its use to measure economic convergence between countries or regions.[3] Sakamoto (2010b) predicts demographic shifts among Chinese prefectures using a Markov

---

[1] Sakamoto (2011) considers research from this viewpoint.
[2] However, both the character and estimation of a parameter (transition probability matrix) differ deterministically.
[3] See Quah (1993, 1996a and b) and Sakamoto and Islam (2008).

chain. Although predictions are more easily derived from stochastic models than from econometric models, predicted outcomes are not always reliable. To strengthen reliability of predictions, the Monte Carlo experiment is used and width is given to a result.[4]

2. Model

The Markov chain is a well-known tool for deriving probabilistic chains (Romanovski, 1948). For each Markov transition matrix $M = (p_{ij})$ with transitional probabilities, $0 \le p_{ij} \le 1$, $\sum_{i=1} p_{ij} = 1$, a linear probabilistic chain can be derived as $p_{t+1} = M p_t$, $t = 0$, 1, 2, … (Sonis and Dendrinos, 2009). The Markov transition matrix also can be used to model the dynamics of economic growth. Let F_t be the vector comprising the GDP of all prefectures in period t and F_{t+1} denote the same for period $t + 1$. Suppose M_t is the matrix that maps F_t onto F_{t+1}. Therefore, we have

$$F_{t+1} = F_t \cdot M_t . \quad (1)$$

Assuming transition matrix M_t is time specific, the share vector after period s, F_{t+s}, will be given by

$$F_{t+s} = F_t \cdot M_t \cdot M_{t+1} \cdot \dots \cdot M_{t+s-1} = F_t \cdot \prod_{i=0}^{s-1} M_{t+i} . \quad (2)$$

Therefore, current GDP is indeed modeled by the Markov chain.

Second, we introduce how to estimate the transition matrix M_t using actual data. In research that measures the convergence of income distributions, such as Quah (1993, 1996a and b), data from each country or each region are collected, a suitable grid line is assumed for the whole sample, a sample is classified for every state of income based on the grid line, and the method of estimating a matrix by totaling the temporal response of each country or region is adopted. In this case, a range of income from low to high is summarized for several states (around five). However, this procedure cannot express individual or intra-regional changes. To investigate prefecture-level changes, this study employs the following processes in its estimation method.

Since M_t cannot be obtained from actual data, an estimation procedure is necessary. The procedure implemented in this study runs along the following lines:

If F_t is (3 x 1), the transition matrix M_t for time t will be (3 x 3) and will appear as

$$M_t = \begin{pmatrix} a_{t,11} & a_{t,12} & a_{t,13} \\ a_{t,21} & a_{t,22} & a_{t,23} \\ a_{t,31} & a_{t,32} & a_{t,33} \end{pmatrix} . \quad (3)$$

Suppose $F_t' = (b_{t,1} \ b_{t,2} \ b_{t,3})$ and $F_{t+1}' = (b_{t+1,1} \ b_{t+1,2} \ b_{t+1,3})$. Per equation (1), we have

$$b_{t+1,1} = b_{t,1}*a_{t,11} + b_{t,2}*a_{t,12} + b_{t,3}*a_{t,13} \quad (4\text{-}1),$$
$$b_{t+1,2} = b_{t,1}*a_{t,21} + b_{t,2}*a_{t,22} + b_{t,3}*a_{t,23} \quad (4\text{-}2),$$
$$b_{t+1,3} = b_{t,1}*a_{t,31} + b_{t,2}*a_{t,32} + b_{t,3}*a_{t,33} \quad (4\text{-}3).$$

However, in this formula the property of the Markov chain may not hold when the sum of the columns of probability matrix M_t equals 1.

---

[4] The Monte Carlo experiment is featured in research by Sakamoto (2010a).

$$\sum_{k=1}^{3} a_{t,jk} = 1 \quad \forall j . \quad (5)$$

Therefore, since we assume the adjustment parameter will hold its properties, we adopt the total growth rate of GDP, g_t, as an adjustment parameter. g_t is defined by

$$g_t = \sum_{j=1}^{3} b_{t+1,j} \bigg/ \sum_{j=1}^{3} b_{t,j} . \quad (6)$$

Then we modify the equations to

$$b_{t+1,1} = g_t \, (b_{t,1}*a_{t,11} + b_{t,2}*a_{t,12} + b_{t,3}*a_{t,13}) \ (4\text{'}-1),$$
$$b_{t+1,2} = g_t \, (b_{t,1}*a_{t,21} + b_{t,2}*a_{t,22} + b_{t,3}*a_{t,23}) \ (4\text{'}-2),$$
$$b_{t+1,3} = g_t \, (b_{t,1}*a_{t,31} + b_{t,2}*a_{t,32} + b_{t,3}*a_{t,33}) \ (4\text{'}-3).$$

However, these three restrictions are insufficient for a unique solution to the nine elements of matrix M_t; more restrictions are needed. An identity matrix offers a trivial solution of M_t. Although not the desired solution, it sources the necessary restrictions. Assuming the distribution does not vary greatly by period, the elements of M_t are such that the matrix will mimic the identity matrix. Using this idea and generalizing M_t to n x n, we estimate the elements of M_t based on the following minimization procedure:

$$\text{Minimize} \sum_{j=1}^{n} \sum_{k=1}^{n} \left(a_{t,jk} - i_{jk} \right)^2$$

$$\text{Subject to } b_{t+1,j} = g_t \cdot \sum_{k=1}^{n} b_{t,k} \cdot a_{t,jk} , \ \forall j ,$$

$$\text{and} \sum_{k=1}^{n} a_{t,jk} = 1, \ \forall j , \quad (7)$$

where i_{jk} is an element of identity matrix I and g_t is the total growth rate of GDP ($g_t = \sum_{j=1}^{n} b_{t+1,j} \bigg/ \sum_{j=1}^{n} b_{t,j}$). This minimization problem can be solved by non-linear programming to produce a unique solution for the elements $a_{t,jk}$.

Third, we construct the transition matrix M^- for forecasting. Since the estimated transition matrix M_t is time specific, we first consider the average of the elements:

$$\overline{M} = \sum_{t=1}^{s} M_t \bigg/ s . \quad (8)$$

In this study, prediction, simulations, and the Monte Carlo experiment are conducted based on this averaged transition matrix:

$$F_{t+1} = F_t \cdot \overline{M} . \quad (9)$$

3. Data

Data are "gross expenditure of prefectures" from the Annual Report of Prefectural Accounts (*Kenmin Keizai Keisan*) for all 47 prefectures. A GDP deflator is based on a chained price index in 2000. Since real GDP by the chain price in 2000 was released from 1996, data of 1995 or before are estimated using the growth rate of real GDP by the chain price in 1995. The period 1990—2007 is used. Official data are fiscal year data. To convert to a calendar year, each year's official GDP data was divided by four, and one quarter of the current year's

GDP was added to the previous fiscal year.

Next, population differences among prefectures pose a problem in the analysis. Since this study examines changes in GDP for each prefecture, per capita GDP was converted into prefectural GDP using 2007 population as the base year. This changes to and analyzes the GDP at the time of converting with the population as of 2007, although each year's GDP is calculated using each year's population. Therefore, if the population during a particular year was smaller (larger) than that in 2007, estimated GDP for that year will also be larger (smaller) and the influence of changes in population during a measurement period will be eliminated.

4. Simulation

The simulation is conducted in three parts. First, we form a prediction for the period 2008—2020 using a Markov chain based on equation (9). Next we analyze changes in predicted outcomes after inserting an economic shock into the Markov chain transition matrix. The simulated shock was a natural disaster equivalent to Japan's March 2011 earthquake. Finally, we introduce uncertainty into each element of the transition matrix before and after the shock and conduct a Monte Carlo experiment to establish the robustness and predictive accuracy of the estimation result. Hereafter, we divide the Monte Carlo experiment into pre- and post-shock periods when presenting analytic details and results.

4-1. Analysis of the deterministic path before Monte Carlo experiment

Table 1 shows partial results from the transition matrix based on equation (9). The transition matrix was estimated based on the optimization problem of equation (7) for 1990–2007, and the arithmetic average is taken. The table shows the transition matrix of Hokkaido to Hokkaido as 0.991877 and that of Hokkaido to Aomori Prefecture as 0.000117. Predictions up to 2020 were performed using this transition matrix. Because it is impossible to depict growth of the entire Japanese economy merely by multiplying a transition matrix, a simulated exogenous growth rate of 1% is inserted and carried up to probability change.

Next, the economic shock accompanying a big earthquake is considered. The 2011 East Japan earthquake directly and indirectly damaged many prefectures. Three northeastern prefectures—Iwate, Miyagi, and Fukushima—were seriously damaged, and recovery will take considerable time. One way to reflect a disaster shock in a transition matrix is to change the elements of the matrix. Many factors essential to GDP, such as capital stock, are destroyed in a natural disaster, adversely affecting GDP. We multiply each element of the transition matrix by a factor less than 1 to make smaller GDP than before shock. Following the prefectures and their rates of shock are assumed: Aomori 0.95, Iwate 0.90, Miyagi 0.90, Fukushima 0.90, Ibaraki 0.95, Chiba 0.97, and Tokyo 0.97. These rates of the shock apply to all the prefectures.

For example, since the transition matrix of Iwate to Hokkaido is 0.000071, Iwate to Aomori is 0.000050, and Iwate to Iwate is 0.997486 in Table 1, we calculate the probabilities by multiplying a number by 0.90 at the time of a shock. In addition, the shock is inserted only into the transition matrix for 2010–2011 because we consider the case of the Great East Japan earthquake, which occurred in 2011.

Figures 1 and 2 assess the deterministic path before the Monte Carlo experiment by comparing cases with and without a disaster shock. The figures represent both the prefecture in which the shock originated and the entire country. Growth rates differ in each prefecture, and it is expected that regional disparity changes. On the other hand, when a disaster shock is inserted, economic growth falls in the year of the shock but recovers thereafter. However, the recovery does not overcome the decline in growth experienced at the time of the shock. It is considered that the element of a transition matrix changes only once in a year and original matrix is carried forward to the next year.

Next, we analyze how predictions for the entire economy change as a result of the simulation. Table 2 shows the total rate of change (not annual averages) in GDP for each prefecture from 2007 to 2020. Since exogenous growth of 1% per year is a given, the change

during a period exceeds 13%. Prefectures exhibiting below-average growth of 10% or less are Hokkaido, Chiba, Kanagawa, Osaka, and Hyogo. Many economically significant prefectures, except Aichi Prefecture, are below average if Hokkaido and Okinawa Prefectures are removed. Therefore, the economic changes indicated by this model suggest that regional disparity is reducible.

On the other hand, in terms of post-shock change, although the prefectures where the shock originated have declined economic growth rates on the rate of the shock suitability, since they remain in the growth rate fall below the rate of the shock, some rally effect is seen about these prefectures. Growth declined in all other prefectures, which were also affected by the disaster shock, but the difference was negligible.

4-2. Analysis of the indefinite path after the Monte Carlo experiment

Next, we consider the case wherein these paths are not deterministic. The Monte Carlo experiment requires data based on information acquired in estimating the transition matrix of equation (9). The experiment is conducted on the assumption that uncertainty is an element of the transition matrix. That is, after giving width to the number of Table 1, it predicts using the transition matrix obtained on the basis on the experiment. It assumes that the numbers in Table 1 have width according to a normal distribution with an average and standard deviation. The average is the numbers in Table 1. Standard deviation is obtained from the result of the transition matrix for each year from 1990 to 2007. The results are shown in Table 3. That is, it experiments by generating a random number according to the average (Table 1) and the standard deviation (Table 3). Since this experiment involves a simulated economic shock, pre-shock and post-shock periods are compared. It is assumed that 300 random numbers are generated when conducting a Monte Carlo experiment. A greater number of repetitions produces not only more precise results but also more complicated calculations; therefore, in this study, repetitions were halted within a range that is easily treated.

Tables 4 and 5 show averages and coefficients of variation in GDP for each prefecture before the shock after the Monte Carlo experiment. The coefficient of variation (the standard deviation divided by the average) increases as it is set to 2020. To generate the random number to the transition matrix of each year, the more this tends toward the future, the more it means that uncertainty increases. However, this number itself is about 2%. Since the number in Table 3 is also quite small, uncertainty also is apparently small. However, growth of the Japanese economy is less than 1% of the present condition, and it is not clear if there is uncertainty of 2% using standard deviation. Moreover, the prefecture's feature about the difference in the coefficient of variation is not observed, it is said to be changing on a random basis (Table 3).

Tables 6 and 7 show the post-shock average and coefficients of variation in GDP for each prefecture after the Monte Carlo experiment. Since the shock occurred between 2010 and 2011, the 2010 result is omitted because it is the same as that in Tables 4 and 5. The right half of the table shows comparisons before the shock. Since the difference in the average for the prefecture where the shock originated declines from 2015 to 2020, growth gradually recovers after the shock. Although the coefficient of variation rises for the prefecture where the shock originated, it falls slightly in each of the other prefectures. Perhaps uncertainty in the prospect of future recovery was elevated by the disaster shock, as the increased coefficient of variation suggests.

Finally, we investigate the degree of duplication in the Monte Carlo sample that overlapped the pre- and post-shock periods. A frequency table was created using the Monte Carlo experiment to calculate an average on the basis of all prefectures before the shock in 2015 and 2020 with logarithms and the width of 0.005. Then, the frequency of duplications before and after the shock is calculated. Table 8 shows that the distribution is the same before and after the shock if it is close to 100 (%). Although the number near 100%, in general, emerges for prefectures from which the shock did not originate, since it is may fully not be 100%, given that it may suffer slight repercussions of the disaster. On the other hand, Miyagi and Fukushima Prefectures have no overlapping sample, and their economies languish after the shock even if uncertainly is assumed. Prefectures such as Tokyo that suffer only slight effects

from the shock show a suitable degree of duplication around 30%. Even if this prefecture experiences the shock, its negative effect may be offset by uncertainty.

5. Conclusion

This study showed changes in GDP for all prefectures of Japan using a stochastic model and explored for predictions. In addition, it adopted the probability element of the stochastic model and analyzed predictions after the occurrence of a shock such as the East Japan earthquake. It also considered a recovery tendency as possible means to explore predictions of disaster shocks that may occur in the future. After inserting the element of uncertainty into the Monte Carlo experiment, the stochastic model was applied and a possibility was shown that a negative effect such as a disaster shock can be negated.

However, the stochastic model needs improvement. For example, the mutual effect among all prefectures is small. Although that may actually be the case, they may have an increasing influence on the people, material, capital, and the present condition with prosperous traffic of information. However, the model presents thought-provoking issues about the future Japanese economy.

References

Quah, Danny. (1993) "Empirical Cross-Section Dynamics in Economic Growth," *European Economic Review*, 37, pp. 426–434.

Quah, Danny. (1996a) "Empirics for Economic Growth and Convergence," *European Economic Review*, 40, pp. 1353–1375.

Quah, Danny. (1996b) "Twin Peaks: Growth and Convergence in Model of Distribution Dynamics," *Economic Journal*, 106, pp. 1045–1055.

Romanovski, Vsevolod. (1948) *Discrete Markov Chains*, Gostechizdat, Moscow.

Sakamoto, Hiroshi and Islam, Nazrul. (2008) "Convergence across Chinese Provinces: An Analysis using Markov Transition Matrix," *China Economic Review*, 19, pp.66–79.

Sakamoto, Hiroshi. (2010a) "Uncertainly of Productivity and Effect of Tax System Change: Monte Carlo Experiment by CGE model (in Japanese)," *Studies in Applied Economics*, 3, pp. 59–73.

Sakamoto, Hiroshi. (2010b) "Migration and Regional Income Disparity in China: An Analysis by Markov Chain (in Japanese)," *Studies in Applied Economics*, 4, pp. 128–147.

Sakamoto, Hiroshi. (2011) "Interdependent Relationship in the Prefectural Economy: Using a Multiregional Growth Model in Japan," presented at NARSC Miami meeting.

Sims, Chirstopher. (1980) "Macroeconomics and Reality," *Econometrica*, 48, pp. 1–48.

Sonis, Michael and Dimitrios, Dendrinos. (2009) "Socio-spatial dynamics and discrete non-linear probabilistic chains," M. Sonis and G.J.D. Hewings (eds.), *Tool Kits in Regional Science*, Springer-Verlag Berlin Heidelberg, pp. 177–197.

Table 1: Transition matrix (average)

	Hokkaido	Aomori	Iwate	Miyagi	Akita	…	Okinawa
Hokkaido	0.991877	0.000117	0.000055	0.000080	0.000144		0.000001
Aomori	0.000003	0.996611	0.000052	0.000033	0.000027		0.000027
Iwate	0.000071	0.000050	0.997486	0.000001	0.000048		0.000051
Miyagi	0.000034	0.000041	0.000037	0.996496	0.000049		0.000010
Akita	0.000032	0.000008	0.000027	0.000043	0.997642		0.000007
…						…	
Okinawa	0.000097	0.000106	0.000129	0.000106	0.000119		0.993580

Source: All table and figure is author's calculation

Figure 1: Prediction before the Monte Carlo experiment (1) (Billion yen)
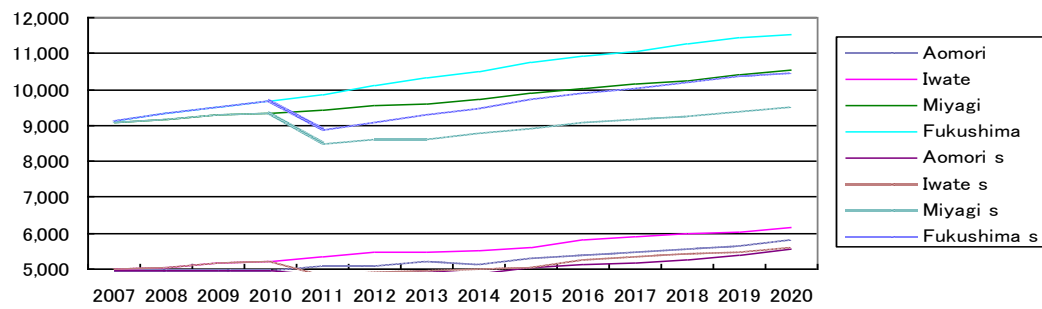
Figure 2: Prediction before the Monte Carlo experiment (2) (Billion yen)
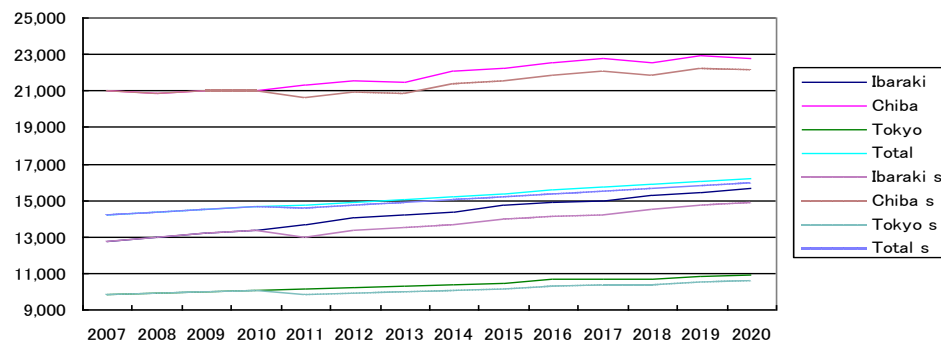
Note: Tokyo is in a scale of 1/10 and the entire country (Total) is in a scale of 1/40.

Table 2: Change of GDP of each prefecture (rate of change from 2007 to 2020 in %)

	Pre shock	Post shock	Change		Pre shock	Post shock	Change
Hokkaido	7.85	7.78	−0.07	Shiga	12.05	12.01	−0.04
Aomori	18.18	12.63	−5.55	Kyoto	14.89	14.85	−0.04
Iwate	23.11	11.79	−11.31	Osaka	3.58	3.56	−0.02
Miyagi	15.92	4.78	−11.14	Hyogo	6.63	6.55	−0.08
Akita	24.58	24.52	−0.06	Nara	12.09	12.03	−0.06
Yamagata	26.74	26.64	−0.10	Wakayama	12.63	12.60	−0.02
Fukushima	26.51	14.75	−11.76	Tottori	18.28	18.21	−0.07
Ibaraki	22.41	16.61	−5.80	Shimane	21.12	21.05	−0.07
Tochigi	14.86	14.81	−0.05	Okayama	12.09	12.03	−0.06
Gunma	15.18	15.15	−0.03	Hiroshima	14.93	14.90	−0.02
Saitama	11.18	11.15	−0.03	Yamaguchi	19.29	19.20	−0.09
Chiba	8.36	5.17	−3.19	Tokushima	23.72	23.66	−0.07
Tokyo	10.31	7.05	−3.27	Kagawa	18.23	18.18	−0.04
Kanagawa	−0.68	−0.68	0.00	Ehime	24.68	24.64	−0.04
Niigata	23.36	23.25	−0.12	Kochi	23.57	23.55	−0.02
Toyama	18.59	18.53	−0.06	Fukuoka	14.37	14.31	−0.06
Ishikawa	19.16	19.11	−0.05	Saga	30.45	30.38	−0.07
Fukui	22.57	22.51	−0.06	Nagasaki	15.65	15.64	−0.01
Yamanashi	16.38	16.33	−0.05	Kumamoto	16.04	16.00	−0.03
Nagano	20.76	20.70	−0.06	Oita	31.39	31.31	−0.08
Gifu	13.43	13.39	−0.04	Miyazaki	17.55	17.54	−0.02
Shizuoka	25.14	25.03	−0.11	Kagoshima	26.66	26.60	−0.06
Aichi	20.94	20.72	−0.21	Okinawa	13.98	13.95	−0.03
Mie	31.89	31.69	−0.20	Total	14.02	12.64	−1.38

Table 3: Standard deviation of a transition matrix

	Hokkaido	Aomori	Iwate	Miyagi	Akita	…	Okinawa
Hokkaido	0.009272	0.000330	0.000139	0.000217	0.000366		0.000000
Aomori	0.000005	0.005170	0.000138	0.000127	0.000104		0.000086
Iwate	0.000274	0.000170	0.005833	0.000000	0.000174		0.000198
Miyagi	0.000071	0.000116	0.000099	0.004646	0.000164		0.000035
Akita	0.000100	0.000019	0.000075	0.000112	0.003158		0.000018
…						…	
Okinawa	0.000211	0.000187	0.000208	0.000207	0.000188		0.006972

Table 4: Pre-shock average and coefficient of variation of GDP for each prefecture after the Monte Carlo experiment (1)

	2010		2015		2020	
	Average	CV	Average	CV	Average	CV
Hokkaido	20,102.67	0.016995	20,616.20	0.027946	21,149.83	0.035109
Aomori	5,162.40	0.015976	5,554.39	0.024648	5,972.96	0.029269
Iwate	5,262.26	0.011921	5,683.56	0.021108	6,130.25	0.025444
Miyagi	9,347.59	0.008341	9,812.48	0.013795	10,311.74	0.017530
Akita	4,309.61	0.010410	4,662.53	0.016434	5,039.93	0.019850
Yamagata	5,193.04	0.010709	5,700.16	0.016941	6,237.31	0.020651
Fukushima	9,648.00	0.009602	10,582.54	0.013522	11,561.13	0.016920
Ibaraki	13,264.11	0.011575	14,153.98	0.017416	15,118.57	0.022093
Tochigi	9,739.26	0.009999	10,386.34	0.015685	11,063.41	0.018918
Gunma	8,690.66	0.012525	9,109.75	0.020279	9,541.39	0.025551
Saitama	23,601.54	0.010762	24,540.60	0.018035	25,555.31	0.023007
Chiba	21,511.46	0.015375	22,202.99	0.023933	22,932.97	0.030810
Tokyo	101,085.10	0.009190	105,220.60	0.014007	109,407.76	0.017464
Kanagawa	34,619.17	0.010367	34,876.32	0.017364	35,157.53	0.022615
Niigata	10,460.88	0.009526	11,215.69	0.015782	12,019.55	0.019572
Toyama	5,299.22	0.009969	5,622.46	0.017205	5,965.89	0.022520
Ishikawa	5,405.25	0.009106	5,737.48	0.014332	6,092.96	0.017526
Fukui	4,023.59	0.009050	4,356.11	0.015033	4,704.45	0.018658
Yamanashi	3,937.22	0.014793	4,228.66	0.022723	4,534.47	0.030119
Nagano	10,211.98	0.011136	11,128.13	0.016536	12,076.97	0.019782
Gifu	8,438.48	0.007904	8,890.68	0.013344	9,383.27	0.017124
Shizuoka	19,946.56	0.008956	21,466.43	0.014431	23,074.61	0.018017
Aichi	42,367.07	0.011383	45,291.32	0.017465	48,386.63	0.021943
Mie	10,211.41	0.014147	11,378.67	0.020190	12,610.94	0.024033

Note: Average is billion yen.

Table 5: Pre-shock average and coefficient of variation of GDP for each prefecture after the Monte Carlo experiment (2)

	2010		2015		2020	
	Average	CV	Average	CV	Average	CV
Shiga	7,253.40	0.017691	7,748.94	0.029712	8,283.94	0.034432
Kyoto	11,307.93	0.010584	11,885.97	0.017107	12,513.07	0.020585
Osaka	41,868.23	0.010208	42,788.31	0.017852	43,735.95	0.022156
Hyogo	21,364.67	0.020009	21,648.06	0.032491	21,991.39	0.038387
Nara	4,261.61	0.013099	4,478.86	0.021409	4,702.97	0.026200
Wakayama	3,615.14	0.010032	3,794.14	0.017336	3,985.55	0.021982
Tottori	2,408.97	0.010327	2,567.31	0.015867	2,735.41	0.020235
Shimane	2,921.05	0.010227	3,184.20	0.017355	3,464.79	0.021101
Okayama	8,417.42	0.016099	8,845.91	0.026216	9,295.51	0.033781
Hiroshima	13,178.64	0.011002	13,761.46	0.019088	14,363.01	0.022861
Yamaguchi	6,503.31	0.009017	7,005.37	0.014122	7,525.86	0.017138
Tokushima	3,071.20	0.014610	3,303.91	0.023450	3,550.39	0.028203
Kagawa	4,054.65	0.015487	4,270.07	0.023386	4,487.23	0.029808
Ehime	5,687.90	0.012421	6,096.04	0.019056	6,516.00	0.022752
Kochi	2,589.73	0.016447	2,754.53	0.028454	2,926.80	0.035202
Fukuoka	20,257.22	0.007947	21,307.12	0.011927	22,401.28	0.015058
Saga	3,498.44	0.009849	3,820.41	0.016822	4,168.38	0.020541
Nagasaki	4,876.74	0.008758	5,220.48	0.013794	5,583.50	0.017835
Kumamoto	6,549.65	0.007707	6,966.47	0.011425	7,394.57	0.014735
Oita	5,390.17	0.008714	5,911.70	0.013523	6,463.30	0.015951
Miyazaki	4,024.63	0.010624	4,287.43	0.017217	4,563.30	0.020886
Kagoshima	6,337.23	0.009998	6,876.77	0.015005	7,454.04	0.018592
Okinawa	3,974.99	0.012712	4,130.88	0.020988	4,290.66	0.026985
Total	585,251.44	0.002407	615,072.41	0.003910	646,426.68	0.005075

Note: Average is billion yen.

Table 6: Post-shock average and coefficient of variation of GDP for each prefecture after the Monte Carlo experiment (1)

	Result				Change of pre shock (%)			
	2015		2020		2015		2020	
	Average	CV	Average	CV	Average	CV	Average	CV
Hokkaido	20,613.38	0.027929	21,143.41	0.035081	-0.01	-0.06	-0.03	-0.08
Aomori	5,283.75	0.025062	5,690.75	0.029739	-4.87	1.68	-4.72	1.60
Iwate	5,132.27	0.021771	5,557.15	0.026208	-9.70	3.14	-9.35	3.00
Miyagi	8,843.79	0.014089	9,309.63	0.017811	-9.87	2.14	-9.72	1.60
Akita	4,661.56	0.016391	5,037.67	0.019783	-0.02	-0.26	-0.04	-0.33
Yamagata	5,698.12	0.016853	6,232.39	0.020490	-0.04	-0.52	-0.08	-0.78
Fukushima	9,560.61	0.014172	10,488.73	0.017857	-9.66	4.80	-9.28	5.54
Ibaraki	13,460.57	0.017608	14,396.59	0.022306	-4.90	1.10	-4.78	0.96
Tochigi	10,383.91	0.015674	11,057.90	0.018903	-0.02	-0.07	-0.05	-0.08
Gunma	9,108.30	0.020260	9,538.09	0.025535	-0.02	-0.09	-0.03	-0.06
Saitama	24,537.36	0.018026	25,547.86	0.022993	-0.01	-0.05	-0.03	-0.06
Chiba	21,541.01	0.024002	22,254.36	0.030864	-2.98	0.29	-2.96	0.17
Tokyo	102,100.05	0.014092	106,205.54	0.017547	-2.97	0.61	-2.93	0.47
Kanagawa	34,875.89	0.017364	35,156.47	0.022615	0.00	0.00	0.00	0.00
Niigata	11,212.80	0.015711	12,012.48	0.019462	-0.03	-0.45	-0.06	-0.56
Toyama	5,621.49	0.017189	5,963.56	0.022475	-0.02	-0.09	-0.04	-0.20
Ishikawa	5,736.78	0.014321	6,091.27	0.017506	-0.01	-0.08	-0.03	-0.11
Fukui	4,355.14	0.015013	4,702.27	0.018632	-0.02	-0.13	-0.05	-0.14
Yamanashi	4,227.19	0.022689	4,531.06	0.030086	-0.03	-0.15	-0.08	-0.11
Nagano	11,124.11	0.016483	12,067.83	0.019708	-0.04	-0.32	-0.08	-0.38
Gifu	8,889.58	0.013335	9,380.58	0.017109	-0.01	-0.06	-0.03	-0.08
Shizuoka	21,458.73	0.014323	23,056.80	0.017831	-0.04	-0.75	-0.08	-1.03
Aichi	45,268.99	0.017380	48,334.39	0.021810	-0.05	-0.49	-0.11	-0.61
Mie	11,370.64	0.020019	12,592.62	0.023747	-0.07	-0.85	-0.15	-1.19

Note: Average is billion yen.

Table 7: Post-shock average and coefficient of variation of GDP of each prefecture after the Monte Carlo experiment (2)

	Result				Change of pre shock (%)			
	2015		2020		2015		2020	
	Average	CV	Average	CV	Average	CV	Average	CV
Shiga	7,746.28	0.029664	8,277.58	0.034395	−0.03	−0.16	−0.08	−0.11
Kyoto	11,883.53	0.017074	12,507.26	0.020541	−0.02	−0.19	−0.05	−0.21
Osaka	42,784.28	0.017802	43,727.12	0.022065	−0.01	−0.28	−0.02	−0.41
Hyogo	21,642.32	0.032464	21,979.01	0.038322	−0.03	−0.08	−0.06	−0.17
Nara	4,477.98	0.021391	4,701.04	0.026169	−0.02	−0.09	−0.04	−0.12
Wakayama	3,793.70	0.017328	3,984.50	0.021978	−0.01	−0.04	−0.03	−0.02
Tottori	2,566.87	0.015865	2,734.37	0.020225	−0.02	−0.01	−0.04	−0.05
Shimane	3,183.52	0.017328	3,463.23	0.021080	−0.02	−0.16	−0.04	−0.10
Okayama	8,843.48	0.026146	9,290.08	0.033655	−0.03	−0.27	−0.06	−0.37
Hiroshima	13,758.88	0.019019	14,356.98	0.022735	−0.02	−0.36	−0.04	−0.55
Yamaguchi	7,003.39	0.014043	7,521.13	0.017011	−0.03	−0.56	−0.06	−0.74
Tokushima	3,303.00	0.023435	3,548.21	0.028180	−0.03	−0.06	−0.06	−0.08
Kagawa	4,269.34	0.023378	4,485.50	0.029801	−0.02	−0.04	−0.04	−0.02
Ehime	6,094.82	0.019042	6,513.26	0.022714	−0.02	−0.08	−0.04	−0.17
Kochi	2,754.20	0.028455	2,926.02	0.035205	−0.01	0.00	−0.03	0.01
Fukuoka	21,303.86	0.011892	22,393.75	0.015006	−0.02	−0.29	−0.03	−0.35
Saga	3,819.44	0.016779	4,166.11	0.020495	−0.03	−0.25	−0.05	−0.22
Nagasaki	5,219.79	0.013784	5,581.88	0.017815	−0.01	−0.07	−0.03	−0.12
Kumamoto	6,965.57	0.011415	7,392.42	0.014712	−0.01	−0.09	−0.03	−0.16
Oita	5,910.23	0.013494	6,459.91	0.015912	−0.02	−0.22	−0.05	−0.25
Miyazaki	4,286.71	0.017212	4,561.59	0.020876	−0.02	−0.03	−0.04	−0.05
Kagoshima	6,875.79	0.014995	7,451.74	0.018581	−0.01	−0.06	−0.03	−0.06
Okinawa	4,130.53	0.020992	4,289.80	0.026985	−0.01	0.02	−0.02	0.00
Total	607,683.54	0.003907	638,661.93	0.005068	−1.20	−0.07	−1.20	−0.14

Note: Average is billion yen.

Table 8: Multiplicity of distribution pre and post shock (%)

	2015	2020		2015	2020
Hokkaido	97.67	97.00	Shiga	96.33	94.67
Aomori	30.00	36.33	Kyoto	98.00	95.67
Iwate	1.67	5.67	Osaka	99.00	97.00
Miyagi	0.00	0.33	Hyogo	97.33	94.33
Akita	96.00	96.33	Nara	98.00	95.00
Yamagata	96.00	95.33	Wakayama	97.33	96.33
Fukushima	0.00	0.67	Tottori	98.00	96.33
Ibaraki	15.67	25.67	Shimane	99.00	95.33
Tochigi	98.67	97.33	Okayama	97.00	96.00
Gunma	98.00	96.67	Hiroshima	97.00	94.33
Saitama	98.67	97.33	Yamaguchi	97.67	93.67
Chiba	50.33	63.33	Tokushima	96.00	93.33
Tokyo	30.00	38.67	Kagawa	97.00	96.67
Kanagawa	100.00	99.00	Ehime	95.67	96.33
Niigata	97.33	94.67	Kochi	97.67	96.00
Toyama	98.33	95.67	Fukuoka	98.33	98.33
Ishikawa	97.67	97.67	Saga	97.33	95.33
Fukui	97.67	98.33	Nagasaki	98.33	96.33
Yamanashi	97.00	93.67	Kumamoto	97.67	97.00
Nagano	96.00	95.67	Oita	97.33	97.00
Gifu	98.33	97.00	Miyazaki	98.00	97.33
Shizuoka	97.33	94.33	Kagoshima	98.00	96.67
Aichi	97.67	91.33	Okinawa	99.33	98.00
Mie	96.00	92.67			

Appendix figure: Prefectures in Japan

PUBLIC PERCEPTIONS OF POLITICAL AND ECONOMIC TRANSFORMATION IN CROATIA AND BIH: A PILOT STUDY *.

Joel I. DEICHMANN
PhD (corresponding author), Bentley University, 175 Forest Street Waltham, MA 02452 USA, (+001) 781.891.2745, e-mail: jdeichmann@bentley.edu

Shivam SENJALIA
Bentley University, 175 Forest Street Waltham, MA 02452 USA, (+001) 781.891.2745, e-mail: senjali_shiv@bentley.edu

Abstract

Following successful accession to the European Union by many countries labeled "transition economies", the definition of Europe's transition zone (or, its modern "frontier") continues to shift. Some of Yugoslavia's successor states continue to struggle as independent entities in the wake of the country's dissolution. Leaders in the Republic of Croatia and the Federation of Bosnia and Herzegovina (BiH) mapped out their return to Europe and have achieved varying levels of success, offering excellent laboratories for comparative assessment of ongoing transformation. As we approach the end of the second decade since the signing of the Dayton Peace Accords, and as Croatia prepares for its own 2013 EU accession, we attempt to better understand interrelated contemporary issues ranging from socio-economic wellbeing to contentment with government. Of particular interest is the prospect of EU accession given the ongoing global recession and widespread uncertainty surrounding the Euro. Our approach entails primary data collection through brief interviews with residents in localities of Croatia as well as Sarajevo, BiH, followed by an analysis of qualitative and quantitative responses. With Croatia's imminent entry to the European Union, problems of economic diversification continue. In BiH, stagnation persists two decades after independence, and the failure of leaders to embrace transparency and generate a shared national consciousness continues to stymy public confidence and domestic growth while dissuading foreign investors.

Keywords: Transformation, Balkan Economies, Croatia, Bosnia
JEL Classification Codes: 05, P2, R1

1. Introduction

Efforts in the Republic of Croatia and Bosnia and Herzegovina (hereafter "BiH") to converge toward European standards of living are ongoing. While considerable research has attempted to evaluate progress toward that goal, the present paper investigates perceptions of citizens in both countries. This descriptive paper bridges quantitative and qualitative approaches in order to assess the state of political and economic affairs in both countries. Findings are based upon interviews carried out during May 2012 with residents of major cities including Zagreb and Sarajevo.

To better understand the context of Croatia and BiH, we begin with a brief overview of the countries. As nation states, both are young, having just gained their independence from Yugoslavia in 1992. Both countries are considered to be emerging middle-income states, although Croatia's economic situation is relatively stronger than that of BiH, as evidenced by its per capita GDP, cumulative FDI, and imminent (2013) accession to the European Union. Table 1 provides important background information for comparison.

Table 1: Overview of Basic Data

Country	Population (thousands)	Area (km sq)	GDPppp (bil USD)	GDP/cap (USD ppp)	Growth 2011	FDI stock 2009 (mil USD)
Croatia	4,480	56,594	79.30	18,300	0.0%	33030
BiH	3,879	51,197	31.57	8100	1.3%	7280

Source: CIA World Factbook, 2012; Hunya, 2010

Croatia's parliamentary democracy follows the civil law system, mimicking the civil codes of former Yugoslavia. Croatia's GDP per capita is $18, 300 (CIA, 2011) heavily concentrated in the services sector, which dominates 70.1% of the economy. An emerging federal democratic republic, BiH is organized into two first-order administrative divisions (the Bosnian-Croat Federation and the Serbian Republic and the internationally supervised district of Brčko. BiH's three presidency members represent the country's population of Bosniaks, Croats, and Serbs, and each president rotates every eight months.

Figure 1: *Location of Croatia and BiH and their major cities*
[Cartography by Joel Deichmann]

The locations of Croatia and Bosnia location in the Balkan Peninsula are presented in Figure 1. Prior to independence, Croatia and BiH existed as republics in the former Federal People's Republic of Yugoslavia along with Serbia, Macedonia, Slovenia, and Montenegro and the two autonomous provinces of Kosovo and Vojvodina. Yugoslavia had been formed after the dissolution of the Austria-Hungarian Empire in 1945 under the rule of Prime Minister Josep Broz Tito (Judah, 2011). Communist Party president and war hero Josip Broz was able to keep Yugoslavia unified since its formation in 1945, until his death in 1980. Broz, known for his authoritarian approach to leadership, is also known as "Tito", a nickname derived from the Serbo-Croatian expression "you (do) that". Tito's tight control, although oppressive at times, kept the country united. Yugoslavia was communist but contrary to

Soviet communism, it was the most free of the communist states at the time and it remained a popular tourist destination. Each republic managed its own affairs, while being monitored by Tito, who carefully and forcefully established a functioning union amongst the South Slavs by discouraging ethnic nationalism. Tito cultivated a Yugoslav "brotherhood" that was above ethnic differences. During the Cold War between the Soviet Union and the United States, Tito's vision of a "third way" enabled Yugoslavia to work with both East and West without being formally united. Tito did not leave a successor to continue his work and as feared, Yugoslav unity started to dissolve soon after Tito's death. Violent acts began to take place between citizens as demand escalated for sovereignty in the republics. Tito had declared that if the provinces were to become independent, they were to do so by a referendum. This led to fracturing along ethnic lines, with relatively "central" BiH left as the most ethnically heterogeneous republic. The more ethnically homogeneous republics of Slovenia and Croatia declared independence, prompting what remained of Yugoslavia (centered on Serbia) to declare war. By 1992, Yugoslavia was in the process of dissolution, and multiethnic Bosnia's declaration of independence resulted in the country becoming the epicenter of conflict as its large Serbian minority was determined to remain within Yugoslavia and create a greater Serbia. Bosnian Serbs received help from extremists groups in Belgrade, which began to drive Muslims out of their homes and engage in *ethnic cleansing* (BBC, 2006).

Although civil wars had broken out in Slovenia and Croatia, Bosnians did not believe they would suffer the same fate, so they did not prepare for war (Cviić and Sanfey, 2010; Demick, 2012). When Bosnia was first attacked, it lacked a standing army, and its capital of Sarajevo faced the added disadvantage of being surrounded by mountains. A three-way war between Bosniaks, Serbs, and Croats began, and Sarajevo lay under siege for three and a half years. The war in Bosnia continued until 1995, when Americans applied pressure to end the war; eventually leading to the Dayton Peace Agreement in November. The settlement's goal was to establish the sovereignty of BiH and to protect human rights among its citizenry.

2. Literature

In attempting to find answers for our research questions, we take a brief look at a wide range of literature, including political and economic transition, and even the growing body of scholarly work on national happiness. The notion of "happiness" is relevant to our inquiry to the extent that people respond subjectively to questions based upon how they feel about their own situation, which of course is informed by culture and values.

Cviić and Sanfey (2010) offer an excellent overview of political change and economic progress in the Balkan region since the 1990s, placing the comparative transformations into historical context. Although emerging from the same Yugoslav system, the countries progressed in very different ways. To a large extent, the authors attribute economic wellbeing to political changes that have taken place since the dissolution of Yugoslavia, with Slovenia enjoying the most growth followed by Croatia, while BiH lags at the other end of the continuum, just ahead of Europe's poorest state, Albania.

Counter-intuitively given Yugoslavia's violent demise and the ongoing global recession, most Balkan countries have been successful at achieving and maintaining economic growth over the past two decades. In fact, between 2001 and 2008, the average weighted growth in the region equaled or exceeded that in Central-Europe and the Baltics every year (Cviić and Sanfey 2010, 135). Unfortunately, BiH has had one of the hardest times gaining back its economic activity following the war. The authors point out that during four years of conflict, economic activity fell by up to 80 percent. To the extent that BiH has seen a turnaround since 1995, it is largely attributable to investment in the steel industry. According to the authors, BiH still requires six to seven years of recovery to surpass its 1989 level of economic output. In addition, the Balkan region continues to project a negative image, and this obstacle must be overcome. Cviić and Sanfey (2010, 124) argue that the very mention of the Balkans "conjures up troubled images of war and conflict, rather than investment opportunities and economic potential". Such statements demonstrate the war's true toll on the country, not just in terms of deaths and injuries.

We now take a brief look at the recent literature summarizing research on the political situation and economy in each country.

Government

As newly independent states, Croatia and BiH both struggle to establish national identity and legitimacy. In the Balkan *shatterbelt* region, this task can be particularly onerous, and in the past has been accomplished for an enduring time period only under Josip Broz Tito's heavy hand. The Croatian government has a long history of changing hands. In 1918, the territory that is now Croatia and BiH was part of the new Kingdom of the Serbs, Croats, and Slovenes, and later became Yugoslavia. After World War II, Josip Broz Tito manipulated Yugoslavia's nascent independence to create a communist regime. Following independence on 25 June 1991, the Republic of Croatia was declared and Franco Tudjman was inaugurated as the first president. Currently, Croatia is ruled by the "Kukuriku" four-party coalition, led by Social Democrats and their PM Zoran Milanović. Croatia's stable democracy lent credence to the republic's European Union (EU) accession efforts, which are rewarded by its 2013 accession as the 28th member.

BiH's governmental structure is generally considered to be confounding and ineffectual (*Economist,* 2012). The country is governed by a Parliamentary Assembly that was established by the Dayton Peace Accords, which were imposed by foreign powers (notably the USA) in an effort to stem the bloodshed of the Civil War. As the highest authority in the country, parliament has a bicameral structure, consisting of fifteen members that form the House of Peoples and 42 members that for the House of Representatives. Representation in the House of Peoples is divided equally between Croats, Bosniaks, and Serbs while representation in the House of Representatives is comprised of 28 members from the Federation of BiH and the remaining fourteen seats go to the Republika Srpska (RS). Assemblies serve for a term of four years. After nearly two decades since independence, and more than a year without a government, the BBC (2012) argues that BiH still needs "create a functional state". It is worth noting that a 2010 Gallup poll found that more than 88 percent of RS's residents favor independence from BiH (*Gallup Balkan Monitor*, 2010).

McNeil, Herzog, and Cosic (2009) offer a thorough overview of citizen perception of local government effectiveness based upon in-depth interviews and household survey questionnaires throughout BiH. The authors find that citizens are only now beginning to recognize their rights to criticize government and demand improvement in services. The authors attribute widespread skepticism toward government to a belief that they do cannot make a difference and to a limited knowledge of government processes. Only 20 percent of respondents are willing to participate in local government, and 70 percent believe that local government decisions never or almost never reflect their priorities. Moreover, the authors point out that women are particularly underrepresented in participatory processes. McNeil et al. (2009) conclude that the onus is on government to affect change by educating and motivating the citizenry, and soliciting suggestions through open meetings.

Similarly, we are interested in how citizens feel with regard to their national government, which as we discuss(ed) earlier is handicapped by a complex and unwieldy structure as set forth by the Dayton Accords (Economist, 2011). We therefore ask respondents what the most important issues are facing their national government, and how satisfied they are with government's effectiveness. We further probe whether respondents believe the necessary progress can be achieved by the present leadership (in the case of BiH, multiple presidents). In Croatia, we ask about the effectiveness of the Kukuriku Coalition. In light of Transparency International's (2011) ranking of Croatia and BiH as the 66th and 91st most corrupt countries, respectively, we ask whether respondents have a reason to believe that this is the case.

Corroborating Transparency International's (2012) rankings, the BBC (2012) reports that corruption and organized crime remain major impediments to EU accession. For this reason, we inquire whether respondents believe government corruption will continue to have an impact on the country or the broader European Union after eventual accession. With the

responsibility to uphold the rule of law, a country's judicial system is intended as a stalwart against corruption. We therefore ask for public perceptions of respective judicial systems, requesting specific examples of known corruption among public officials or in everyday life,

European Union Accession

As a supranational political and economic entity that embodies for many the notion of "successful transition", the European Union warrants our attention here. Several Balkan countries have been seeking membership since Yugoslavia's dissolution (Bechev, 2012), including Croatia and BiH, which represent only two of eight countries working toward EU membership (European Union, 2012). According to Domm (2011), European Union accession involves a conversation about the economic condition of candidates, as well as preparedness and willingness to adopt the euro. In January 2012, a referendum in Croatia resulted in a two-to-one vote in favor of joining the European Union (Castle, 2012), albeit with a meager 43 percent voter turnout.

According to accession rules and the *Acquis Communautaire*, all new members after 2004 must adopt the euro as their currency (European Commission, 2012). Croatia's imminent accession in 2013 also begs the question of the suitability of membership for its Balkan neighbors. BiH trails Serbia, Montenegro, and the former Yugoslav Republic of Macedonia (FYROM) in accession progress and is not expected to be admitted anytime soon. The ongoing Euro crisis only compounds the legacy of the 1990s war, with differential implications for successor republics, and remembering that BiH was the conflict's epicenter (Panagiotou, 2010; Bechev, 2012).

Currently, BiH remains at "potential candidate" status for EU accession. Following the signing of the bilateral Stabilization and Association Agreement ("SAA"), BiH made significant strides in resolving issues brought forward by the EU. However, in order to achieve full "candidate" status, the last unresolved condition remaining is the so-dubbed Sejdić-Finci amendment, resulting from a 2009 case in the European Court of Human Rights, where Jakob Finci, a Jew, and Dervo Sejdić, a Roma, were found to be discriminated against by the BiH constitution. In the current constitutional provisions, the presidency and upper house of Parliament are reserved for members of the Serb, Croat, and Bosniak ethnic groups, rendering anyone in the "other" category ineligible for election. Since this finding by the European Court of Human Rights in 2009, BiH has been unable to reach an agreement between its six political parties on the implementation of an amendment to resolve this barrier to EU entry. If the issue is resolved, the country will be granted "candidate" status, and will be permitted to proceed in accession preparations (Adelina-Marini, 2012). In the meantime, BiH already benefits from its associate status with the EU, as this affiliation underwrites Bosnia's reputation and builds global confidence in the country (Mustafic-Cokoja 2012). A recent Gallup poll (*Gallup Balkan Monitor,* 2010, 8) reveals some optimism, as the average date expected by BiH citizens for their country to become a full member of the EU is 2018.

Croatia was awarded EU "candidate" status on 18 June 2004 after six years of negotiations closed. The republic's entrance to the EU is scheduled for 1 July 2013, making Croatia the second Yugoslav successor state to join the EU after Slovenia. Croatia's accession was delayed by organized crime issues, but over the past few years the country managed to capture its highest profile targets. However, economic concerns remain both in the EU and in Croatia. The EU still languishes in the midst of the financial crisis, as leaders struggle to avoid being dragged down by debts of existing members such as Greece, Italy, Spain, and Portugal (Lekic & Gec, 2011). Another concern is that Croatia has been reluctant to undertake deep fiscal reforms. Moreover, Croatia is required to conform to European Commission standards, requiring appointment of judges and state prosecutors that will result in more "transparent" judicial systems, as well as making "high-level corruption investigations more thorough" (BBC, 2012).

Although Croatia's accession referendum has been upheld by a two-thirds majority of voters in that country, concerns remain about the direction of the country. For this reason, we inquire why respondents take their chosen position in favor of or against EU membership, and

what the implications are for other successor states of Yugoslavia. We further ask about concerns related to the euro crisis in Southern Europe, and whether Croatia after accession might exacerbate the problem or be part of the solution.

Economy

Croatia's July 2013 European Union accession has been approved by the 27 member states and upheld by a domestic referendum, but budget deficits continue to threaten growth. According to the Croatian Bureau of Statistics (2012), gross external debt reached 44.6 billion Euros in 2011. Compounding the debt problem is a trade deficit of 6.7 billion Euros, signaling the relatively small economy's overdependence upon foreign goods.

Often at the expense of agriculture and manufacturing (Benacic, 2012), Croatian policymakers deliberately placed a heavy emphasis upon tourism, particularly from other countries (Ministry of Tourism, 2003). However, this creates a dependency upon income that is subject to the economic wellbeing of people in other countries, and most of Croatia's tourists come from Europe. The Croatian Bureau of Statistics (2012) provides very detailed data on the country's economic composition, with extensive reference to the tourism industry. Although the Ministry of Tourism (2011) and the World Travel and Tourism Council (2012) estimate tourism at approximately one quarter of Croatia's GDP, the industry is difficult to track because it transcends so many categories (such as transportation, hotels, restaurants), and is considered to be a subset of the "service" sector. Services represent nearly two-thirds of the country's employment and GDP, compared with less than manufacturing and less than three percent in agriculture. The World Bank estimates international tourism in Croatia at over 35 percent of total exports in 2010, and has at times represented as much as half of all exports.

According to the UNWTO (2012), foreign tourism numbers have risen tremendously in the last decade and continue to progress from Croatia's stature, along with France, Italy, and Spain, as one of the most desirable destinations in the world (Škuflić and Štoković, 2011). The government has attempted to maximize the country's competitive advantage in tourism by focusing upon that sector (Ministry of Tourism, 2003). When Croatia joins the EU in 2013, the expectation is that arrivals and receipts will accelerate, as citizens of more member countries could cross freely into the country, yielding foreign exchange and revenue for Croatia's economy. Three quarters of tourists already originate in EU countries, with an even higher number projected following accession.

According to the UNWTO (2012, 7), international tourism arrivals to both countries have grown at about ten percent each of the past two years (2009-2011). However, Croatia attracts over nine million tourists per year, while BiH has yet to surpass 400,000 during any single year. Similarly, international tourist receipts in 2011 favor Croatia ($9.185 billion) over Bosnia ($628 million). Given tourism's importance in Croatia's economy, it warrants special attention in this paper. Croatia is a popular destination for tourists from around the globe due to its geographic advantages of climate and scenery. In 2011, it attracted 9.1 million visitors, resulting in $9.2 billion in tourist expenditures (UNWTO, 2012). Croatia's Ministry of Tourism (2011) estimates the receipts in recent years to be approximately 22 percent of the Country's GDP.

In recent years, the economic growth generated by the tourism industry in Croatia is a sign of great potential for the country to further enhance its status as a popular destination. The survival of Croatia's tourism industry depends on monitoring current trends and recognizing areas of potential investment and new market/infrastructural opportunities. As evidence of successful planning, the Ministry of Tourism (2011) reports that since 1999, the number of visitors has enjoyed 20% annual growth per year until the economic crisis hit. Škuflić and Štoković (2011) assess the growing impact of tourism in Croatia's economy as well as increasing demand, substantiating data that show its growth is faster than that of the rest of the economy. They point out that 75.2% of tourists come from within Europe. Drilling down into these numbers, it is interesting to consider the breakdown of the origins that contribute to Croatia's tourism inflows in 2009. The leaders include Germany (22.7%),

Slovenia (11.2%), Italy (10.2%), Austria (8.9%), Czech Republic (8%), and Poland (5.4%). All of these countries are members of the European Union, and at least parts of most of them are successor states of the Austro-Hungarian Empire or Yugoslavia.

According to Naef (2011), although war slowed international tourism to a virtual standstill in the 1990s, its memory and the scarred landscape now provide an opportunity to grow "dark tourism" in such epicenters of conflict as Vukovar and Sarajevo. Naef (2012) further examines media coverage and popular films as a means of popularizing the Balkan "powder keg" and explores the effects of exploitation by certain actors.

Happiness

In order to capture perceptions of political and economic realities, it is instructive to consider the issue of happiness, especially when obtaining responses from a population that was traumatized by recent war. Primo Levi (1995) states that "sooner or later in life, everyone discovers that perfect happiness is unrealizable, but there are few who pause to consider the antithesis: the perfect unhappiness is equally unobtainable". Although written about the Holocaust, this passage has equal applicability to the Balkan War, as it is appropriately echoed in Demick's (2012) *Logavina Street*[6].

Measures of happiness represent a growing literature that complements economic measures of wellbeing (Brooks, 2008; Wiener, 2008). Demick (2012) portrays Yugoslavia as a "happy" country prior to the 1990s conflict, and the 1984 Olympics showcased Yugoslavia's peaceful coexistence on a global stage, leaving the impression among foreigners that this multi-ethnic confederation is an extraordinarily happy place. The World Database of Happiness (Veenhoven, 2010) lists BiH as a 5.6 and Croatia as a 6.0, on a scale of 0-10 (Costa Rica being the happiest at 8.5). In another study according to the World Values Survey (2012), Croatia is the 31st happiest country in the world. To our respondents, we explain that we are interested in learning more about their level of happiness as their countries emerge from the war.

3. Methodology

Following Sayer (1993), this pilot combines elements of both qualitative and quantitative approaches, employing empirical data from statistical agencies as well as semi-structured survey responses. While most research designs conform to either positivist or realist techniques, Sayer (1993) argues that these methodologies are not mutually exclusive. The advantage of combining both approaches is arguably to treat their individual shortcomings; using existing datasets allows us to glean the big picture, and but with semi-structured interviews we are able to probe for more details.

The main purpose of this exercise is to better understand the intricacies of Balkan citizens' perspectives on current events through face-to-face conversation. Our interview script is formatted in a flexible fashion and administered in a casual setting in order to invite context-specific comments and facilitate probing when necessary. Interviews are given by groups of two or more students in social situations in Zagreb, Sarajevo, Mostar, and Dubrovnik (see Figure 1), and both the interviewers and the respondents are instructed to forgo answering any questions that might make either party uncomfortable. Our questions relate to contemporary politically-themed topics of government and regulation, as well as the more economic themes of corruption, tourism, and happiness[7].

Interview responses are then coded, tallied, and analyzed in order to capture a better picture of the overarching trends in opinion toward government, regulations, economy (with special emphasis on tourism) and overall happiness.

The sample size of our pilot is twenty (eight in Croatia, twelve in Bosnia-Herzegovina). In addition to opinions, we requested basic demographic data. The average age

---

[6] The book *Logavina Street* tells the story of several individuals and families who lived on Logavina Street, a main street in the center of Sarajevo, Bosnia, during the war. This novel does not try and find ways to make the war sound better and talk about the happiness seen in every one's daily life; the author states factual instances that happen to people that lived on this street in Sarajevo during the war.
[7] A copy of the interview script/survey instrument is available from the authors upon request.

of respondents in Croatia is 39 (four female, three male, one undeclared), and 27 in BiH (six female, two male, and four undeclared). About half of the respondents are students, with the others listing occupations as painter, sales, cashier, baker, journalist, professor, project manager, neuropsychologist, NGO worker, and economist. They currently reside in Ploče, Dubrovnik, Sarajevo, Neum, Banja Luka, and Zenica.

4. Analsyis

a. Government

The government situations in Croatia and BiH are very different. Croatia is a Republic on the verge of joining the European Union, while BiH remains under supervision by the international community following the imposed Dayton Accords, and according to Štiks (2011), is "effectively a semi-protectorate". Bieber (2011) raises concerns that as recently as 2010, a Gallup poll found that more than 88 percent of the respondents in the RS would prefer independence from their multi-ethnic state. This section summarizes the interview responses provides an analysis of interview responses as interpreted by the authors. Given the importance of government's role in the transformation of the Western Balkans, our questions address satisfaction levels with the present government. On a scale of 0-10, the average score for satisfaction among Croats is 4.14, while for Bosnians it is 2.01.

Our second question asks respondents where they believe government policy priorities should lie. Figure 2 illustrates the responses.
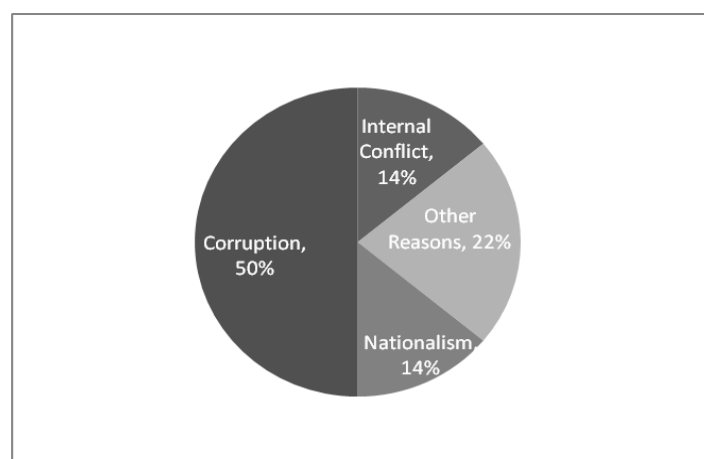
Figure 2: *Policy Priorities: Most Important Issue Facing Government*
Source: fieldwork by research team May 2012, N=19

Half of the respondents in Croatia and BiH believe that the most important issue facing their respective national government is corruption. Many people feel that nepotism in government is widespread, and that manipulation is common in bureaucracies that administer laws. Other issues that prevail are nationalism (14%), which can be defined as the enforcement of a non-native identity upon people. Especially following the breakup of Yugoslavia, a stronger nationalist mentality has emerged in the newly formed states, and in BiH, affiliation is split mainly between Serbs and Bosniaks. Internal conflicts represent 14% of the responses, and derive from the inability of their government to establish and enforce regulations. Following months without a consensus on leadership (*Economist,* 2011), we find that Bosnian citizens remain frustrated with an ineffectual government run by three different presidents; while others express consternation that rules are slow to establish and properly implement.
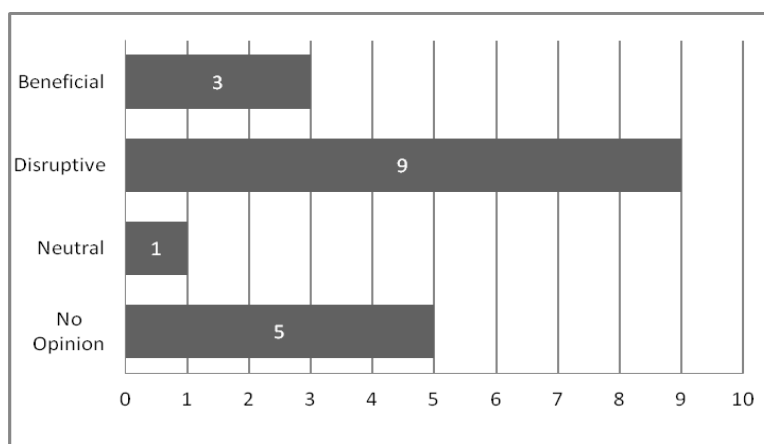
Figure 3: *Difficulty of Starting a Business*
[Source: fieldwork by research team May 2012, N=18]

When asked whether government facilitates or hinders the creation of small businesses, many believe the process is very arduous and discouraging. Calling it a "complicated procedure" and in one case claiming that "corporations are killing small [business] production", respondents believe doing business has become so exasperating because of their national economic situations. Others decline comment on the situation, possibly because of lack of knowledge of how to start a business. In a few cases respondents argue that government does assist business, especially in regions such as Dubrovnik where tourism is much more prevalent.

Our final question with regard to government is the expectation for effectiveness over the next five years. Respondents in both countries are extremely pessimistic. With responses ranging from -2 (much worse) to +2 (much better), the mean score in Croatia is -0.14, while respondents in BiH average -0.9 (a solid "slightly worse"). Most of those in Croatia who indicate a basis for their expectation cite the role of the EU in reforming their own government, while the widespread pessimism in BiH is justified by a solitary respondent, who simply states "I hate our government".

b. Regulation and Corruption

Given a considerable level of difficulty for well-established countries to determine appropriate business regulation strategies that promote economic growth, it is unsurprising that Croatia and BiH, which continue their dramatic transformation from socialist economies toward capitalism, are not particularly healthy in their own business regulation strategies. One example of this is the dubious process of privatization that continues to plague Croatia, where it is widely known as "legalized theft" (Benacic, 2012). Perceptions of corruption are presented in Figure 4.
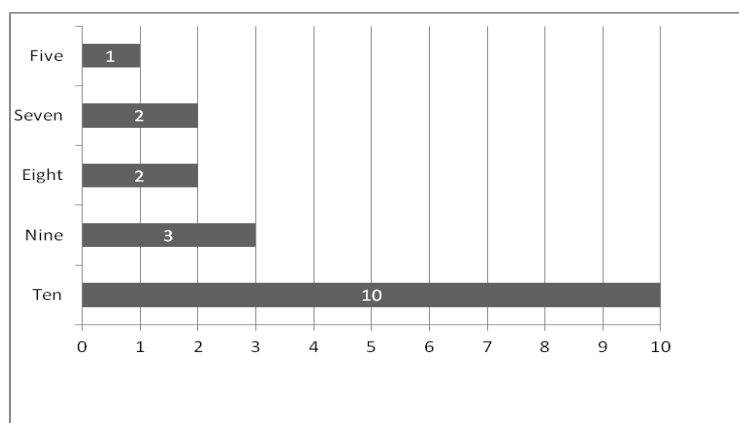
Figure 4: *Perceived Scale of Corruption (Scale of 0-10)*
[Source: fieldwork by research team May 2012, N=19]

Based on the opinions of a combination of individual citizens, business executives, government administrators, we find that Croatia and BiH both possess unhealthy bureaucratic systems. The systems are generally not conducive for growth of small and medium sized enterprises (SMEs), although Croatia's business environment seems to be relatively more favorable than that of BiH. Because of their size, large businesses are more noticeable to government administrators, and they are therefore better equipped to deal with the bureaucratic infrastructure and develop strategic personal connections with politicians. Nevertheless, even large enterprises are dissatisfied with the implementation of laws in the present regulatory environment. A thirty-one year old project manager at a large employer is among the seventy-three percent of respondents in Bosnia who gives "corruption" a score of "10", signifying that it is a problem of utmost importance (the remainder assigned the number of "9" to corruption.

Government corruption is an issue facing many legislatures around the world, to the detriment of society. In BiH and Croatia, government corruption is viewed as widespread, and regarded as major obstacle to economic progress. According to some respondents, nepotism is one of the most common examples of government corruption. Particularly in BiH, we observe an abundance of jobs created as "secretaries" for all levels of political positions, representing what many believe to be careless government spending. Corruption occurs elsewhere when legislatures give unfair tax breaks to corporate partners, creating an unfair advantage to big businesses over the working class population.

Based on comments from the Bosnian parliament's administrative employees as well as members of the Foreign Investment Promotion Agency (FIPA) the country has one of the most bloated, if not *the* most bloated, system(s) of government in the world (Mustafic-Cokoja, 2012). As articulated in more detail by Cviić and Sanfey (2010), this structure was established by the Dayton Accords in 1995. The most urgent purpose of the agreement was to establish and maintain immediate peace between the Serb, Croat, and Bosniak ethnic majorities, but little thought was given to ongoing long-term effective governance.

As indicated by several of our respondents, one of the government's largest shortcomings is the complexity of administrative procedures and bureaucracy. Further compounding multiple levels of authority, permits are required for actions ranging from starting a business to marketing. In BiH, it is a notoriously difficult and lengthy process to apply for and obtain those permits. The granting of permits is decidedly non-transparent (Mustafic-Cokoja, 2012), and even if it were, many individuals surveyed cite great difficulty in understanding the system.

Convoluted administrative procedures necessary for operating a business discourage some foreign investors and inhibit the growth and development of SMEs within the country. To further complicate the situation, the political and economic turmoil that prevailed following BiH's independence in 1992 muddled the privatization process. The government lacks a complete set of records for land and property ownership, leaving businesses with a tangle of ownership issues to unravel when attempting to purchase and develop property

(Mustafic-Cokoja, 2012). Some survey respondents lament that contract enforcement by the judicial system takes too long, thereby placing businesses at a disadvantage when conducting transactions and forming agreements with other companies.

Although the regulatory environment is difficult enough to navigate in its current form, bureaucracy's lack of transparency creates an environment where corruption flourishes. Government employees are generally perceived by the public as giving preferential treatment to friends and close associates, making permits more difficult to obtain for SMEs businesses owned by individuals who do not enjoy the benefit of connections. This finding is strongly supported by our survey results, as 91% of respondents rate government corruption at the dire level of at least 9 or 10 ("worst"). Some go on to complain that unfair tax breaks and laws tend to be implemented for "connected" corporations. Furthermore, our interviews reveal that bribe money exchanges hands at an alarming rate, making fully legitimate transactions more difficult because administrative officials often show preference to businesses that come "bearing gifts", a problem that FIPA Senior Advisor Mustafic-Cokoja (2012) confirms.

The country's judicial system does little to solve these issues, and our respondents blame its ineffectualness and inefficiency. On average, our respondents rate the effectiveness of the BiH judicial system at 2.9/10, compared with 6.2/10 in Croatia. Probing deeper into these low scores, we find that numerous cases concerning allegations of corruption in the government remain in pending status for exceedingly long periods of time, and it is widely assumed that money changes hands to ensure convictions never occur.

Indeed, Croatia's regulatory environment is significantly healthier than that of BiH, as evident by its fulfillment of requirements for EU accession. However, some of the problems in BiH plague Croatia as well. Croatia has yet to streamline its daunting bureaucracy and permitting processes, and exhibits little transparency beyond minimum EU standards, detracting from its attractiveness to foreign firms (Deichmann, 2013). Corruption also survives in Croatia's bureaucracy, but compared to BiH we observe less concern among Croatian survey respondents. Many Croats believe corruption remains widespread, although they provide no concrete details on where it might be occurring.

An example Croatia's broken bureaucracy can be found in the case of Končar Power Transformers Ltd., which is required to pay a disposal tax on the oil included in their new power transformers, of which 95 percent are exported. Despite the fact that the oil is never disposed of in Croatia itself, Končar must pay this variable tax because the Croatian bureaucratic system does not provide a reasonable procedure for calculating the tax for exporters, relying solely on oil purchased in Croatia for use in manufacturing (Milčić, 2012).

Croatia taxes companies at a rate of approximately two-thirds of reported net profit. On the other hand, the country levies no capital gain tax, interest tax, real estate tax, nor property tax (Tica, 2012). This tax policy promotes more property and capital investments from companies, but may also lead to dubious accounting policies by companies seeking to reduce their tax burden. To further guide the economy, the Central Bank of Croatia sets a minimum interest rate standard. However, Sergio Resegotti, CEO of Banco Populare (2012) argues that these interest rates are irrelevant during the present period of economic contraction because banks have a tendency to set higher interest rates in response to increased risk.

Despite already having a free trade agreement with the EU, Croatia maintains close ties to former members of former Yugoslavia. After its EU accession, Croatia will be subject to the EU's internal standards for quality. This has the potential for negative economic consequences for both Croatia and BiH because Croatia relies on food imports from BiH, which has yet to meet the EU's food quality standards (Mustafic-Cokoja, 2012).

   c. Economy

Because the economy plays such a vital role in the lives of citizens, most people seem to hold a rather clear opinion about its condition. Wiener (2008) rightly points out that the economy can be a major consideration in overall societal happiness. For our purposes, we are interested in perceptions of the economy at the national, local, and household levels, and whether respondents believe that the overall outlook is positive, negative, or neutral, followed

by probing into the reasons underlying the prognosis.

With regard to perceptions on the economy, our target group in Croatia is slightly more optimistic than respondents in BiH. The questions focus upon the state of the national economy, the local economy, and the respondent's household economic situation, going on to ask about expectations for eventual EU accession and allowing for open-ended responses. Table 2 summarizes the results.

Table 2: *Perceptions of Economic Situation at Various Scales*

Country	National Situation?	Near future?	Local Situation?	Near Future?	Household Situation?	Following EU Accession?
Croatia	4.0	0.0	5.0	.29	5.57	-.67
BiH	2.5	-.71	4.0	-.54	6.21	.42

As presented earlier in Table 1, the 2011 standard of living measured by GDP per capita, purchasing power parity is higher in Croatia ($18,300) than in Bosnia ($8100). For this reason, it is no surprise that Croats have a higher opinion about their national situation than do respondents in BiH. Sadly, if we assume that a score of "5" represents the middle of the scale, respondents in both countries are pessimistic about their national and local economic situation, and Bosnians believe that it will get worse in the near future, both for their country (-.71) and in their locality (-.54).

It is heartening to observe that perceptions of household economic status are relatively positive, and in fact more positive in BiH (6.21) than in Croatia (5.57). Bosnian respondents believe that the impact of membership in the EU would be positive for their economy. In contrast, our Croat respondents believe that conditions will deteriorate after accession. At first sight, we might speculate that this pessimism results from relatively better current conditions in Croatia vis-à-vis BiH. This may also be a consequence of the limited size of our sample, or it could be related to jitters of imminence of accession. Now that Croatia has achieved admission, its citizens are faced with the reality that they will need to adjust to higher prices. This is part of a widespread and growing anxiety in accession candidates in the midst of crises in Greece and elsewhere that leads to what Rupnik (2011) refers to as "accession fatigue". Bechev (2012, 3) points out that "Balkan citizens are not in love with the EU; rather, they see it as something inevitable".
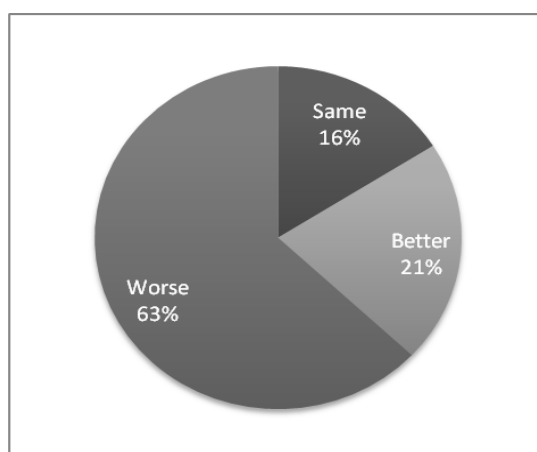
Figure 6: *Economic Outlook*
[Source: fieldwork by research team May 2012, N=19]

As shown in Figure 6, an overwhelmingly negative sentiment is evident in the region when respondents are asked to comment on their economic outlook over the next five years. More than 75% of respondents believe the economic state of their nation will either deteriorate or at best stay the same in the near future. However, as clarified in Table 1, contrasts are evident between the two countries under investigation. In Croatia, respondents

are virtually neutral (average of 0.0 on a scale of -2 to +2), while in BiH, they are rather pessimistic (average response of -0.708 on the same scale). Only one of twelve BiH respondents is slightly optimistic (even at the city and household level), and this person did not provide any demographic data or open ended responses in their questionnaire, so we are unable to speculate upon the reasons why.

Some of our respondents raise concerns that things will become more expensive after Croatia joins the EU. For example, a 25 year-old female sales associate in Dubrovnik laments that "if we join the EU, we will adopt the euro. Wages will stay the same but prices will be higher. (I live in) a big, tourist city with (already) high prices". This sentiment, which was echoed elsewhere in our fieldwork, provides an excellent segue to a deeper discussion of findings about the largest industry in the Republic of Croatia: tourism.

d.   Tourism

Although viewed as a priority in both countries, tourism is an especially significant cornerstone of Croatia's economy at 22 percent of GDP. The country's economy relies primarily on the service sector, as government policymakers in the new Republic emphasized tourism at the expense of agriculture and manufacturing, causing what Benacic (2012) sees as the "catastrophic decline of agriculture in the breadbasket regions of the former Yugoslavia". Indeed, several of our respondents argue that the economy needs more production of goods and manufacturing.

Other sectors of the economy aside, when people are asked about the role of tourism, almost 75% of people in both countries believe that it is very beneficial. Table 3 reports measurements of perceived impact from international tourism, following a framework first introduced by Getz (1977) and distinguishing between economic, socio-cultural, and environmental dimensions.

Table 3: *Perceptions of Tourism*

Country	Scale of Importance	Economic Impact	Social Impact	Environmental Impact	Future Increase or Decrease? (-2 → +2)
Croatia	9.57	+1.6	+1.0	+0.6	+0.3
BiH	8.55	+0.8	+0.9	+0.8	+1.2

As summarized in Table 3, Croats and Bosnians feel similarly about the importance of tourism in the economy, at 9.57 and 8.55, respectively, on a scale of importance ranging from 0-10. We find this interesting because in terms of income, the industry is so much more important in coastal Croatia than in nearly land-locked Bosnia, whose only seaside city is the resort town of Neum. Our respective groups of respondents seem to recognize this differential, however, as Croats estimate the economic impact of the industry at an average score of 1.6 on a scale ranging from -2 for very negative to +2 for very positive. Bosnians, on the other hand, actually value the social/cultural impact of tourism (+0.9) over its economic multipliers (+0.8).

We find that environmental impact of tourism is gauged to be moderately positive in both countries. Given that environmental impacts are often thought to be negative (for example, litter, pollution, and congestion), how can tourism impact a host country positively? Tourism can provide the economic resources to ensure that attractions, be they natural or man-made, are protected and preserved for a sustainable tourist industry in the future. Bosnians in particular expect the tourism industry to grow dramatically in the near future (+1.2 on a scale of -2 to +2, versus +0.3 in Croatia). Of course this is partly due to the virtual destruction of the industry in BiH during the war, and a rise is "dark tourism" in the present (Naef, 2011; Naef, 2012). A sociology professor from Banja Luka, BiH explains her expectation of "a lot" more tourists as follows: "the war is over and we are very attractive country". Moreover, a 31 year-old Sarajevo neuropsychologist comments that "I notice that

every year there are more people coming from the Europe and other parts of the world" (sic). In addition, as a 56 year old female cashier in Dubrovnik points out, Croatia's tourism future is subject to "limited capacity". The geographic advantage Croatia enjoys with its long Adriatic coastline and distance from much of the conflict means that the already successful industry may have little room for growth.

Given the importance of tourism in Croatia in particular, this industry warrants special analysis that goes far beyond the scope of the present paper. We therefore call for future research in this area, especially given the likelihood of the ongoing European crisis to further curtail traveling holidays.

   e. *Happiness*

As briefly mentioned in our literature section, a growing body of research examines the notion of "happiness" and its determinants. Because happiness is thought to be culture-specific, and no consensus exists upon its definition, our inquiry asks respondents in the Western Balkans what happiness means to them. Given the trauma that descended upon the Balkan region during the recent war, we find this to be a particularly revealing component of our research. The open-ended series of questions also helps us to probe into some of the aforementioned issues, and allows respondents to raise important issues that we have not anticipated. With reference to happiness, we ask our respondents what three things in life are most important to them, and what makes them happy. We go on to ask them to describe what they consider to be a good day. Finally, we ask them to tell us about the happiest moment in their lives.

Figure 5 summarizes the results. When asked what they consider to be most important in their lives, the top answer among our respondents was their personal health along with the health of their family. The second most important thing, at 37%, was loved ones (friends and family), with several references to children. Lastly, other important aspects mentioned include food, love, and wealth, and sunshine.
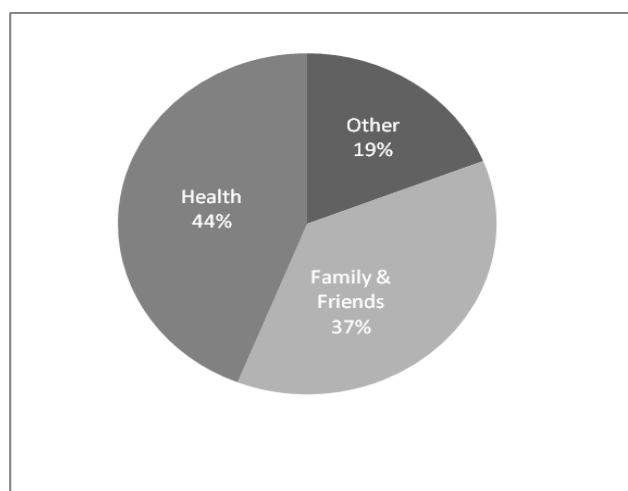
Figure 5: *Most Important Things in Life*
[Source: fieldwork by research team May 2012, N=19]

The open-ended responses also shed light on important events in life. A 20 year-old female in Dubrovnik describes her happiest memory as the day she got her job in sales. A 25 year-old male student from Zenica cites God as being most important in his life, and goes on to describe a perfect day as follows: "I wake up, drink coffee, have a shot, and begin my day". A 29-year old female economist from Doboj, BiH, describes her happiest memory as a birthday when her family gave her a watch inscribed with a reminder that she, her mother, her brother, her father, are a team that will be "together always".

Reflecting upon Weiner's (2008) *Geography of Bliss,* happiness is indeed defined differently in the Balkans. While the author associates happiness with different culture-specific priorities (such as wealth in Switzerland, deprivation in Moldova) in various case

studies, in no chapter of his book does he expound upon a culture with an emphasis placed on health, family, and friends as much as we observe in the Western Balkans. Because the data set for this aspect of our research is so small, more inquiry should be done on this topic to better understand the meaning of happiness, especially comparing the subtle differences between the two neighboring countries in our investigation.

5. Conclusions

By interviewing local citizens, companies, and government administrators, then tabulating and analyzing the responses, we conclude that both Croatia's and BiH's economies show great potential for the future. This is particularly true for Croatia, which has seen significant growth in its tourism industry, and will be positioned to take advantage of a consolidated market upon its 2013 entry the EU. BiH is not far behind, and some leaders are taking legitimate steps to resolve remaining barriers to efficiency and transparency in their over-sized bureaucracy. Of course, any optimistic appraisal of either country should be tempered given the ongoing European crisis and considerable frustration with reform as unveiled by the fieldwork presented here.

Indeed, a feeling of pessimism remains widespread amongst the region's citizens for many different reasons. In Croatia, this is primarily the result of the economic crisis that first struck Europe in 2008, and then came to the Balkans somewhat later. In Bosnia, pessimism endures as a result of the war, and is compounded by a sense of powerlessness thanks to the governing constraints imposed by the well-intentioned Dayton Accords (Štiks, 2011). Bosnians are vocally unhappy with their own government, but they have not yet given much thought to the implications of EU membership if they eventually join, a prospect that is looking increasingly threatened as "enlargement fatigue" mounts among the existing 27 members (Panagiotou, 2010). Indeed, by some accounts (Bieber, 2011) the very future of BiH remains in question. However, some of our survey respondents still believe that EU accession will be beneficial because better legislative structures are associated with SSA compliance.

EU membership could also potentially help Croatia's economy by easing the process of border crossings, thereby facilitating growth in its vital tourism sector. Similarly, Bosnia could benefit from EU membership economically, further enhancing security and transparency to make foreign investors more comfortable committing resources there. However, as new EU border crossings are erected on Croatia's shared border with BiH and as EU trade rules are applied, BiH could also suffer from short-term isolation from one of its top trade partners. The implications of new borders have been widely examined by scholars, and in this post-Yugoslav context offer an excellent opportunity for further research.

Of course, the principle limitations of the present research should be acknowledged. First, although the interviews are revealing, their number is insufficient for claiming representativeness of the larger population. Accordingly, we present this study as merely a pilot. Further research should broaden the scope of survey administration to include many more respondents. Because our surveys were administered in person, the collection of data was extremely time-consuming, and we and our interview team underestimated the time commitment involved in data collection. In addition, our survey instrument was written in the English language, not the native language of the respondents, which could introduce misinterpretations. Upon coding and summarizing our responses, we became aware that some of our questions had been misunderstood by respondents, none of whom are native English speakers. This particularly became an issue when the Likert scale was used. For example, where open-ended responses clearly revealed concern about corruption, some respondents gave the problem a "0" on the corresponding quantitative scale of "0 to 10". In addition, when asked to describe one of (his) happiest memories, a 30 year old journalist in Sarajevo responded "war memories". We are aware of the Bosnian sense of humor with regard to the traumatic siege of the city, but based upon straightforward and non-sarcastic answers throughout the rest of this completed survey, we feel that this respondent did not understand the question. Issues such as these should be considered in future fieldwork. Researchers should not assume that their questions are understood properly, and should be prepared to probe if there is a possibility that a question has been misunderstood.

With regard to policy, this research offers several suggestions. First and foremost, public officials should be aware that they are being watched carefully by their citizenry. As this research and other inquiries (Gallup Balkan Monitor, 2011) attest, citizens are paying attention and their frustration is mounting. Especially in BiH, respondents strongly criticize the bloated bureaucracy and lack of transparency by public servants. Frustration with politicians and police in particular continues to grow, as the years pass and improvement in personal wellbeing continues to stagnate. Secondly, from our responses we detect deep concern about economic policy. In Croatia, for example, while the role of tourism in the economy has been officially declared (Tica, 2012) and is widely recognized by respondents, our surveys reveal that citizens are apprehensive about the impact of EU crises on inbound tourism, while other voices argue that Croatia is already "too full" with tourists.

In sum, the main contribution of this research is to bring together elements of quantitative and qualitative analysis to better understand public perceptions of a timely topic: the ongoing transformation of two Balkan counties. This is particularly timely given Croatia's imminent EU accession, and the pursuit of the same by Bosnia and Herzegovina. While putting a finger on the pulse of the citizenry with respect to politics, economics, and overall happiness, this paper also provides further directions for deeper research into a variety of themes. Given that tourism represents 22% of Croatia's economy by share of GDP, how has the industry been impacted by the economic crisis in Europe, and how do Croats feel about this level of dependency? As Croatia and presumably other states including BiH enter the EU, how will public opinion about membership evolve? As BiH works toward accession, how will its government handle issues such as corruption and regulation, both of which clearly arise as important in the eyes of its citizenry? While we believe this paper has shed meaningful light on contemporary issues in the region, it also introduces these and other questions that will grow in importance as additional Yugoslav successor states continue to reintegrate with Europe.

References

Sofia A. M.,"The Sejdić-Finci Case Holds European Door for Bosnia Closed."*Euinside*. Euinside Association,. http://www.euinside.eu/en/news/sejdi%C4%87-finci-case-hold-the-european-door-for-bosnia-closed, 2012, (accessed 2 June 2012).

Benacic, A. "How Croatian Agriculture Bought the Farm", *The Christian Science Monitor*. On-line edition. 22 November. www.csmonitor.com, 2012, (accessed 29 November).

Borneman, J., Fischer L., and Gamdzic, E. "Tito and Yugoslavia." *Death of the Father: Tito & Yugoslavia*. Web. 12 May 2012. http://cidc.library.cornell.edu/dof/yugoslavia/yugo.htm, 1998, (accessed 12 May 2012).

Bradbury P. Digital Journal. Winter Tourism in Croatia: Split has record November. Jan 2012. http://digitaljournal.com/article/317583, (accessed 2 June 2012).

BBC (British Broadcasting Corporation). EU Enlargement: The Next Eight. Available at http://www.bbc.co.uk/news/world-europe-11283616, 2012, (accessed 26 April 2012).

BBC, "Timeline:Break-up of Yugoslavia." http://news.bbc.co.uk/2/hi/europe/4997380.stm, 2006, (accessed 12 May 2012).

Bechev, D.. "The Periphery of the Periphery: The Western Balkans and the Euro Crisis", European Council on Foreign Relations Paper. http://ecfr.eu/page/-/ECFR60_WESTERN_BALKANS_BRIEF_AW.pdf, 2012, (accessed 13 November 2012).

Bieber, F. "The Western Balkans after the ICJ Opinion." In Jacques Rupnik (ed.) *The Western Balkans and the EU: 'The Hour of Europe'*. European Union Institute for Security Studies Chaillot Papers. June. Available at http://www.iss.europa.eu/publications/detail/article/the-western-balkans-and-the-eu-the-hour-of-europe/ , 2011,(accessed 10 December 2012).

Brooks, A.. "*Gross National Happiness: Why Happiness Matters for America and How We Can Get More of it",* New York: Basic Books, 2008.

Castle, S. Croatia Votes 2 to 1 to Join European Union. *The New York Times.* January 22. http://www.nytimes.com/2012/01/23/world/europe/croatia-votes-2-to-1-to-join-european-union.html, 2012, (accessed 25 April).

Croatia Business Report. "Croatian Opposition's Election Victory Confirmed. Now What?" December 6. http://croatiabusinessreport.wordpress.com/2011/12/06/the-croatian-election-result-what-now/. 2011, (accessed 16 December).

Croatian Bureau of Statistics. Statistical Databases. http://www.dzs.hr/, 2012 (accessed 8 November 2012).

Cviić, C., and Sanfey. P. "*In Search of the Balkan Recovery: The Political and Economic Reemergence of South-Eastern Europe",* New York: Columbia University Press, 2010.

Deichmann, J. I. Origins of Foreign Direct Investment in Croatia: Application of an Expanded Gravity Model. Chapter 1 in Anastasios Karasavvoglou (Editor), *Balkan and Eastern European Countries in the Midst of the Global Economic Crisis*. Berlin: Springer, 2013, (pp.3-21).

Deichmann, J. I. Historical Legacies and the Origins of Foreign Direct Investment in Bosnia and Herzegovina. *South East European Journal of Business and Economics*. 7, 2012, (pp.7-18).

Demick, B.. L*ogavina Street: Life and Death in a Sarajevo Neighborhood.* New York: Spiegel & Grau, 2012.

Divjak, B. and Pugh, M. The Political Economy of Corruption in Bosnia. *International Peacekeeping.* August. 15 (3), 2008, (pp. 373-384).

Domm, R. "Next Steps on BiH: Key Elements to a Revised EU Strategy." *Journal of Southeast European & Black Sea Studies* 11, (no. 1), *Academic Search Premier*, EBSCO*host*, 2011,(pp. 53-67.), (accessed May 7, 2012).

Economist. A New Bosnian Government: Bosnia's December Surprise. December 30th. http://www.economist.com/blogs/easternapproaches/2011/12/new-bosnian-government, 2011, (accessed 13 January 2012).

European Commission. Economic and Financial Affairs: Adopting the Euro. http://ec.europa.eu/economy_finance/euro/adoption/index_en.htm, 2012, (accessed 25 April).

Gallup Balkan Monitor. Insights and Perceptions: Voices of the Balkans. http://www.balkan-monitor.eu/files/BalkanMonitor-2010_Summary_of_Findings.pdf, 2010, (accessed 15 December 2012).

Getz. D. The Impact of Tourism on Host Communities: A Research Approach. In B.S. Duffield (ed.) *Tourism: A Tool for Regional Development.* Edinburgh: Tourism and Recreation Research Unit: University of Edinburgh, 1977, (pp. 9.1- 9.13).

Hunya, G.. *Database on Foreign Direct Investment in Central, East and Southeast Europe, 2010: FDI in the CEECs Hit Hard by the Global Crisis.* Vienna Institute for International Economic Studies. http://publications.wiiw.ac.at/files/pdf/FDI/fdi_may10_contents.pdf,2010, downloaded 14 October 2011).

Judah, T. "Yugoslavia: 1918 - 2003." *BBC News*. BBC, 17 Feb. 2011. Web. http://www.bbc.co.uk/history/worldwars/wwone/yugoslavia_01.shtml, 2012.

Lekic, Slobodan, and Jovana Gec. Croatia Signs EU Accession Treaty. *Bloomberg Business Week.* http://www.businessweek.com/ap/financialnews/D9RH3P882.htm, 2011, (accessed 1 May 2012).

Levi, P.. *Survival In Auschwitz.* Austin: Touchstone Publishing, 1995.

McNeil, M., Herzog A., and Cosic S. Citizen Review of Service Delivery and Local Governance in Bosnia and Herzegovina. World Bank Accountability in Action Program: Governance Working Paper Series. Available at http://siteresources.worldbank.org/EXTGOVACC/Resources/BIHWeb.pdf, 2009,(accessed 3 May 2012).

Ministry of Tourism: Croatia. "Croatian Tourism Development by 2010". Retrieved from: http://www.mint.hr/UserDocsImages/TOURISM-FINAL-2010.pdf, 2003.

Milčić, I.. Interview with President of the Managing Board of Končar PowerTransformers Ltd., Zagreb, Croatia.2012, May 16.

Mustafic-Cokoja, D. Interview with Senior Advisor of Foreign Investment Promotion Agency (FIPA), Sarajevo, Bosnia and Herzegovina. 2012, May 18.

Naef, P.. From *Traumascapes* to *Touristscapes*: "War Tours" in Sarajevo and Vukovar. http://www.inter-disciplinary.net/wp-content/uploads/2011/02/naeftpaper.pdf,2011, (accessed 10 December 2012).

Naef, P.. *Travelling Through a Powder Keg: War and Tourist Imaginary in Sarajevo*. http://www.viatourismreview.net/Article5_EN.php. (accessed 15 December 2012).

Official website of the Croatian Embassy. http://www.croatiaemb.net. (accessed 15 December 2012).

Panagiotou, R.. Effects of the Global Economic Crisis on South-East Europe. *Journal of Balkan and Far Eastern Studies* 12 (Vol. 2), 2010, (187-194).

Resegotti, S.. Interview with Country Manager of Managing Board of Banco Popolare Croatia d.d., Zagreb, Croatia, 2012, May 16.

Rupnik, J. (ed.). *The Western Balkans and the EU: 'The Hour of Europe'.* European Union Institute for Security Studies Chaillot Papers. June. Available at http://www.iss.europa.eu/publications/detail/article/the-western-balkans-and-the-eu-the-hour-of-europe/,2011, (accessed 10 December 2012).

Sayer, A. *Method in Social Science: A Realist Approach.* London,Hutchinson, 1993.

Škuflić, L. and Štoković I.. Demand Function for Croatian Tourist Product: A Panel Data Approach. *Modern Economy* 2 (Vol.1), 2011, (pp. 48-52).

Štiks. I.. The European Union and Citizenship Regimes in the Western Balkans. In Jacques Rupnik (ed.) *The Western Balkans and the EU: 'The Hour of Europe'.* European Union Institute for Security Studies Chaillot Papers. 2011. Available at http://www.iss.europa.eu/publications/detail/article/the-western-balkans-and-the-eu-the-hour-of-europe/ (accessed 10 December 2012).

Tica, J.. Lecture entitled "Overview of the Croatian Economy" at University of Zagreb Faculty of Economics and Business, Zagreb, Croatia. 2012. May 15.

Transparency International. Official Web Site. www.transparency.org. (accessed 10 October 2012).

UNWTO United Nations World Tourism Orgainization . *World Tourism Highlights 2012*. http://mkt.unwto.org/en/publication/unwto-tourism-highlights-2012-edition. (accessed 10 October 2012).

Veenhoven, R. . "*Happiness in Bosnia Herzegovina (BA")*, World Database of Happiness, Erasmus University Rotterdam, The Netherlands. Available at http://worlddatabaseofhappiness.eur.nl, (accessed 10 May 2012).

World Travel and Tourism Council. "Travel and Tourism Economic Impact 2012: Croatia." http://www.wttc.org/site_media/uploads/downloads/croatia2012.pdf. (accessed 9 January 2013).

Wiener, E.. "*The Geography of Bliss: One Grump's Search for the Happiest Places in the World",* New York: Twelve Publishing, 2008.

World Values Survey. "*Happiness Net Survey"*, Available at http://www.worldvaluessurvey.org/, (accessed 10 May 2012).

FINDING UNDERLYING FACTORS USING THE INDEPENDENT COMPONENT ANALYSIS ON LABOUR MARKET – APPLICATION ON UNEMPLOYMENT RATE IN MONTHLY VARIATION

Cristina LINKARU
National Institute for Science Research in The Field of Labour and Social Protection- INCSMPS, Romania, e-mail: cristina.lincaru@yahoo.de

Vasilica CIUCĂ
National Institute for Science Research in The Field of Labour and Social Protection- INCSMPS, Romania, e-mail: silviaciuca@incsmps.ro

Speranţa PÎRCIOG
National Institute for Science Research in The Field of Labour and Social Protection- INCSMPS, Romania, email: pirciog@incsmps.ro

Draga ATANASIU
National Institute for Science Research in The Field of Labour and Social Protection- INCSMPS, Romania, email: incsmps1@incsmps.ro

Abstract
Independent Component Analysis ICA is "a method for finding underlying factors or components from multivariate (multidimensional) statistical data". Considering that the specific of this method is "that it looks for components that are both statistically independent and Non-Gaussian, we try to apply ICA method on labour market data. Following the methodology presented by Hyvärinen, Karhunen, Oja (2001) on the problem" cashflow of several stores belonging to the same retail chain, trying to find fundamental factors common to all stores that affect the cash flow" we apply on analysing the unemployment rates, seasonally adjusted, in monthly variation at EU27 level between January 2000- September 2011. The data source is EUROSTAT, indicator [une_rt_m]: „Unemployment rate, monthly average, seasonally adjusted data, total (%), resulting 141 months/cases. Orginal mixture data are pre-processing in the stage of Pre-whitened using Principal Component Analysis PCA, with NIPALS algorithm and for ICA the FastICA Algorithm from STATISTICA 8.0 Software.

„Most measured quantities are actually mixtures of other quantities.."[8]

1. Introduction

Starting from Hyvärinen, Karhunen, Oja financial applications[9] of Independent Component Analysis ICA as "a method for finding underlying factors or components from multivariate (multidimensional) statistical data", considering that the specific of this method is "that it looks for components that are both statistically independent and nongaussian, we try to apply ICA method on labour market data.

---

[8] J.V. Stone, (2005): *A Brief Introduction to Independent Component Analysis* in Encyclopedia of Statistics in Behavioral Science, Volume 2, pp. 907–912, Editors Brian S. Everitt & David C. Howell, John Wiley & Sons, Ltd, Chichester, 2005 ISBN 978-0-470-86080-9
[9] K. Kiviluoto şi E. Oja, Independent component analysis for parallel financial time series. În *Proc. ICONIP'98, vol.2, pg. 895-898, Tokio, Japan, 1998.*

Following the methodology presented[10] on the problem" cashflow of several stores belonging to the same retail chain, trying to find fundamental factors common to all stores that affect the cash flow" we apply on analysing the unemployment rate, seasonally adjusted, in monthly variation at EU27 level between January 2000-September 2011. The data source is EUROSTAT, indicator [une_rt_m]: „Unemployment rate, monthly average, Seasonally adjusted data, total (%), resulting 141 months/cases.

ICA is based on the idea that independence is a stronger property then unecorrelatedness [PCA]. Uncorrelatedness in itself is not enough to separate the components",”PCA or factor analysis cannot separate the signals: they gave components that are uncorrelated"[11] Among the applications of the ICA there are already some on econometrics – parallel time series financial data[12].

2.   Data treatment as signal from informational perspective

According with the ICA theory the working unit is a signal. If "any signal represents form the mathematical point of view a time function" **[13]** then we shall point some specific characteristics under this assumption:

•   On the labour market there are studied behaviours of the individual during the economic activity span. If there are used micro data organised in longitudinal data base we can tell that we increase the chances to model better the reality. When reference is to the individual the variables could be compared with "**analogical signals**": the individual lives as continuous function with emitted continuous values in R[14]

$$f : \Re \rightarrow \Re$$

$$f : [\Re] \rightarrow [\Re] \quad (1)$$

•   Data treatment as signal from informational perspective allow the conversion analogue in digital or the conversion from continuum in discreet[15] through precise procedures that combines operations like: discretization, sampling, quantification, coding, etc. In the technical literature those operations could be described as functions of time (see **Fig. 1**)

•   Signals transmits amplitudes and „any signal could be decompose in sum of the sinusoidal signals –subject of the **Fourier Analysis"[16].**

•   Sinusoidal signals are orthogonal and are the only ones from nature able to propagate through linear systems without to be distorted (is changing only the amplitude and phase). Sinusoidal signals contains extremely small information:

$$x(t) = x(A, T, t) \quad (2)$$

$$x(t) = A \sin(\omega * t)$$

$$f = \frac{1}{T}$$

$$\varphi = \omega * t$$

---

[10] Hyvärinen, Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.441.

[11] Hyvärinen, Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.7.

[12]Kiviluoto K. and E. Oja. Independent component analysis for parallel financial time series. In *Proc. ICONIP'98*, volume 2, pages 895-898, Tokyo, Japan, 1998.

[13] Ioan P. Mihu, Despre semnale şi sisteme din volumul Procesarea numerică a Semnalelor, pg.2

[14] Laurenţiu Frangu – Introducere în Inginerie Electronică şi Telecomunicaţii, 2008, pg. 30

[15] Laurenţiu Frangu – Introducere în Inginerie Electronică şi Telecomunicaţii, 2008

[16] William Stallings, Data and computer communications, Chapter 3, transmisia datelor,

http://ftp.utcluj.ro/pub/users/cemil/prc/Chapt_3ro.ppt#256,1,William Stallings Data and Computer Communications

u(t):**D**→**C**: t∈D; u∈C
u=f(t)
D domain
C codomain

a. analogical signals S(t)
$$\subseteq \Re \wedge C \subseteq \Re$$
t: signals in continuous time
u: continuous signals

b. **discretization** – representing with un finite number of data the analogue signal

C) $\supset \subseteq \Re \wedge C \subseteq (Z \vee Q)$
 t: signals in continuous time
u: discreet signals

c. **sampling** (shinking the domain) $D \subseteq (Z \vee Q) \wedge C \subseteq \Re$
t: signals in discreet time
u: continuous signals
Te – sampling period

d. **digital signals/quantized** S[n] or S[nTe]
$$\subseteq (Z \vee Q) \subseteq (Z \vee Q)$$
t: signals in discreet time
 u: discreet signals
Te - sampling period
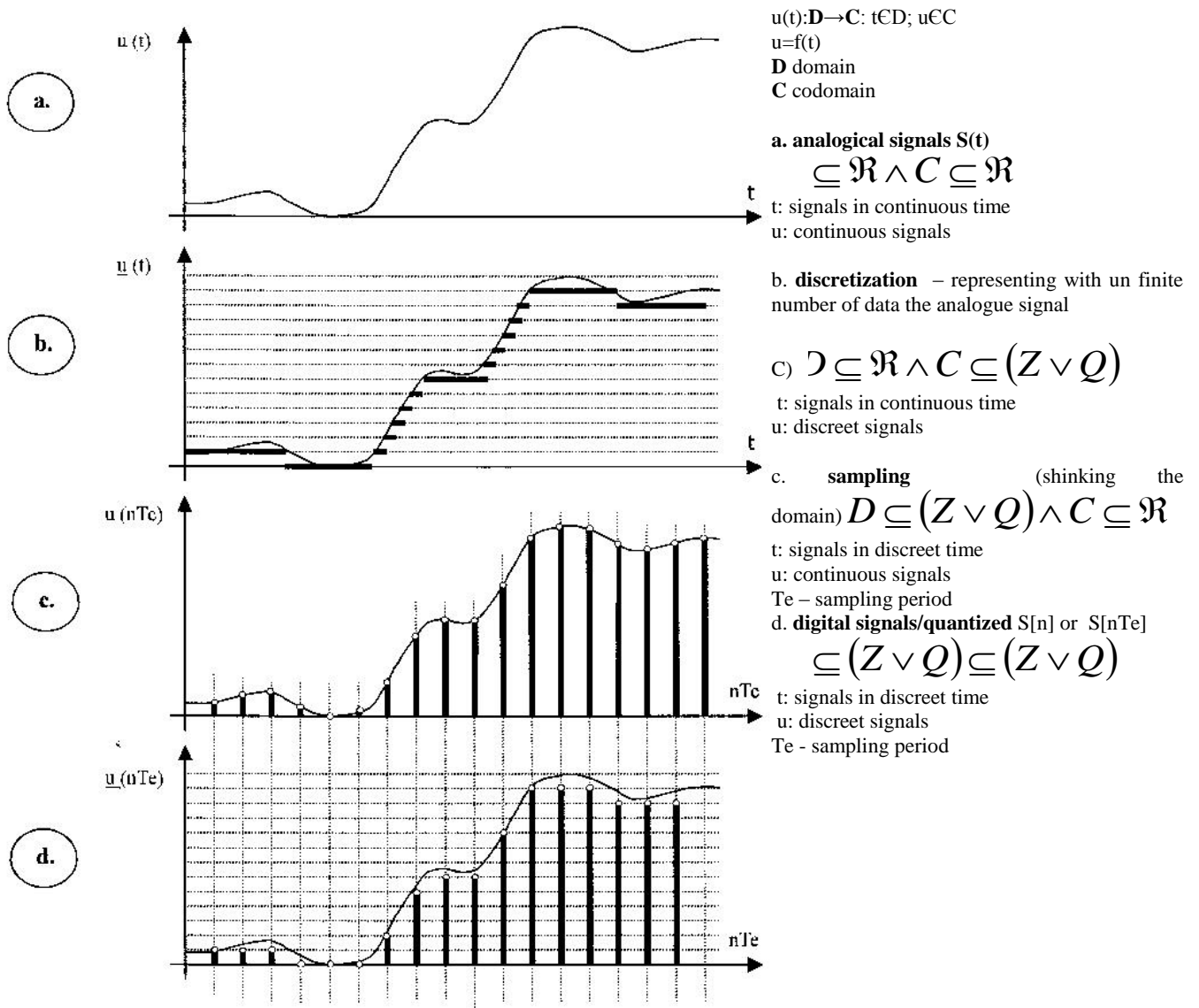
Fig.1[17]**. Main types of signals as time function**

After an complete cycle, t=T:

$$\varphi = \omega T = 2\pi$$

$$\omega = \frac{2\pi}{T} \qquad (3)$$

---

[17] Fig.1. este preluată din Ioan P. Mihu, Despre semnale şi sisteme din volumul Procesarea numerică a Semnalelor, pg.3

The general form with the initial phase:

$$x(t) = A\sin(\omega t + \phi), \text{ la } t=0, \phi_0=0 \quad (20)$$

(we consider our signal with initial phase 0)

$$x1(t) = A1 \sin(\omega t + \phi1)$$
$$x2(t) = A2 \sin(\omega t + \phi2)$$

Then the phase shift of *x*2 by *x*1 is:

$$\Delta\phi = (\omega t + \phi2) - (\omega t + \phi1) = \phi2 - \phi1 \qquad (4)$$

If two signals have rigorously the same frequency then are coherent signals.

where:

> *A the amplitude of the oscillation (it is an positive number and has the physical dimension of x(t))   [um x(t)]*
>
> *T period. Represents the time duration after that the x(t) gets same values, in the same sense [seconds; hours; months; years, etc]*
>
> *f frequency of the signal x(t), the inverse of the T. Show as many times the cycle is repeated in the time unit of T [Hz]*
>
> *ω pulsation or angular speed   [rad/s]*
>
> *ϕ observed signal phase x(t). it is the argument of the sinus function and has the value of an angle, its position in time is measured in [rad];*

The observed data (including labour market data) and provided by statistical sources could be interpreted as the amplitudes of the signal in expression digitalised/quantified, already sampled. (see Fig.2.)
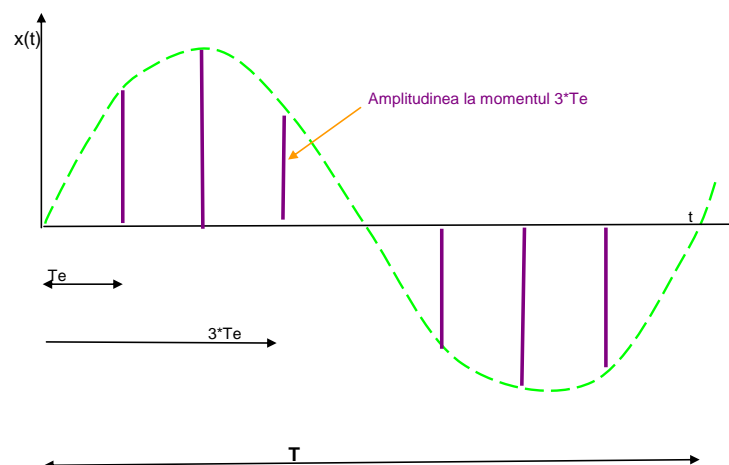
> *x(t)=variable from the labour market with signal representation*
> *Te sampling period (the minimum period of time for which are provided the data on labour market – in our case monthly frequency)*
> *T period – in our case 1 year 1;*
> *A = A(t) amplitude is function of the measurement moment , at any Te*

Fig. 2. Signal in expression digitalised/quantified (including some labour market data) – sinusoidal representation

We emphasise that the ICA method was developed in technical sciences like electronics, imagistic and telecommunication. It is connected with another signal important property is interference. Interference represents „a physical phenomenon that combines the electromagnetic, sound or optical signals through addition or subtraction according to their phases."[18] The „superposing of the signals from the same

---

[18] http://www.scritube.com/tehnica-mecanica/SEMNALE-ELECTRICE93336.php

frequency band (difference between maximum and minim of the frequency's , f_{max}-f_{min} =LBs) [19]. This mixing phenomenon of the signals could distort the original signal. "Under certain conditions, the signals underlying measured quantities can be recovered
by making use of ICA. ICA is a member of a class of *blind source separation* (BSS) methods."[20]

3.   Method Independent Component Analyis ICA

The modelling and prediction of the dynamics of the macroeconomic factors using the Independent Component Analyis – ICA is still at beginning. Hyvärinen, Karhunen and Oja[21] affiliate this method among the methods „for finding underlying factors or components from multivariate (multidimensional) statistical data". This method is strongly differentiated from others through the two essential hypotheses that are simultaneously realised: the component looked for are **both independent** (one component doesn't offer any information about the other component) in statistical sense and is **non-Gaussian** (have not a normal distribution). This method allows the linear representation only based on multivariate signals/data offering a „learned" representation without supervisor, as neuronal calculus type. The intrinsic data message exploration includes the ICA method under the **data mining** and **exploratory data analysis** methods. First mention of this method was signalled in **1980**, by J. Herault, C. Jutten, B. Ans[22], in neuronal signal processing data.   The next step in this method development was represented signal separation of sources solutions (including BSS blind sources separation) by J.F. Cardoso, P. Comon[23], J.L.Lacoume, A. Cichocki and R. Unbehauen. The exponential growth of the computers power brings in attention of the users from different fields those techniques developed in more „strict technical fields" [brains imagistic, imagines processing, signal deconvolution, telecommunications – lately other signals from mobile communication CDMA (Code-Division Multiple Access), etc.]. The **Fast Independent Component Analysis (FICA) or FastICA** algoritm (created by Hyvärinen, Karhunen, Oja) enhanced the popularity of the method ICA because of its efficiency and new applications like: Hopfield networks, self organised maps Kohonen SOM, JADE algorithm, Cichocki-Unbehauen algorithm, etc. **FastICA** could be applied now on different software environments (MATLAB 5 /5.2., C++/C, STATISTICA 8.0, as well as dedicated soft). The STATISTICA 8.0. environment offer two options: the simultaneous extraction variant (parallel) and the successive extraction variant (one unit at the time- artificial neuron with the weight of an vector, neuron under the property of being able to learn – named also deflation). We highlight the expanding tendency of ICA's borrowing in economics[24]. The financial domain registered the first applications of those techniques especially on parallel data similar with the econometric applications in parallel time series separations, decomposing in independent component which offers a new perspective over the **data structure**. In view to apply those techniques are respected the independence hypothesis and non-Gaussianity of the components/factors that describes in a linear representations the measured multivariate data.

---

[19]Iacob, Sisteme şi tehnici multimedia, http://andrei.clubcisco.ro/cursuri/5master/tagcmrv-stm/01_stmm1_intro.ppt#273,33,Slide 33

[20] Stone, J.V. (2005): *A Brief Introduction to Independent Component Analysis* in Encyclopedia of Statistics in Behavioral Science, Volume 2, pp. 907–912, Editors Brian S. Everitt & David C. Howell, John Wiley & Sons, Ltd, Chichester, 2005 ISBN 978-0-470-86080-9

[21] Hyvärinen, Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.1.

[22]Cited from „Martin Sewell, Independent Component Analysis, Department of Computer Science University College London http://www.stats.org.uk/ica/: „ANS, B., J. H´ERAULT, and C. JUTTEN, **1985.** Adaptive neural architectures: Detection of primitives. In: Proceedings of COGNITIVA'85. pp. 593–597. // H´ERAULT, J., and B. ANS, **1984.** Circuits neuronaux ´a synapses modifiables: D´ecodage de messages composites par apprentissage non supervis´e. Comptes Rendus de l'Acad´emie des Sciences, 299(III-13), 525–528. // H´ERAULT, J., C. JUTTEN, and B. ANS, **1985.** D´etection de Grandeurs Primitives dans un Message Composite par une Architecture de Calcul Neuromim ´etique en Apprentissage non Supervis´e. In: Actes du X`eme colloque GRETSI. pp. 1017–1022."

[23] COMON, Pierre, 1994. Independent Component Analysis, A New Concept?, Signal Processing, 36(3), 287–314.

[24] K. Kiviluoto şi E. Oja, Independent component analysis for parallel financial time series. În *Proc. ICONIP'98, vol.2, pg. 895-898, Tokio, Japan, 1998.*

Box 1[25]

Independent Component Analysis ICA/ Nongaussian factor analysis

"A generative model – it describes how the observed data are generates by a process of mixing the components

s_j"[book, ICA, Hyvarinen, Karhunen, Oja,pg.151]

Assumption

the components s_i are statistically *independent*-

- the key to estimating the ICA model is nongaussianity
- *a gaussian variable has the largest entropy among all random variables of equal variance*. **Negentropy** is in some sense the optimal estimator of nongaussianity

the independent component must have *nongaussian* distributions

we observe n linear mixtures $x1, ...,xn$ of n independent components

$$xj = aj_1s_1+aj_2s_2+...+aj_ns_n, \text{ for all } j.$$

$x_j(t)$, observed values, mixture xj, random vector

$s_k(t)$ independent component ("**source**" means here an original signal, *latent variables, meaning that they cannot be directly observed.), is a random variable, instead of a proper time signal, nongaussian*

The ICA model:

$$\mathbf{x} = \mathbf{As},$$

A mixing matrix

$$\mathbf{x} = \sum_{i=1}^{n} \mathbf{a}_i s_i.$$

$$\mathbf{s} = \mathbf{Wx} = \mathbf{A^{-1}x}$$

W un-mixing/ separation matrix

ICA consists in estimating both the s(t) and A(t), (j=k)

Ambiguities of ICA

1. We cannot determine the variances (energies) of the independent components
2. We cannot determine the order of the independent components.

Preprocessing for ICA

Centering - the observed signals are centred around their means **so that the transformed signals have zero mean**

Whitening - linearly transforming the observed signals *X* into a new set of variables, which **are uncorrelated and their variances equal unity**

The FastICA Algorithm: algorithm for maximizing the contrast function - nonquadratic function *G*

Deflation - which extracts one principal component at a time.

Parallel or Multiple Extraction and its multi unit version.

---

[25] Hyvärinen Aapo and Erkki Oja, Independent Component Analysis: Algorithms and Applications Neural Networks Research Centre, Helsinki University of Technology, pg.2

4. Data

In view to find underlying factors using the Independent Component Analysis on labour market we make the application on unemployment rate in monthly variation, analyzed in non-seasonal trends. In our case the time series xi(t), i=1 to 141 months, T= 1 year, in view to isolate the effects of policies across the UE 27 using only one indicator the unemployment rate seasonally adjusted, in monthly variation at EU27 level between January 2000-September 2011. The data source is EUROSTAT, indicator [une_rt_m]: „Unemployment rate, monthly average, seasonally adjusted data (see Annex 1, Metadata notes), all persons (15-74 years), in (%), resulting 141 months/cases. (see Fig.1). In the last decade there are similitudes in the variation of unemployment rate in stages: convergence, minimum and divergence. It is evident that before February and March 2008 (respectively the month 98 and 99) there were evident some characteristics for entire EU27 :

   a. An "homogene" behaviour:
   * an convergent tendency of the diminishing the level of unemployment rate around the 6.8% UE27 mean (respectively the month 98 and 99) – as the best performance period for the labour markets in terms o unemployment policies results;
   * an convergent tendency to maximise the level o unemployment rate around the 9.7% UE27 mean (January and May 2010 respectively the month 121 and 125) – as the worst performance period for the labour markets in terms o unemployment policies results. This period could represent the maximum crises period manifestation;
   b. An "un-homogene" behaviour: differentiated behaviour for the EU27 states regarding the performance of labour market performance considering that the decreasing tendency of the unemployment level (for at least 3 months) could be an indicator of the recovery initiating. Evidently after January and May 2010 there is visible a split in countries behaviour- some of them are decreasing the unemployment rates but other it still increases.
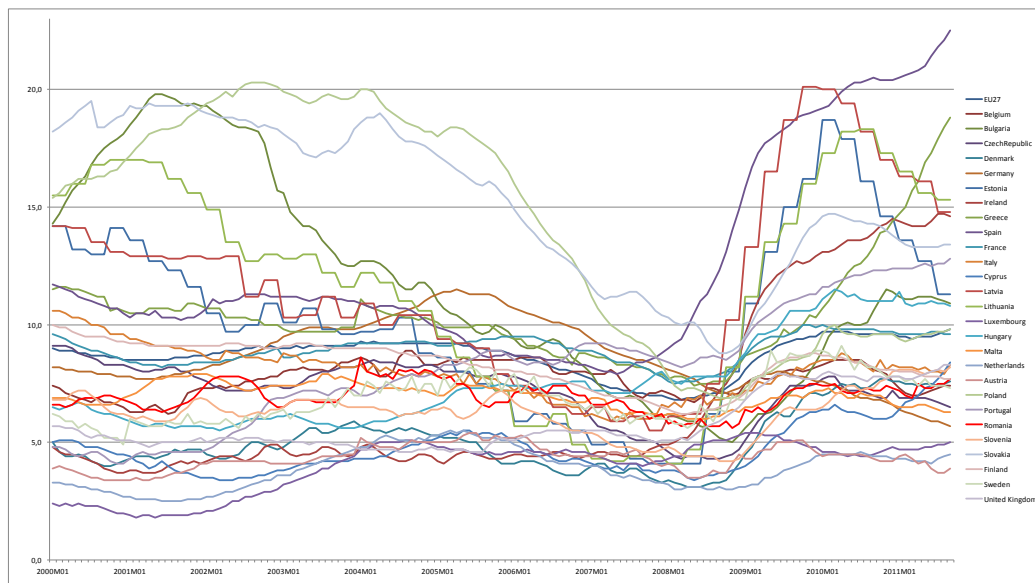
Fig. 3. The original unemployment time series (141 months).

5. The Model

In our model unemployment rate is treated as signal of the performance of the labour market functioning performance. Applying the ICA method, we consider that there are multilevel interactions between labour markets and consequently common structures possibly to be identified. Under this perspective there are likely to identify common factors (**like crises with sudden effect on labour market** functioning, next to seasonal variations due to holydays and other annual variations). One limit of this model is given by the consideration of "instant" variation and not considering inertia,

delays, etc. Based on the perspective that the interdependency between the European economies is increasing, and then the unemployment rates at national level **are not "pure" but mixed signals** using this method could be an high potential to surprise also the effect of labour market policies of every country (passive and active measures). In this context we try to apply ICA method in view to **isolate the new clusters** generated under the actions of "European" underlying factors, grouped by a common "behaviour".

5a. Pre-whitened data using PCA

The original 27 dimensional signal was projected to the subspace spanned by 11 principal components (covering 99,0697% from total variance of Eigenvalues, see Annex 2_Table 1a and b, Fig.1). The level of the Eigenvalue indicate also the importance (rank) of the principal component, PCA 1 captures 37,918 % , the PC 2 captures 31.808%, PC 3 captures 19.339%, etc. of the variability in the data. Choosing the number of principal components could be a problem. If we apply a threshold of minim 90% variance of the Eigenvalues then the minimum PCA components will be 4 that cover 92.8272% from total variance of it. So, from the original space of 27 dimension we reduce to an interval of 4 to 11 variables with less redundancy, that conserves as good as possible the initial characteristics." In PCA the **redundancy is measured by correlations** between data elements, while in ICA the much richer concept of independence is used, and in ICA the reduction of the number of variables is given less emphasis. Using only the correlation as in PCA has the advantage that the analysis can be based on second-order statistics only, In connection with ICA, PCA is a useful pre-processing step…(for ICA first step) data can be pre-processed by whitening, removing the effect of first and second order statistics"[26].

Using the STATISTICA 8.0 software we apply PCA as multivariate exploratory technique under variants offered by „STATISTICA PLS[27] with the state-of-the art ***NIPALS* algorithm** for building *PLS* models (Geladi and Kowalski, 1986). The algorithm assumes that the **X** and **Y** data have been transformed to have means of zero. This procedure starts with an initial guess value for the *t*-scores **u** and iteratively calculating the model properties in separate and subsequent steps". Applying NIPALS algorithm with Maximum number of iteration: 50, Convergence criterion=0.0001, Fitting method =Number of components by cross validation V-fold (V value 7), resulted 11 components, noted PCA 1 to PCA 11. The variable importance as a measure o the maximum power of component representation is offered by the model with 11 PCA (see annex 2_Table 2).

In Annex 2_ **Fig. 2 a** and **b** there are presented the case wise data diagnostics in view to **detect the outliers** through: "Hotelling T^2 Control Chart" and "Distance to Model Chart". The outlier's analysis reflects that for the last decade there become visible an abnormal tendency in unemployment, localised in the last intervals 140-141 months, corresponding for the months August-September 2011, the end of our series.

As a measure of increasing interdependency between the European economies is the growing tendency of **clustering among variables** unemployment rates for the EU27. In Annex 2_Table 3 is presented with red the significant correlation coefficients between the selected variables. There are relations (positive or negative) one to many, for each country. Austria, Belgium, Netherland and Poland indicate greater independence (over 8/26 insignificant coefficients). On the other extreme Czech Republic, Hungary, Denmark, Italy, Lithuania, Malta, Slovenia indicate labour market sensitiveness (only 3/26 insignificant coefficients). As particular case **Romania indicates positive dependency with all countries UE26**. As a detail, Romania's highest dependency of the unemployment variation is with France - explains 35,5% from original variability and indicates through the regression coefficient 0.599% as monthly medium increase, as a measure of the "proportional" to each other are two variables.

---

[26] Hyvärinen A., Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, Chapter 6. Principal Component analysis and whitening, pg. 125

[27] *Partial Least Squares (PLS)* (also known as Projection to Latent Structure) is a popular method for modelling industrial applications. It was developed by Wold in the 1960s as an economic technique, but soon its usefulness was recognized by many areas of science and applications including *Multivariate Statistical Process Control (MSPC)* in general and chemical engineering in particular.

Relations between original variables could be described also in the new coordinate system resulted through PCA applying. This system offers also an image regarding the way in which the original variables are correlated to each other and their influence in determining a component. In **Annex 2_Table 5 is presented the Correlations of the variable „country" with each factor PCA.** Also „variables placed close to each other influence the PCA model in similar ways, which also indicates they are correlated" [28]To illustrate better this is presented in **Annex 2_ Fig.3. the l**ine plot (p1) of the variable "country" against the loadings of PC1. In reference with PCA1 Malta is the less influential role and UK plays the most influential role in determining the first PC1.

In Fig. 4 we identify some possible clusters, after the projection of every input vector "country" into subspace, with **orthogonal factors/component**, given by the PCA1 (p1) and PCA2 (p2) – components that capture almost 70% variability in the data. It is possible to delimitate the following clusters:

o   Positive correlation with both factors PCA1 and PCA2 is registered for:

First group: Lithuania, Slovenia, Estonia, Latvia, Greece, France, Denmark, Romania.

Second group (more with the PCA2, uncorrelated with PCA1): Finland, Czech Republic, Italy

o   Positive correlation with PCA1 and negative correlation with PCA2

Sweden, Ireland, United Kingdom, Hungary, Portugal, Luxemburg

o   Positive correlation with PCA2 and negative (Germany at this extreme) correlation with PCA1(Malta the other extreme*): Poland, Bulgaria, Slovakia.*

In **Fig.5 a** and **b** there is presented the matrix plot of the data variables „countries" projections in 11 dimensional subspace and 4. Regardless the changing of the number of dimensions the loadings are the same.

5b. Results: Finding underlying factors using the Independent Component Analysis on labour market – application on Unemployment rate in monthly variation

Applying PCA we obtained uncorrelated components noted as PCA 11 (Annex 3 fig.1a.), but not independent. In Annex 3_Table 6a and b is presented that the PCA 11 (and also the variant PCA 4) are uncorrelated with their covariance is 0." The main reason why we calculate the ICA's for two dimensions 11 and 4 is sustained but the comment *"in real world application is that there is no prior knowledge on the number of independent components. Sometimes the Eigen values spectrum of the data covariance matrix can be used, but in this case the Eigen values decreased ratter smoothly without indicating any clear signal subspace dimension. Then the only way is to try different dimensions. If the independent components that are found using different dimensions for the whitened data **are the same or very similar**, we can trust that they are not just artefacts produced by compression, but truly indicate **some underlying factors in the data**."*[29]

 Another property is that if they are independent then they are uncorrelated but unecorrelatedness doesn't imply independence. In the literature there are some considerations useful like:

• Whiteness, an slightly stronger property then unecorelatedness of zero mean **vector means that its components** are uncorrelated and their variance equal unity.- the covariance (as well as correlation matrix) matrix equals the identity matrix ;[30]

• ICA: **factors are called "sources" and learning is "unmixing**". Since latent variables assumed to be independent, trying to find linear transformation of data that **recovers independent causes**[31].

---

[28] [STATISTICA 8.0. Electronic Manaual]

[29] Hyvärinen A., Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.442

[30] Hyvärinen A., Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.159

[31]   CSC2515:   Lecture   8   Continuous   Latent   Variables,   Lecture   9:   Continuous,   Latent   Variable   Models http://www.cs.toronto.edu/~hinton/csc2515/notes/lec7middle.pdf
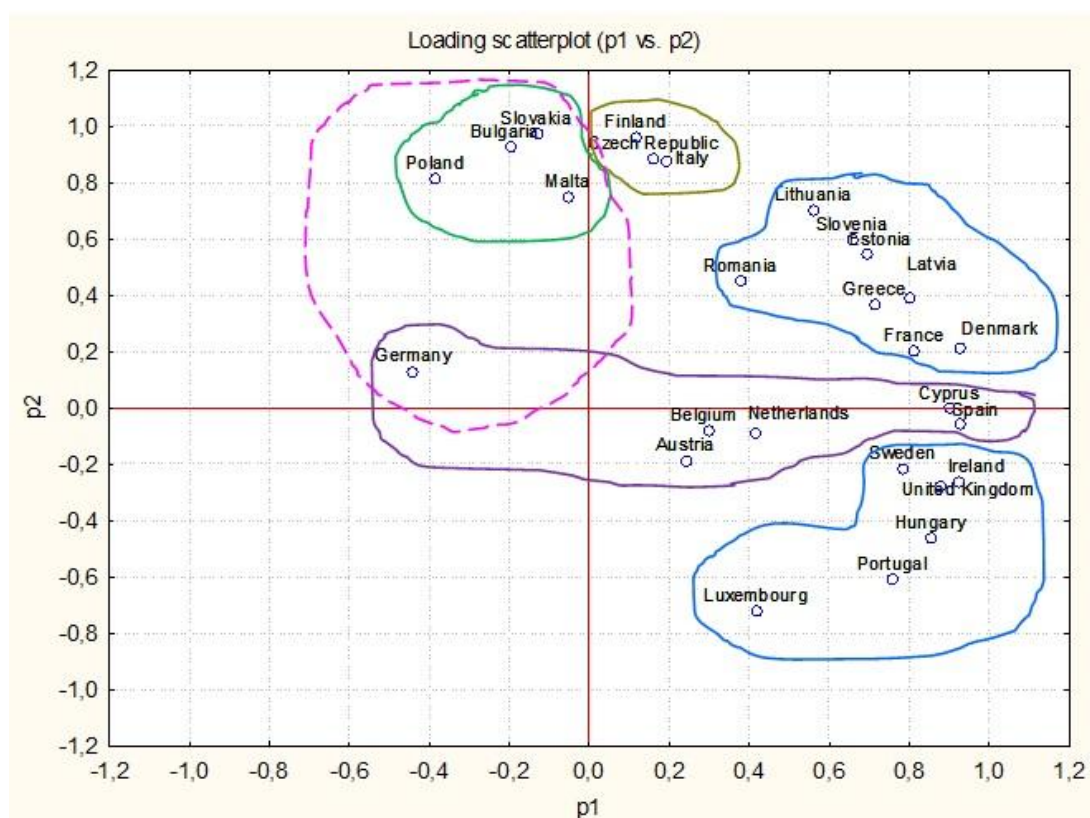
Fig.4.Variable „country" projected in the subpace of the PCA1 and PCA2

Months (141 units), time
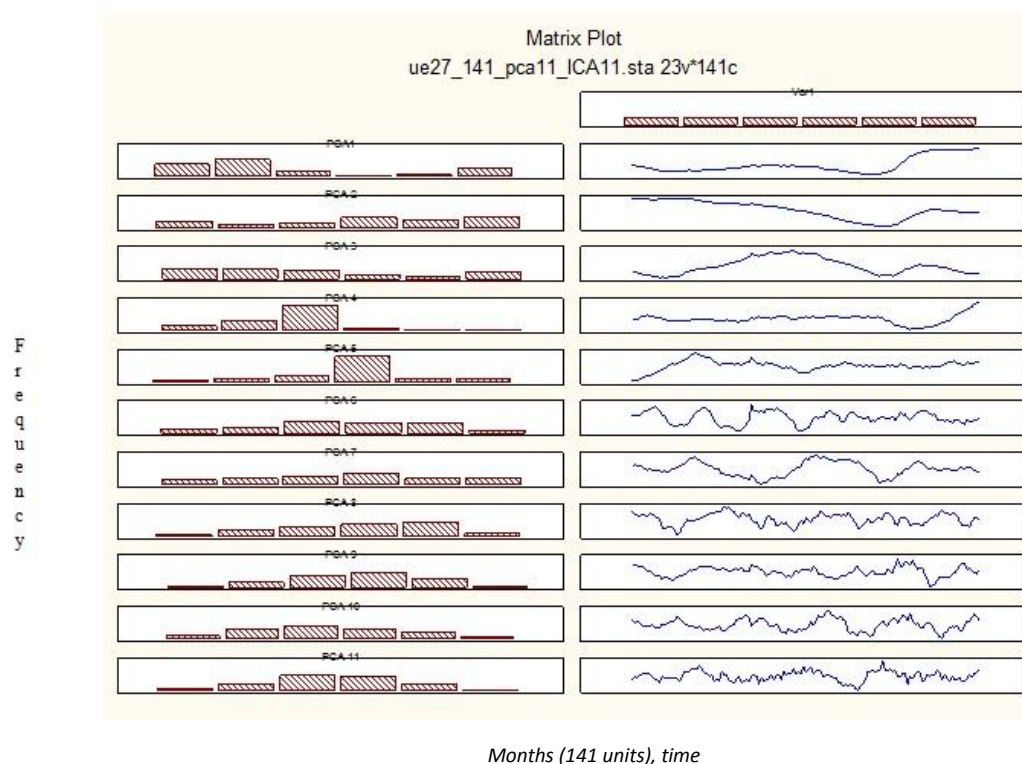
Fig.5. a. Data variables „countries" projections in 11 dimensional subspace
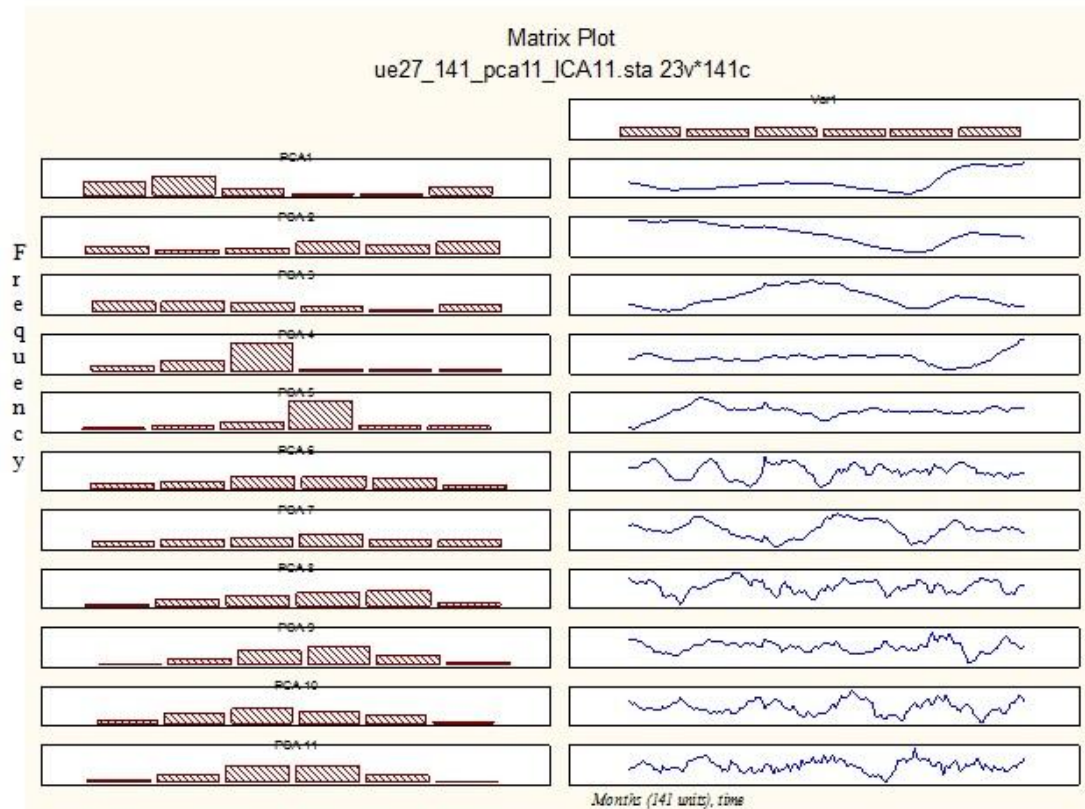
Fig.5. b. Data variables „countries" projections in 4 dimensional subspace

- note that the **components need not be orthogonal, but that the reconstruction is still linear.** ICA is typically posed as an optimization problem. ICA is based on nongaussianity maximization."[32]

We apply FastCIA algorithm, separate the sources that are maximally independent in view to find non-Gaussian projections as dimensions which directions are meaningful for the decision.

The PCA11, PCA4 components are treated as mixed factors, that acts simultaneously, under the assumption of the statistical property of signals that the sources signals (noted in our case as ICA for 11 components and ICA for 4 components) **are at each time, statistically independent** (independent in the sense that information about the value of one component it not helps in determines the value of other). As it is mentioned in theory "We assume that each mixture x_i as well as each independent component s_j is **a random variable (have 0 mean, variance 1, ,** instead of proper time or time series,,,,,We also neglect any time delays that may occur in the mixing, which is why this basic model is often called the instantaneous mixing model"[33]. The obtained component ICA's are 0 mean and 1 variance"[34] and describes the independent causes. In reality, however, the mixing coefficients (Annex 3 Table 3b) are unknown. Therefore it is the task of *ICA* to find estimates of the mixing coefficients (see Annex 3 Table and b) before we can extract the signals s_1 and s_2.

There were estimated 11 ICA for the first variant and respectively 4 ICA for the second variant, using the FastICa Algorithm from STATISTICA 8.0. Fast Independent Component Analysis (FICA), with the

---

[32] David Gleich, Principal Component Analysis and Independent Component Analysis in Neural Networks, CS 152 – Neural Networks, 6 November 2003
[33] Hyvärinen A., Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.151
[34] Hyvärinen A., Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons, pg.159

parallel extraction method (The components are extracted simultaneously), Function used in the approximation to neg-entropy Nonquadratic function G: Log-cosh, normalised variables.

So the result obtained is calculated for the 2 dimensions 11 and 4, of this endeavour is presented in the Fig. 6 a and b, The reconstructed „sources"- ICA11, as independent components, for the reduced space with PCA at 11 (4) dimensions.

In view to shape better the data model, we keep in mind that it describes a structure "specifies a dedicated *grammar* for a dedicated artificial language for (*a specific*) domain, represents classes of entities (kinds of things) ....., (contains) information and the attributes of that information, and relationships among those entities and (often implicit) relationships among those attributes"[35].

In our analyze trends excludes the seasonal influences and make possible to identify Factors with sudden effect on labour market functioning in general, and over the unemployment variation in particular. Our sources could have different interpretations, like:

> **ICA11_1**: starting point (minimum) august 2005, maximum point august 2006. Visible effects of the Europe transition from EU15 to EU25, following May 2004, 10 more countries joined the EU: the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia[36] are New Members of UE, (Hurricane Katrina struck Florida and the Gulf Coast after the August), increasing the unemployment rate in EMU countries, etc,;
>
> **ICA11_2:** starting point (maximum) January 2000 – initiating the Lisbon Strategy;
>
> **ICA11_3:** starting point (minimum) February 2010 – evident effects of the global crises on increasing the unemployment;
>
> **ICA11_4:** minimum July 2004, maximum October, 2005; …etc
>
> ……..

At this point there is a lot to work and also interpretations are also possible. Maybe our model is not well stabilised because at the dimension variations, the components found are not virtually the same.

Using the found mixing coefficients it is also possible to analyse the original time series and cluster them in groups.

Based on the perspective that the interdependency between the European economies is increasing, and then the unemployment rates at national level **are not "pure" but mixed signals** using this method could be a high potential to surprise also the effect of labour market policies of every country (passive and active measures).

6. Final remarks

„The ICA success is dependent by the key hypothesis that regards the physical world philosophy approach. This hypothesis sustain that variables or the independent signals are generates by different physical processes."[37] Stone (2005), with the convention that the term of signal is interchangeable with the term of variable, emphasis independence in the ICA context using the argument that two independent signals do not allow the prediction of one using the other. The empirical experience in the science field (physics, biology, IT, price stocks, etc.) has demonstrated that, without any doubt, in reality most of the measured signals have to be independent signals mixtures. Regardless its limits, "ICA is a very general technique in which are observed random data linear transformed in independent component, maximum independent one regard the other and in the same time they have " interesting distributions", this method allow the optimised estimation of latent variables model"[38]. The increasing computing capacity brings in the users attention also these techniques imported from strict technical domains. Beyond the analogy of signal theory with the labour market field, it is still a challenge to interpret the results obtained through this method. The idea to better exploit this relatively new technique represents only the frame and impetus to keep learning.

---

[35] http://en.wikipedia.org/wiki/Data_model#Data_structure
[36] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:European_Union_(EU)
[37] Bell, A.J. & Sejnowski, T.J. (1995). An information maximization approach to blind separation and blind deconvolution, *Neural Computation* **7**, 1129–1159.
[38] http://research.ics.tkk.fi/ica/
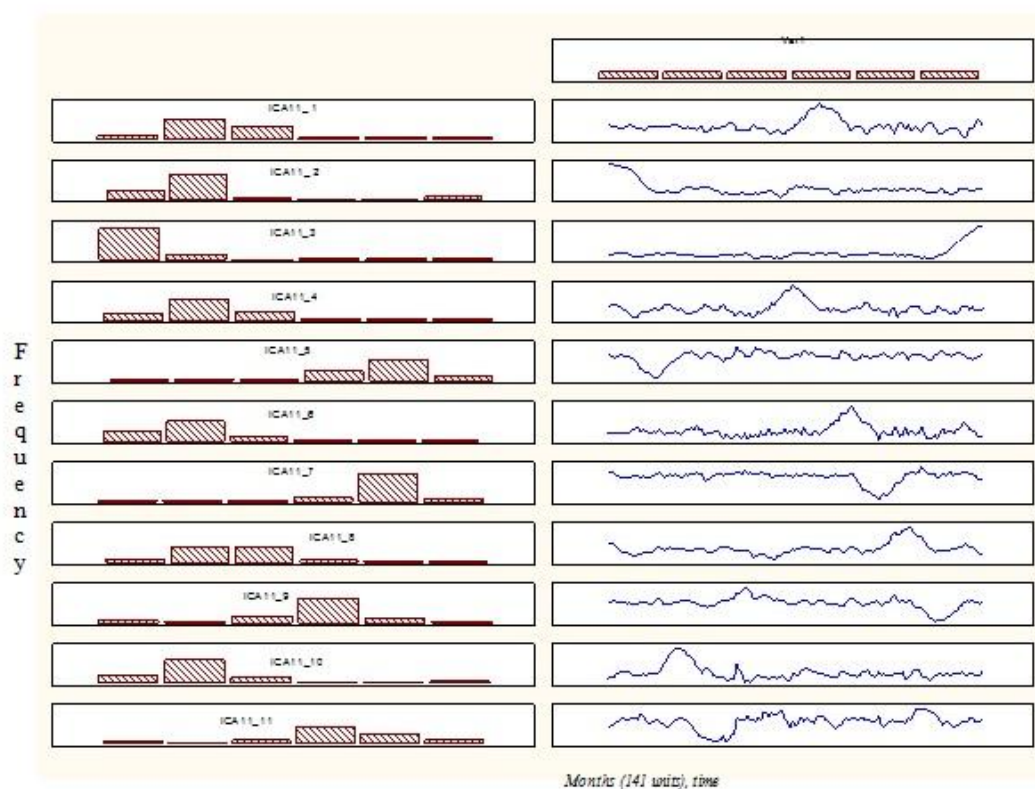
Fig.6. a. The reconstructed „sources"-ICA11, as independent components, for the reduced space with PCA at 11 dimensions
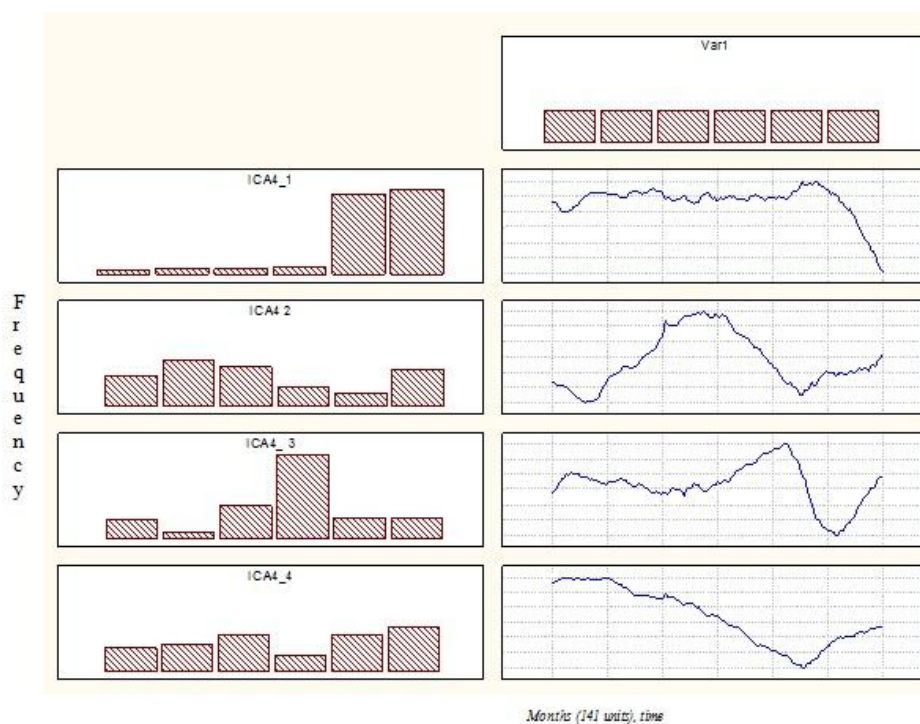
Fig.6. b. The reconstructed „sources"-ICA 4, as independent components, for the reduced space with PCA at 4 dimensions

Selective Bibliography

Bell A.J. and T.J. Sejnowski. Learning higher-order structure of a natural sound. *Network*, 7:261-266, 1996.

Bell A.J. and T.J. Sejnowski. The 'independent components' of natural scenes are edge filters. *Vision Research*, 37:3327-3338, 1997.

Bell, A.J. & Sejnowski, T.J. (1995). An information maximization approach to blind separation and blind deconvolution, *Neural Computation* 7, 1129–1159.

Buzuloiu A., Sofron E., Institutul National de Cercetare-Dezvoltare în Informatica,Universitatea din Pitesti ICI, Bucuresti http://www.ici.ro/RRIA/ria2004_3/art02.htm

Cardoso, J. (2000). On the stability of source separation algorithms, *Journal of VLSI Signal Processing Systems* 26(1/2), 7–14

Catalin Dumitrescu, *Universitatea Politehnica Bucuresti*, ANALIZELE TIMP-FRECVENTA DIN CLASA COHEN, http://rria.ici.ro/ria2005_2/art04.htmlComon P., Independent Component Analysis - a new concept?, *Signal Processing*, 36 287-314, 1994.

Creţu Train, Fizică Generală, Editura Tehnică 1984

Didier G. Leibovici and Christian Beckmann, An introduction to Multiway Methods for Multi-Subject fMRI experiment, FMRIB Technical Report 2001, Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (FMRIB), Department of Clinical Neurology, University of Oxford, John Radcliffe Hospital, Headley Way, Headington, Oxford, UK.

Esbensen K. H., Guyot D., Westad F., Houmøller L. P., *Multivariate Data Analysis in Practice*, Aalborg University, third Edition, pp.10, Oslo: Camo Process AS, 2002.

Gheorghe Puscasu, Bogdan Codres, Semnale si metode de procesare, http://facultate.regielive.ro/cursuri/automatica/semnale_si_metode_de_procesare-117361.html

Hurri J., A. Hyvärinen, and E. Oja. Wavelets and natural image statistics. In *Proc. Scandinavian Conf. on Image Analysis '97*, Lappenranta, Finland, 1997.

Hyvärinen A., (2001). Complexity pursuit: separating interesting components from time series, *Neural Computation*13, 883–898.

Hyvärinen A., and Erkki Oja, Independent Component Analysis: A Tutorial, node14: Negentropy, Helsinki University of Technology Laboratory of Computer and Information Science;

Hyvärinen A., E. Oja, P. Hoyer, and J. Hurri. Image feature extraction by sparse coding and independent component analysis.In *Proc. Int. Conf. on Pattern Recognition (ICPR'98)*, pages 1268-1273, Brisbane, Australia, 1998.

Hyvärinen A., Karhunen, Oja, Independent Component Analysis, 2001 John Wiley & Sons

Hyvärinen A., Survey on Independent Component Analysis , Helsinki University of Technology Laboratory of Computer and Information Science P.O.Box 5400, FIN-02015 HUT, Finland, aapo.hyvarinen@hut.fi
http://www.cis.hut.fi/~ aapo/, http://cis.legacy.ics.tkk.fi/aapo/papers/NCS99web/

Hyvärinen A., What is Independent Component Analysis,
http://www.cs.helsinki.fi/u/ahyvarin/whatisica.shtml

Hyvärinen Aapo and Erkki Oja, Independent Component Analysis: Algorithms and Applications Neural Networks Research Centre, Helsinki University of Technology, pg.11

Hyvärinen, Aapo, Juha Karhunen, Erkki Oja, Independent Component Analysis, A volume in the Wiley Series son adoptive and Learning Systems for Signal Processing, Communications and Control, Simon Haykin, Series Editor, 2001;

Iacob, Sisteme şi tehnici multimedia, http://andrei.clubcisco.ro/cursuri/5master/tagcmrv-stm/01_stmm1_intro.ppt#273,33,Slide 33

Jutten C. and J. Herault., Blind separation of sources, part I: An adaptive algorithm based on neuromimetic architecture. *Signal Processing*, 24:1-10, 1991;

Karhunen J., A. Hyvärinen, R. Vigario, J. Hurri, and E. Oja. Applications of neural blind separation to signal and image processing. In *Proc. IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP'97)*, pages 131-134, Munich, Germany, 1997.

Kiviluoto K. and E. Oja. Independent component analysis for parallel financial time series. In *Proc. ICONIP'98*, volume 2, pages 895-898, Tokyo, Japan, 1998.

Laurenţiu Frangu – Introducere în Inginerie Electronică şi Telecomunicaţii, 2008, pg.33

Lt. col. ing. Szilagyi A., REZUMATUL TEZEI DE DOCTORAT, TEMA: CONTRIBUŢII LA REALIZAREA MODELĂRII RECEPTOARELOR DE RĂZBOI ELECTRONIC DE RADIOLOCAŢIE, Conducător de doctorat: Colonel (r) prof. univ. dr. ing. Gheorghe GAVRILOAIA BUCUREŞTI, 2006, pp.57

Makeig, A.J. Bell, T.-P. Jung, and T.-J. Sejnowski. Independent component analysis of electroencephalographic data. In Advances in Neural Information PRocessing S. Systems 8, pages 145-151. MIT Press, 1996.

Nisbet Robert, John Elder, John Fletcher Elder, Gary Miner, Handbook of statistical analysis and data mining applications, 2009, http://books.google.ro/books?id=U5np34a5fmQC&pg=PA168&lpg=PA168&dq=Simulta neous+Extraction+and+Deflation&source=bl&ots=Sp_YFUtfHQ&sig=EgHIDGjd7yRxw sXIq-SM8mQXU5k&hl=ro#v=onepage&q=Simultaneous%20Extraction%20and%20Deflation &f=false

Olshausen B. A. and D. J. Field. Emergence of simple-cell receptive field properties by learning a sparse code for natural images. *Nature*, 381:607-609, 1996.

Pascu Mihai N. — Noti̧te curs Probabilităţi şi Statistică , CAPITOLUL 1. ELEMENTE DE TEORIA PROBABILITĂŢTILOR, pg. 57, http://cs.unitbv.ro/~pascu/probstat/10.Variabile%20aleatoare%20independente.pdf

Ristaniemi T. and J. Joutsensalo. On the performance of blind source separation in CDMA downlink. In Proc. Int. Workshop on Independent Component Analysis and Signal Separation (ICA'99), pages 437-441, Aussois, France, 1999

Schrödinger, Erwin What is Life - the Physical Aspect of the Living Cell, Cambridge University Press, 1944

Stone, J.V. (2001). Blind source separation using temporal predictability, *Neural Computation* 13(7), 1559–1574.

Stone, J.V. (2004). *Independent Component Analysis: A Tutorial Introduction*, MIT Press, Boston

Stone, J.V. (2005): *A Brief Introduction to Independent Component Analysis* in Encyclopedia of Statistics in Behavioral Science, Volume 2, pp. 907–912, Editors Brian S. Everitt & David C. Howell, John Wiley & Sons, Ltd, Chichester, 2005 ISBN 978-0-470-86080-9

Stone, J.V. (2004), Independent component Analyis- a Tutorial introduction, Bradford Book, The MIT Press, Cambridge, Massachusetts, London, England, 2004;

Vigário R., J. Särelä, and E. Oja. Independent component analysis in wave decomposition of auditory evoked fields. In Proc. Int. Conf. on Artificial Neural Networks (ICANN'98), pages 287-292, Skövde, Sweden, 1998.

Vigário R., J. Särelä, V. Jousmäki, and E. Oja. Independent component analysis in decomposition of auditory and somatosensory evoked fields. In Proc. Int. Workshop on Independent Component Analysis and Signal Separation (ICA'99), pages 167-172, Aussois, France, 1999.

Vigário R.. Extraction of ocular artifacts from EEG using independent component analysis. Electroenceph. clin. Neurophysiol., 103(3):395-404, 1997.

Wang Ruye, Independent Component Analysis, node4: Measures of Non-Gaussianity;

William Stallings, Data and computer communications, Chapter 3, transmisia datelor, http://ftp.utcluj.ro/pub/users/cemil/prc/Chapt_3ro.ppt#256,1,William Stallings Data and Computer Communications

Tehnici exploratorii multivariate: *Cluster Analysis*, *Factor Analysis, Discriminant Function Analysis, Multidimensional Scaling, Log-linear Analysis, Canonical Correlation, Stepwise Linear and Nonlinear (e.g., Logit) Regression, Correspondence Analysis, Time Series Analysis, General Additive Models, Classification Trees, General Classification and Regression Trees*, and *General CHAID Models*.

Help STATISTICA 8.0.

http://cis.legacy.ics.tkk.fi/aapo/papers/NCS99web/node16.html:

http://cis.legacy.ics.tkk.fi/aapo/papers/NCS99web/node19.html

http://cis.legacy.ics.tkk.fi/aapo/papers/NCS99web/node53.html#Bell97a
http://en.wikipedia.org/wiki/Independent_Component_Analysis
http://en.wikipedia.org/wiki/Negentropy
http://en.wikipedia.org/wiki/Software_deployment
http://research.ics.tkk.fi/ica/
http://ro.wikipedia.org/wiki/Semnal_(electronic%C4%83)
http://www.scritube.com/economie/Introducere-in-analiza-statist25427.php
http://www.scritube.com/tehnica-mecanica/SEMNALE-ELECTRICE93336.php
http://www.unibuc.ro/prof/niculae_c_m/telecom/convolutia.htm
Eurostat

<div align="right">**Annex 1**</div>

<div align="center">**Metadata notes: Unemployment - LFS adjusted series[39]**</div>

Unemployment - LFS adjusted series
Compiling agency: Eurostat, the statistical office of the European Union, extraction from Metadata.doc

Unemployed persons *are all persons 15 to 74 years of age (16 to 74 years in ES, SE (1995-2000), UK, IS and NO) who were not employed during the reference week, had actively sought work during the past four weeks and were ready to begin working immediately or within two weeks. Figures show the number of persons unemployed in thousands.*

The duration of unemployment is defined as the duration of a search for a job or as the length of the period since the last job was held (if this period is shorter than the duration of search for a job).

Monthly data on seasonally adjusted unemployment rates are published approximately 31 days after the end of the month (average timeliness of 2009 releases).

In the monthly application, the idea is to keep the time series as comparable in time as possible. It means that possible breaks in the LFS series due to changes in the definitions or in the filtering of the micro data have been adjusted: in 1991/1992 there was general definition precision; the gradual implementation of the 'new' unemployment definition following the Regulation (EC) 1897/2000 still leads to backwards revisions while also a general improvement in the micro data filtering of the LFS data from 2001 onwards caused breaks and backwards adjustments. While the original LFS data consists of the raw series as they are recorded at each point of time, the same series are adjusted when they are used as benchmarks for the monthly harmonized time series;

Seasonal adjustment is done by Eurostat for most Member States on a disaggregated level (country by gender by agegroup, indirect approach) using TRAMO/SEATS.

---

[39] http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/une_esms.htm

Annex 2_Table 1a. Information about the *PC- principal component model*

Component	R2X	R2X(Cumul.)	Eigenvalues	Q2	Limit	Q2(Cumul.)	Significance	Iterations
Principal Components Analysis Summary (UE27_141.sta) Number of components is 11 99,0698% of sum of squares has been explained by all the extracted components.								
1	0,379186	0,379186	10,23803	0,176926	0,043915	0,176926	S	13
2	0,318089	0,697275	8,58839	0,447203	0,045379	0,545007	S	9
3	0,193390	0,890665	5,22154	0,598256	0,046957	0,817210	S	4
4	0,037607	0,928272	1,01539	0,266034	0,048662	0,865838	S	9
5	0,020227	0,948499	0,54612	0,132572	0,050512	0,883624	S	14
6	0,014435	0,962934	0,38975	0,121133	0,052525	0,897721	S	6
7	0,009726	0,972660	0,26260	0,158079	0,054726	0,913889	S	14
8	0,007098	0,979758	0,19164	0,120777	0,057143	0,924289	S	7
9	0,004579	0,984337	0,12364	0,081423	0,059809	0,930454	S	15
10	0,003673	0,988010	0,09917	0,112983	0,062765	0,938311	S	17
11	0,002688	0,990698	0,07257	0,050971	0,066063	0,941456	UNKNOWN	13

OBS: we use as variable scale the *Unit standard deviations*
Where PC model diagnostics

R^2X the *fraction of the explained variation (the larger the greater is significance of the principal component analysed)*
Q^2X the *fraction of predicted variation*
Because the first principal components respects the rule Q^2>Limit then are significant

Annex 2_Table 1b

	Eigenvalues	% Total variance	Cumulative eigenvalue	Cumulative %
Principal Components Analysis Eigenvalues (UE27_141_4PCA.sta) Number of components is 12 Principal Components Analysis sum of variance 27,0000				
PCA1	10,23803	37,91862	10,23803	37,91862
PCA2	8,58839	31,80885	18,82642	69,72747
PCA3	5,22154	19,33903	24,04796	89,06650
PCA4	1,01539	3,76069	25,06334	**92,82720**
PCA5	0,54612	2,02268	25,60947	94,84987
PCA6	0,38975	1,44351	25,99922	96,29339
PCA7	0,26260	0,97261	26,26182	97,26600
PCA8	0,19164	0,70979	26,45346	97,97579
PCA9	0,12364	0,45792	26,57710	98,43371
PCA10	0,09917	0,36730	26,67627	98,80101
PCA11	0,07257	0,26877	26,74884	**99,06978**
PCA12	0,05723	0,21195	26,80607	99,28173

Annex 2_ Fig. 1

Eigenvalues scree plot
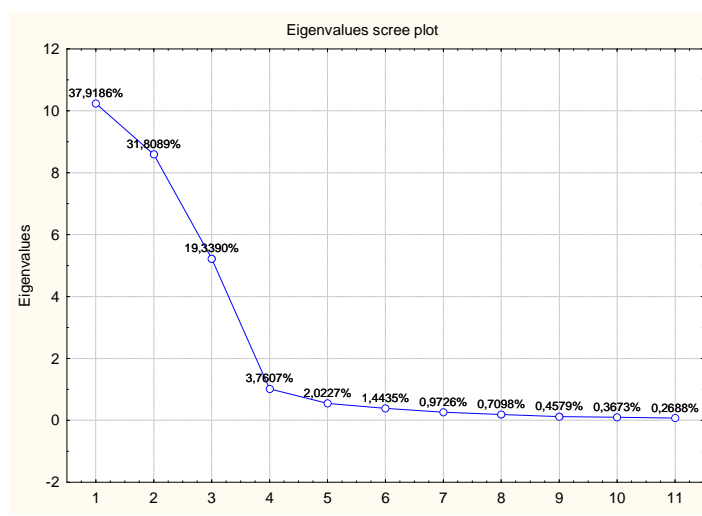
Note that the first principal eigenvalue captures 37,918 % , the second one captures 31.808% and the third one captures 19.339% of the variability in the data. However, this trend decreases as we add more components to the model.

Annex 2_Table 2. Variable importance

Variable	Variable importance (UE27_141.sta) Number of components is 11		
	Variable number	Power	Importance
Romania	25	0,997915	1
Ireland	10	0,997674	2
Austria	22	0,997071	3
Spain	12	0,996412	4
United Kingdom	30	0,994116	5
Luxembourg	18	0,994084	6
Portugal	24	0,993628	7
Estonia	9	0,993354	8
Slovakia	27	0,993246	9
Netherlands	21	0,992238	10
Czech Republic	6	0,992009	11
Finland	28	0,991792	12
Latvia	16	0,991673	13
Lithuania	17	0,991464	14
Hungary	19	0,991440	15
Italy	14	0,991365	16
France	13	0,990970	17
Malta	20	0,990497	18
Belgium	4	0,990273	19
Denmark	7	0,989623	20
Poland	23	0,989229	21
Bulgaria	5	0,988671	22
Greece	11	0,986199	23
Germany	8	0,982553	24
Sweden	29	0,982545	25
Cyprus	15	0,980816	26
Slovenia	26	0,977986	27

Power measures how well a variable is represented by the principal component. All countries EU 27 are well represented by PCA.

Annex 2_Fig. 2. Case wise data diagnostics in view to detect the outliers
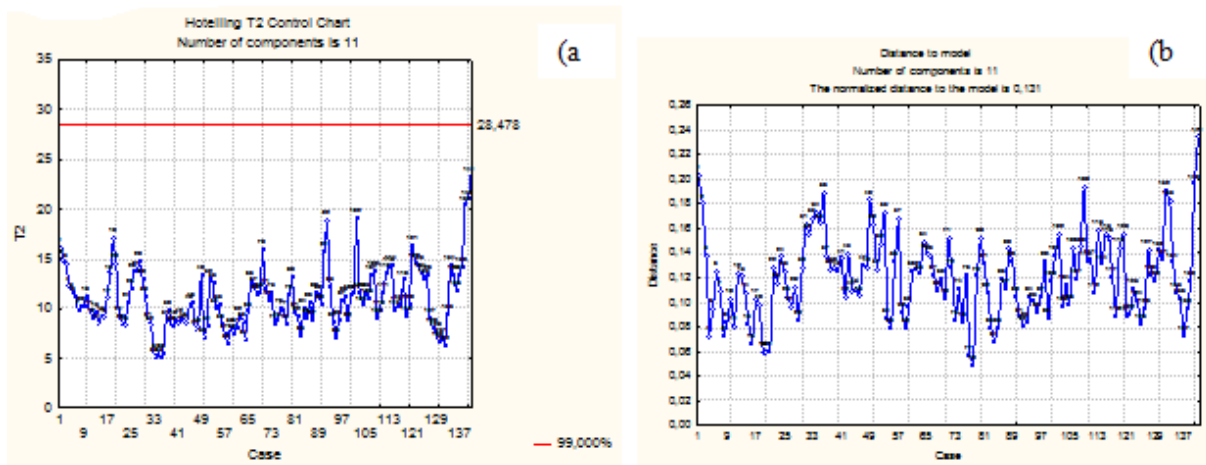
Another data diagnostics using scatterplot of the *x*-scores, "*The x-scores are the transformed values of the X observations in the principal component system. An x-score with too high a value (i.e., one that deviates substantially from the point of origin) can again be regarded as an outlier or abnormal.*" [STATISTICA 8.0. Electronic Manual]

Annex 2_Table 3. Clustering among the variables

Correlations (UE27_141.sta) Marked correlations are significant at $p < ,05000$ N=141 (Casewise deletion of missing data)

	Belgium	Bulgaria	Czech Republic	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus	Latvia	Lithuania
Belgium	1	-0,337161	0,230962	0,329046	0,60949	-0,045142	0,098131	-0,077788	0,030353	0,605895	-0,25643	0,267912	-0,026155	-0,205497
Bulgaria	-0,337161	1	0,675191	0,024563	-0,007515	0,392009	-0,353504	0,316131	-0,153579	-0,086229	0,784128	-0,195731	0,247649	0,61606
Czech Republic	0,230962	0,675191	1	0,319982	0,354623	0,517027	-0,189439	0,356634	-0,038875	0,515067	0,745724	0,236818	0,36792	0,574501
Denmark	0,329046	0,024563	0,319982	1	-0,335524	0,729473	0,80261	0,759711	0,854925	0,773888	0,311865	0,802394	0,79681	0,660921
Germany	0,60949	-0,007515	0,354623	-0,335524	1	-0,477525	-0,66012	-0,473968	-0,695208	0,059427	-0,200864	-0,296856	-0,565677	-0,490183
Estonia	-0,045142	0,392009	0,517027	0,729473	-0,477525	1	0,577335	0,586311	0,717425	0,557448	0,73864	0,535995	0,960956	0,944351
Ireland	0,098131	-0,353504	-0,18944	0,80261	-0,66012	0,577335	1	0,597768	0,967742	0,570064	0,006763	0,766781	0,72907	0,442277
Greece	-0,077788	0,316131	0,356634	0,759711	-0,473968	0,586311	0,597768	1	0,686226	0,551132	0,467116	0,765023	0,622824	0,670878
Spain	0,030353	-0,153579	-0,03888	0,854925	-0,695208	0,717425	0,967742	0,686226	1	0,572861	0,223327	0,750744	0,839629	0,625031
France	0,605895	-0,086229	0,515067	0,773888	0,059427	0,557448	0,570064	0,551132	0,572861	1	0,236444	0,797358	0,590622	0,411044
Italy	-0,25643	0,784128	0,745724	0,311865	-0,200864	0,73864	0,006763	0,467116	0,223327	0,236444	1	0,175434	0,615214	0,84409
Cyprus	0,267912	-0,195731	0,236818	0,802394	-0,296856	0,535995	0,766781	0,765023	0,750744	0,797358	0,175434	1	0,612521	0,4236
Latvia	-0,026155	0,247649	0,36792	0,79681	-0,565677	0,960956	0,72907	0,622824	0,839629	0,590622	0,615214	0,612521	1	0,891592
Lithuania	-0,205497	0,61606	0,574501	0,660921	-0,490183	0,944351	0,442277	0,670878	0,625031	0,411044	0,84409	0,4236	0,891592	1
Luxembourg	0,574767	-0,868858	-0,4107	0,286354	0,131127	-0,235176	0,463942	-0,059316	0,313689	0,362117	-0,656535	0,390446	-0,091504	-0,426077
Hungary	0,155144	-0,548862	-0,31027	0,654542	-0,563059	0,404919	0,943997	0,446397	0,845959	0,54012	-0,187758	0,764625	0,560179	0,2148
Malta	0,319594	0,640372	0,718539	0,193106	0,439072	0,293597	-0,289119	0,059324	-0,167882	0,222199	0,456941	-0,131529	0,197665	0,379193
Netherlands	0,832528	-0,353272	0,291721	0,44371	0,553753	-0,045544	0,179292	0,184942	0,108644	0,668044	-0,223456	0,527117	-0,025333	-0,164302
Austria	0,833988	-0,420741	0,160134	0,233857	0,62975	-0,162447	0,068452	-0,146056	-0,03673	0,540829	-0,372218	0,251269	-0,091206	-0,319844
Poland	0,155673	0,771192	0,746605	-0,118652	0,599777	0,025509	-0,6454	0,006749	-0,493724	-0,00911	0,503734	-0,315677	-0,133348	0,20503
Portugal	0,40574	-0,709871	-0,39184	0,613861	-0,289422	0,1248	0,829942	0,332567	0,689384	0,531299	-0,465961	0,692646	0,29384	-0,064005
Romania	0,515451	0,285132	0,593978	0,500887	0,300253	0,288033	0,106977	0,431887	0,169808	0,59406	0,235743	0,37362	0,287816	0,309933
Slovenia	0,225285	0,438214	0,672841	0,747903	-0,114988	0,634099	0,413225	0,836457	0,51367	0,720866	0,598993	0,688673	0,616973	0,687726
Slovakia	-0,011652	0,90228	0,878828	0,114965	0,296852	0,392311	-0,407552	0,263738	-0,213624	0,134998	0,783586	-0,089455	0,227474	0,559211
Finland	0,053744	0,811912	0,917656	0,311096	0,16043	0,634285	-0,16256	0,330886	0,039707	0,361846	0,878845	0,083669	0,494462	0,725676
Sweden	0,664301	-0,473057	0,106743	0,700365	0,047891	0,358951	0,675441	0,264732	0,601304	0,785107	-0,149857	0,694976	0,465284	0,144992
United Kingdom	0,025301	-0,349853	-0,21328	0,711934	-0,708855	0,576958	0,972201	0,53995	0,935779	0,544424	0,015644	0,720797	0,724824	0,426505

	Lithuania	Luxembourg	Hungary	Malta	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	United Kingdom
Belgium	-0,205497	0,574767	0,155144	0,319594	0,832528	0,833988	0,155673	0,40574	0,515451	0,225285	-0,011652	0,053744	0,664301	0,025301
Bulgaria	0,61606	-0,868858	-0,54886	0,640372	-0,353272	-0,420741	0,771192	-0,709871	0,285132	0,438214	0,90228	0,811912	-0,473057	-0,349853
Czech Republic	0,574501	-0,410701	-0,31027	0,718539	0,291721	0,160134	0,746605	-0,391836	0,593978	0,672841	0,878828	0,917656	0,106743	-0,213279
Denmark	0,660921	0,286354	0,654542	0,193106	0,44371	0,233857	-0,118652	0,613861	0,500887	0,747903	0,114965	0,311096	0,700365	0,711934
Germany	-0,490183	0,131127	-0,56306	0,439072	0,553753	0,62975	0,599777	-0,289422	0,300253	-0,114988	0,296852	0,16043	0,047891	-0,708855
Estonia	0,944351	-0,235176	0,404919	0,293597	-0,045544	-0,162447	0,025509	0,1248	0,288033	0,634099	0,392311	0,634285	0,358951	0,576958
Ireland	0,442277	0,463942	0,943997	-0,289119	0,179292	0,068452	-0,6454	0,829942	0,106977	0,413225	-0,407552	-0,16256	0,675441	0,972201
Greece	0,670878	-0,059316	0,446397	0,059324	0,184942	-0,146056	0,006749	0,332567	0,431887	0,836457	0,263738	0,330886	0,264732	0,53995
Spain	0,625031	0,313689	0,845959	-0,167882	0,108644	-0,03673	-0,493724	0,689384	0,169808	0,51367	-0,213624	0,039707	0,601304	0,935779
France	0,411044	0,362117	0,54012	0,222199	0,668044	0,540829	-0,00911	0,531299	0,59406	0,720866	0,134998	0,361846	0,785107	0,544424
Italy	0,84409	-0,656535	-0,18776	0,456941	-0,223456	-0,372218	0,503734	-0,465961	0,235743	0,598993	0,783586	0,878845	-0,149857	0,015644
Cyprus	0,4236	0,390446	0,764625	-0,131529	0,527117	0,251269	-0,315677	0,692646	0,37362	0,688673	-0,089455	0,083669	0,694976	0,720797
Latvia	0,891592	-0,091504	0,560179	0,197665	-0,025333	-0,091206	-0,133348	0,29384	0,287816	0,616973	0,227474	0,494462	0,465284	0,724824
Lithuania	1	-0,426077	0,2148	0,379193	-0,164302	-0,319844	0,20503	-0,064005	0,309933	0,687726	0,559211	0,725676	0,144992	0,426505
Luxembourg	-0,426077	1	0,568552	-0,391601	0,657779	0,610327	-0,54478	0,800203	0,094249	-0,131238	-0,679752	-0,592261	0,700607	0,388759
Hungary	0,2148	0,568552	1	-0,44736	0,246949	0,157035	-0,77628	0,90313	0,013798	0,274582	-0,580026	-0,35667	0,70095	0,935556
Malta	0,379193	-0,391601	-0,44736	1	0,168378	0,234567	0,799842	-0,405117	0,438977	0,402818	0,766293	0,735497	0,071267	-0,339253
Netherlands	-0,164302	0,657779	0,246949	0,168378	1	0,797054	0,113324	0,504722	0,559438	0,369712	0,004103	0,008773	0,703885	0,0534
Austria	-0,319844	0,610327	0,157035	0,234567	0,797054	1	0,074803	0,400713	0,458177	0,102691	-0,098039	-0,048977	0,679905	-0,000695
Poland	0,20503	-0,54478	-0,77628	0,799842	0,113324	0,074803	1	-0,702113	0,434748	0,310461	0,901446	0,748521	-0,307954	-0,695796
Portugal	-0,064005	0,800203	0,90313	-0,405117	0,504722	0,400713	-0,702113	1	0,090848	0,191975	-0,659531	-0,505113	0,765353	0,775509
Romania	0,309933	0,094249	0,013798	0,438977	0,559438	0,458177	0,434748	0,090848	1	0,562979	0,48429	0,489778	0,377736	0,035211
Slovenia	0,687726	-0,131238	0,274582	0,402818	0,369712	0,102691	0,310461	0,191975	0,562979	1	0,515173	0,611396	0,359421	0,356724
Slovakia	0,559211	-0,679752	-0,58003	0,766293	0,004103	-0,098039	0,901446	-0,659531	0,48429	0,515173	1	0,919704	-0,243745	-0,444986
Finland	0,725676	-0,592261	-0,35667	0,735497	0,008773	-0,048977	0,748521	-0,505113	0,489778	0,611396	0,919704	1	-0,045508	-0,165425
Sweden	0,144992	0,700607	0,70095	0,071267	0,703885	0,679905	-0,307954	0,765353	0,377736	0,359421	-0,243745	-0,045508	1	0,604975
United Kingdom	0,426505	0,388759	0,935556	-0,339253	0,0534	-0,000695	-0,695796	0,775509	0,035211	0,356724	-0,444986	-0,165425	0,604975	1

Note: p-value less than 0.05 would result in the rejection of the null hypothesis at the 5% (significance) level.

Annex 2_Table 3.b. Clustering among the variables *(Detail Romania)*:

Romania:Belgium: $y = 3{,}3722 + 0{,}4673{*}x$; $r = 0{,}5155$; $p = 0.0000$; $r^2 = 0{,}2657$

Romania:Bulgaria: $y = 6{,}5023 + 0{,}0398{*}x$; $r = 0{,}2851$; $p = 0{,}0006$; $r^2 = 0{,}0813$

Romania:Czech Republic: $y = 4{,}8505 + 0{,}2955{*}x$; $r = 0{,}5940$; $p = 0.0000$; $r^2 = 0{,}3528$

Romania:Denmark: $y = 5{,}7623 + 0{,}2382{*}x$; $r = 0{,}5009$; $p = 0.0000$; $r^2 = 0{,}2509$

Romania:Germany: $y = 5{,}8762 + 0{,}1257{*}x$; $r = 0{,}3003$; $p = 0{,}0003$; $r^2 = 0{,}0902$

Romania:Estonia: $y = 6{,}4857 + 0{,}0469{*}x$; $r = 0{,}2880$; $p = 0{,}0005$; $r^2 = 0{,}0830$

Romania:Ireland: $y = 6{,}8493 + 0{,}0175{*}x$; $r = 0{,}1070$; $p = 0{,}2067$; $r^2 = 0{,}0114$

Romania:Greece: $y = 5{,}689 + 0{,}1231{*}x$; $r = 0{,}4319$; $p = 0{,}00000$; $r^2 = 0{,}1865$

Romania:Spain: $y = 6{,}6592 + 0{,}0247{*}x$; $r = 0{,}1698$; $p = 0{,}0441$; $r^2 = 0{,}0288$

Romania:France: $y = 1{,}5919 + 0{,}5994{*}x$; $r = 0{,}5941$; $p = 0.0000$; $r^2 = 0{,}3529$

Romania:Italy: $y = 5{,}8899 + 0{,}1345{*}x$; $r = 0{,}2357$; $p = 0{,}0049$; $r^2 = 0{,}0556$

Romania:Cyprus: $y = 5{,}9532 + 0{,}2142{*}x$; $r = 0{,}3736$; $p = 0{,}00001$; $r^2 = 0{,}1396$

Romania:Latvia: $y = 6{,}4577 + 0{,}0437{*}x$; $r = 0{,}2878$; $p = 0{,}0005$;$r^2 = 0{,}0828$

Romania:Lithuania: $y = 6{,}4786 + 0{,}0416{*}x$; $r = 0{,}3099$; $p = 0{,}0002$; $r^2 = 0{,}0961$

Romania:Luxembourg: $y = 6{,}7571 + 0{,}052{*}x$; $r = 0{,}0942$; $p = 0{,}2663$; $r^2 = 0{,}0089$

Romania:Hungary: $y = 6{,}931 + 0{,}0045{*}x$; $r = 0{,}0138$; $p = 0{,}8710$; $r^2 = 0{,}0002$

Romania:Malta: $y = 3{,}1971 + 0{,}5388{*}x$; $r = 0{,}4390$; $p = 0{,}00000$; $r^2 = 0{,}1927$

Romania:Netherlands: $y = 5{,}4087 + 0{,}4012{*}x$; $r = 0{,}5594$; $p = 0.0000$; $r^2 = 0{,}3130$

Romania:Austria: $y = 4{,}6589 + 0{,}5315{*}x$; $r = 0{,}4582$; $p = 0{,}00000$; $r^2 = 0{,}2099$

Romania:Poland: $y = 6{,}1683 + 0{,}0562{*}x$; $r = 0{,}4347$; $p = 0{,}00000$; $r^2 = 0{,}1890$

Romania:Portugal: $y = 6{,}7807 + 0{,}0226{*}x$; $r = 0{,}0908$; $p = 0{,}2840$; $r^2 = 0{,}0083$

Romania:Romania: $y = 0 + 1{*}x$; $r = 1{,}0000$; $p = $ ---; $r^2 = 1{,}0000$

Romania:Slovenia: $y = 4{,}7185 + 0{,}3601{*}x$; $r = 0{,}5630$; $p = 0.0000$; $r^2 = 0{,}3169$

Romania:Slovakia: $y = 5{,}5817 + 0{,}0907{*}x$; $r = 0{,}4843$; $p = 0{,}00000$; $r^2 = 0{,}2345$

Romania:Finland: $y = 4{,}3179 + 0{,}3186{*}x$; $r = 0{,}4898$; $p = 0.0000$; $r^2 = 0{,}2399$

Romania:Sweden: $y = 5{,}3632 + 0{,}2333{*}x$; $r = 0{,}3777$; $p = 0{,}00000$; $r^2 = 0{,}1427$

Romania:United Kingdom: $y = 6{,}8577 + 0{,}0187{*}x$; $r = 0{,}0352$; $p = 0{,}6785$; $r^2 = 0{,}0012$

Where: r - Pearson correlation coefficent / linear or product-moment correlation
      r^2-Adjusted r^2, coefficient of determination/variance of the model's predictions in total variance
      p - result of statistical significance testing

Annex 2_Table 4.

Variable	Variable number	Valid N.	Mean	Std.Dev	Scaling factor
	Descriptive statistics (UE27_141.sta) Number of components is 11				
Belgium	4	141	7,68936	0,681773	0,681773
Bulgaria	5	141	11,64326	4,432225	4,432225
Czech Republic	6	141	7,15532	1,242142	1,242142
Denmark	7	141	5,04965	1,299540	1,299540
Germany	8	141	8,66667	1,476756	1,476756
Estonia	9	141	10,21489	3,791794	3,791794
Ireland	10	141	6,61631	3,772449	3,772449
Greece	11	141	10,36738	2,168294	2,168294
Spain	12	141	12,39504	4,249963	4,249963
France	13	141	8,96525	0,612604	0,612604
Italy	14	141	7,99574	1,083373	1,083373
Cyprus	15	141	4,72482	1,078038	1,078038
Latvia	16	141	11,62128	4,072974	4,072974
Lithuania	17	141	11,70426	4,607011	4,607011
Luxembourg	18	141	4,00284	1,120009	1,120009
Hungary	19	141	7,58014	1,886805	1,886805
Malta	20	141	6,99291	0,503508	0,503508
Netherlands	21	141	3,88014	0,861910	0,861910
Austria	22	141	4,33901	0,532752	0,532752
Poland	23	141	14,17660	4,780027	4,780027
Portugal	24	141	8,17376	2,487157	2,487157
Romania	25	141	6,96525	0,618060	0,618060
Slovenia	26	141	6,23972	0,966354	0,966354
Slovakia	27	141	15,24752	3,298735	3,298735
Finland	28	141	8,30922	0,950105	0,950105
Sweden	29	141	6,86809	1,000880	1,000880
United Kingdom	30	141	5,75461	1,164381	1,164381

Annex 2_Table 5.

Loading spreadsheet (UE27_141.sta) Number of components is 11

	PCA 1	PCA 2	PCA 3	PCA 4	PCA 5	PCA 6	PCA 7	PCA 8	PCA 9	PCA 10	PCA 11	PCA 12
Belgium	0,3003	-0,0820	0,8733	-0,1689	0,0643	-0,0328	0,0030	0,3000	-0,0415	-0,0595	0,0462	-0,0831
Bulgaria	-0,1959	0,9274	-0,2192	0,1049	0,1582	-0,0322	0,0679	-0,0148	-0,0249	-0,0205	0,0152	0,0418
Czech Republic	0,1591	0,8834	0,3377	0,0052	-0,2351	0,0392	0,0297	-0,0517	-0,0500	0,0893	-0,0439	0,0224
Denmark	0,9289	0,2136	0,0738	0,0200	0,1757	-0,0782	-0,1318	-0,0048	0,0207	-0,0433	-0,1273	-0,0018
Germany	-0,4408	0,1292	0,8695	-0,0392	-0,1171	-0,0312	-0,0186	-0,0066	-0,0133	-0,0141	0,0010	0,0448
Estonia	0,6962	0,5443	-0,2980	-0,3011	-0,0843	0,0634	-0,0561	0,0143	-0,0830	-0,0487	-0,0514	0,0010
Ireland	0,9254	-0,2640	-0,2455	-0,0500	0,1005	-0,0281	-0,0073	0,0023	0,0323	0,0027	0,0151	0,0217
Greece	0,7146	0,3664	-0,1974	0,5297	0,0844	-0,0741	-0,0061	-0,0445	0,0480	0,0332	0,0044	-0,0832
Spain	0,9274	-0,0566	-0,3133	-0,0641	0,1159	-0,0060	-0,0968	0,0233	0,0802	0,0220	0,0308	-0,0066
France	0,8120	0,2026	0,4341	-0,0069	-0,2011	0,0433	0,1682	0,0865	0,0313	0,1226	-0,0805	0,0022
Italy	0,1919	0,8762	-0,2905	-0,0669	-0,2371	0,0316	-0,1144	0,0485	0,0843	-0,0331	0,1132	-0,0334
Cyprus	0,8997	-0,0016	0,0904	0,2882	-0,2363	-0,0313	0,0274	-0,1067	-0,0937	-0,0271	0,0311	-0,1063
Latvia	0,8005	0,3915	-0,3122	-0,2926	0,0082	0,0747	-0,0007	-0,0343	0,0107	-0,0425	0,0093	-0,0194
Lithuania	0,5614	0,7011	-0,3835	-0,1336	0,0339	0,0201	-0,0946	-0,0168	-0,0159	-0,0232	-0,0201	0,0209
Luxembourg	0,4181	-0,7191	0,4634	-0,0101	0,0165	0,0470	-0,2488	-0,0123	0,0855	0,1280	0,0218	0,0198
Hungary	0,8538	-0,4623	-0,1642	-0,0242	-0,0484	-0,0116	0,1017	-0,0049	-0,0859	-0,0686	0,0435	0,0537
Malta	-0,0535	0,7475	0,3936	-0,2873	0,2915	-0,2851	0,0744	-0,0782	-0,0712	0,0965	0,0217	-0,0587
Netherlands	0,4152	-0,0882	0,8512	0,1855	-0,0944	-0,0479	-0,1815	-0,0230	-0,0721	-0,0476	-0,0266	0,0198
Austria	0,2416	-0,1864	0,8766	-0,1690	0,0137	0,0372	0,1559	-0,1682	0,1930	-0,1257	-0,0223	-0,0318
Poland	-0,3842	0,8151	0,3882	0,0735	0,1123	-0,0845	-0,0686	0,0166	0,0488	0,0020	0,0202	0,0115
Portugal	0,7586	-0,6090	0,1436	0,0714	0,0952	-0,0990	0,0092	0,0259	-0,0482	-0,0457	-0,0537	0,0418
Romania	0,3784	0,4517	0,5397	0,2155	0,3094	0,4601	0,0513	-0,0040	-0,0566	0,0162	0,0399	0,0109
Slovenia	0,6568	0,5958	0,1209	0,3231	-0,0329	-0,1906	0,1043	0,1016	0,0724	-0,0278	0,0549	0,1100
Slovakia	-0,1311	0,9732	0,1427	0,0473	0,0166	0,0136	-0,0606	-0,0397	-0,0230	-0,0537	-0,0018	0,0207
Finland	0,1165	0,9618	0,0879	-0,1511	-0,0930	0,0632	-0,0055	0,0432	0,0693	0,0224	-0,0444	0,0017
Sweden	0,7843	-0,2143	0,4683	-0,2506	-0,0274	-0,0434	-0,0162	-0,1433	-0,0509	0,0455	0,1163	0,0521
United Kingdom	0,8789	-0,2782	-0,3308	-0,0982	0,0271	0,0233	0,1356	0,0539	0,0318	0,0703	0,0077	-0,0002

[*PCA can also help you to analyze the relationship between the original variables, the way they correlate to each other and their influence in determining the new coordinate system. The quantity at the centre of such analyses is the x-loadings factors. The x-loadings of a principal component with respect to a variable is the cosine of the angle between the directions of that component and the axis of the respective variable. This implies that the more influential a variable in determining a component, the more the variable axis is aligned with that component.*
Scatter plots of the loading factors PC 1 and PC2] [STATISTICA 8.0. Electronic Manual]

to analyze the relation between the variables and identify the most influential ones in determining the *PCA* model.

Annex 2_ Fig.3. Relations between original variables.
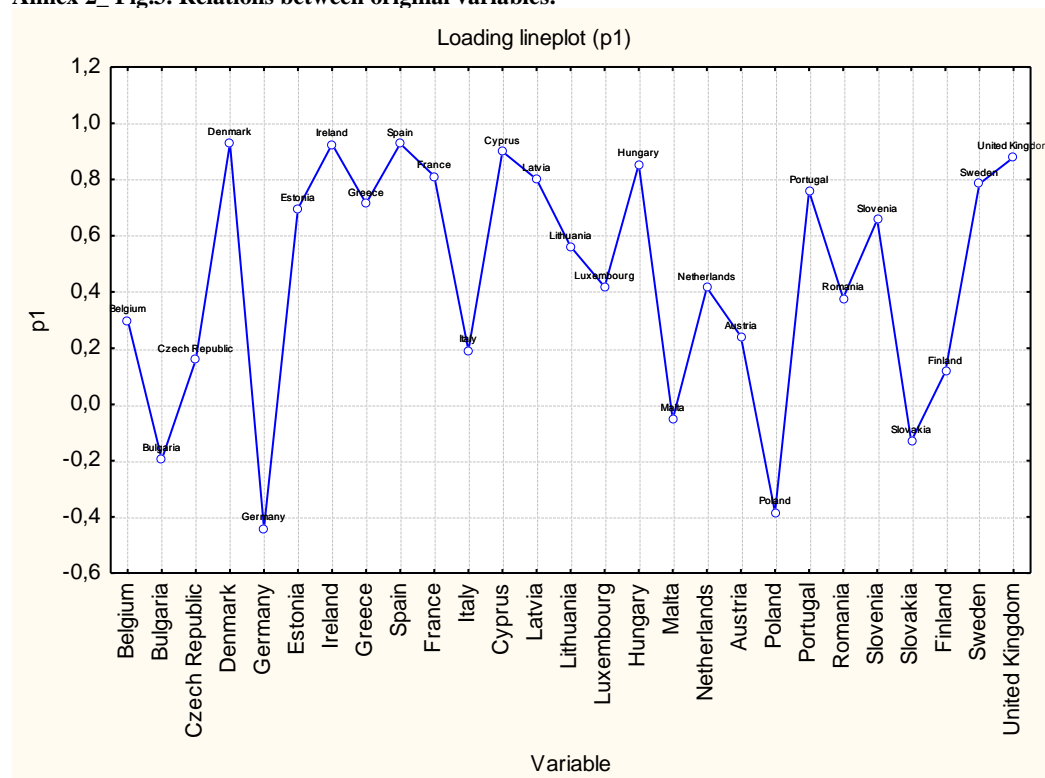
Annex 3

Annex 3_Fig.1.a
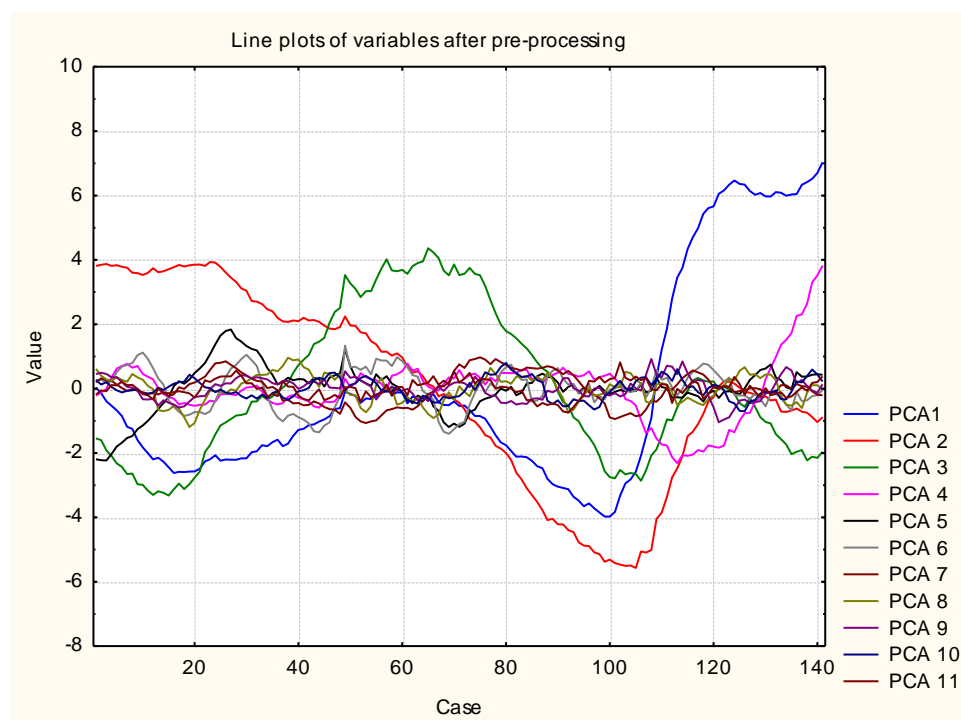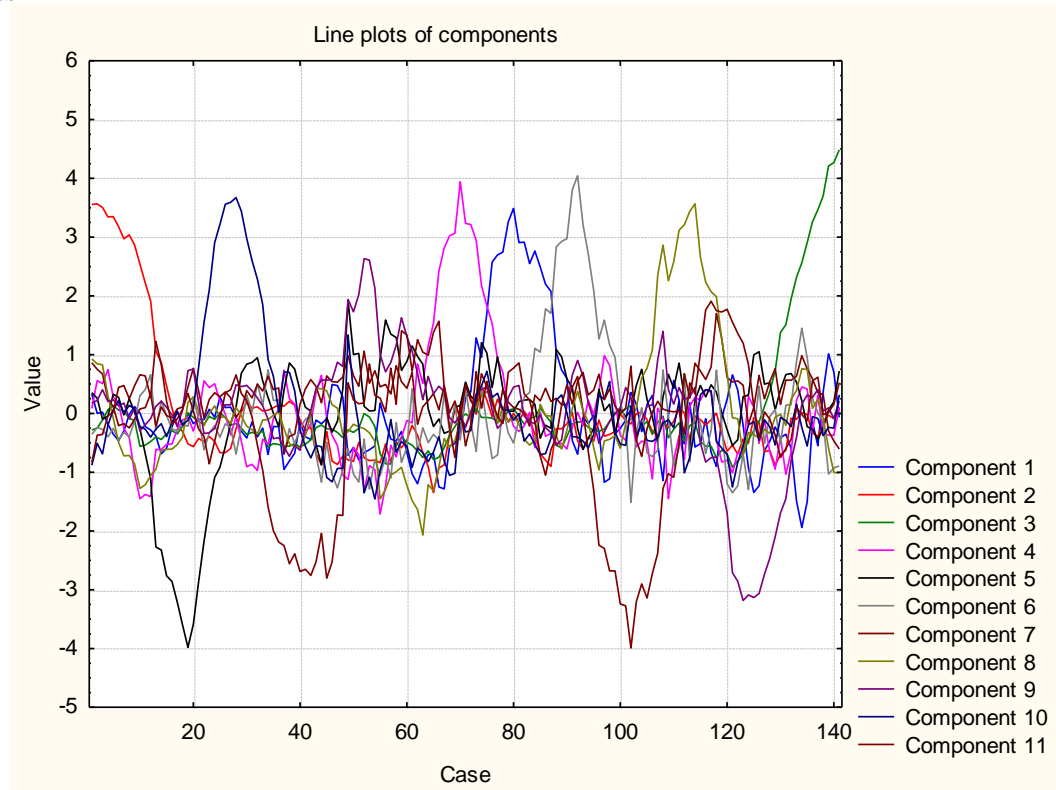
Annex 3_Fig.1.b

Annex 3_Fig.1.c

Annex 3_Table 1

Factor	1	2	3	4	5	6	7	8	9	10	11
Eigenvectors of covariance matrix (ue27_14_PCA11_faramediaUe.sta)											
PCA1	-0,006570	-0,009134	0,012618	0,074093	-0,197024	0,299039	-0,389047	-0,459584	-0,459139	-0,482496	0,244529
PCA 2	-0,147165	-0,175773	0,126047	0,246640	-0,477937	0,516565	-0,315558	0,053125	0,310157	0,362198	-0,213729
PCA 3	-0,584712	-0,670382	0,367561	-0,000706	0,112692	-0,162353	0,115591	0,003067	-0,083633	-0,101405	0,062386
PCA 4	0,086081	0,061685	0,077737	0,535351	-0,469837	-0,075203	0,468456	0,330700	-0,080564	-0,255767	0,262714
PCA 5	-0,132035	-0,040668	-0,210938	-0,421317	0,018202	0,350328	-0,034631	0,384338	0,307159	-0,185024	0,598626
PCA 6	0,432136	0,033320	0,737030	0,075524	0,195282	-0,057224	-0,194149	-0,051364	0,270284	0,023869	0,328430
PCA 7	-0,221705	0,021122	-0,369226	0,448376	0,094219	-0,353147	-0,217067	-0,337140	0,379404	0,139312	0,394087
PCA 8	0,080711	-0,060597	0,055067	-0,427638	-0,469673	-0,090907	0,414491	-0,540505	0,105304	0,249905	0,193806
PCA 9	0,605857	-0,710828	-0,335969	0,044999	-0,004312	-0,043039	-0,054740	0,033321	0,036108	-0,063135	-0,038658
PCA 10	0,041914	-0,052871	-0,036250	0,091167	0,134110	0,117801	-0,003123	0,134136	-0,580797	0,662070	0,400370
PCA 11	-0,018421	0,029165	0,039387	-0,263845	-0,461921	-0,580526	-0,505404	0,318311	-0,135806	0,036381	0,027205

	1	2	3	4
Eigenvectors of covariance matrix (UE27_141_4PCA				
PCA 1	-0,603891	-0,694122	0,387744	0,056254
PCA 2	0,323247	0,079140	0,532171	0,778487
PCA 3	0,399362	-0,022455	0,672179	-0,623042
PCA 4	-0,609374	0,715142	0,338561	-0,051113

Annex 3_Fig.2a. Case with 11 PCA/11 ICA

Eigenvalues of covariance matrix
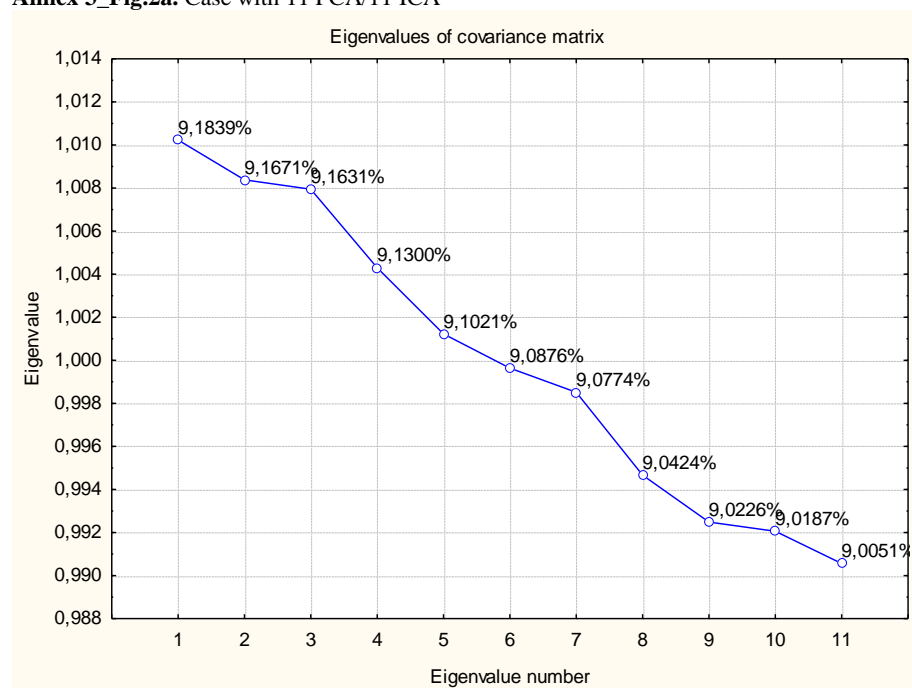
Annex 3_Fig.2b. Case with 4 PCA/4 ICA

Annex 3_Table 2a

	ICA 1	ICA 2	ICA 3	ICA 4	ICA 5	ICA 6	ICA 7	ICA 8	ICA 9	ICA 10	ICA 11
ICA 1	-0,219246	-0,234663	0,164920	0,112453	0,001232	0,117901	0,490185	0,305702	-0,340904	0,626312	-0,030023
ICA 2	-0,116131	0,340179	-0,399329	0,129538	-0,712979	0,248664	0,129991	0,261979	0,194308	0,001023	0,032976
ICA 3	0,517138	-0,105961	-0,296488	0,712802	0,134443	-0,165877	0,048276	-0,066917	0,164685	0,209096	0,045911
ICA 4	-0,072208	-0,078579	0,397981	0,097637	-0,360900	-0,533854	0,375325	-0,193160	0,145412	-0,176100	0,418455
ICA 5	0,226622	-0,311837	0,469724	0,117107	-0,021170	0,387830	-0,103209	0,520202	0,347229	-0,234706	0,096270
ICA 6	-0,283875	-0,416644	-0,177574	0,177822	0,011851	0,009505	0,362616	-0,105990	0,107959	-0,443366	-0,575748
ICA 7	0,371874	0,564352	0,395987	-0,041263	0,030486	0,065389	0,361939	-0,104612	0,083908	0,022866	-0,479580
ICA 8	0,249231	-0,305383	-0,221357	-0,571103	-0,036629	-0,057413	0,188255	-0,092264	0,551092	0,340510	-0,035040
ICA 9	-0,485290	0,077731	0,258596	0,282148	0,031322	0,193344	-0,255510	-0,383009	0,482997	0,350242	-0,075313
ICA 10	-0,214378	0,295948	-0,204434	0,002787	0,559621	0,187422	0,441332	0,099005	0,246336	-0,186742	0,419789
ICA 11	0,228004	-0,188667	0,020033	-0,011954	-0,162232	0,617387	0,176012	-0,581658	-0,246637	-0,085599	0,258698

Non-gaussian matrix (ue27_14_PCA11_faramediaUe.sta)   Estimated Non-gaussian matrix.

Annex 3_Table 2b

Non-gaussian matrix (UE27_141_4PCA.sta)   Estimated Non-gaussian matrix.

	ICA 1	ICA 2	ICA 3	ICA 4
ICA 1	-0,555627	-0,032717	0,222026	-0,800570
ICA 2	-0,022943	-0,091327	0,954111	0,284264
ICA 3	-0,783783	-0,307978	-0,197802	0,501705
ICA 4	-0,276471	0,946435	0,035376	0,163014

Annex 3_Table 3a

	ICA 1	ICA 2	ICA 3	ICA 4	ICA 5	ICA 6	ICA 7	ICA 8	ICA 9	ICA 10	ICA 11
Mixing matrix (ue27_14_PCA11_faramediaUe.sta) Estimated mixing matrix computed from centered data.											
PCA1	-0,219139	-0,115109	0,515500	-0,072156	0,225335	-0,283754	0,371623	0,248324	-0,484020	-0,213301	0,227244
PCA 2	-0,234476	0,339123	-0,104645	-0,078003	-0,310638	-0,416919	0,565061	-0,305779	0,077697	0,295185	-0,188123
PCA 3	0,165370	-0,400656	-0,298438	0,399589	0,470836	-0,178865	0,398323	-0,222576	0,259481	-0,204804	0,019685
PCA 4	0,112333	0,131567	0,712269	0,097832	0,116499	0,177810	-0,040679	-0,571122	0,282013	0,002428	-0,011823
PCA 5	0,000274	-0,712336	0,133025	-0,359637	-0,021917	0,011087	0,030018	-0,035857	0,030470	0,557808	-0,163664
PCA 6	0,116686	0,250563	-0,166332	-0,535252	0,388954	0,008743	0,064433	-0,057862	0,194575	0,185630	0,618810
PCA 7	0,489203	0,129535	0,048907	0,377294	-0,104911	0,362657	0,361776	0,188165	-0,255231	0,439802	0,175542
PCA 8	0,304055	0,261296	-0,066882	-0,193017	0,520331	-0,106601	-0,105725	-0,092534	-0,382342	0,098962	-0,581503
PCA 9	-0,341915	0,195470	0,165558	0,145448	0,348837	0,108274	0,084164	0,553751	0,485196	0,247240	-0,247937
PCA 10	0,623471	0,001103	0,208358	-0,175430	-0,234107	-0,441229	0,023210	0,339677	0,349548	-0,186318	-0,085247
PCA 11	-0,030117	0,033135	0,045480	0,418141	0,096799	-0,575511	-0,479514	-0,035287	-0,076126	0,419812	0,258208

Annex 3_Table 3b

	ICA 1	ICA 2	ICA 3	ICA 4
Mixing matrix (UE27_141_4PCA.sta) Estimated mixing matrix computed from centered data.				
PCA 1	-0,557621	-0,023474	-0,783854	-0,277766
PCA 2	-0,030996	-0,089300	-0,307277	0,944764
PCA 3	0,223245	0,952533	-0,198085	0,037411
PCA 4	-0,802765	0,283578	0,502032	0,162215

Annex 3_Table 4a

	PCA1	PCA 2	PCA 3	PCA 4	PCA 5	PCA 6	PCA 7	PCA 8	PCA 9	PCA 10	PCA 11
Un-mixing matrix (ue27_14_PCA11_faramediaUe.sta) Estimated un-mixing matrix computed from centered data.											
ICA 1	-0,219353	-0,234850	0,164472	0,112574	0,002196	0,119118	0,491175	0,307353	-0,339899	0,629164	-0,029928
ICA 2	-0,117157	0,341238	-0,398012	0,127507	-0,713631	0,246770	0,130443	0,262665	0,193153	0,000942	0,032816
ICA 3	0,518783	-0,107283	-0,294543	0,713342	0,135865	-0,165421	0,047647	-0,066953	0,163816	0,209838	0,046344
ICA 4	-0,072260	-0,079153	0,396380	0,097440	-0,362165	-0,532468	0,373357	-0,193306	0,145376	-0,176773	0,418768
ICA 5	0,227914	-0,313038	0,468618	0,117716	-0,020421	0,386713	-0,101509	0,520077	0,345629	-0,235307	0,095741
ICA 6	-0,283997	-0,416369	-0,176288	0,177836	0,012617	0,010268	0,362579	-0,105380	0,107647	-0,445511	-0,575988
ICA 7	0,372125	0,563645	0,393660	-0,041848	0,030956	0,066344	0,362106	-0,103498	0,083652	0,022522	-0,479649
ICA 8	0,250141	-0,304990	-0,220144	-0,571085	-0,037401	-0,056965	0,188344	-0,091990	0,548444	0,341349	-0,034794
ICA 9	-0,486564	0,077768	0,257713	0,282285	0,032173	0,192117	-0,255792	-0,383678	0,480808	0,350940	-0,074499
ICA 10	-0,215459	0,296712	-0,204068	0,003148	0,561443	0,189217	0,442869	0,099051	0,245436	-0,187166	0,419766
ICA 11	0,228767	-0,189213	0,020380	-0,012083	-0,160800	0,615972	0,176480	-0,581815	-0,245341	-0,085952	0,259189

Annex 3_Table 4b

	PCA 1	PCA 2	PCA 3	PCA 4
Un-mixing matrix (UE27_141_4PCA.sta) Estimated un-mixing matrix computed from centered data.				
ICA 1	-0,553641	-0,034436	0,220814	-0,798385
ICA 2	-0,022413	-0,093359	0,955695	0,284948
ICA 3	-0,783713	-0,308681	-0,197518	0,501378
ICA 4	-0,275179	0,948115	0,033337	0,163809

Annex 3_Table 5a

Pre-whitening matrix (ue27_14_PCA11_faramediaUe.sta)

	PCA1	PCA 2	PCA 3	PCA 4	PCA 5	PCA 6	PCA 7	PCA 8	PCA 9	PCA 10	PCA 11
ICA 1	1,002669	-0,001546	0,000317	0,000251	0,000149	-0,000026	-0,000058	0,000110	-0,000011	0,000042	-0,000095
ICA 2	-0,001546	1,000663	-0,001427	-0,001151	-0,000216	0,000048	0,000040	0,000182	0,000079	-0,000097	-0,000032
ICA 3	0,000317	-0,001427	0,995952	0,000600	-0,000056	0,000280	-0,000140	-0,000021	0,000302	0,000052	0,000014
ICA 4	0,000251	-0,001151	0,000600	1,000245	0,001788	-0,000263	-0,000417	-0,000060	-0,000016	0,000057	0,000310
ICA 5	0,000149	-0,000216	-0,000056	0,001788	1,001964	0,002154	0,001045	-0,000375	0,000058	0,000191	-0,000011
ICA 6	-0,000026	0,000048	0,000280	-0,000263	0,002154	0,997694	0,002571	0,000246	-0,000286	0,000066	-0,000038
ICA 7	-0,000058	0,000040	-0,000140	-0,000417	0,001045	0,002571	1,000496	0,001694	0,000138	0,000061	0,000022
ICA 8	0,000110	0,000182	-0,000021	-0,000060	-0,000375	0,000246	0,001694	1,000795	-0,000463	0,000701	-0,000968
ICA 9	-0,000011	0,000079	0,000302	-0,000016	0,000058	-0,000286	0,000138	-0,000463	0,995616	-0,000651	0,000240
ICA 10	0,000042	-0,000097	0,000052	0,000057	0,000191	0,000066	0,000061	0,000701	-0,000651	1,003784	0,000655
ICA 11	-0,000095	-0,000032	0,000014	0,000310	-0,000011	-0,000038	0,000022	-0,000968	0,000240	0,000655	1,000310

Annex 3_Table 5b

Pre-whitening matrix (UE27_141_4PCA.sta)

	PCA 1	PCA 2	PCA 3	PCA 4
ICA 1	0,998472	0,001088	0,000978	-0,001193
ICA 2	0,001088	1,002049	-0,002123	0,000719
ICA 3	0,000978	-0,002123	1,001114	0,001231
ICA 4	-0,001193	0,000719	0,001231	0,998410

Annex 3_Table 6a

Covariance matrix (ue27_14_PCA11_faramediaUe.sta)   The covariance matrix of centered and standardized (if specified) data.

	PCA1	PCA 2	PCA 3	PCA 4	PCA 5	PCA 6	PCA 7	PCA 8	PCA 9	PCA 10	PCA 11
PCA1	1,000000	0,006647	-0,000512	-0,000001	0,000000	0,000000	0,000000	0,000000	0,000000	0,000000	0,000000
PCA 2	0,006647	1,000000	-0,003913	-0,000006	0,000000	0,000000	0,000000	0,000000	0,000000	0,000000	0,000000
PCA 3	-0,000512	-0,003913	1,000000	0,001145	-0,000026	-0,000016	-0,000021	0,000009	-0,000003	0,000001	0,000000
PCA 4	-0,000001	-0,000006	0,001145	1,000000	-0,004613	-0,000546	0,000005	0,000000	0,000000	0,000000	0,000000
PCA 5	0,000000	0,000000	-0,000026	-0,004613	1,000000	-0,005489	0,000087	0,000000	-0,000002	0,000000	0,000000
PCA 6	0,000000	0,000000	-0,000016	-0,000546	-0,005489	1,000000	-0,005572	0,000067	0,000270	-0,000021	-0,000015
PCA 7	0,000000	0,000000	-0,000021	0,000005	0,000087	-0,005572	1,000000	0,004960	0,000017	0,000021	-0,000003
PCA 8	0,000000	0,000000	0,000009	0,000000	0,000000	0,000067	0,004960	1,000000	0,003842	0,001970	-0,000325
PCA 9	0,000000	0,000000	-0,000003	0,000000	-0,000002	0,000270	0,000017	0,003842	1,000000	0,006191	-0,000082
PCA 10	0,000000	0,000000	0,000001	0,000000	0,000000	-0,000021	0,000021	0,001970	0,006191	1,000000	-0,004807
PCA 11	0,000000	0,000000	0,000000	0,000000	0,000000	-0,000015	-0,000003	-0,000325	-0,000082	-0,004807	1,000000

Annex 3_Table 6b

Covariance matrix (UE27_141_4PCA.sta)   The covariance matrix of centered and standardized (if specified) data.

	PCA 1	PCA 2	PCA 3	PCA 4
PCA 1	1,000000	0,006647	-0,000512	-0,000001
PCA 2	0,006647	1,000000	-0,003913	-0,000006
PCA 3	-0,000512	-0,003913	1,000000	0,001145
PCA 4	-0,000001	-0,000006	0,001145	1,000000

Covariance measure dependence of x on y, non normalised, where x, y are independent.

Eigenvalues are equal to variance of projections along corresponding eigenvector ($\sigma^2 = \xi$) Eigenvectors of a symmetric matrix are orthogonal, normalized basis vectors for a coordinate system. Total variance in data is given by sum of eigenvalues. [40]

$$C = \begin{bmatrix} \sigma_1^2 & 0 \\ 0 & \sigma_2^2 \end{bmatrix} = \begin{bmatrix} \xi_1 & 0 \\ 0 & \xi_2 \end{bmatrix}$$

Annex 3_Table 7a

Descriptive statistics of separated source data (ue27_14_PCA11_faramediaUe.sta) Number of components: 11						Descriptive statistics for variables (ue27_14_PCA11_faramediaUe.sta) Number of valid cases: 141				
	Mean	Variance	Minimum	Maximum			Mean	Variance	Minimum	Maximum
ICA 1	0,000000	0,999385	-3,97801	1,934869		PCA1	0,000000	10,23803	-3,97392	7,032930
ICA 2	0,000000	0,998537	-0,92013	4,477845		PCA 2	0,000000	8,58839	-5,57076	3,936121
ICA 3	0,000000	0,999532	-1,45835	3,665043		PCA 3	0,000000	5,22154	-3,32295	4,364150
ICA 4	0,000000	0,995466	-2,79739	1,896845		PCA 4	0,000000	1,01539	-2,31210	3,822250
ICA 5	0,000000	0,996458	-4,03926	1,499888		PCA 5	0,000000	0,54612	-2,22974	1,838798
ICA 6	0,000000	1,005686	-3,48735	1,948706		PCA 6	0,000000	0,38975	-1,40335	1,334375
ICA 7	0,000000	0,996886	-2,06508	3,567277		PCA 7	0,000000	0,26260	-1,06926	0,974273
ICA 8	0,000000	1,005739	-1,72374	3,954616		PCA 8	0,000000	0,19164	-1,19199	0,961533
ICA 9	0,000000	1,001332	-3,18592	2,634494		PCA 9	0,000000	0,12364	-1,04479	0,921608
ICA 10	0,000000	1,000690	-3,99528	1,696116		PCA 10	0,000000	0,09917	-0,70351	0,799567
ICA 11	0,000000	1,000859	-1,34836	3,559213		PCA 11	0,000000	0,07257	-0,74287	0,817664

Annex 3_Table 7b

Descriptive statistics of separated source data (UE27_141_4PCA.sta) Number of components: 4						Descriptive statistics for variables (UE27_141_4PCA.sta) Number of valid cases: 141				
	Mean	Variance	Minimum	Maximum			Mean	Variance	Minimum	Maximum
ICA 1	0,000000	1,001693	-1,83510	1,575418		PCA 1	0,000000	10,23803	-3,97392	7,032930
ICA 2	0,000000	0,998915	-2,37548	2,055181		PCA 2	0,000000	8,58839	-5,57076	3,936121
ICA 3	0,000000	1,000186	-1,29439	4,432552		PCA 3	0,000000	5,22154	-3,32295	4,364150
ICA 4	0,000000	0,999267	-1,73535	1,388644		PCA 4	0,000000	1,01539	-2,31210	3,822250

---

[40] ***, Why is dimensionality reduction useful?, http://rieke-server.physiol.washington.edu/People/Fred/Classes/545/PCA2.pdf

PCA11 MATRIX PLOT
ue27_141_pca11_ICA11.sta
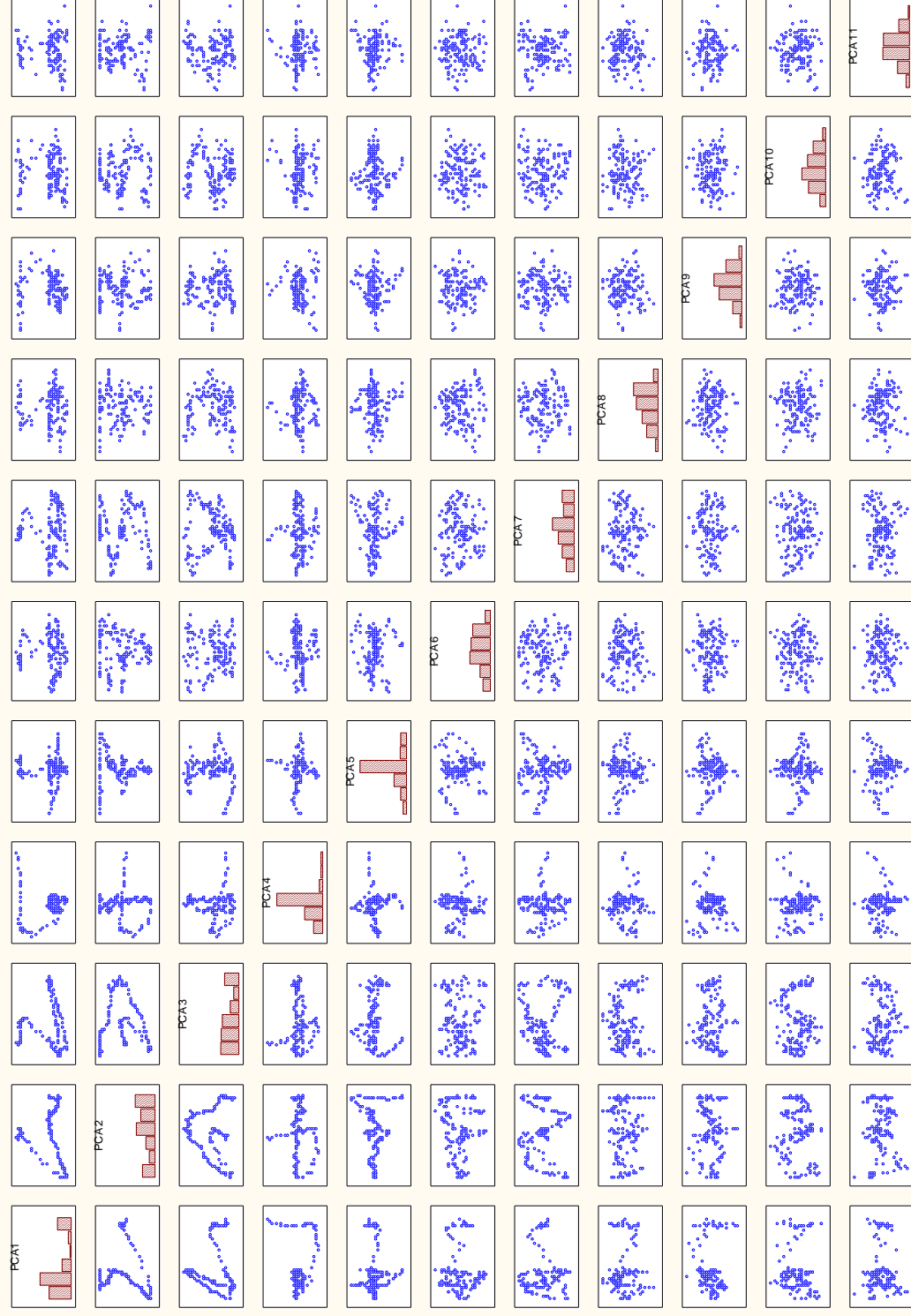
ICA11 MATRIX PLOT
ue27_141_pca11_ICA11.sta
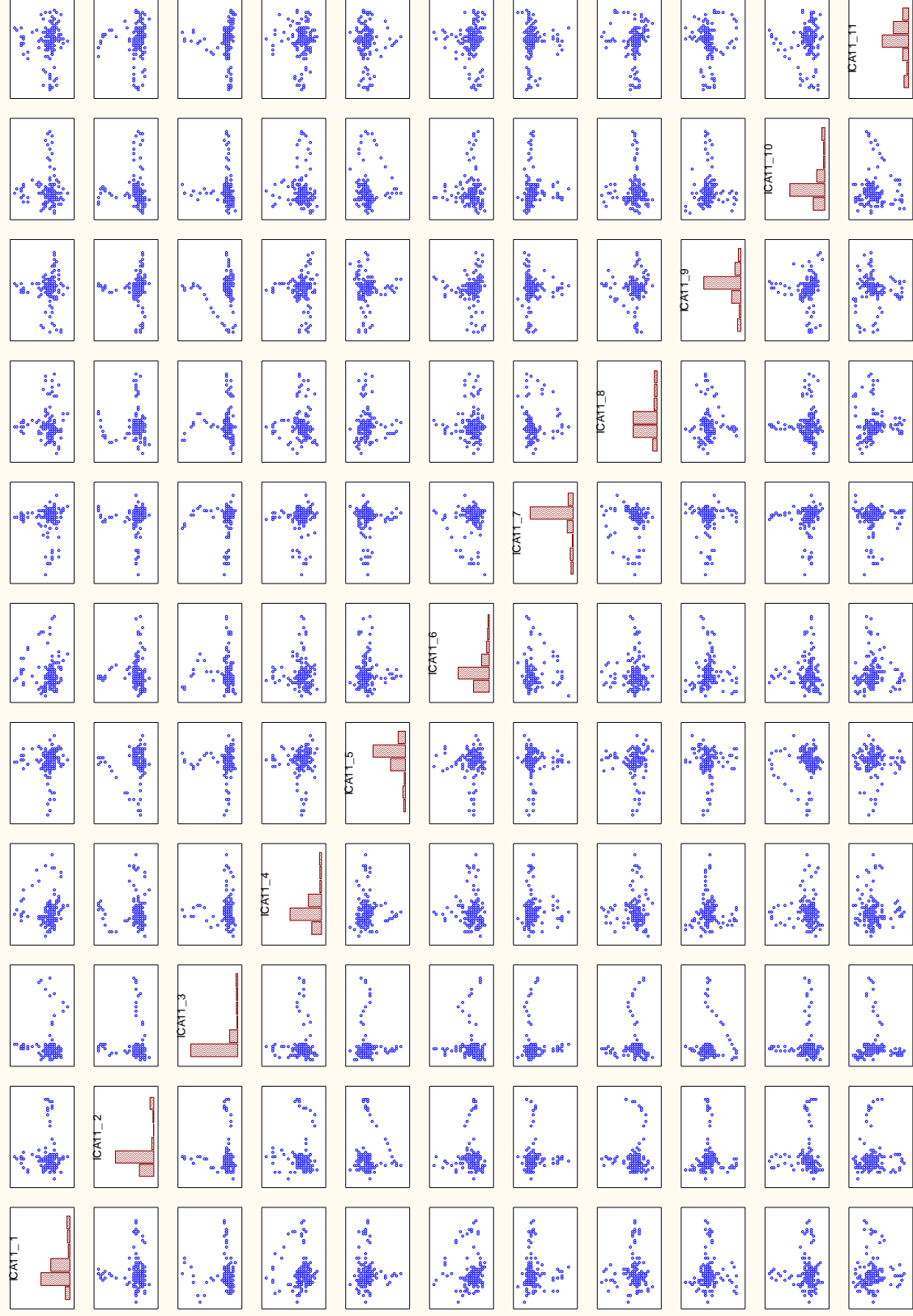
FEAR OF CRIME IN BEYOGLU CITY CENTER

Funda YIRMIBESOGLU
Istanbul Technical University, Faculty of Architecture
funday@itu.edu.tr

Nilgun ERGUN
Istanbul Technical University, Faculty of Architecture
ergunn@itu.edu.tr

Abstract

Beyoglu, which is one of two most important historical centers in the 17 million Istanbul, and where a gentrification process is being implemented since the 1980's. This research is based on the differences in physical, demographical and economical characteristics of Istanbul's districts, which show a rise in ratios of crime, especially in the city center such as the Beyoglu and Eminonu districts. In the Beyoglu central district which is economically better developed and with mixed land usage, differentiation in day/night population will be analyzed in order to determine how this could affect increase in crime.
The crime survey is conducted in the Beyoglu district between 2006 and 2008. The questionnaire results provide an insight into the mapping of crime in Beyoglu streets. The purpose of the study with this questionnaire is also to analyze fear from crime in the Beyoglu streets. At the end of the research, crime prevention strategies are going to be improved and new suggestions will be presented for the streets where crime rates are high.

Keywords: crime, city center, Beyoglu
JEL Classification: R0

1. Introduction

In studies made in developed countries, close relationships have been found between crime levels and the physical and demographic characteristics of residential areas related with land value characteristics. (Ackerman, 1976, 2004; Brantingham, et.al, 1980; Rengert, 1981; Kohlfeld and Sprague, 1988; Bursik and Grasmick, 1993; Harries, 1999). Consequently, it has been observed that the main reasons for the increase in urban crime and violence are the result of turmoil in the social, political and economic structures.

In developing countries on the other hand, political and economic changes, changes in the social structure as a result of migration, improper urbanization especially in big cities of these countries, lead to problems related with education, health, transportation and employment, which become factors that increase crime rates and criminal tendency. Furthermore, the turmoil caused by different value judgments besides traditional values, which came into existence as a consequence of industrialization, information technologies, and globalization is also a significant factor in the increase in crimes and crime rates.

A sustainable urban environment can be defined as an environment that does not threaten the safety of its present and future inhabitants, and does not create any concerns about people's personal security and safety of their possessions. As can be seen from the definition, the problem is not only about crime, but also about the fear of crime. For this reason, it is as important to cut down the fear of crime, as it is to prevent and reduce crime itself, since fear prevents people's activities and their ability to use the environment. According to Susan Smith (1989), when people are scared, they change their habits and tend to stay at home more often. When they do go out, they keep away from public transportation, and avoid particular streets and people. Therefore, fear of crime has a considerable influence on society's mood, human health, and quality of life. Fear of crime can turn places in to "forbidden grounds", and can make people feel disappointed with the justice system, and cause them to move out. Since those people who move out are generally wealthier, crime zones shift places.

With a population of 17 million, Turkey's largest city Istanbul is a city where urban quality of life has very intense positive and negative effects. Growing internal migration from rural areas to urban areas, rapid population growth, unemployment, and squatting recently resulted in rising crime rates.

2. Literature Review

According to studies on the distribution of urban crime in urban areas in recent years, it is seen that distribution of crime varies due to multi-centered city developments with dynamic structures. (Harries, 1976, 1999; Elie, 1994; Rich, 1995; Craglia et.all, 1999, 2001; Openshaw, 1999; Anselin, et al. 2000; Paulsen, Robinson 2004; Ackerman, 1998, 2004; Ergun, Yirmibesoglu, 2005).

Modern theories in this tradition include the recent examples of Newman's (1972) "defensible space theory," Cohen and Felson's (1979) "routine activities theory," and Wilson and Kelling's (1982) "broken windows theory.

Kelling and Wilson's (1982) "broken windows" theory states that environmental disorientations and the increase in neglected buildings aggravate crime and vandalism, and therefore increase the environmental disorientation even more.

According to "routine activities" theory, opportunities play a role in the taking place of crime, and experts indicate that reducing the opportunities can prevent crime (Cohen, 1979; Clarke and others, 1993; Felson, and others, 1998; Jan van Dijk, 1994). This approach is used as crime prevention through environmental design, in the USA, Canada and Australia. In Europe, this concept is known as "the reducing of crime and fear of crime through urban planning, building design, urban management and maintenance." Crime prevention is thus generally defined as aiming to decrease real crime, and increase the sense of safety and security. (Newman, 1972; Taylor and others 1987; Plessis, 1999; Crowe, 2000; Van Soomeren, 2000; Cozens, 2001; Eck, 2003; Smith and others, 2003).

Research and evaluations have provided examples of situations where physical design or redesign appears to have contributed substantially to lowering crimes or to crime-related public order problems (Ralph et al, 1996).

• **Designing safer public housing.** Buildings with fewer apartments per entryway, fewer stories, and better views of the outside have residents with lower levels of fear and rates of victimization (Newman and Franck, 1980, 1982).

• **Erecting barriers and changing street patterns.** In a North Miami neighborhood, building barriers and altering street patterns seem to have helped residents reduce the volume of drug dealers and buyers driving through the area. The result: Crimes such as auto theft and assault declined more rapidly in their neighborhood than in the city as a whole (Atlas, 1991; Ycaza, 1992).

• **Controlling access to buildings, schools, parks, public housing, or other trouble spots through the use of regulated entry.** Measures used by the Bronx's Community and Clergy Coalition, for example, include requiring an identification card, setting limited hours of usage, diverting traffic through specific checkpoints, and using metal detectors in schools or other public buildings (Weisel, Gouvis, and Harrell, 1994).

• **Creating safer public places.** Seattle's Adopt-a-Park program removes overgrown trees and bushes and increases lighting in neighborhood parks to deter drug dealing, vandalism, and the presence of homeless people (Weisel, Gouvis, and Harrell, 1994). Success was reported for a similar Project in a major downtown public park in Stockholm (Knutsson, 1994).

In research made by Ergun and Yirmibesoglu since 1998, spatial differences in the distribution of crime according to various factors have been observed in İstanbul, and the highest rate of crime was established to be in; Eminonu, which is a center of commerce with a very high day time and low night time population; and Beyoglu, which is a commercial, cultural and entertainment center. These are not only large administrative, commercial and entertainment centers, but they also have a complex structure with wealth on one hand, and poverty on the other, cultural potential on one hand, and neglect on the other, a high rate of unemployment on one hand, facilities and potentials on the other. Additionally, a complex social texture has developed in these areas resulting from migrants from Anatolia.

However, while according to previous research Beyoglu had a high crime rate, this has started to change and the number of crimes committed are decreasing thanks to the recent gentrification process, restoration of buildings and urban design implementations in various streets.

3. Distribution of Crime against Property and Persons in Istanbul

Conducted in 32 district municipalities in Istanbul between the years 2000–2005, a descriptive study is made which evaluates the relationship between the distribution of crimes against property and persons, among districts and the different physical and social structures observed in these districts.

Land use is the most important factor. The data of land use was taken from the Istanbul Master Plan, prepared by Istanbul Metropolitan Municipality (IMM, 1995; IMM, 2000). Land uses were evaluated according to three categories "residential", "residential + commercial" and "residential + industrial" (IMM, 1995; Giritlioglu et al., 1993; Kilincaslan, 1974; Tekeli, 1994).

When the use of land is reviewed in the districts (map 1), it is observed that: Of the 18 districts, eight are residential-commercial land use; four are residential-industrial use while mainly residential use is observed in the remaining six districts.

Two of the eight districts having residential-commercial use [Eminonu, Beyoglu (on the European side)] are central business districts while the other six are peripheral districts [Fatih, Sisli, Besiktas, Bakirkoy (on the European side) and Uskudar, Kadikoy (on the Asian side)].
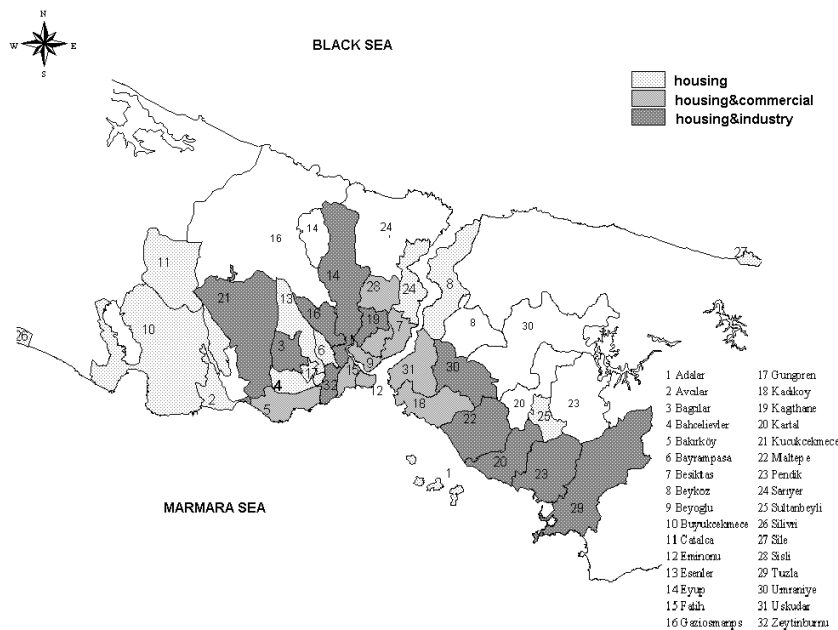
Map 1. Land use in Districts

In this study, crimes against property are defined as armed robbery, robbery (vehicles, businesses, homes), pick pocketing and snatch thievery, while crimes against persons are defined as murder, injury and/or harm (IPD, 2005).

Between 2000–2005, total crimes committed in Istanbul were 292,118 (not including traffic and terrorism related crimes) and the yearly average was 58,423.

Total crime average has been calculated per 10000 people in Istanbul between 2000-2005. Types of crimes committed are classified as crimes against persons and crimes against property.

Total crime rate average is 64 in 10000; property crime rate is 5 in 1000 people; and the rate of crimes against persons is 1 in 1000. Rates below and above these averages have been classified as "very low", "low", "high" and "very high" respectively. Crime rates are rated as "high" and "very high" in 12 districts out of 32 in Istanbul between 2000–2005. Crime rates are rated as "high" in old districts, central and sub-central districts (IPD, 2005).

Distribution of property crime and personal crime are shown in maps 2 and 3, respectively, in Istanbul. When we look at the spatial distribution of property crime, it is seen that crime rate is high in areas where land values are considerably high in Bosphorus' two coasts and along the Marmara coast.
The highest rates of property crime are found on the European side; "Eminonu" (central business district). Other high rates of crime on the European side are observed in "Beyoglu" (central business district),
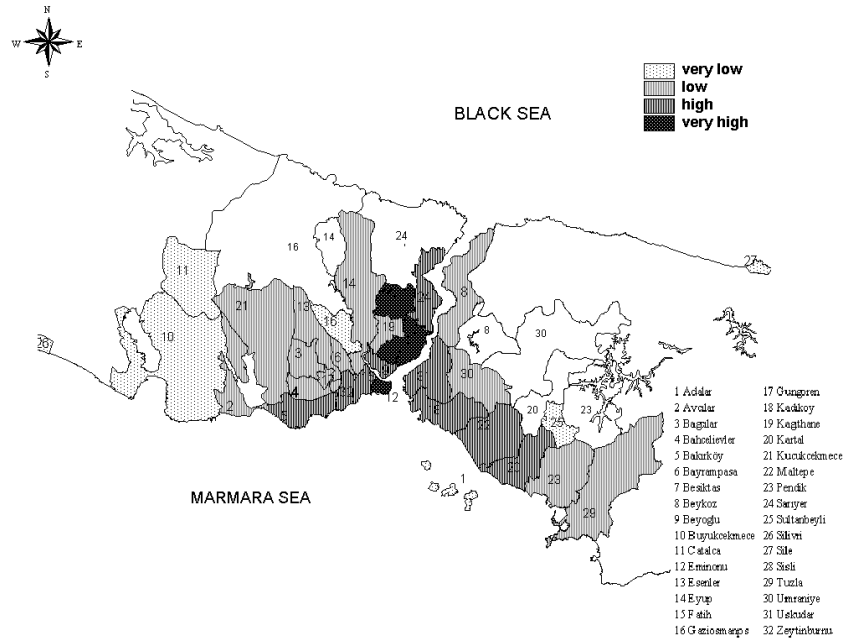
Map 2. Property Crime in Istanbul Between 2000-2005

"Eminonu" has the highest personal crime ratio (Map 3), followed by "Beyoglu" (central business district),
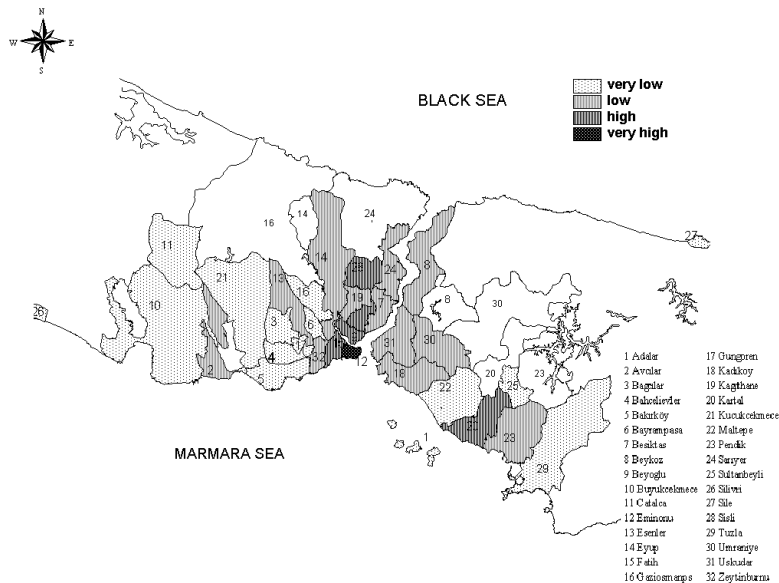
Map 3. Personal Crime in Istanbul Between 2000-2005

In an analysis made between the years 2000-2005, it is noted that districts away from the city center, especially Buyukcekmece, display a significant increase in property and personal crime.
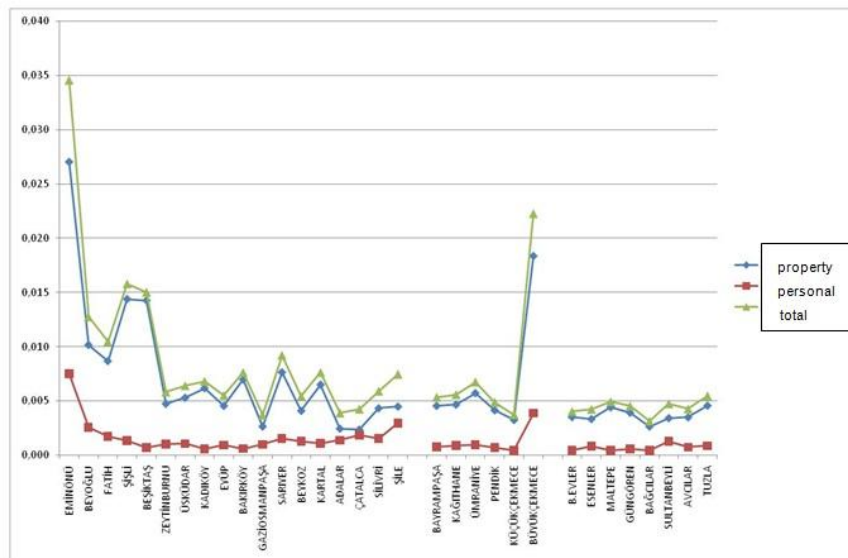
Figure: 1. Property, Personal and Total Crime in Istanbul Between 2000-2005
Property and Personal Crime in Beyoglu Between 2002-2007 is shown below.
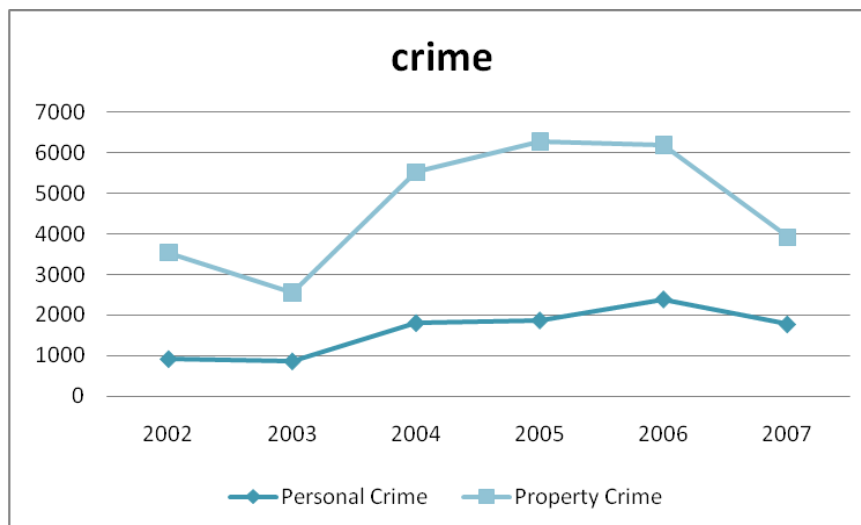
Figure 2. Property and Personal Crime in Beyoglu Between 2002-2007 (IPD, 2008)

4. Fear of Crime in Beyoglu

A commercial, cultural and entertainment center, with a settled population of 225.000, Beyoglu displays different characteristics due to a population which reaches millions during the day and night. In Beyoglu district, a total of 300 surveys have been conducted; 100 surveys each for Cihangir, Asmalı Mescit, Galata neighborhoods, all of which had been recently renovated in 2006. This survey was repeated in 2008 in order to display the change. 300 people who participated in the survey are shown in the table below, showing male – female rates according to years. It can be seen that the number of males interviewed in 2006 and 2008 are higher (respectively, 57 and 89%).

If an evaluation is made, concerning the years 2006 and 2008 the survey was conducted, it is observed that mostly the young population (ages 20-40) were surveyed.

55.7% of the participants of the survey were born in Istanbul. This rate shows a tendency to decrease in 2008.

According to the 2006 statistics, when the duration of settlement in Istanbul is evaluated, rate of new arrivals (0-5 years) turns out very low, 13.7%. In 2008, this rate decreases to 7.3%. According to 2006 statistics, rate of settlement for 10 years or more is 73%. And in 2008, settlement for ten years or more is 84%.

Evaluating where the participants of the survey live in Istanbul, 2006 statistics show us that the rate of people living in city centers is considerably high at 46.7%. In 2008, this rate decreases to 36.7%. It is regarded that the rate of people who live in city centers or within 10 km of city centers is high (76.4% and 62.4% by order of survey years).

Table 1. Where people live

Survey Year	2006		2008	
	Number of people	%	Number of people	%
City center	140	46,7	110	36,7
Within 10 km	89	29,7	77	25,7
10-20 km	55	18,3	81	27,0
20-30 km	10	3,3	21	7,0
30 and more	3	1,0	7	2,3
Out of İstanbul	3	1,0	4	1,3
Total	300	100,0	300	100,0

As far as educational backgrounds, persons who participated in the survey in 2006, have a high educational level (43% high school, 29% university, %19.7 secondary school graduates). But in 2008, these levels are found to be decreasing.

Evaluating occupational groups, 2006 data shows us that the highest rate (29.3%) belongs to scientific and technical self-employed professionals. Commerce and sales professionals are second at 16.7%. Employees of the service sector turn out at 15.3% and non-agricultural employees at 11.7%. In 2008, commerce and sales professionals appear at a higher rate at 37.7%.

According to the reasons why participants come to Beyoglu, it appears that a high rate of 37.3% comes for residence in 2006, and 57% comes for business purposes in 2008.

Table 2. The Reason for Coming to Beyoglu

Year of Survey	2006		2008	
	Number of People	%	Number of People	%
Entertainment, shopping	96	32,0	27	9,0
Business	92	30,7	171	57,0
Residence	112	37,3	102	34,0
Total	300	100,0	300	100,0

When the weekly usage of Beyoglu is evaluated, the participants' weekly usage appears to be quite frequent. In 2006, maximum 46% visited Beyoglu daily. In 2008, daily usage had risen to 55.7%.
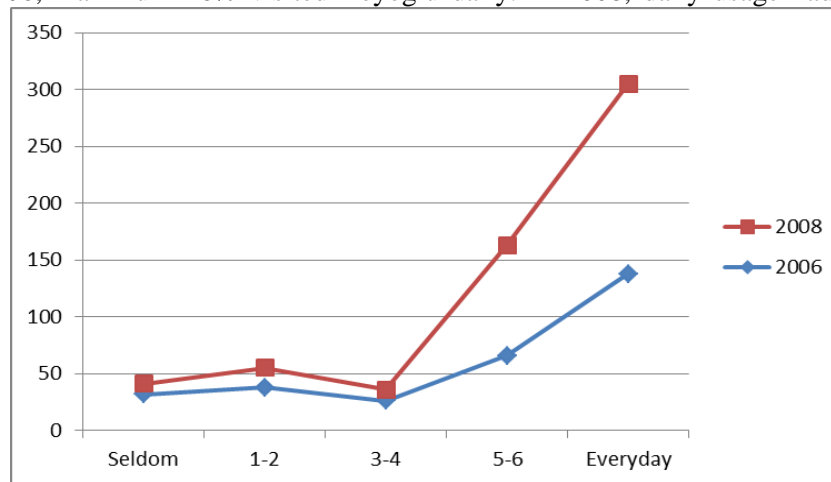
Figure 3. Weekly Usage of Beyoglu

Concerning daytime safety in Beyoglu, most of the participants state that Beyoglu is safe during the day. It is observed to be 69.7% and 71.7% safe respective to survey years.

Table 4. Daytime Safety

Survey Year	2006		2008	
	Number of People	%	Number of People	%
Safe	209	69,7	215	71,7
Purse-snatching	15	5,0	22	7,3
Burglary	34	11,3	18	6,0
Deforcement	6	2,0	6	2,0
Personal	19	6,3	21	7,0
Other causes	17	5,7	18	6,0
Total	300	100,0	300	100,0

As far as nighttime safety in Beyoglu, a very large number of the participants state that Beyoglu is not safe at nights. Beyoglu is considered safe at a rate of 24.7% and 22.3% respective to survey years. Especially in 2008, the rate of feeling of safety seems to decrease.

Table 5. Nighttime Safety

Survey Year	2006		2008	
	Number of People	%	Number of People	%
Safe	74	24,7	67	22,3
Purse-Snatching	32	10,7	56	18,7
Burglary	75	25,0	45	15,0
Deforcement	21	7,0	19	6,3
Personal	58	19,3	67	22,3
Other causes	40	13,3	46	15,3
Total	300	100,0	300	100,0

Evaluating if people are afraid of walking alone in Beyoglu; most of the participants state that they are not afraid of walking alone in Beyoglu (approximately 80% to 72%). In 2008, there is a decreasing tendency.

Table 6. Fear of Walking Alone

Survey Year	2006		2008	
	Number of People	%	Number of People	%
Safe	241	80,3	217	72,3
Purse-Snatching	2	,7	17	5,7
Burglary	5	1,7	17	5,7
Deforcement	3	1,0	8	2,7
Personal	4	1,3	17	5,7
Other causes	45	15,0	24	8,0
Total	300	100,0	300	100,0

Streets where the participants feel unsafe can be seen below. These streets are streets that;
- are especially preferred by low income class, and the migrant population. Eg. Tarlabasi, etc.
- are dark and more desolate backstreets. Eg. Arslanyatagı, Sadri Alisik etc.
- have steep slopes enabling the criminal to run away easily. Eg. Meclisi Mebusan, etc.
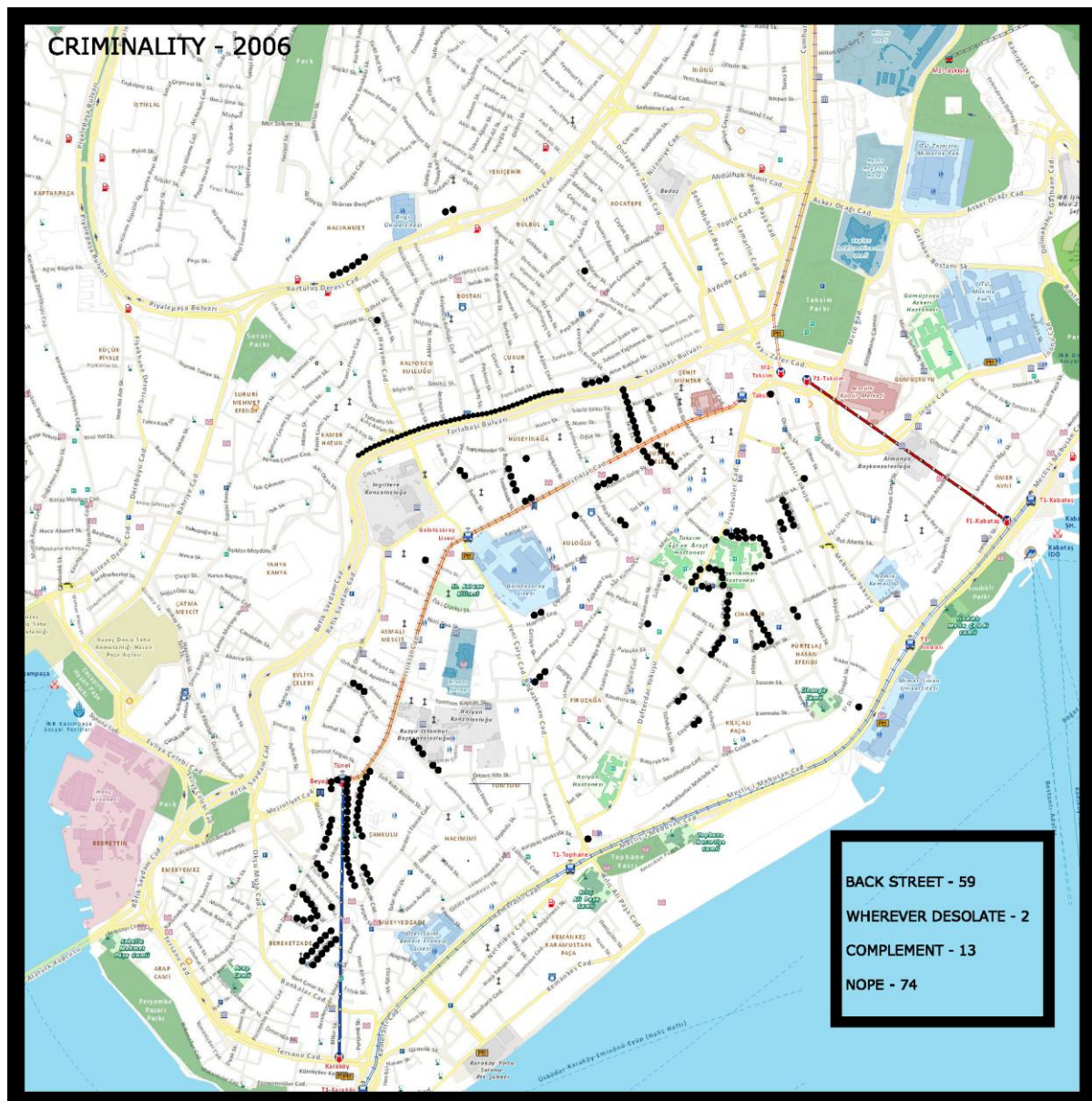
Map 4. Streets where the participants feel unsafe in Beyoğlu in 2006

Map 5. Streets where the participants feel unsafe in Beyoğlu in 2008

Evaluating whether Beyoglu has major problems with crime, most of the participants had not experienced any in Beyoglu, (around 74% to 62%). In 2008, crime rates decrease significantly, so the rate of crime in Beyoglu has decreased. Those who did face crime had experienced crimes against property.

Table 7. Issues About Crime

Survey Year	2006		2008	
	Number of People	%	Number of People	%
No	222	74,0	186	62,0
Personal	5	1,7	11	3,7
Property and Personal	5	1,7	29	9,7
Property	68	22,7	74	24,7
Total	300	100,0	300	100,0

It was determined that most of the participants turn out to be facing crime related problems twice a year, (around 24% to 29%)
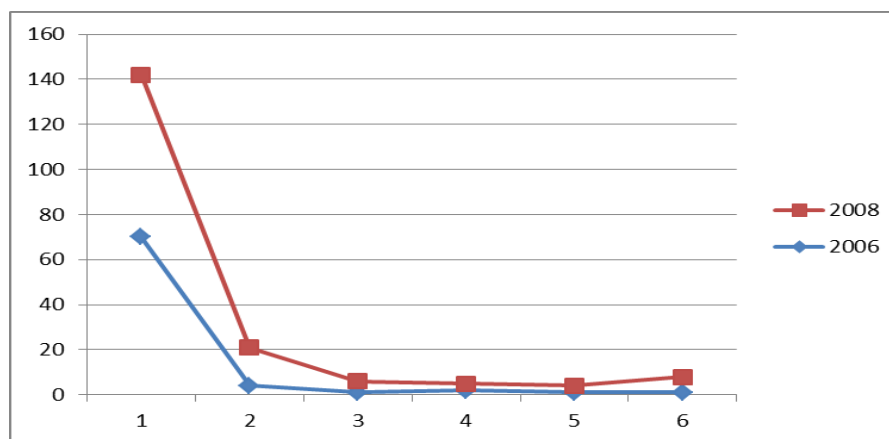
Figure 4. How Many Times a Year (Facing Crime)

When asked if relatives of the participants of the Beyoglu survey had experienced any problems, it was found that those who said "No" have increased in 2008 to 46.3%. Most of those crimes had been crimes against property.
When questioned how many times a year relatives face problems; the rate was found to be once a year, 47% in 2006 but fell to 17% in 2008.
When we examine factors which caused insecurity in 2006, participants had chosen other humans at only 8.3% in order of priority. In 2008 this rose to 41%. On the other hand, as can be seen in the table below, whereas the most effective factors that cause insecurity were users, Urban Decay, and poor lighting in 2006, these rates decrease in 2008 after renovations and restoration which took place in the district.

Table 9. Factors that Create Insecurity According to Priority

Survey Year	2006		2008	
	Number of People	%	Number of People	%
Humans	25	8,3	123	41,0
Users	134	44,7	129	43,0
Urban Decay	125	41,7	118	39,3
Poor Lighting	150	50,0	138	46,0
Unemployment	122	40,7	92	30,7

When we examine if Beyoglu is safe after the district was renovated, 50.3% of the participants stated that it is safe in 2006, but this rate decreases to 45% in 2008.

Table 10. Safety After Restoration

Survey Year	2006		2008	
	Number of People	%	Number of People	%
Yes	151	50,3	135	45,0
No	149	49,7	165	55,0
Total	300	100,0	300	100,0

Evaluating the reasons whether Beyoglu is safe or not after the renovation of the district, negative views about the area was 48.7% in 2006, and 51% in 2008.
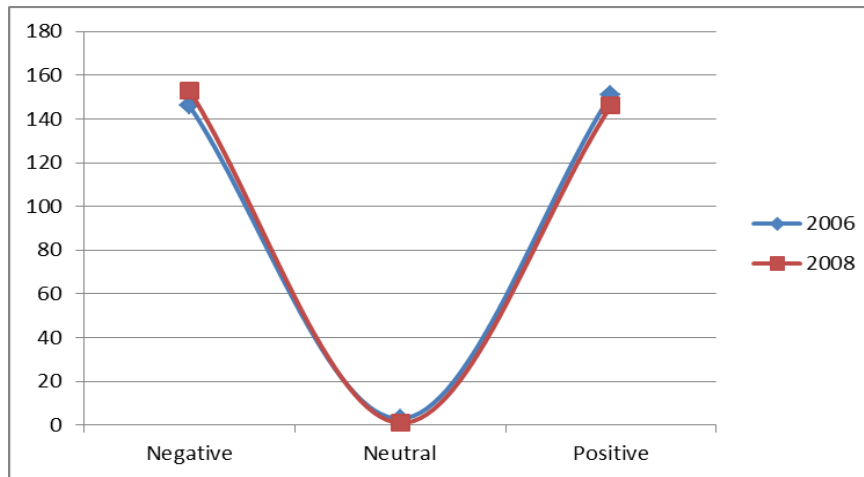
Figure 5. Reasons

When a general evaluation is made after the survey, it is found that;
- Fear of crime with the ones who live within the research area is less than the ones who have come from the outside,
- The usage of Beyoglu has become more frequent,
- Number of people who come for commercial reasons has increased,
- Number o people who come for entertainment and shopping has decreased,
- In spite of the fact that the rate of exposure to crime is greater, number of people who think Beyoglu is safe during daytime has increased,
- Number of people who think it is safe during nighttime has decreased,
- Walking alone is safe (72-80%)
- People feel insecure in streets which are populated by low income class and migrants,
- People feel insecure in dark and desolate backstreets,
- People feel insecure in streets with steep slopes, where the criminal can get away easily.

5. Conclusion

Beyoglu, which is one of two most important historical centers in the 17 million Istanbul, and where a gentrification process is being implemented since the 1980's, we have observed a downward trend in crime rates, thanks to urban design applications, especially in the recent years. In order to understand the effects of this trend on fear of crime, 600 people in the area have been interviewed in two year intervals and their impressions noted.

Our analysis show that fear of crime in 2006 was less than 2008, due to the fact that the ones who lived in the area outnumbered the ones who visited the district for one reason or the other.

On the contrary, the 2008 survey revealed that the ones who came to visit the district outnumbered the population who lived there. Even though renovation applications have resulted in a decrease in crime, fear of crime has not fallen. It is observed that people who visit Beyoglu, still fear crime because of a previous exposure of themselves or their relatives.

As can be seen from the research, although the area was renovated, the rate of being exposed to crime is still high in its peripheries, therefore, in spite of the downward trend in the district, fear of crime remains.

Hence, it is understood that renovating one area is not enough, and it is necessary to expand the restoration applications to its peripheries. It is expected that future studies will shed more light to the subject.

References

Ackerman, W.V., Murray, A.T., "Assessing spatial patterns of crime in Lima, Ohio", Cities, Vol. 21, No. 5, pp: 423–437, 2004, Published by Elsevier Ltd.,Printed in Great Britain, 2004

Ackerman, W. V., "The spread of crime to smaller Ohio cities and the spatial distribution of crime in Lima", Ohio. The Justice Professional 10, pp: 265–289, 1998

Anselin, L., Cohen, J., Cook, D., Gorr, W., Tita, G., "Spatial Analyses of Crime. In Criminal Justice: Measurement and Analysis of Crime and Justice", ed. Duffe, David, 4: pp: 213-262. Washington DC: National Institute of Justice, 2000

Atlas, R., "The Other Side of CPTED." Security Management, 1991

Clarke, R. V., Felson, M. (Eds.). "Routine Activity and Rational Choice:Advances in Criminological Theory", 5. New Brunswick, NJ: Transaction Books, 1993

Brantingham, P J And Brantingham, P L., "Crime occupation, and economic specialization. In Crime: a Spatial Perspective" (eds.) D E George-Abeyie, K D Harries, Columbia University Press, New York, 1980

Bursik, Jr. R J And Grasmick, H G., "Neighborhoods and Crime". Lexington Books, New York, 1993

Cohen, L. E, Felson, M.. "Social Change and Crime Rate Trends: A Routine Activity Approach", American Sociological Review 44: pp: 588-608, 1979

Cozens, P. M., "Sustainable Urban Development and Crime Prevention Through Environmental Design for the British City. Towards an Effective Urban Environmentalism for the 21st Century", Cities, vol:25 issue:3, pp: 123-128, 2001

Craglia M., Haining R. And Signoretta, P., "Modeling High-Intensity Crime Areas In English Citie"S, Urban studies, Vol.38, No.11, pp: 1921-1941, 2001

Craglia M., Haining R. And Signoretta, P. ,"Modeling the Geography of High Crime Areas in UK Cities: a GIS Based Approach", Paper presented at the Second AGILE Conference, Rome, 15-17 April 1999, Rome: Universita' La Sapienza, 1999

Crowe, T. D. ,"Crime Prevention Through Environmental Design", Butterworth - Heinemann, Oxford, 2000

Eck, J., Weisburd, D., "Crime Places In Crime Theory", Crime Prevention Studies, vol. 15, edited by Johannes Knutsson. Monsey, New York: Criminal Justice Press, Willan Publishing, UK), 2003

IPD, Istanbul Police Department, Archive Data, 2008

IPD, Istanbul Police Department, Archive Data. 2005

Elie, D. "Spatial Analysis of Crime" (Analyse Spatial et Criminologie), Criminologie, 27 (1), pp: 7-21, 1994

Ergun, N., Yirmibesoglu, F. , "Istanbul'da Suc ve Suc Dağılımı" Turkiye'de Kriminoloji ve Ceza Adaleti: Yeni Arastirmalar – Yeni Projeler Kolokyumu, Bilgi Univeritesi-TUBITAK, Istanbul, 2005

Ergun, N., "Gentrification in Istanbul", Cities, Elsevier, Vol. 21, No 5, pp. 391-405, 2004

Felson, M., Clarke, R.V., (Ed. Barry Webb, B.,), (1998) "Opportunity Makes the Thief Practical theory for crime prevention",Home Office, Policing and Reducing Crime Unit Research, Development and Statistics Directorate

Giritlioglu, C., Bolen, F., Erkut,G., Ergun,N., Yirmibesoglu,F., "Metropoliten Sehir Merkezlerinde Kullanılmayan Yapı-Konut Potansiyelinin Yeniden Degerlendirilmesi", TUBITAK Arastırma Projesi, Istanbul, 1993

Harries, K., The Geography of Crime and Justice. New York, NY: McGraw Hill, 1974

Harries, K., "Mapping Crime: Principles and Practice". Washington DC: National Institute of Justice (NCJ 178919), 1999

I.M.M., Istanbul Büyükşehir Belediyesi, Sayılarla Istanbul, Istanbul'daki Mevcut Gecekonduların Ilcelere Göre Dağılımı, Mesken ve Gecekondu Müdürlüğü, 2000

I.M.M., Istanbul Büyükşehir Belediyesi, Istanbul Master Plan, 1995

Jan Van Dijk, "Understanding crime rates: On interactions between raional
choices of victims and offenders" British Journal of Criminology , Vol 34, pp: 105-121, 1994

Kilincaslan, I. "Buyuk Istanbul Sehrinde Hizmetler ve Belediye Giderleri Analizi Uzerine Bir Deneme", ITU Mimarlik Fakultesi Baski Atolyesi, Istanbul, 1974

Knutsson, J., "The Vassapark Project." Paper presented at the Environmental Criminology and Crime Analysis Conference, Rutgers University, Newark, NJ., 1994

Kohlfeld, C. W., Sprague, J., "Urban Unemployment Drives Urban Crime" Urban Affairs Quarterly, 24, pp: 215–241, 1988

Newman, O., "Defensible Space: Crime Prevention Through Urban Design" NY: Macmillan, 1972

Newman, O., Karen F., Factors Influencing Crime and Instability in Urban Housing Developments. Washington, D.C.: U.S. Government Printing Office, 1980

Newman, O., Karen F., "The Effects of Building Size on Personal Crime and Fear of Crime." Population and Environment 5: pp: 203–220, 1982

Openshaw, S., Alvanides, S., "Applying Geocomputation To The Analysis Of Spatial Distributions In Geographical Information Systems". 2d ed. Edited by P. Longley, M.Goodchild, D. Maguire, and D. Rhind. New York: John Wiley & Sons.,1999

Paulsen, D.,J., Robinson, M.,B., "Spatial Aspects of Crime: Theory and Paractice", Allyn & Bacon Pub., 2004

Plessis, C., "The Links Between Crime Prevention And Sustainable Development", Open House International, Volume 24, No 1, pp: 33-40, 1999

Taylor, R. B., Harrell, A. V., "Physical Environment and Crime" January A Final Summary Report Presented to the National Institute of Justice, U.S. Department of Justice Office of Justice Programs National Institute of Justice, 1996

Rengert, G., "Burglary in Philadelphia: a critique of an opportunity structured model. In Environmental Criminology" (eds.) P J Brantingham, P L Brantingham, Sage, Beverly Hills, CA. 1981

Rich, T. F., "The Use of Computerized Mapping in Crime Control and Prevention Programs", NIJ Research in Action, 1995

Smith, M.J., Cornish, D.B. (ed), "Theory for Practice in Situational Crime Prevention", Crime Prevention Studies, Volume 16, Criminal Justice Press, Monsey, NY, USA, Willan Publishing, Devon, UK, 2003

Smith, S.J., "Social Relations, Neighbourhood Structure, and the Fear of Crime in Britain" , in D. Evans and D. Herbert (eds), The Geography of Crime (London: Routledge), 1989

Taylor, R.B., Gottfredson, S., "Environmental Design, Crime, and Prevention, Communities and Crime", (Eds.) Albert, J. R., Tonry, M., The University of Chicago Press, pp: 403-407, 1987

Tekeli, I., "The Development of the Istanbul Metropolitan Area: Urban and Administration and Planning", Kent Basimevi, Istanbul, 1994

Van Soomeren, P., "Crime Prevention Solutions for Europe: Designing Out Crime, Conference on the Relationship Between the Physical Environment and Crime Reduction and Prevention", Amsterdam, The Netherlands, 2000

Weisel, D.L., Gouvis, C., Harrell, A.V., "Addressing Community Decay and Crime: Alternative Approaches and Explanations." Washington, D.C.: The Urban Institute. Final report submitted to the National Institute of Justice, 1994

Wilson, J. Q., Kelling G. L., Broken Windows; The Atlantic Monthly, Volume 249, No. 3; pp: 29-38, 1982

Ycaza, C., "Crime Rate Drops in Shores." The Miami Heral, 1992

Yirmibesoglu, F.; Ergun, N., "Property and Personal Crime in Istanbul", European Planning Studies, Carfax Publishing, April 2007, 15, 3, pp: 339-355, 2007

LOCAL ECONOMIC DEVELOPMENT POLICIES AND TOURISM. AN APPROACH TO SUSTAINABILITY AND CULTURE

Margherita PEDRANA
Assistant professor in Applied Economics
European University of Rome
E-mail: margherita.pedrana@unier.it

Abstract

The economic development of an area has been largely discussed in literature. It is linked to the economic structure and resources of a territory. Moreover, also infrastructure and investments may affect the local economic development. Tourism is an economic activity in which visitors move to an area to visit a particular destination. Tourism has different purposes and may also be complementary to other local economic activities.

As all economic activities which affect the development of an area, also tourism has to be managed on routes and specific context. The role of tourism is important in the context of local economic development. Public institutions have to be aware of the capacities of an area and try to help its development. However, if not well managed the local resources may be destroyed by tourist. A local tourism policy towards sustainability is indispensable for the future development of an area.

This paper is organized as follow. The first part will analyze the role of tourism in local area. Subsequently, a model of local economic development and its application on tourism is investigated. Latter, the role and implications for local policy of sustainable tourism are shown. Finally, some conclusions and policy implications are drawn.

Introduction

Tourism studies have been a large development since 1950s because of the improvement of the transport systems and routes. After that, many tourism destinations have developed. Especially due to globalization, local economies have been pushed to compare themselves to other local economies, located elsewhere in the world. This is true also for tourism with is obviously linked to the movement of people from a place to another. Improving transport systems and economic wellbeing, tourism has become a fundamental *glocal*[41] economic activity.

Moreover, tourism is one of the most globalized activities. For instance, the meeting between different cultures and the movement of people leads to the dissemination of global tendencies. However, globalization did not help in the explanation of convergence and divergence and the decentralization of decision. With glocalization we define the establishment of globalization, but with the respect of local entities. There is usually the contrast between local and global. However, Robertson, 1995 shows that they are not in contrast, but local is a part of global. It may be defined as the global attention to the local context. This concept helps in understanding the connections between the local economies and the global context.

---

[41] The concept of glocalization started with the English sociologist Roland Robertson (1995), and then was developed by Bauman (Swyngedouw, 2000).

Until 1980s studies on tourism have been confined into marketing activities on restricted sites (Agarwal, 1999). However, tourism is a crucial local economic activity. Therefore, in the 1990s the development of tourism-led economic development initiatives started, in order firstly to help resorts and secondly to enforce the local economic development programs.

In this paper, first of all we will define the role of tourism in local, national and international economy. Secondly, we will present a model of local economic development and we will implement on tourism and tourism destination. Thirdly, we will analyze the relevance of sustainable tourism for an area and finally some conclusions ad policy implications are drawn.

The role of tourism in the local and global economy

In this paragraph we will investigate on how important is tourism in national, regional and local economy, as well in the international context. As shown in the introduction, tourism is an important issue for the economic development of an area. In this paper, we will not discuss on reasons and motivations that lead tourists to go to an area or another. We want to investigate the role of tourism in local economic development, and how policies may affect the results of a specific destination.

Tourism may be also a source for economic restructuring. Areas in which industrial economic tissue has been largely affected by crisis, tourism may help not just for the economic conversion of such activities (i.e. industrial museums, cultural district), but also for a new way of routing local economic development. Tourism may be also considered an option for the local development of an area, both alone or complementary with other economic activities.

A tourism destination has different life phases. Following Ejarque, 2003 a destination starts from an introduction, involvement, development, consolidation and maturity, following different flows of arrivals and the local economic development of the activities.

Over the time many areas have been converted into tourism destination, either as lonely economic activity or for the development with other complementary activities. Modern tourism becomes a key driver for socio-economic development for its effects of job creation, investment in local enterprises, infrastructure development and export revenues earned (UNTWO, 2011). Although the crisis, international tourism increases also in 2011 and 2012, following the previous year trends (see figure 1, for more details). In the first eight months of 2012, as recorded by UNWTO, there has been a growth of 4% in comparison with the same period of 2011.

Over time, in the past decades, there has been an increase in the number of destination (UNWTO, 2011). Therefore, tourism in modern age has become a key driver for socio-economic progress. Moreover, tourism is the key factor for the creation of jobs and enterprises, for the infrastructure development and help in the increase of the export revenues. The overall export income which is generated by inbound tourism exceeded US$ 1 trillion in 2011. Tourism exports count for about 30% if the world's exports of commercial services and 6% of overall exports of goods and services. It is the fourth industry for exports. The World Tourism Organization estimates tourism contribution to worldwide GDP at about 5%, in Italy it is about the 10% (UNWTO, 2011).

There have been many changes during the past years. Worldwide there has been an increase in international arrivals, also in the past year. Following data from UNWTO 2012b, the strongest increase from 2011 to 2012 is in Asia and the Pacific (+7%) and Africa (+6%), followed by Americas (+4%) and finally Europe (+3%). Emerging economies, especially in BRICS countries have increased of about 5%. In particular, China and the Russian Federation see the highest growth in tourism expenditure (UNWTO, 2012b). In 2010, China gains the third place worldwide for arrivals, following France and United States. Spain and Italy follow (UNWTO, 2011).
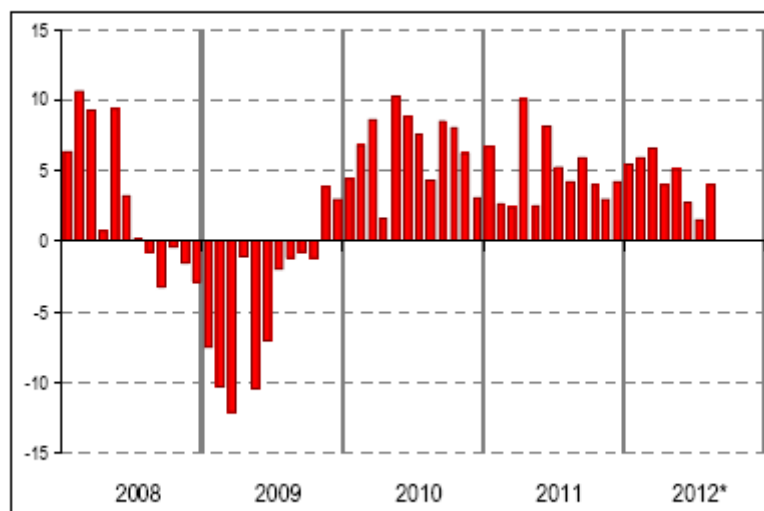
Figure 1: International tourist arrivals, monthly evolution (% change)
Source: World Tourism Organization, 2012b.

From January to August 2012, the number of International tourists has increased up to 705 million worldwide, with a growth of 4% comparing with the same period of 2011. Global growth is due to the increase of the number of tourists in new developed countries (such as China, India etc.). Across the world, there will be an increase in the number of tourists, despite the economic uncertain scenario. According to WTTC (*World Travel and Tourism Council*), in Italy, the expectations are towards a increase of the total contribution of Travel and Tourism to GDP (WTTC, 2012).

Tourism in the framework of local economic development context

Local economic development has become a global issue. The concept involves different themes, actors involved and there is not a definition which may help to understand in synthesis what local economic development is. For the single territory, it is the challenge of enhancing prosperity and well-being (Pike, Rodrìguez-Pose and Tomaney, 2010). For a Nation as a whole, a chance of development on a global scale starts from the local one.

However, there is not a clear strategy or program to develop local economic development. In this paper we will try to show how analysis on local economic development may influence also tourism analysis. Following the simple model shown by Pike, Rodrìguez-Pose and Tomaney, 2010 (see figure 2), we will point out what it may happen when a local policy fails in the development of an area. The four axes on which local economic development may start with are local firms, inward investment, infrastructure and labour skills. All these four elements are essential for the development of an area. In the absence of one or more of the axes there may be risk in the long term the sustainable development of the area. A weakness in the local industrial tissue could lead to the lack of attraction of other firms which may enforce the local industry also through spill-over, knowledge diffusion and investment in the local area. Investments are essential for the development of the area, both from inside and outside the territory. Education and skills among local people and community are the driven factor both for the social and human capital involved in the local economic structure. Local skills are connected also with the local labour force. Accessibility and infrastructure represent another axe on which the local and regional economic development is found. In areas in which there are not the suitable infrastructure and there is not an institutional and political will to build them, an industry may not be enough supported to develop the specific local territory.
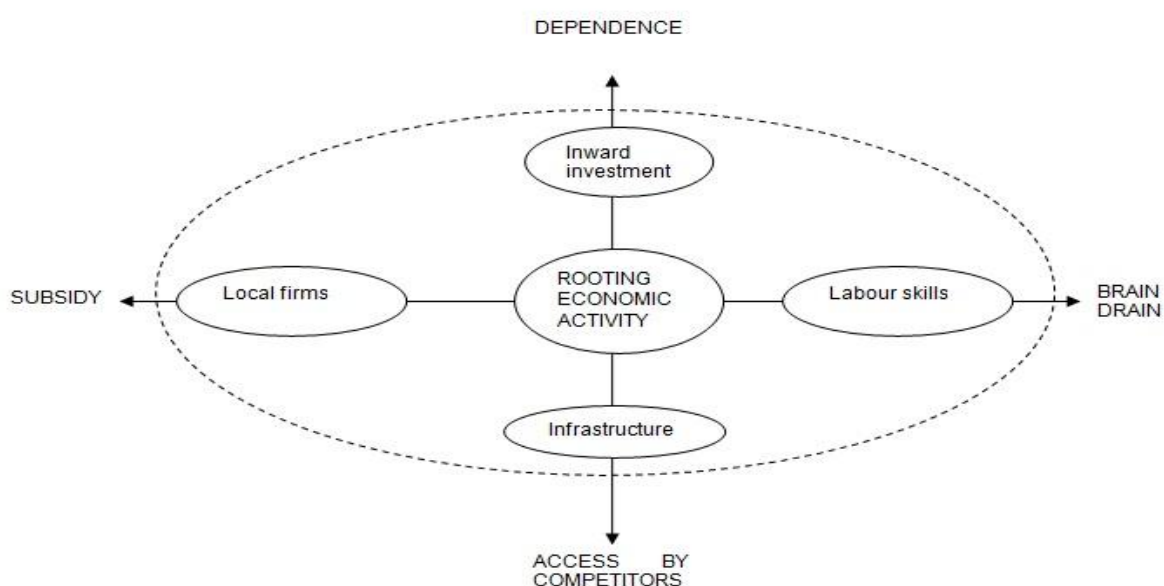
Figure 2. The bases and risks of local development strategies.

Source: Pike, Rodrìguez-Pose and Tomaney, 2010.

Local economic development involves different strategies and issues, first of all, the relationship between private and public in the development of an area. The institutional framework and rules and norms involved are essential for the good governance of an area (North, 1990). On the other hand, the local context and community and the partnership between private and public sector are essential for the development of all aspects and strategies involved.

Another cause of failure of traditional policies is the tendency to replicate standardized policies in different areas without a complete analysis of the local economic, social and institutional context. Moreover, traditional policies usually address to the promotion of specific industrial sectors, whereas local policies may address more to the development of networks and values chain in different sectors.

Another aspect connected with local economic development is the territorial competition. Territories compete to attract labour and investments, which may create competitive assets for the local development. Moreover, territories may compete to attract foreign firms in order to invest in the local production.

For the single enterprise, the territory may be considered as a resource, from which it gets inputs and skills for its activity (Martini, 2005). The area in which an enterprise is located is not just considered the location, but also a place where elements like institutions, social relations, capabilities and culture is integrated.

The first studies on the impacts on territory by tourism are in 1960s. They were about the spaces involved in tourism. For instance, Toschi, 1959, analyses the relationship between space and tourism, through the difference between three regions, the departure, the transit and the arrival. As we will explain in this paper, the strong relationship between territory and tourism.

Tourism is first of all an economic activity which helps local areas to develop towards a tourism destination. According to the World Tourism Organization, tourism is the movement of people from a place to another for more than one night for different reasons. From this movement of people many effects may arrive. Some of them are quite linear consequences (e.g. the birth of hospitality and travel industry) where as many of them are indirect effects also on local community. The positive effects are for example the enhancement of well-being and the growth of the local economies. Local firms influenced by tourism are not only the direct ones, but also the induced economies which obtain new customers, although indirectly. Other effects concern the environment and the social –cultural context which may be affected by the arrival of new cultures and styles of life, but also but an overcrowding in

the local area and therefore the pollution and disruption of the territory and the local natural life. In the case of tourism, territorial competition concerns with competition among destinations. Territories which have a tourism vocation compete on the attraction of new tourist towards a destination. The strategies may be different, from promotion to new attractions (Franch, 2010).

However, following the previous model of analysis, we will now discuss on how the four axes may help in the development of tourism. Tourism is connected first of all with the accessibility of an area. In order to develop a tourist destination, transport systems and infrastructures help tourists in arriving to a destination. On this point, the role of public institutions and policies is crucial, in order to create the local structures and infrastructures to be accessible. Education and local skills, together with local culture and traditions, are often the element which attracts tourists to a destination. The tourism management has to be educated to receive people as tourists, with adequate skills. After the first tourists, the local industry tissue must be organized and created, in order to receive more tourists. Inward investments are essential for the development of an area.

Tourism destinations have some peculiar features in the development of the area. First of all, the importance of infrastructures is the key factor for the future development of the area. However, the local natural resources may be exploited and in some cases also destroyed by the arrival of many tourists and infrastructures have to respect the local natural area. The second characteristic of tourism destination is the importance of the context and the local community. Especially in community tourism destinations,[42] where a local community is resident in the area, one of the attraction may be the local community itself with its traditions and culture. Thirdly, more often and especially in rural communities the investments are from outside the community and there is also the exploitation of the local natural and labour resources without the real and sustainable economic development of an area. Finally, the local industry tissue of a tourism destination is composed by many different enterprises and industry, often small and medium size enterprises. The hospitality sector is not the only involved in the development of a tourism area. There are also restaurants, travel agencies (both inside and outside the area), tour operators, tourist information offices, amenities, attractions. Moreover, there are also enterprises which are not directly involved in the tourist process of production, but they are induced industries, such are transport enterprises, associations, the local community itself and the local public institutions.

In a tourism destination, all these enterprises have different aims and strategies. The systemic vision of the area and the involvement of all the actors it is therefore quite difficult. Generally speaking, there must be strategies and policies in the economic development of an area, which aim at the local strategic governance and territorial systemic view. In figure 3, it is shown the territorial systemic strategy.

---

[42] In the literature there is the difference between community and corporate tourism destinations (Martini, 2005). The first ones are based on a community and a place in which there are residents before the arrival of tourists. The second ones are created often from scratch and are places in which the aim is the tourism economic activity (e.g. holiday village, themes parks etc.). In this paper, if it is not specified, the reference is to community tourism destination.
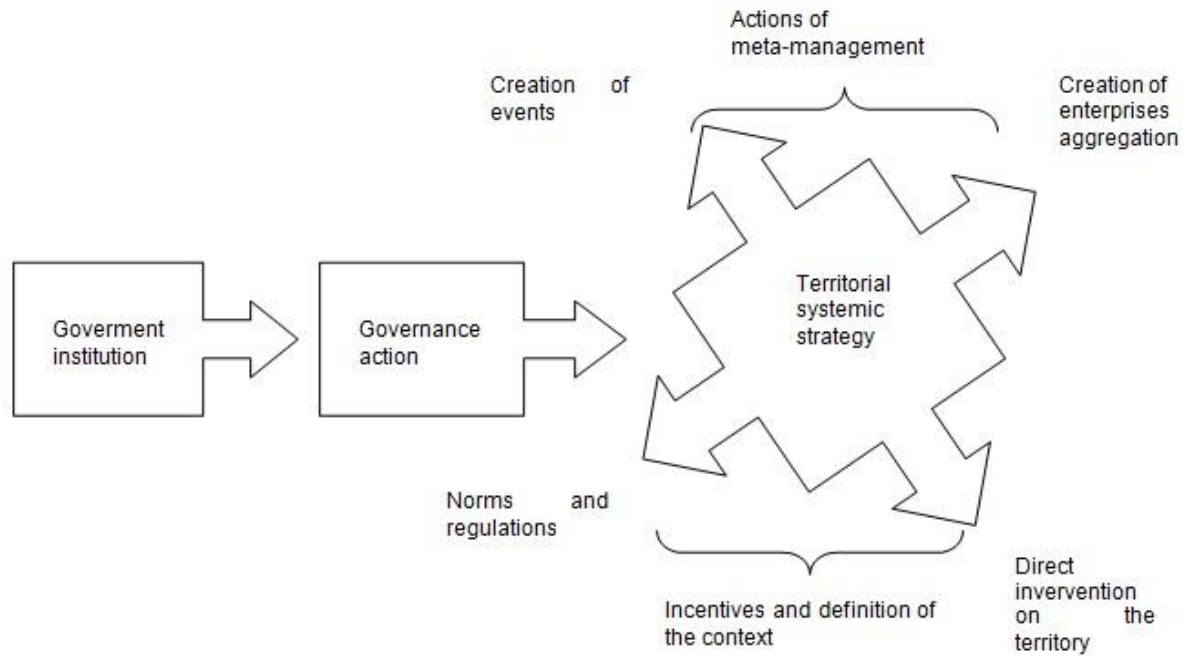
Figure 3 Territorial systemic strategy
Source: Adapted from Martini, 2005.

The territorial systemic strategy has to come from a government institution which has the power to address the local intervention guidelines, through incentives to local aggregations, direct intervention on the territory (e.g. infrastructure) and the creation of organization aimed at the local economic development. In this sense, there is a kind of meta-management o destination management. In this context, decisions on local economic development must be taken from institutions together with all parties involved, such as associations, enterprises, etc. In the local community there may be also some changes in the local culture and traditions due to the contact with tourists.

Three are the main features in a tourism destination. First of all, the complexity of the local system of supply has to be analyzed. There are different enterprises with different purposes, which may not have the same concept of what the tourism destination is and how to improve it. The second important factor to be considered is the relationship with the territory. The main attraction for tourists is the natural environment, together with the social and cultural one. The third characteristic concerns with the seasonality and all economic, social and cultural problems.

Effects of tourism on territory

In the context we have analyzed, the potential of a tourism destination is linked to the territory, especially in community tourism destination. The protection of the local context has to be the priority for the local government and local policies. Therefore, the potential policies of the local context have to be addressed to the sustainability, not only of the local economy, but also to the local natural and socio-cultural environment.

As shown before, the relationship between territory and tourism has to be strong. However, this relationship is different according to the different stages of the tourism development. Following the Tourism Area Life Cycle (Ejarque, 2003); there is a first phase of exploration, in which the local infrastructures and enterprises are not organized. Secondly, the phase of involvement, in which tourism

starts to be recognized as a source of local economic development. The third phase is development, where mass tourism and organization of the destination start to be well structured and there are also institutions which define policies on tourism. Then there is the phase of consolidation. After this first

life cycle there may be two results. The first one is a renewal, especially in cases in which there has been sustainable policies and a change in the strategies of the destination (e.g. the thermal tourism as a complementary tourism of the destination). The second result may be the decline of the destination.

In tourism, the territory becomes the supply of the destination. Therefore, the use of the territory has to be in a sustainable view of the tourism in a destination.

There are different effects of tourism on a destination. In figure 4 there are the positive and negative effects of tourism on the destination.

Positive effects	Negative effects
- Recovery and valorization on an economic and social point of view of declined areas - Protection and conservation of natural, social and cultural heritage - Development of local communities - Creation of employment and income for local population - Social and educational function - Foreign currency into the destination Nations - Incentive to the development and improvement of infrastructures - Valorisation of natural, artistic and cultural resources	- Energy and water consumption - Pollution - Impact on local system of garbage management - Loss of biodiversity - Needs in transport and mobility - The place in which there is income is not the same place in which the tourism is enjoyed

Figure 4. Possible effects of tourism on territory
Source: own elaboration

The positive effects are obviously connected with the economic local development of population. The increase in income and employment is the main positive effect of tourism on a defined area. A second important effect concerns the valorization of areas in which there had been industries and where they left from the area. Such area may have high unemployment and risks connected with the decline of the area. Natural parks may attract tourists and therefore have the money for the protection of the natural resources.

However, there may be also negative effects. The first one is pollution and the deterioration of the environment. The natural, social and cultural environment may be deteriorated by the use of tourism, especially in the development phase, when mass tourists are coming.

Implications for sustainable and cultural tourism

Tourism uses the territory and the environment of a destination as its first resources. Therefore, local policies have to be addressed to the sustainability and environment respect. The sustainable tourism is not to exceed in own carrying capacity, when tourism activities develop without changing the natural, social and cultural environment. Moreover, TCI, 2005 add also that tourism has not to obstacle the development of other social and economic activities. Following this criteria, all tourism activities have to be aware of the potential effects on the environment.

Tourism, therefore, is sustainable when does not exceed the own carrying capacity. The logical consequence is that the tourism activities develop to be active in an infinite period of time, without changing the natural, social and cultural environment. Moreover, tourism activities should not obstacle the development of other social and economic activities (TCI, 2005).

The Brundtland report in 1987 first define the sustainability of tourism and its activities, in order to be an activity also for the future generations. In 1992 there has been the program Agenda 21 for travel industry.

In past decades, there has been an increasing attention towards themes of sustainability, especially in tourism, through the intervention of public and international institutions. Moreover, there is also new demand of nature-oriented forms of tourism (such as green tourism, countryside tourism).

In developed countries, territories have been submitted to more safeguard, especially in cultural and artistic centres.

According to WTO, 1999, the carrying capacity is the capability of an environment of support a specific change or pressure. The carrying capacity is the maximum use of an area which does not damage the environment. There are different capacities. First of all, the relationship with the environment and therefore the natural resources. Secondly, the experience and beauty of the cultural tourists' expectations. Finally, the socio-economic capacity, so the social and economic satisfaction of the local population.

Sustainability is usually addressed just to the conservation of a natural environment, in order to preserve all the features for the future generations. However, sustainability involves also the culture and traditions of the local population. The cultural issue in tourism has become essential to understand the trend, especially in location such as Italy. The historical and cultural heritage is the aim of the travel and the purpose for tourists to visit a specific area.

Conclusions

In a local economic development perspective, the interaction between tourism and territory becomes fundamental. Tourism has become one of the most important industries. It is based on globalization and its role in the global development, whereas its dimension is local and it is connected with the local tissue of enterprises.

Starting from a model of local economic development, institutions have to be aware of the problems and risks of a not well organized and sustainable program of intervention on the territory.

Government intervention has to declare routes for the local economic development, especially for what concerns sustainability.

References

Agarwal, S. (1999), *Restructuring and local economic development: implications for seaside resort regeneration in Southwest Britain*, Tourism Management 20 (1999), pagg. 511-522.

Candela, G. and Figini, P. (2010), *Economia del turismo e delle destinazioni*, McGraw-Hill.

Capello, R. (2004), *Economia regionale*, Il Mulino.

Cooper, C. e altri. (2002), *Economia del turismo. Teoria e pratica*, Zanichelli, Bologna.

Ejarque, J. (2003), *La destinazione turistica di successo,* HOEPLI.

Franch, M. (2010), *Marketing delle destinazioni turistiche. Metodi, approcci e strumenti*, McGraw-Hill.

Garibaldi, R.(2008), *Economia e Gestione delle Imprese Turistiche*, edizioni HOEPLI.

Martini, U. (2005), *Management dei sistemi territoriali. Gestione e marketing delle destinazioni turistiche*, Giappichelli, Torino.

North, D. (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

Pike, A. Rodriguez-Pose, A. e Tomaney, J. (2010) *Local and Regional Development*, London: Routledge.

Robertson, R. (1995), *Glocalization: time-space and homogeneity-heterogeneity*, in Featherstone, M., Lash, S. and Robertson, R., *Global modernities*, SAGE Publications.

Rogerson, C.M. (2002) *Tourism- LED local economic development: the South African Experience*, Urban Forum.

Swyngedouw E:, 2000, Authoritarian Governance, Power and the Politics of Rescaling, Environment and

Planning Society and Space, 18: 63-76.

TCI (2005), *Sviluppo sostenibile e competitività del settore turistico*, Milano.

Toschi U. (1959), *Geografia Economica*, Vol. IV del *Trattato Italiano di Economia*, Torino, Utet, pp. 370-387.
UNWTO (2011), *Tourism Highlights,* 2011 Edition.
UNWTO (2012a), *Compendium of Tourism statistics*, 2012 Edition.
UNWTO (2012b), *World tourism barometer.*
WTTC (2012), *Travel &Tourism. Economic Impact 2012. Italy.*

http://www.world-tourism.org/sustainable/climate/decdjerba-eng.pdf

COMPETITIVENESS, CLUSTERS AND POLICY AT THE REGIONAL LEVEL: RHETORIC VS. PRACTICE IN DESIGNING POLICY FOR DEPRESSED REGIONS

Argentino PESSOA

CEF.UP[*], Faculdade de Economia, Universidade do Porto

Rua Dr. Roberto Frias

4200-464 Porto, Portugal

Email: apessoa@fep.up.pt

Abstract

This paper reviews the most important theoretical foundations of the concept of spatial competitiveness. To that effect it deals with three levels of competitiveness: the country, the region and the tourism destination. It draws attention to the main aspects that such concepts of competitiveness must include, and it links the regional competitiveness with the related concept of cluster. Therefore, section 2 reviews the key aspects of competitiveness at the first level, highlighting the role of the main forces that act at the national level. Section 3 extends the concept to the regional level, highlighting the critical aspects that must be considered when policy tries to increase the competitiveness of a particular region. Section 4 analyses the possibilities of extending the competitiveness concept to tourism destinations. Next, the paper analyses the literature on policy advice and discusses the inconsistency between the theory and the policy designed to promote regional competitiveness. Finally, the paper presents some concluding remarks on regional policy applied to depressed regions.

Keywords: clusters, competitiveness, regional policy, tourism.
JEL Codes: Q25, Q28, R19, R58.

1. Introduction

Since the publication of *The Competitive Advantage of Nations* (Porter, 1990) that competitiveness has increasingly become a paragon in public policy discourse[43]. Initially focused on the national level, the idea of competitiveness was quickly extended to other spatial levels of the nation. In fact, a growing body of literature has looked at the region as a distinctive unit in the analysis of economic development, and a consensus exists on seeing the region as an increasingly vital component in the global–local nexus of development (Storper 1997). In the same vein, Porter's argumentation that 'competitive advantage is created and sustained through a highly localised process' (Porter, 1990, p. 19) has determined a shift away from the competitive advantage of nations to the competitive advantage of regions.

So, initially used at the national level, the idea was quickly extended to other spatial dimensions. As a result the tendency to explain regional growth and development in terms of competitiveness has been increasingly vulgarised. However, even though competitiveness is omnipresent in policy-maker' speeches, a scientific consensus about the exact meaning of this concept is absent. Some consider it an extension of the sum of the performances of all firms in a region; others extend the competitive behaviour of firms to regions, while a more recent view takes a step further and stresses the importance of knowledge creation.

---

[43] Of course, there are those who consider competitiveness as a 'dangerous obsession' (Krugman, 1994).

Somewhere in between is the recognition of the importance of reaching a competitive performance through territorial quality and public service efficiency. Moreover, competitiveness attained by creating synergies among local actors, or by integrating external firms in the local relational network, exploiting spillovers and increasing returns, is usually added to the picture.

At the same time, as the competitiveness discourse became fashionable, the intention of using tourism with the alleged purpose of propelling the competitiveness of depressed regions has increased in a similar way. However, this strategy is not straightforward. Two points must be called to mind. First, the need to understand what regional competitiveness is, given that it is usually based on a narrow conception of how regions compete, prosper and grow (Gillian, 2005). Second, we need to be aware of the theoretical foundations of regional strategies. Regarding the latter point, there are two alternatives: a strategy that tries to replicate the world's best practices, and a strategy based on the economics of regional clusters. The effectiveness of policy to increase regional competitiveness and to overcome the obstacles to regional development depends on the chosen strategy. In the first case, an enlightened policy-maker designs policy based on an alleged superior knowledge of the best path for the regional economy in the future. This paper will argue in favor of the second alternative.

This second alternative is not only more consistent with the new theories that emphasize aspects highlighted by regional science and economic geography — such as proximity (Boschma, 2005), industrial districts (Putnam, 1993), localized learning (Maskell et al., 1998) and that 'one size does not fit all' (Tödtling and Trippl, 2005) — but they are also consistent with theories that explain economic growth as an endogenous process (Arrow, 1962; Romer, 1986; Pessoa, 2005). In fact, endogenous growth models show not only how important externalities (as for instance localization externalities) are for explaining growth and how policy can affect the growth rate of the economy. Furthermore, considering economic development as an endogenous process allows to explain the different performances of regions, as they have different endogenous resources and so they can create or sustain competitive advantage through a 'localised process', as pointed by Porter (1990).

Hence, given the above-mentioned set of problems, this paper reviews the most important theoretical foundations of the spatial competitiveness conception, dealing with three levels of competitiveness: the country, the region and the tourism destination. Consequently, it draws attention to the main aspects that such levels of competitiveness must include and it links the regional competitiveness with the related concept of cluster. Therefore, section 2 reviews the main aspects of competitiveness at the first level, highlighting the role of the main forces acting at the national level. Section 3 extends the concept to the regional level, highlighting the critical aspects that must be considered when policy tries to increase the competitiveness of a particular region. Section 4 extends the competitiveness concept to tourism destinations. Next, the paper analyses the literature on policy advice and discusses the inconsistency between the theory and the policy designed to promote regional competitiveness. Finally, the paper presents some concluding remarks on regional policy applied to depressed regions.

2. Competitiveness: the Competitive Advantage of Nations

With the publication of *The Competitive Advantage of Nations* (Porter, 1990) in the early 1990s, competitiveness and competitive advantage have become paragons in public policy discourse. This seminal book together with the increasing popularity of the NPM (New Public Management) (Hood, 1991; Osborne and Gaebler, 1992)[44], compound the basic ingredients of this popularity in policy decision-maker circles. However, popularity and science do not always go hand in hand.

Porter's *Competitive Advantage of Nations* can help understand the competitive position of a nation in global competition, and it highlights some differences from the traditional view, which was prevalent after the Second World War. According to this traditional perspective, competitiveness depends on endowments of generic factors of production (capital, labour and natural resources, such as minerals, energy and land) and, therefore, competition is driven by the cost of inputs with a clear

---

[44] For instance, Hood (1991) explicitly refers to competition as a doctrine for public management. But, the idea of competition is the most widely accepted concept among authors identified with the NPM.

effect on policy grounds: the recommendations are to accumulate factors and compete where the nation had a comparative advantage (Porter, 1990).

In his book, Porter argues that, as a rule, the competitive advantage of nations doesn't result from the accumulation of generic factors, but on the contrary, it is the outcome of four interconnected influences in and between companies which can be influenced in a pro-active way by government. The interrelated forces for Competitive Advantage in Porter's Diamond, as is depicted in figure 1, depend on: i) the context for firm strategy and rivalry; ii) demand conditions; iii) factor conditions; and iv) related and supporting industries.
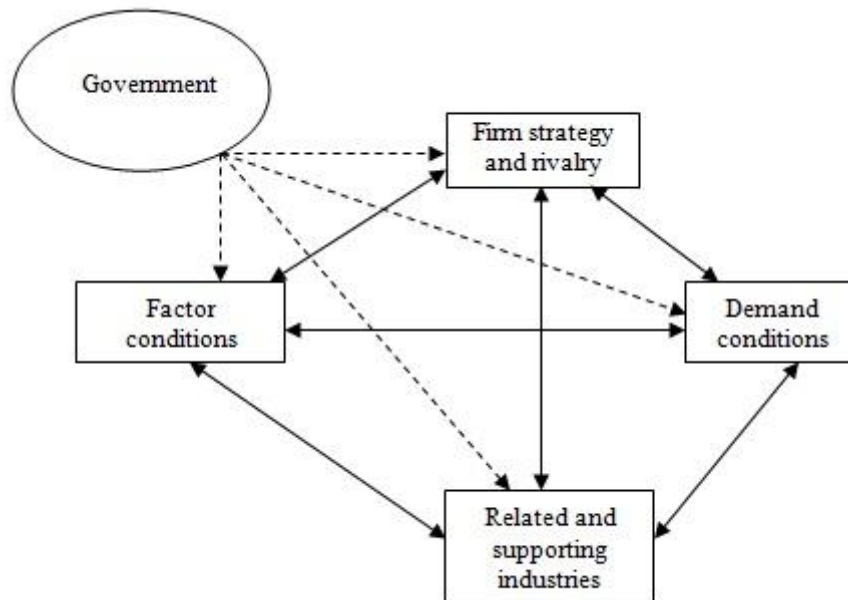
Figure 1. Porter's Diamond Model for the Competitive Advantage of Nations

The government can influence all these forces positively. For instance, regarding the context for firm strategy and rivalry, the government can provide not only the incentives for the business climate[45] but also by using policies toward competition. In relation to demand conditions, the government can use several policy instruments to upgrade demand ranging from setting up quality, safety, and environmental standards, to the policy ruling buyer information and after sale services, in addition to policies that promote early adoption of new products and services.

Porter's Diamond Model has clear implications on development policy, pointing to a role for Government, and reducing the traditional bias towards supply side. The role of government, acting as a catalyst and challenger, it is to encourage, or even push, companies to raise their aspirations and move to higher levels of competitive performance. So, it must encourage companies to raise their performance, to focus on specialized factor creation and to stimulate rivalry by limiting direct cooperation and enforcing anti-trust regulations (Porter, 1990).

A low level of local demand tends to reduce local innovativeness and entrepreneurship, encourages the exodus of skilled and educated workers in search of better employment prospects elsewhere, hinders the development of high-quality cultural and infrastructural capital, and generally

---

[45] The business climate is broadly defined and includes macroeconomic and political stability, the tax system, labor market policies affecting the incentives for workforce development, and intellectual property rules and their enforcement. All these contribute to the willingness of companies to invest in upgrading capital equipment, skills, and technology.

weakens the competitive dynamics of the area. Tackling the supply side is certainly necessary to foster growth and development, but may not be sufficient as such. Action may also be needed to help stimulate local demand and, particularly, stimulate early demand for advanced products.

For the aim of this paper two specific forces deserve further attention: factor conditions and the related and supporting industries. Factor conditions refer to the basic inputs that allow competition to take place. They range from material things, such as physical infrastructure and research organizations, to more intangible ones like legal and institutional infrastructure, and information. To increase productivity, factor inputs must improve in efficiency, quality, and ultimately, specialization to particular cluster areas.

However, as alleged above, Porter's analysis disputes the traditional view on competitiveness, arguing that for understanding what competitiveness is it is fundamental to divide the production factors in two categories: specialized factors and general use factors. The former are created, not inherited, while the general use factors are non-key, as is the case of natural resources, unskilled labor and raw materials. Any company can obtain these, and so, they do not generate any sustained competitive advantage. On the contrary, specialized factors involve important sustained investment and so are more difficult to be replicated by other firms.

On the other hand, the endowment of all inherited (or hardly influenced by policy) factors gives the country a rather passive view towards national economic opportunities. So, an important contribution of Porter's argumentation is that sustained industrial growth has hardly been built on basic inherited factors. On the contrary, he is in agreement that abundance of such factors may actually weaken the competitive advantages of a particular country. In this respect, there is in Porter's perspective some similarity with the natural resources course view (e.g., Sachs and Warner, 2001).

The critical importance of the specialized factors, particularly those connected with innovation, is apparent not only because they are necessary for high levels of productivity, but also because they tend to be less tradable. Therefore, an important lesson to take is that competitiveness policy must concentrate on specialized factors. But, which are the specialized factors in the sense given by Porter? This is a key question to design a policy capable of enhancing competitiveness. But, for now, let's return to figure 1.

Related and supporting industries refer to the local pressure, the lack of suppliers of materials, components, machinery and services, as well as the existence, extent and international competitive strength of other industries in the nation that support or assist the industry in question. Spatial proximity of upstream and downstream industries facilitates the exchange of information and promotes a continuous exchange of ideas and innovations. Productivity and productivity growth are higher where firms or industries are not isolated. That is, where there is a cluster[46].

According to Porter (1998, p. 78) "clusters are geographic concentrations of interconnected companies and institutions in a particular field". "Clusters take varying forms depending on their depth and sophistication, but most include a group of companies, suppliers of specialized inputs, components, machinery, services, and firms in related industries." So, clusters typically include firms in downstream industries, producers of complementary products, specialized infrastructure providers and other institutions that provide intangible inputs. Education, information, research, specialized training, and technical support, provided by universities and other organizations such as think tanks, vocational training providers, and standards-setting agencies are usually found inside the cluster location. Clusters can also contain trade associations and other professional bodies for its members.

So, following Porter (1998a) the advantages of clusters vis-à-vis outsourcing or vertical integration are an increase of productivity, which results not only from access to information and other specialized inputs, but also from complementarities among cluster participants. Often clusters improve the rate and success of innovation and shrink barriers to new business formation. Porter argues that this is a different view from traditional agglomeration economies, which are centred on cost minimization, while cluster advantages rest on information, transaction costs, complementarities, and externalities that result from other investments.

---

[46] According to OECD (1999, p. 381) "Clusters are characterised as networks of production of strongly interdependent firms (including specialised suppliers), knowledge producing agents (universities, research institutes, engineering companies), bridging institutions (brokers, consultants) and customers, linked to each other in a value-adding production chain".

In sum, clusters stimulate the formation of competitive advantages. But, as it is well known, clusters are not equally distributed in the national territory. There are regions with several and vibrant clusters while in other locations clusters are absent. So, if the competitive advantage is associated to the existence of clusters and these are territorially localized, two conclusions can be drawn: first it makes sense to consider regional, instead of national, competitiveness; second, policy should promote cluster formation and upgrading. However, in policy terms, what is the right way? Should policy reinforce and develop existing and emerging clusters or, on the contrary, create entirely new clusters?

Although the shift from comparative to competitive advantages has been vulgarized in policy makers' speeches this seldom has consequences in practice. Many governments and other public authorities use the term competitive advantage instead of comparative advantage, but go on to draw the policy as if some generic factors can be a source of competitive advantages per se. In fact, it is crucial to consider that the sources of competitive advantage are unique-location specific factors that stimulate learning and innovation activity. So, as Porter highlights, the competitive advantages are localized. As Porter (1998, p. 77) points out, local competition on a global market has created a paradox: "Competitive advantages in a global economy lie in local things — knowledge and relationships that distant rivals cannot match". Malecki (2004) also argues that in a globalised economy, the key resources for regional and urban competitiveness depend on localised processes of knowledge creation, in which people and firms learn about new technology, learn to trust each other, and share and exchange information. This refocuses the advantages as regionally specific and puts also the focus on clusters.

3. Regional competitiveness

Regional competitiveness is an interesting subject from the academic perspective, as is visible by the increasing number of academic studies (see, for instance, Steinle, 1992; Amin and Thrift, 1994; Steiner, 1998; Cheshire and Gordon, 1995, 1996, 1998; Storper, 1995, 1997; Camagni, 2002a, 2002b; Porter, 1998a, 2000, 2001, 2003). However, despite the growing literature, there is still no generally agreed theoretical or empirically-based consensus about a useful framework to deal with regional competitiveness and, perhaps because this lack, the public policy discourse is 'somewhat chaotic and ill-defined' (Gillian, 2005). So, without a clarification of what regional competitiveness is, it seems that policy action is partly guided by fashion and partly motivated by the belief that the performance of a region is governed by competitiveness understood as something like a 'natural law' (Kitson *et al.*, 2004) of the modern economy.

But, what are the drivers of regional competitiveness? What is the exact meaning of regional competitiveness?

In a previous article (Pessoa, 2008) we have addressed the first question considering a framework for analysing regional competitiveness. This is reproduced in Figure 2, which highlights a model that shows the basic elements that constitute the idea of regional competitiveness. In this model we have firms, which play a central role, and six focus areas (environmental resources, the local milieu, factor market and global market and legal and physical infrastructures), which drive the behaviour of firms. In the framework, two main reasons for market failures are also present: the externalities that arise from the environmental resources and from the milieu and the existence of public and semi-public goods, such as legal and physical infrastructures. All the drivers are interrelated and influence the firms' behaviour. Apart from the solution for these market failures, public intervention at regional level has limited capacity to affect regional competitiveness[47] positively. So, in figure 2 the motivation for public intervention is associated to market and coordination failures that are linked to the existence of externalities and public goods.

Clusters are important sources of externalities. As stated by Delgado, Porter and Stern (2012) industries participating in a strong cluster register higher employment growth as well as higher growth of wages, number of establishments, and patenting. Since clusters are not equally distributed in the national territory, externalities associated to clusters can be significant in the convergence/divergence dynamics. Although at a more aggregate level neoclassical theorists tend to foresee convergence while

---

[47] Of course other public policies can influence the competitiveness of a region. But unless they affect positively national competitiveness, the increase in competitiveness of a particular region is offset by a decrease in another or other regions.

the new economic geography has a propensity for predict divergence, at the regional level we can analyse the cluster effects more accurately and see that for depressed regions the possibility of establishing strong clusters can mean convergence with economic and technological frontier regions. Moreover, there is some cumulativeness associated to clusters and externalities, as it is shown by the evidence that new regional industries emerge where there is a strong cluster environment (Delgado, Porter and Stern, 2012).

The framework depicted in figure 2 can be used to assess the competitiveness of a specific region. Using this framework in a previous paper (Pessoa, 2008) we have concluded that the Portuguese Douro region is not competitive at the regional level. However, figure 2 is compatible with different meanings of regional competitiveness, and so it's time to deal with the second question above: What is the exact meaning of regional competitiveness?
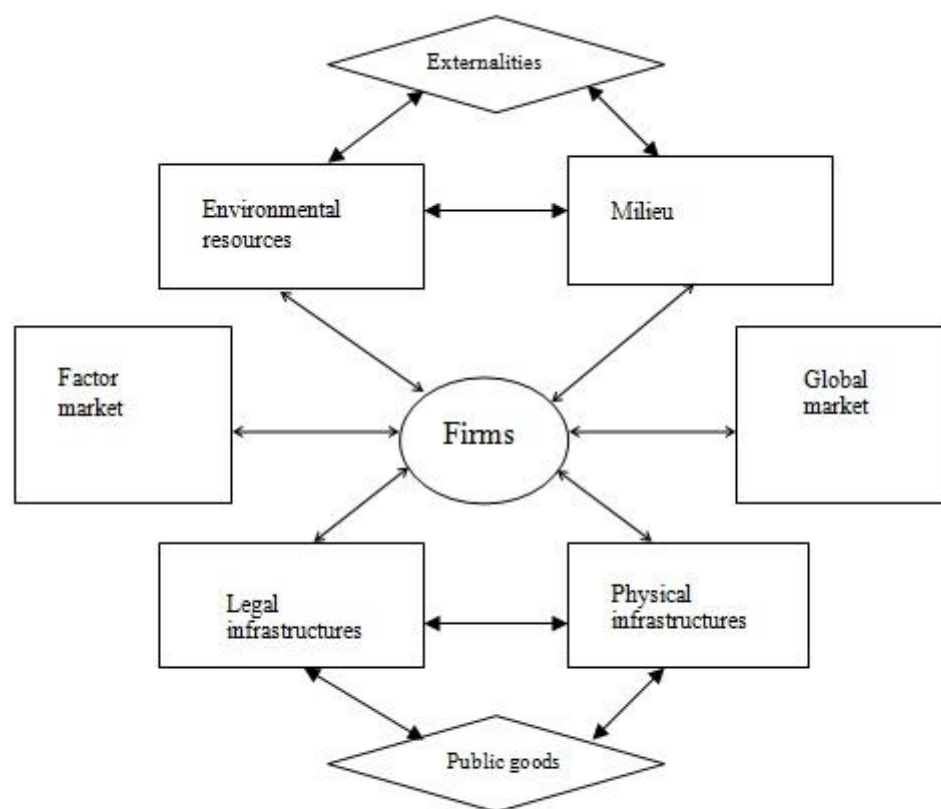
Source: Pessoa (2008)

Figure 2. Regional competitiveness: the central role of firms
Source: Pessoa (2008)

In fact, regional competitiveness is used in a plurality of meanings. At its simplest form, it might be defined as the success with which regions compete with one another in some way: over shares of domestic and/or export markets or over attracting capital or workers (Kitson *et al*., 2004). This assertion has been criticised in varied instances. On the one hand, because regions are not firms they cannot exit (Krugman, 1994, 1996; Boschma, 2004). On the other hand, if regions compete for a relatively small number of large investment projects, they are placed in a Prisoners' Dilemma game: as

Thomas (2003) has shown, there is no incentive for them to cooperate or not to continue to compete by offering subsidies and other incentives to investors. So competition between regions cannot be taken as the main characteristic of the regional competitiveness concept (Cheshire and Gordon, 1998; Turok, 2004).

There are other authors that see regional competitiveness as a combination of two or more characteristics. It is the case of Storper, who presents one of the most well-known concepts of 'place competitiveness'. He defines it as "the ability of an (urban) economy to attract and maintain firms with stable or rising market shares in an activity, while maintaining or increasing standards of living for those who participate in it" (Storper, 1997, p. 20). Not only "stable or rising market shares" but also "maintaining or increasing standards of living" are possible with high productivity. So, why not define regional competitiveness by the level of regional productivity?

In fact, regional productivity measured both from firm-based micro-data and from aggregate regional output figures can be viewed as a useful indicator of the so-called 'revealed regional competitiveness' (Gardiner *et al.*, 2004). However, we cannot mechanically extend the notion of national competitiveness to the regional level. When Porter and Ketels (2003) have emphasized that true competitiveness is measured by productivity, they were referring to the competitiveness of a nation. Although the evolution of productivity can offer helpful information on a region's standard of living, both in cross-sectional and temporal terms, there are empirical problems in accurately measuring it, as well as there are theoretical concerns about the interpretation to give to the real *regional* productivity (on this conceptual issues see Kitson *et al.*, 2004)[48].

Apart from that, looking only to productivity can be misleading: a high productivity of labour can result from reductions in employment by, for instance, shutting down plants. So, it is more useful to look at competitiveness as a function of complex interrelationships between variables (Turok, 2004). In this perspective, competitiveness can be thought of as an attribute of regions that base its dynamics in three variables: i) sales of local products in contested external markets; ii) use of local assets (people and other endogenous resources) in an efficient way; iii) adding value to its firms and workers, which means maintain or increase employment.

In figure 3, which puts together the above-mentioned variables, productivity in itself is only one aspect of revealed regional competitiveness. As underlined by Kitson *et al*. (2004), the ability to sustain a high rate of employment amongst the working-age population is as important as having a high output per worker. But, of course, efficiency matters for regional competitiveness. The link between static efficiency and the prosperity of regions stems from the fact that not only the reduction of slackness but also the reallocation of resources and the improvement of organization make the level of output, produced from given inputs, theoretically higher[49]. This increased output allows higher sales at the same time as it consents high rates of employment. However, what is here in analysis is the identification of regional competitiveness with the prosperity of regions. So, to a certain extent, regional competitiveness and regional prosperity are interchangeable concepts: prosperity is competitiveness based on endogenous resources.

---

[48] Apart from the general problems associated with measuring and interpreting national or sectoral productivity, there are specific problems associated to the sub national status of the region, such as the need to opt between indicators based on residence and workplace-based measures.

[49] By *slack-reducing* efficiency gains we mean those gains that involve the movement of the economy from within its production possibility frontier onto the frontier, thus resulting in full utilization of all available labor, capital and other factors of production. By *allocative* efficiency gains we mean those gains that involve along the economy's production possibility frontier from less efficient lines of employment of labor, capital and other inputs, to more efficient ones, thereby increasing regional economic output at full employment. By *organizational* efficiency gains, finally, we mean those gains that stem from outward shifts of the production frontier as a result of the reorganization of production, for instance, through the adoption of new production methods or better management.
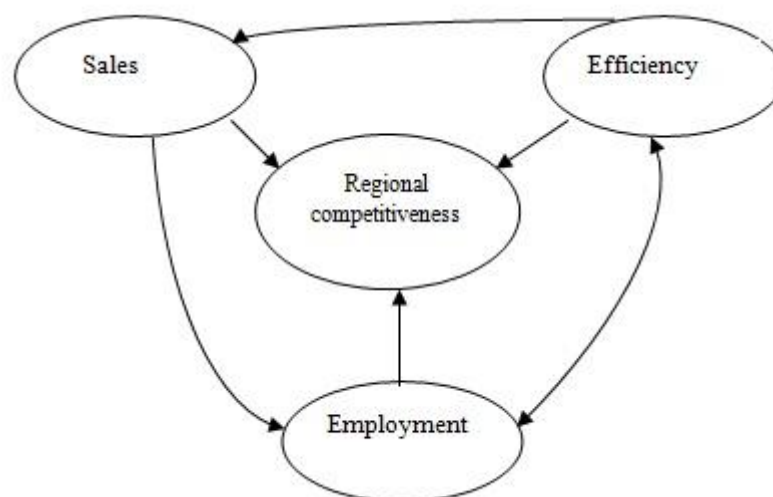
Figure 3. Regional competitiveness

Regional prosperity depends on the resources given, including endogenous resources such as the raw materials and the local labour force, together with physical capital. But the quality and skills of the labour force, the extent, depth and orientation of social networks and institutional forms, the range and quality of cultural facilities and assets, the presence of an innovative and creative class (knowledge, learning and creativity), and the scale and quality of public infrastructures are all just as important as, and serve to support and strengthen an efficient productive basis to the regional economy (Kitson *et al*, 2004). This productive basis is also enhanced by the interactions between environmental resources and 'milieu', as depicted in figure 2. Such interactions condition the ability of regions to attract skilled, creative and innovative people, forcing to provide high-quality cultural facilities and to encourage the development of social networks and institutional arrangements. In sum, because all these interactions originate key regional 'externalities', or 'assets', they are not only forces that benefit local firms and businesses but they also feed a common commitment to regional prosperity, and hence they are major aspects of regional competitive advantage.

Although figures 2 and 3 highlight the more important drivers and assets of regional prosperity, they are, however, too static. Competitive advantages rest on 'making more productive use of inputs, which requires continual innovation' (Porter, 1998, p. 78). So the fundamental question is: how can the innovation capacity be improved in a regional context?

Here, we agree with Porter (1998): clusters make the difference, since they drive the 'direction and pace of innovation, which underpins future productivity growth' (Porter 1998, p. 80). Additionally, because a cluster allows each member to benefit as if it had a greater scale, or as if it had joined with others without sacrificing its flexibility, clusters affect regional prosperity in two other ways: by increasing the productivity of firms based on the area, and by stimulating the formation of new businesses. Furthermore, the use of the cluster theory gives to policy-makers the opportunity to focus on the advantages of the economies of agglomeration and on the role of social capital interactions in the development of a region (Novelli *et al*., 2006).

In sum, two lessons must be drawn from the regional competitiveness perspective: i) although productivity can be important for competitiveness as underlined by Porter (1990, 1998) and Krugman (1996), the most decisive criterion for classifying a region as competitive is its prosperity; ii) clusters are important forms of spatial organization and critical drivers of the firms' productivity and, therefore, of regional prosperity.

4. Competitiveness in tourism destinations.

The positive impacts of tourism on regional development, are widely acknowledged (Pessoa, 2008) particularly in areas where there are few alternative economic activities (Hall and Boyd, 2005),. On the one hand, there are direct economic benefits (tourist spending, the increase in demand for

labour, the construction of collective and cultural infrastructures, etc.) and social and cultural effects (interacting with people from different environments and with diverse traditions increases the cultural level and enhances the capacity for understanding different cultures). On the other hand, tourism can also have positive externalities over all the community, such as a greater awareness of the environment and local culture, conservation of monuments and wildlife preservation (Tisdell, 1983, 1987)[50].

Recognizing the above positive effects, many national Governments, as the Portuguese, have chosen Tourism as a strategic sector in the respective economy. In Portugal, this choice has been materialised in the Tourism Development Plan, which determines the implementation of a varied range of measures and projects to eliminate certain difficulties that previously threatened the development of traditional tourist destinations, as well as the use of tourism to transform some 'lagging' Portuguese regions into tourist destinations.

The Douro Valley, one of the 'lagging' Portuguese regions, is promoting tourism by implementing several projects through different channels, including infrastructures and marketing. The often proclaimed objective is to transform Douro into the fourth Portuguese tourism destination. The highly competitive market of global tourism, and the belief that the expected contribution of tourism is significant, drives public authorities to invest large amounts of resources into advertising activities to promote this tourism destination. This is often justified with the need to increase regional competitiveness. However, the success of such an application of resources in the improvement of market shares and in increasing regional competitiveness in depressed regions is doubtful at best. Two points must deserve attention: tourism competitiveness and the need to consider externalities, as well as increasing returns, in the promotion of regional economic activities.

Despite being considered a 'nebulous phenomenon' (Hunter and Green, 1995), tourism relies directly and indirectly on a wide range of environmental resources, such as landscape, climate, environment and culture. The specific combination of these resources is a distinctive mark among regions, and so it can constitute a potential advantage when competing with other regions. However, we must note that what gives the advantage is not the resource *per se* but the way local agents exploit such combination. In fact, if the environmental resource is not exploited, i.e. if nobody has taken advantage of it in the near past, this means that a real advantage doesn't exist.

On the other hand, to recognize the contribution of tourism for the growth of some countries and regions doesn't mean that tourism is a panacea for all depressed regions. The strategy used in order to enhance regional competitiveness must be locally justified. However, is competitiveness in tourism equivalent to any other activity? Before answering this question, let's look at figure 4, where competitive forces in tourism are depicted.

Figure 4 is built up of two axes. The horizontal axis illustrates the main forces that determine the business profitability in the short to medium run. One can observe that these forces (bargaining power and rivalry) are not specific of tourism. So, we must concentrate on the vertical axis, which highlights the main factors that determine the long-term attractiveness of the tourism destination. This axis illustrates an important point in driving competitiveness in tourism: competitiveness depends on the phase of the life cycle of the tourism destination. This specificity distinguishes tourism from other economic activities in terms of rivalry and costs incurred in marketing and advertising.

In fact, while the rivalry between two firms in manufacturing is important in increasing the efficiency of both firms, in tourism this cannot be a principle of an absolute kind. In this respect, two cases must be distinguished. If the region where firms operate is a well-known destination, and tourism is a mature industry, rivalry between tourism competitors is fundamental to innovate in services provided and in increasing the long-term attractiveness of the tourism destination. However, if the region is trying to be noted as a tourism destination, the cooperation between local agents is crucial. Here more important than to fight for a share of the scarce market is to explore complementarities and to benefit from the mutual externalities that arise not only between tourism

---

[50] Investments based on tourism can certainly also produce negative externalities. Tourism at any destination is closely interlinked with the host community and its way of life, and has a symbolic dimension that differentiates each destination. So, individual projects that do not fit the cultural or symbolic values will have negative effects that will affect all the others. But apart from this, tourism may also impose various pressures on the host community during growth phases. (Buhalis and Fletcher, 1995 Brown and Giles, 1994).

competitors[51] but also, and more importantly, from external economies that take place when interacting with other economic activities.

Figure 4. Competitive forces in tourism
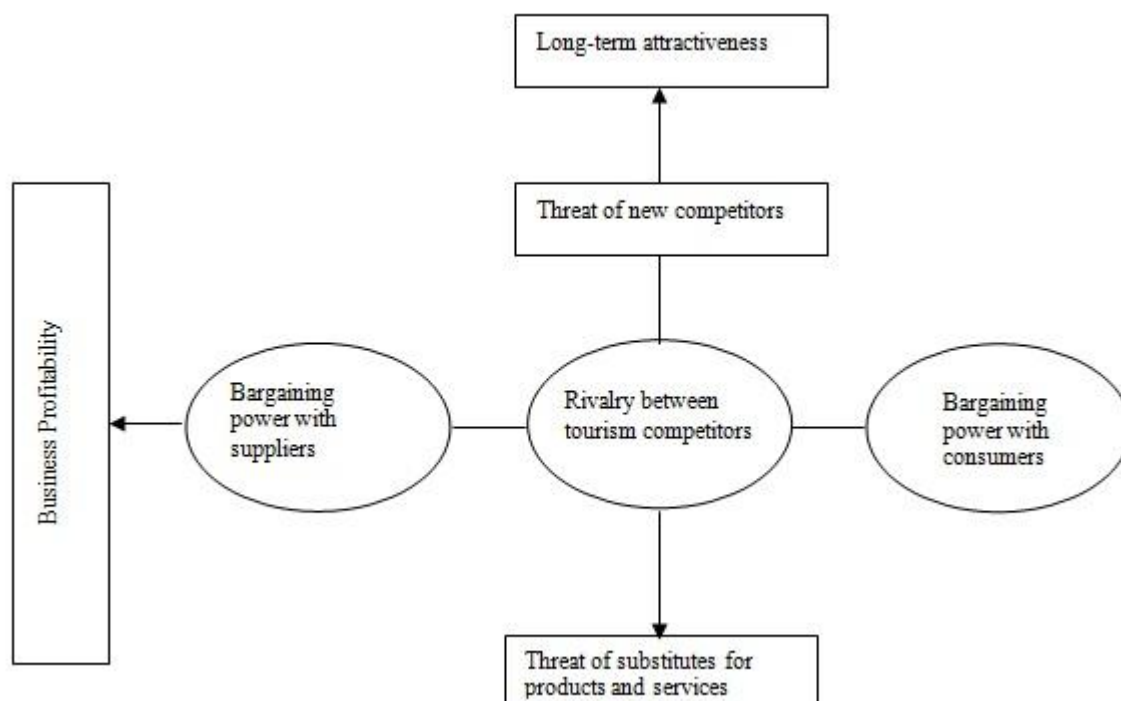
Moreover, the relationship between costs and returns of tourism promotion is not linear: the ratio between costs and benefits depends on the phase of life cycle of the tourism destination. In a depressed region that is trying to be noted as a tourism destination the ratio of the costs of marketing per new attracted tourist is considerably higher than in a mature tourism destination. The best promoters of tourism are tourists, and so it is very expensive for a depressed region to become a tourism destination, without massive application of money. So a question arises: What is more profitable from a social point of view? To spend this money in the promotion of tourism or, on the contrary, to use that money in promoting a generic "business and peoples' climate"?

The lessons extracted from the previous sections make it clear that using tourism to increase competitiveness in a region without tourism tradition only makes sense if tourism is assumed as a complementary activity to other activities that are embedded in the region and that can provide some tourism assets. Moreover, as was demonstrated in sections 2 and 3, the existence of potentialities is not a sufficient reason to justify a competitiveness strategy; the decisive factor in regional competitiveness is not the potential of resources, but the way they are profited, managed and used.

Why did policymakers choose tourism to pull the entire region, instead of looking to the embedded activities and regional clusters? The most obvious answer is the lack of policy advice in the existing literature. In our view, however, the problem is not the lack of policy advice, but the scale of values of policy makers. There is an ideal ranking of industries in the policy makers' mind that they try to impose because they consider it miraculous, as they have proven elsewhere to be growth enhancing.

---

[51] For instance, in rural tourism each investor will benefit from the fact that other sites or farms are available in their region, because this will increase the attraction of the rural location for external visitors.

5. Policy Advice

The literature on how to enhance regional competitiveness is characteristically varied and aims in various ways to incorporate different concepts (e.g. proximity, social capital, social embeddedness). Typically these concepts have developed from different approaches. Although much of this work is positioned within regional studies or economic geography, there are other important sources. For instance, some concepts came from the resource-based perspective[52]; others were derived from the new trade and growth theory, as well as from empirical insights resulting from a wealth of case studies of regions with innovative firms.

Even though the literature is varied, there have been very few attempts to bring the diverse sources of theoretical knowledge together in contributions that advise on regional policies. Most contributions concentrate on single elements of such policies (for example, finance or technology transfer agencies). Even the significant body of literature on the innovation systems[53], which consists of both theoretical and empirical work on innovation systems, is of little help on policy advice, perhaps because scholars face a paradox (Rosenfeld, 1995): The advice of scholars is much more appropriate for policy-makers than other theoretically refined contributions, but its high level of specificity narrows the range for policy motivation.

Rosenfeld (1995), Koschatzky (1997a) Archibugi *et al.* (1999), OECD (1999) and Tödtling and Trippl (2005) are some of the few contributions on policy advice. But these publications have limitations. In fact excepting Rosenfeld's (1995) book, which presents a practical guide to policy-making for strengthening clusters of different types, all the other publications are narrowly focused on specific aspects of innovation and learning. Although the book edited by Koschatzky (1997) takes a practical and pragmatic view upon regional policy, it is essentially focussed on high-tech SMEs. On the other hand, Archibugi *et al.* (1999) focuses only on a national level, while the OECD (1999) book takes the interaction between regional clusters and national-level innovation systems into consideration, yet it spends the most substantial effort on reviewing existing innovation policies.

The central idea of Tödtling and Trippl (2005) is that there is no "ideal model" for regional policy, as innovation activities differ strongly between regions. They followed the typology of RIS (regional innovation system) presented by Isaksen (2001) and built a taxonomy composed by 3 types of less-favoured or "problem" regions (metropolitan, peripheral and old industrial regions). According to Tödtling and Trippl (2005, p. 1215) the key challenge in peripheral regions is to strengthen and upgrade the regional economy by fostering "catching up learning". Additionally, the proper policy measures include the attraction of external companies and efforts to embed them into the region. Moreover, firms should be linked to knowledge providers and external clusters, as well as to innovation systems at national or supranational level.

Regional policies cannot be copied and pasted as a citation in a paper, because regions are embedded in different systems of innovation, and different systems have different specific factors. Following the high-tech appeal of the 1980s and the 1990s, experiences with implementing replicas of policies that have provided evidence of success in other regions have proven strongly discouraging, as the implementation of many 'dirigiste RIS' have shown. In those years, in several countries, with more emphasis in France, Japan (Park, 1997) and Taiwan, regional policy consisted of assembling high technology industry and R&D into larger regions. Such were the cases of Japanese 'technopolis' project (Bass, 1997; Park, 1997; Sternberg, 1997), 'science cities', or 'technology parks' (Bass, 1997). Although such endeavours were highly expensive and complex, and often aimed at creating altogether

---

[52] The resource-based approach aims to explain the organization of economic activity and competitive advantage through a focus on capabilities and learning. While Foss (1996) discusses the theoretical bases, Maskell *et al.* (1998) and Lawson and Lorenz (1999) have empirically applied this perspective at the regional level.
[53] This literature tries to empirically describe how, and theorize on, systems of firms, networks and institutions support firm-level innovation. For a description of national innovation systems (NIS) see Lundvall, 1992; Nelson, 1993; and Edquist 1997. For regional innovation systems, which interlink NIS with economic geography, see Asheim, 1997; Asheim and Cooke, 1999; Braczyk *et al.*, 1998.

new RIS[54], the results have on the whole been unsatisfactory (Hassink, 1996; Sternberg, 1997; Asheim and Cooke, 1999)[55].

On the other hand, experience from more unpretentious policy measures implemented in territorially embedded regional innovation systems, (also called "grassroots RIS") as for example, real services in Italian industrial districts, or technology transfer agencies in regionally networked innovation systems (also called "network RIS") as the German *Länder,* have offered important alternative inspiration for regionally-based policy. These more modest policies mostly support present economic activities within regions and hence sustain their present functioning, while stimulating bottom-up learning by offering local firms incremental innovations and motivation to change routines[56].

Policy certainly has costs. But there are policy instruments that are more expensive than others. The cheaper policy is the one that uses spontaneous market incentives. This is in accordance with the advice of Maskell *et al.* (1998, p. 189): 'successful public policy *must conform to the market processes*, not try to work against them'. The idea of an enlightened policy-maker, designing policy according to a superior knowledge of the best path for the regional economy, is indeed naive. As Glasmeier (1999) points out, instead of focusing on what regions should and should not produce, policy-makers should take account of what goes on at the 'substructure'.

A general policy subject in this respect is to stimulate linkages of various kinds, to particular types of other firms and knowledge centres (for example, technological service centres, R&D organizations, or universities), as has been mentioned by several authors (e.g. Asheim and Cooke, 1999; Malecki *et al.*, 1999). In order to obtain new technological knowledge, to encourage cross-region linkages is also important. In this respect, vertical linkages to external customers or suppliers, horizontal linkages to external partner firms, linkages to external universities or research organizations are of critical importance for organic learning[57]. Additionally, the important role of organic learning, stressed by several authors (see Lorenzen, 2001), shows that policy should leave room for experimentation and variety.

To conclude, only few attempts to elucidate policy options are made in the existing literature, and contributions on policy that take local factors into account are in fact exceptional. Until now, most contributions have been dedicated to clarify the basic theoretical arguments and to offer empirical illustration, while less attention has been paid to describing broader conclusions (Lorenzen, 2001). This fact helps to explain why policy-makers typically employ a way that is denied by theory: they use its belief on the use of a generic factor that has proven elsewhere to have positive effects on growth to force an 'ideal' regional policy, without attending to the specific factors that drive the competitiveness of a given region.

6. Concluding remarks

The way central and local authorities are usually dealing with peripheral regions forgets many of the theoretical lessons of the two last decades. They typically have decided to use some type of industry (high tech, tourism, etc.) as a catalyst of regional development in a voluntarism way without a serious analysis of the regional competitiveness factors. In what respects to tourism, they confuse environmental resources with tourism resources, and act as if the potentiality given by the environmental resources were a competitive advantage *per se*. However, one of the lessons of the recent theory is that competitive advantage results not from the mere existence of resources but is the outcome of the ability to drive the factors in the context of the specific problems they are seeking to solve.

Tourism support in a peripheral region is not disputable *per se*. What is doubtful is the preference given to tourism investments in a region with low demand of tourism and, moreover, the belief that tourism development is sufficient to pull the other activities in the region. This preference

---

[54] This type of RIS is called regionalized national innovation system in the Asheim and Gertler's (2005) taxonomy, but it is also known as "dirigiste RIS".

[55] The analysis of these frustrated experiences is also useful to illustrate the fact that a top-down approach at the regional level is easier said than done (Lorenzen, 2001).

[56] See Lorenzen (2001) and the references therein.

[57] While organic learning has a variety of non-planned origins (for example, learning by trial-and-error or learning by interacting with suppliers and customers), the planned learning at the microeconomic level is related to a deliberate 'search' for information.

distorts intersectoral competition and contributes to the crowding-out of other investments, as well as to spent large sums in promotion and marketing with very uncertain results[58].

Another problem is that policy for peripheral regions tends to be significantly supply-side in approach, and little attention is given to the demand side. It seems that policymakers believe in a variety of Say's law for regional competitive advantage: if all the 'drivers' are in place, then demand should follow. As Porter's work has emphasised, demand for a region's products is not simply an end result, but is itself an important 'driver' of a region's competitive advantage. This excessive supply-side orientation of policy, and the consequent little attention paid to the demand side, tends to neglect the need for stimulating local demand and creating favourable macroeconomic conditions and policies.

In opposition to the 1980s and early 1990s, regions today compete on at least two fronts. Firstly, regions must attract investments by forming an inspiring business climate: by providing attractive space for location, by guiding firms through public administration, by reducing the bureaucracy burden, etc. Secondly and closely linked, the ability to attract and retain highly skilled labour is crucial to the current and future prosperity of regions (Florida, 2002). So, they must attract people by shaping a competitive people's climate, which is also able to impede people from draining to the outside.

As an economic issue, regional competitiveness suggests that both local authorities and central government will have a role to play. First, regional systems are locally and sectorally specific. In regional competitiveness, as in innovation, one size does not fit all (Tödtling and Trippl, 2005). The implication is that policy decisions need to be informed by locally relevant knowledge, and varied by region and economic sector. Yet, for regional competitiveness, many of the effective governmental forces are proper education, infrastructure, and collaborative and coordinative mechanisms. In summary, for governments to play an effective role in building a vigorous competitive regional system, it is necessary to invest in the longer term, based on deeper insight into the patterns and dynamics of innovation in sectors specific to the region, principally in the existing clusters. As Porter explains, although governments should support *all* clusters, policy should reinforce and build on existing and emerging clusters, rather than attempt to create entirely new ones (Porter, 1998).

References

Amin, A. and Thrift, N. (1994) *Globalisation, Institutions, and Regional Development in Europe*. London: Oxford University Press.

Archibugi, D., *et al.* (Eds) (1999) *Innovation Policy in a Global Economy*. Cambridge: Cambridge University Press.

Arrow, Kenneth J. (1962), "The Economic Implications of Learning by Doing", *Review of Economic Studies, Vol.* 29(3), pp. 155-73.

Asheim, B. (1997) 'Learning regions' in a globalised world economy: towards a new competitive advantage of industrial districts?, in S. Conti and M. Taylor (Eds) *Interdependent and Uneven Development: Global-local Perspectives*. Aldershot: Ashgate.

Asheim, B. and Cooke, P. (1999) Local learning and interactive innovation networks in a global economy, in E.J. Malecki and P. Oinas (Eds) *Making Connections: Technological Learning and Regional Economic Change*. Aldershot: Ashgate.

Asheim, B. and Gertler, M. (2005) The Geography of Innovation: Regional Innovation Systems. in Fagerberg, Mowery & Nelson (eds) *The Oxford Handbook of Innovation*. Oxford University Press, Oxford.

Bass, S.J. (1997) Japanese research parks: national policy and local development, *Regional Studies*, 32(5), pp. 391–403.

Boschma, R. A. (2004) Rethinking regional innovation policy: the making and breaking of regional history, in Fuch S G. and Shapira P. (Eds) *Rethinking Regional Innovation and Change: Path Dependency or Regional Breakthroughs*? Kluwer, Dordrecht.

Boschma R (2005) Proximity and Innovation: A Critical Assessment, *Regional Studies* 39(1), 61-74.

---

[58] For instance, seven years after the decision of transforming Douro Valley in a tourism destination, this region goes on suffering from a significant decrease in resident population, whereas the tourism activity grows at rates excessively lower than the national average.

Braczyk, H.-J., *et al.* (Eds) (1998) *Regional Innovation Systems*. London: UCL Press.

Brown, G. and Giles, R. (1994)*,* "Coping with tourism: an examination of resident responses to the social impact of tourism", in, A.V. Seaton (ed.), *Tourism: the state of the art*. Chichester (UK): Wiley. 755-764.

Buhalis, D. and Fletcher, J. (1995), "Environmental impacts on tourist destinations: an economic analysis", in H. Coccossis and P. Nijkamp (eds) *Sustainable Tourism Development*. Aldershot (UK): Avebury, 3-24.

Camagni, R. (2002a) On the concept of territorial competitiveness: sound or misleading?, *Urban Studies* **39**, 2395-2411.

Camagni, R. (2002b) Territorial competitiveness, globalisation and local milieux, *European Spatial Research and Policy* **9**, 63-90.

Cheshire, P. and Gordon, I. R. (Eds) (1995), *Territorial Competition in an Integrating Europe.* Avebury, Aldershot.

Cheshire, P. and Gordon, I. R. (1996) Territorial competition and the predictability of collective (in)action, *International Journal of Urban and Regional Research* **20**, 383-399.

Cheshire, P. and Gordon, I. R. (1998) Territorial competition: some lessons for policy, *Annals of Regional Science* **32**, 321-346.

Delgado, Mercedes, Michael E. Porter and Scott Stern (2012) Clusters, Convergence, and Economic Performance, NBER Working Paper No. 18250.

Edquist, C., 1997. Systems of innovation approaches—their emergence and characteristics. In: Edquist, C. (Ed.), Systems of Innovation. Pinter, London, pp. 1–35.

Florida, R. (2002) *The Rise of the Creative Class – and how it's transforming work, leisure, community, & everyday life*. The Perseus Books Group, New York.

Foss, N.J. (1999) Networks, capabilities, and competitive advantage, *Scandinavian Journal of Management*, 155, pp. 1–15.

Gardiner, B., Martin, R. and Tyler, P. (2004) Competitiveness, productivity and economic growth across the European regions, *Regional Studies*, 38(9), pp. 1045-1067.

Gillian, Bristow (2005) Everyone's a 'winner': problematising the discourse of regional competitiveness *Journal of Economic*

Glasmeier, A.K. (1999) Territory-based regional development policy and planning in a learning economy: the case of 'real service centers' in industrial districts, *European Urban and Regional Studies*, 6(1), p. 73-84.

Hall C. Michael and Stephen Boyd (eds) (2005), *Nature-based Tourism in Peripheral Areas: Development or Disaster?* Clevedon, UK: Channel View Publications.

Hassink, R. (1996) Technology transfer agencies and regional economic development, *European Planning Studies*, 4(2), p. 1996.

Hood, C. (1991). A Public Management for All Seasons? *Public Administration*, Vol. 69(1), pp. 3-19.

Hunter, C and Green, H (1995) *Tourism and the environment: a sustainable relationship*? Routledge, London; New York.

Isaksen, A., 2001. Building regional innovation systems: is endogenous industrial development possible in the global economy? *Canadian Journal of Regional Science* 1, 101–120.

Kitson, M., Martin, R. and Tyler, P. (2004) Regional Competitiveness: An elusive yet key concept? *Regional Studies* 38(9): 991-999.

Koschatzky, K. (Ed.) (1997) *Technology-Based Firms in the Innovation Process: Management, Financing, and Regional Networks*. Heidelberg: Physica-Verlag.

Krugman, P. (1994) Competitiveness: A Dangerous Obsession, *Foreign Affairs*, 73, 2, pp. 28-44.

Krugman, P. (1996) Making sense of the competitiveness debate*, Oxford Review of Economic Policy,* 12, pp. 17-35.

Geography Volume 5, Number 3 Pp. 285-304.

Lawson, C. and Lorenz, E.H. (1999) Collective learning, tacit knowledge, and regional innovative capacity, *Regional Studies*, 33(4), pp. 305–318.

Lorenzen, Mark (2001) "Localized Learning and Policy: Academic Advice on Enhancing Regional Competitiveness through Learning", *European Planning Studies*, 9: 2, 163 — 185

Lundvall, B.-A. (Ed.), 1992. *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*. Pinter, London.

Malecki, E. J. (2004) Jockeying for position: what it means and why it matters to regional development policy when places compete, *Regional Studies*, 38(9), pp. 1101 – 1120.

Maskell, P., et al. (1998) *Competitiveness, Localised Learning, and Regional Development: Specialisation and Prosperity in Small Open Economies*. London: Routledge.

Nelson, R. (Ed.), 1993. *National Innovation Systems — A Comparative Analysis*. Oxford University Press, Oxford.

Novelli, Marina, Birte Schmitz, and Trisha Spencer (2006). "Networks, clusters and innovation in tourism: A UK experience", *Tourism Management* 27, 1141–1152.

OECD (1999) *Boosting Innovation: The Cluster Approach*, conference proceedings. Paris: OECD.

Osborne, D. and Gaebler, T. (1992). *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector.* Reading, MA: Addison-Wesley Publishing Company.

Park, S.-C. (1997) The Japanese technopolis strategy, in J. Simmie (Ed.) *Innovation, Networks, and Learning Regions?* London: Jessica Kingsley Publishers.

Pessoa, A. (2005). "Ideas" driven growth: the OECD evidence. *Portuguese Economic Journal* 4(1), 46-67.

Pessoa, A. (2008) "Tourism and Regional Competitiveness: the Case of the Portuguese Douro Valley," FEP Working Papers 299, Universidade do Porto, Faculdade de Economia do Porto.

Porter, M. (1990) *The Competitive Advantage of Nations.* Basingstoke, Macmillan.

Porter, M. (1992) *Competitive Advantage: Creating and Sustaining Superior Performance.* Issue 10. PA Consulting Group, London.

Porter, M. (1998) Clusters and the new economics of competitiveness, *Harvard Business Review* December, 76(6), 77-90.

Porter, M. (1998a) Location, clusters and the new economics of competition, *Business Economics* **33**, 7-17.

Porter, M. (2000) Location, competition and economic development: local clusters in the global economy, *Economic Development Quarterly* **14**, 15-31.

Porter, M. (2001) Regions and the new economics of competition, in Scott, A. J. (Ed.) *Global City Regions,* pp. 139-152. Blackwell, Oxford.

Porter, M. (2003) The economic performance of regions, *Regional Studies* **37**, 549-578.

Porter, M. and Ketels, C. (2003) UK Competitiveness: Moving to the Next Stage, DTI Economics Paper 3, London: Department of Trade and Industry.

Putnam, R.D. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton Press.

Romer, Paul M. (1986), "Increasing Returns and Long-run Growth*". Journal of Political Economy*, Vol. 94(5), pp. 1002-37.

Rosenfeld, S.A. (1995) *Industrial-Strength Strategies: Regional Business Clusters and Public Policy*. Washington, DC: The Aspen Institute.

Sachs, J. D. and Warner, A.M. (2001). "Natural Resource and Economic Development: The Curse of Natural Resources", *European Economic Review*, 45, 827-838.

Steiner, M. (Ed.) (1998) *Clusters and Regional Specialisation: On Geography, Technology, and Networks*. London: Pion.

Steinle, W. J. (1992) Regional competitiveness and the single market, *Regional Studies* **26**, 307-318.

Sternberg, R. (1997) New industrial spaces and national technology strategies: the case of Kyushu and the Japanese 'Technopolis strategy', in J. Simmie (Ed.) *Innovation, Networks, and Learning Regions?* London: Jessica Kingsley Publishers.

Storper, M. (1995) Competitiveness policy options; the technology-regions connection, *Growth and Change* Spring, 285-308.

Storper, M. (1997) *The Regional World: Territorial Development in a Global Economy.* Guilford Press, New York.

Thomas, K. (2003) Geographic scales and the competition for economic growth, *American Behavioral Scientist* **46**, 987-1001.

Tisdell, C.A. (1983) "Conserving living resources in Third World countries: economic and social issues", *International Journal of Environmental Studies*, Vol. 22, pp. 11-24.

Tisdell, C.A. (1987), "Tourism, the environment and profit", *Economic Analysis & Policy*, Vol. 17 No. 1, March, pp. 13-30.

Tödtling, Franz and Michaela Trippl (2005). **"**One size fits all? Towards a differentiated regional innovation policy approach", *Research Policy*, 34(8), 1203-1219.
Turok, Ivan (2004) "Cities, Regions and Competitiveness", *Regional Studies* 38(9), 1061-1075.

THE CHANGING ROLE OF GOVERNMENT LABS IN SCIENCE AND TECHNOLOGY POLICY

Rashid NIKZAD
Industry Canada
50 Victoria st., Gatineau, QC, Canada
Rashid.Nikzad@ic.gc.ca and Rashid.Nikzad@uottawa.ca

Abstract
This paper discusses the role of government and government labs in the innovation system by looking at the content and context in which this role changed in industrialized countries in the past 40 years. The paper concludes that even though we observe a decreasing trend in the share of government performed R&D in all industrial countries, there is still a substantial role for government labs to play. Also, better measurement mechanisms should be designed to evaluate the effectiveness of science and technology (S&T) in government and higher education as main public S&T institutions.

1. Introduction

There are several justifications for government support of science and technology (S&T) activities. First, governments are responsible for providing and enhancing scientific knowledge and technology for public sector functions (security, health, and communications). S&T for these tasks may be performed in public research laboratories or contracted out to private firms. The second justification is market failure in S&T and under-investment in innovation activities in the private sector. The rationale for this type of support is that due to the difficulty of firms in fully appropriating all economic benefits of S&T, private firms invest less in innovation than the socially optimal level. Government instruments to expand S&T activity in the private sector may include indirect tools such as R&D tax credits; direct tools such as grants and contributions, procurements, and contracts; and government direct involvement in S&T through government labs. The latter is the subject of this paper.

This paper discusses the changing role of government and government labs in the innovation system, and looks at the content and context in which the role of government labs changed in industrialized countries in the past 40 years. For this purpose, the S&T roles of the private sector, higher education, and government in the past and in the present will be compared. Most of the discussion will be in the Canadian context. As part of the discussion, the role of government in performing S&T in the present day will be also explored. Moreover, as an example of government labs, the functions and impacts of the National Research Council Canada (NRC) will be presented to show the potential impacts of a research-oriented government lab on innovation and economic growth in Canada. The paper concludes that even though we observe a decreasing trend in the share of government performed R&D in all industrial countries, there is still a substantial role for government labs to play. Also, better measurement mechanisms should be designed to evaluate the effectiveness of S&T in government and higher education as main public S&T institutions.

The structure of the paper is as follows. The next Section reviews the role of government in the innovation system over the past 40 years. The objective of this section is to identify the trends of the main S&T players. Section 3 takes this review deeper by highlighting the rationale behind a smaller

role for government labs in innovation in the present system. Section 4 discusses the potential roles of government labs in the present day. Section 5 presents NRC as the Government of Canada's largest S&T institute. This section also presents some of the findings of the studies that have assessed the economic impact of NRC on the Canadian economy. This assessment is particularly important since to the best of my knowledge, it is one of few empirical assessments of government labs in Canada. Section 6 concludes and discusses the findings.

2. The Role of Federal Government S&T

According to endogenous growth models, the main drivers of economic growth are investment in machinery and equipment, increase in labour force, and increase in productivity. However, by looking at the economic growth of developed countries in recent decades, it becomes clear that the productivity growth accounts for the larger part of economic growth in these countries. Higher productivity means improvements in labour and capital, as well as more efficient use of these two factors. The main contributor to productivity growth is the development of new methods of production through technology growth and innovation. This could happen through increasing the stock of general knowledge either by performing S&T domestically or by importing it through interaction with other countries. This section presents domestic S&T players with an emphasis on the role of government S&T.
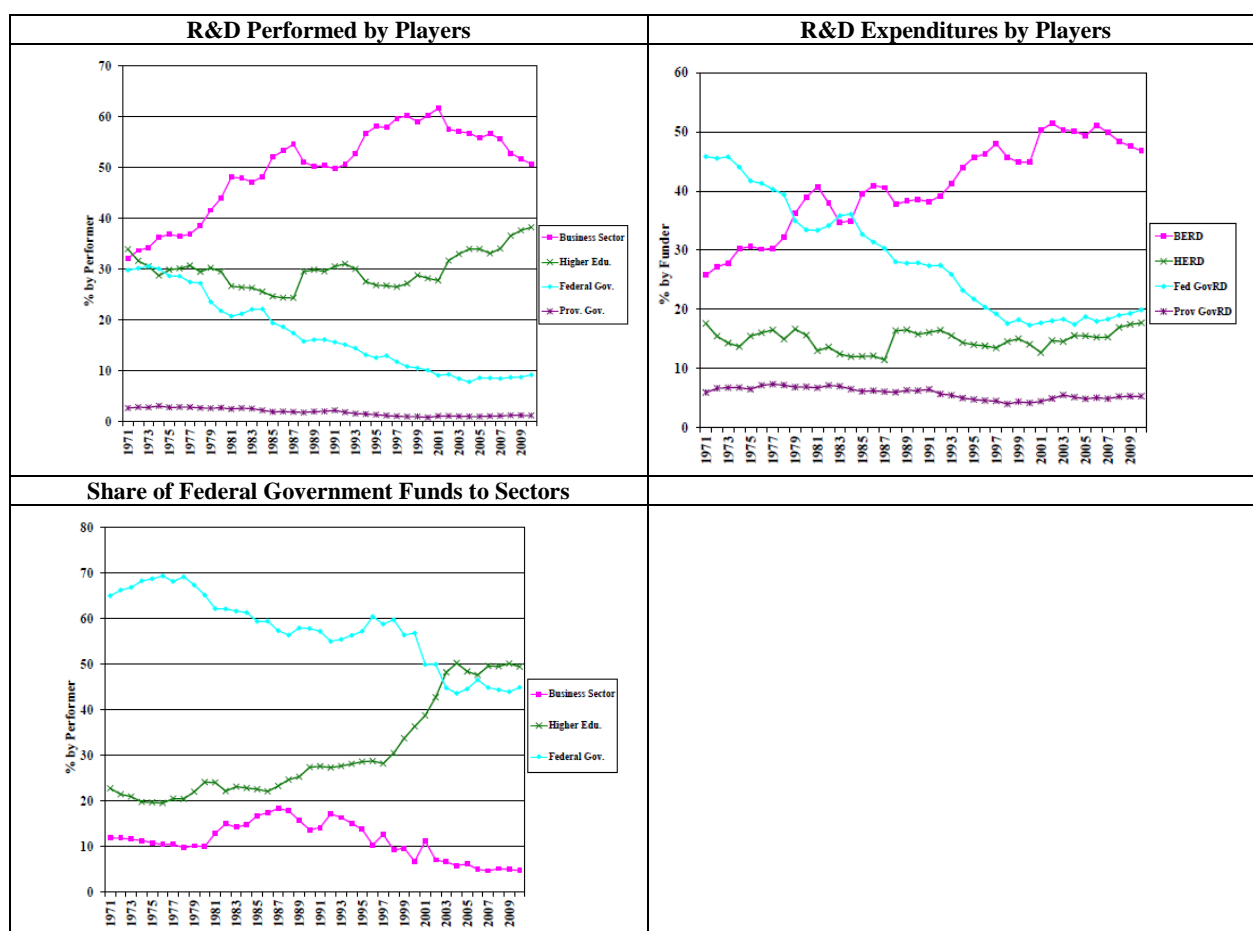
Figures 1- The roles of different players in funding and performing R&D in Canada
(1971-2009)
Source: Statistics Canada (CANSIM, Table 358-00011)

There are three main categories of S&T investors and performers in a country: the business sector, institutions of higher education (universities and colleges), and governments (federal, provincial, territorial, and local). The strength of a country's innovation system depends on the complementary strengths of these three key sectors and the alignment among them. The general

perception of these players is that the business sector is focused on applied and commercial S&T, universities are mostly involved in fundamental research, and governments support national research missions in areas such as defence, energy, space, and regulations, which are mainly of a "public good" nature (Crow and Bozeman; 1998 [3]; Doern and Kinder, 2002 [5]).

Economic theory suggests that the most important role of governments to support S&T is to ensure a competitive marketplace and to create an environment for the private sector to compete domestically and internationally (e.g. Government of Canada, 2007 [7]). There are also other reasons for governments to engage in S&T activities more actively: the main being the existence of market failure in S&T due to the difference between the private and social rates of returns to S&T activities. The second reason is to provide public goods to citizens. This category includes food safety, health, environment, defence, and so forth. Governments may carry out these tasks by using direct and indirect instruments (e.g. grants and tax credits) or by engaging directly in S&T activity in government labs. In what follows, the roles of government and other players in funding and performing S&T activities over the past four decades will be presented.

Figure 1 presents funding and performing of R&D by investor type for Canada from 1971 to 2009. Over the past 40 years, the federal government's share in funding R&D decreased significantly from 45% in 1971, to less than 20% in 2010. On the other hand, the share of the business sector increased from 25% to around 50% over the same period. The shares of higher education and provincial governments in funding R&D remained relatively constant at about 16% and 6%, respectively. Also, while all major players (business sector, higher education, and federal government) had an equal share in performing R&D in 1971, the share of the business sector and higher education has increased significantly since then. Other observations from Figure 1 are that provincial governments perform only around 2% of total R&D, and that most of the federal government funds go to the higher education.

Figure 2 suggests that the same trend is observed in all OECD countries: the share of government performed R&D significantly decreased in all developed countries over the past three decades. However, the decrease in the share of government performed R&D was more significant in Canada: while Canada had one of the highest shares of government performed R&D in 1981, this share became one the lowest by 2009.

OECD (2010) [15] also confirms this trend by using a similar measure: Canada's in-house government R&D as a share of GDP fell slightly to 0.188 percent in 2008 from 0.195 percent in 2006 so that the gap between Canada and other G7 countries continued to widen (Science, Technology and Innovation Council, 2011 [16]). The most significant decrease in terms of government performed R&D occurred in Australia. Moreover, Figure 2 shows that Canada has the highest share of R&D performed by the higher education sector among industrialized countries. At the same time, its share of business performed R&D is one of the lowest among the OECD countries.

These graphs suggest that while all countries shifted their government R&D resources to the business sector and higher education, Canada's emphasis was more on higher education as an engine of growth compared to other countries. The rationale behind this shift will be discussed in the next two sections.

3.   The Changing Place of Government in the Innovation System

As discussed in the previous Section, a decreasing trend in the role of government S&T programs in Canada and other industrialized countries is observed in the past four decades. This section discusses the reasons behind this change. Two periods may be considered for the purpose of this study: until the post-World War II period and after. Until the post-World War II, the federal government played a central role in the development and financing of S&T activity in Canada (a situation typical of many countries at the time) due to the following reasons (Council of Science and Technology Advisors, 1999 [2]):

- **In this earlier period, the federal government created the required S&T capacity in order to respond to specific national needs;**
- **Research projects in federal labs were coveted and were a key component of many scientific career paths;**

- **Government possessed almost all of the country's S&T facilities, infrastructure and expertise; and,**
- **Linkages between the various players in the innovation system (university-industry-government) were weak.**

Figures 2- The roles of different players in funding and performing R&D in selected industrialized countries, (1981-2009)
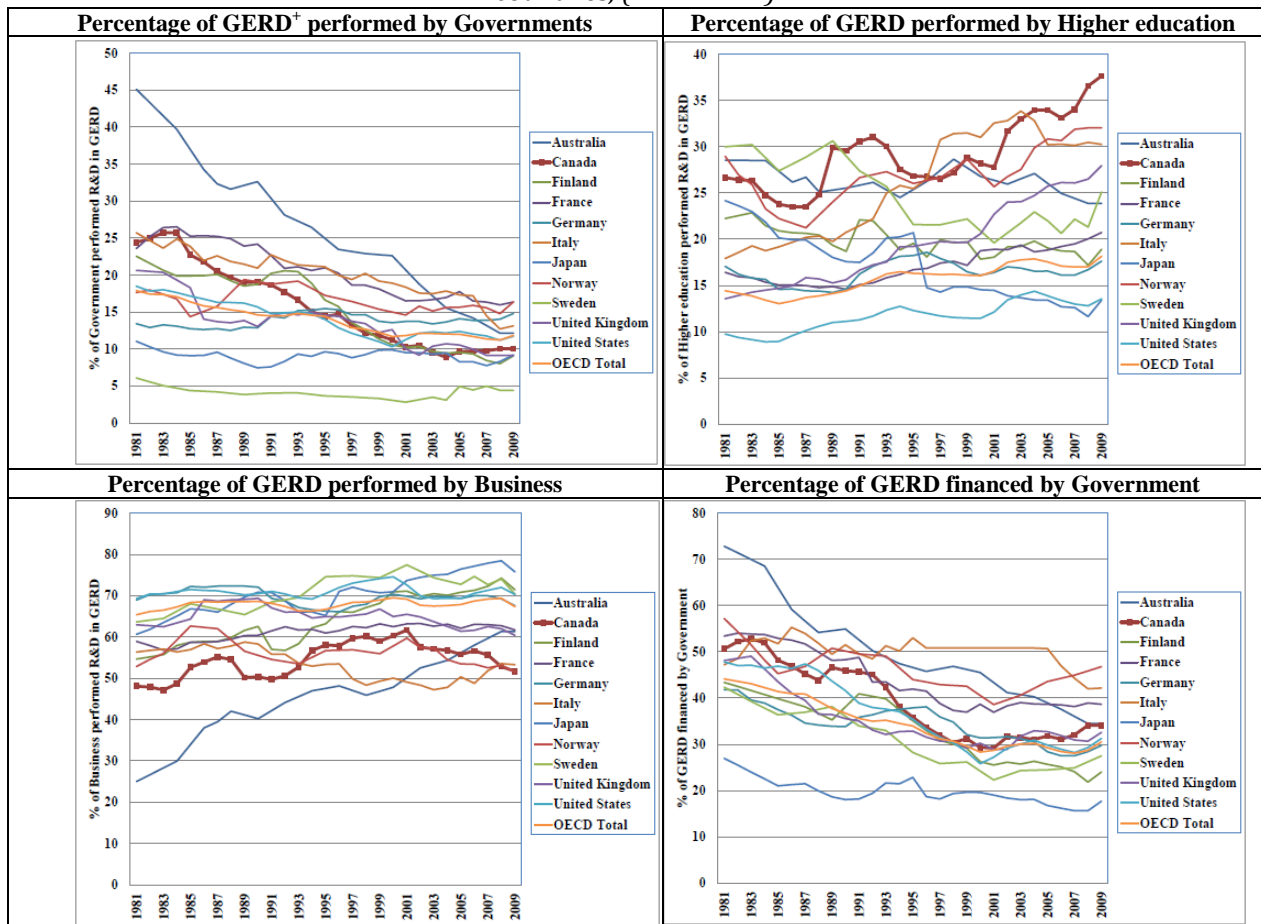
Figures 2- The roles of different players in funding and performing R&D in selected industrialized countries, (1981-2009)

Source: OECD (2010a)

[+] GERD: Gross Domestic Expenditures on R&D

However, this picture changed significantly due to government S&T policies since the 1970s:

- **Government began to invest heavily in S&T capacity in universities;**
- **Government made extensive efforts to support R&D in industry by offering tax incentives, doing collaborative research projects, and, in a few cases, assisting in the establishment of privately-owned research facilities.**

As a result of government policies, Canada's universities have become highly research intensive, and Canada's industrial R&D is world-class in many fields. S&T linkages among government, universities and the private sector also improved significantly (Treasury Board Secretariat, 2008 [17]). Because of these changes, the Canadian innovation system is no longer dominated by the federal government. In other words, the growing strength of S&T in Canadian universities, industry and non-profit research institutes means that there are more S&T skills, knowledge and capabilities available from outside government than in the past, and the vast majority of relevant research will be undertaken outside of federal labs. This change in the relative strength of S&T players put pressure on government to change its S&T role. Meanwhile, other

factors can also be mentioned for this trend. For example, globalization had an important role in this change. A key characteristic of globalization is the integration of domestic and foreign markets. The implication of this process is that policy decisions must be backed up with world-class science and technology. Another factor was the increased public expectations from governments in the areas of health and safety, environmental issues, security, economic and social well-being. These issues have raised public expectations about what governments can and should be doing, as well as a level of excellence in both science and decision-making (Dufour and de la Mothe, 2001 [6]).

The pace of technological change and the rate of advancement in knowledge was another factor that affected government involvement is S&T. As Dufour and de la Mothe (2001) [6] emphasize, "New products and technologies often require new types of regulatory responses or new needs for regulatory science. Governments need to be able to keep pace with these developments to ensure the safety of their citizens and the environment, and to ensure that commercial development is not adversely affected by government delays in product/process approvals. In some rapidly advancing, technology-intensive fields, government scientists need a level of expertise that often requires hands-on, continuing experience in leading-edge research to understand the results they are required to assess". Finally, part of the decrease in the role of governments in innovation is due to the concept of the New Public Management (NPM). Under NPM, countries such as the United Kingdom, Australia, and New Zealand have changed their governance (including S&T) structure quite extensively; though, the Canadian federal government adopted a relatively moderate approach in implementing NPM (Doern and Kinder, 2002 [5]). In any case, governments around the world were under pressure to reduce government spending and to ensure top value for that spending. As a result, there is more stress on demonstrating clear needs for federal investments in S&T today. Finally, there are also questions about the efficiency and effectiveness of government labs in performing S&T activities. For example, the following concerns have been raised about the efficiency of government labs (Dufour and de la Mothe, 2001 [6]):

- **Government labs are not always the best way to foster the commercialization of technologies;**
- **It is difficult to introduce competition in government labs to obtain better results;**
- **The performance incentives within federal labs are weak because they are neither salary-based (as in the private sector) nor publication based (as in the universities);**
- **Public intervention has benefits as well as costs. All government programs, including government labs, generate costs of administration and compliance. Just as there are market failures, there may also be "government failures" (Government of Canada, 2011 [8]);**
- **It is generally believed that the private sector and universities are more efficient than government in performing S&T.**

The result was that for most countries government labs were required to either be transferred to universities or satisfy the needs of the private sector. Some implications of this new vision were to look for full value for money, put intramural R&D activities to a market test, transfer of technology, and develop accountability and performance measures to assess and make full use of the in-house research capacity (Dufour and de la Mothe, 2001 [6]).

Different governments took different approaches in dealing with these challenges based on their political systems and the historical development of their S&T systems (Council of Science and Technology Advisors, 1999 [2]). For example, France's central government still performs a substantive amount of S&T either internally or through private sector contractors. In most cases, the reason for government direct involvement is the riskiness of the long-term project where the economic outcomes cannot be assessed before-hand, and there is a need for public involvement, not only as a funder, but also as an initiator and a first user (Laredo, 2001 [11]). This is in contrast with, for example, the United States that has a strong private sector orientation.

An interesting example is the United Kingdom. Until the election of Mrs. Thatcher's Conservative government in 1979, it was assumed that it was the government's responsibility to procure S&T assistance for both the public administration and the public good, and that this should be supplied mainly through publicly funded or owned research organizations. However, the introduction

of NPM changed this concept by forcing government to reduce the size of the public sector. S&T functions were then seen as clear targets for reforms. Yet, despite many reviews of S&T status in the United Kingdom, the majority of publicly-funded S&T organizations still remained in the public sector domain (Boden et at., 2001 [1]).

Australia had a more radical change in transferring its S&T facilities to universities and the business sector as illustrated in Figure 2. The Australian government established the Advisory Council of Science and Industry in 1916 as the first step towards a "national laboratory". This resulted in the establishment of the Council for Scientific and Industrial Research (CSIR) in 1926 to carry out scientific research to assist primary and secondary industries in Australia. CSIR was renamed to the Commonwealth Scientific and Industrial Research Organization (CSIRO) in 1949, and since then, expanded its activities to almost every industry. CSIRO was a main player in S&T development policy of Australia in the 1980s and 1990s (Martin, 1995 [12]). However, similar to other industrialized countries, the situation changed in Australia in the past decades with a reduction of the share of government labs in S&T spending and a greater emphasis on the business sector and universities as engines of innovation. Though, a study on the commercialization of research in Australian universities in recent years shows that, despite improvements in this area in universities, there are still significant difficulties in transferring innovations from Australian universities to industries (Zhao, 2004 [18]).

With respect to the Canadian government, reviewing the S&T recommendations of different advisory councils in the past 50 years shows that there has been a consistent tendency to recommend that government labs perform more like private sector entities, or that their roles be taken over by contractors or third part institutes such as universities. Also, reviewing these reports suggests that the importance of government labs for economic growth received more attention than the role of government labs for public good. Doern and Kinder (2002) [5] have done a comprehensive review of S&T recommendations to Canadian governments in the past and pointed out some of the challenges.

Despite these trends in reducing the role of government S&T, according to the Council of Science and Technology Advisors (1999) [2], almost all governments of the OECD countries have some in-house R&D capability, even a highly private-sector-oriented government such as the United States. In smaller countries, this capability is a relatively important element of the overall national R&D system; in larger countries, in-house R&D is relatively less important.

4.   What Are the Roles of Government Labs?

Despite the changes in the scope of government S&T activities, there is still a considerable role for government performed S&T. This section discusses the core tasks of government labs that cannot be taken over by university labs or industry because of their essential "public good" nature (The Council of Science and Technology Advisors, 1999 [2]; Dufour and de la Mothe, 2001 [6]; Doern and Kinder, 2002 [5]; Government of Canada, 2007 [7]). These tasks include:

- **specific S&T tasks that some departments are required to carry out by legislation;**
- **specific requirements for S&T in support of policy formulation and government decision making that, in many instances, cannot be conducted at arms' length by third parties because of the complexity of the issue, security, etc., or when a rapid response is required. Also, contracting out all of these responsibilities to academic or private sector would not only create a government contract monitoring and management problem, but could also lead to breaches of security and a lost assurance to government;**
- **in selected fields, an in-house S&T capability is an essential element for government to maintain the credibility it requires to be an effective regulator and a negotiator in national and international agreements;**
- **to undertake testing and approval in areas related to drugs, bio-medical devices, vaccines, blood products, etc, which require government involvement as well as research capability and scientific assessments in order to evaluate and verify outside results for the protection of citizens. The same is true for regulatory control of food and consumer product safety, environment, defence, etc., as well as to support emergency preparedness dealing with issues such as earthquakes, floods, and so forth.**
- **to establish and negotiate standards in order to harmonize domestic and international**

- **regimes to protect citizens and provide a favourable business climate;**
- **the need for confidentiality in working with third parties, with government scientists acting as an "honest broker" in bringing together partners that would normally be competing;**
- **the need to maintain long-term data collection and analysis programs that, otherwise, would not be done by the private or university sector;**
- **to provide technical assistance to small and medium sized businesses (SMEs) which are working in a technology-intensive area and which do not have the needed in-house expertise or equipment. No firm or university could easily provide this service due to the lack of expertise, experience, and/or conflict of interest;**
- **to conduct basic research, not because government researchers are expected to contribute to the stock of capital knowledge, but because basic research will support government researchers to be involved in the latest developments, findings, and techniques so that they can be called upon as required in support of government decisions. This makes a difference between the role of government scientists and that of university/industry scientists (Dufour and de la Mothe, 2001 [6]). Support for science policy often involves providing timely information to government decision makers about what to do on a particular issue.**

Although, it is important to note that the federal government needs to have a degree of scientific and/or technological capacity to be able to exercise the option of outsourcing the research and assessing the quality of the results. The government department or agency should have a clear understanding of its needs for the specific scientific or technology research and/or development.

5. Federal Government Labs

Figure 3 presents the main federal departments and agencies that undertake S&T in Canada and the share of each of total budget in 2007-08 fiscal year. These departments undertake S&T to provide public good, support economic development objectives, and perform basic research. The National Research Council of Canada (NRC) as the Government of Canada's premier research institute will be described in more detail in this section.

Federal involvement in industrial S&T began with the establishment of NRC in 1916. NRC is Canada's premier S&T organization. Its establishment was influenced in part by the wartime debate in Britain and Australia on the creation of similar research bodies (Dufour and de la Mothe, 2001 [6]). Its first lab, in 1932, was designed to promote industrial development through R&D. Its labs' efforts underwent more change after World War II when it spun off several new entities. NRC is now comprised of more than 20 institutes and national programs, spanning a wide variety of disciplines and offering a broad array of services. The institutes and programs are organized into five key areas[60]:

- **Life Sciences,**
- **Physical Sciences,**
- **Engineering,**
- **Technology and Industry Support,**
- **Corporate Management.**

At the end of the first quarter in fiscal year 2010-11, NRC's total planned spending authorities were $888 million. NRC accounts for roughly thirty percent of intramural federal government R&D. It is important to note that there was already a noticeable movement at NRC in the 1980s towards greater business representation and away from academic representation, so that at the start of the 1990s, NRC was already a business oriented council (Doern, 2000 [4]). The most recent Government of Canada's S&T report, *Innovation Canada: A Call to Action - Review of Federal Support to Research and*

---

[60] http://www.nrc-cnrc.gc.ca/eng/about/corporate-overview.html. A complete list of NRC institutes and programs is available at http://www.nrc-cnrc.gc.ca/eng/ibp/index.html.

Development (2011), recommends that NRC become even more industry-oriented, and that most of its research labs be transferred to universities (Government of Canada, 2011 [8]).
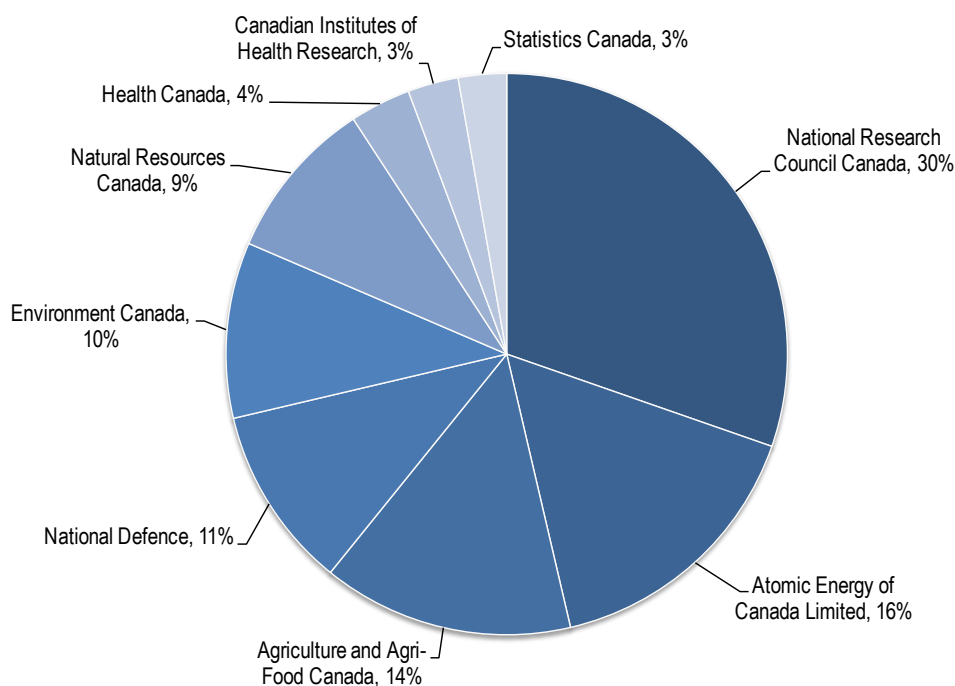
Figure 3- Canadian Federal R&D Spending by Government Department and Agency (2007-08)

Source: Statistics Canada, Federal Scientific Activities

It is worth noting that NRC is one of few government departments that tried to assess its socio-economic impacts quantitatively at the national level: in an effort to provide quantitative evidence of the impacts and return on investment to taxpayers of their activities, NRC has developed several methods to empirically measure the impacts related to its S&T activities on various levels of the Canadian economy (Kijek, et al. (*forthcoming*); Nikzad et al. [10], 2012a [13] and 2012b [14]). These measures assess the impact of:

- **NRC labs on Canada's total factor productivity (TFP);**
- **NRC expenditures on business R&D;**
- **NRC expenditures on GDP;**
- **NRC services and the Industrial Research Assistance Program (NRC-IRAP) on companies (NRC clients).**

These studies show that NRC activities have a considerable positive impact on the Canadian economy. Based on these studies, NRC was found to have had a positive and (statistically) significant impact on Canadian productivity so that the total value of NRC's impact on Canadian productivity is estimated at approximately $1.2 billion annually in terms of increased GDP growth. NRC's expenditures results ultimately in increased Canadian Business Expenditures on R&D (BERD) with an estimated $1.69 increase in BERD for every dollar spent on NRC S&T activities. Also, using data on both NRC client and non-client company data, NRC has a positive and (statistically) significant impact on private sector clients' sales, high skilled R&D employment, total employment and exports. In terms of increased employment, NRC creates between 8,000 and 10,000 direct private sector jobs annually, of which 3,500 and 4,500 are direct high skilled, "high-value", private sector R&D jobs.

It is worth mentioning that these studies look only at the monetary values of the impacts, while other potential impacts such as health, environment, safety, and like are missing in the study because of the difficulty in estimating these impacts. Our understanding of NRC and other government S&T programs will be improved if we can also include measures of "non-market"

impacts of government's S&T.

6. Conclusion and discussion

This paper reviewed the S&T role of government labs in Canada and other industrialized countries in the past 40 years. A decreasing trend of government S&T and an increasing share of the private sector and universities in S&T are observed in all industrialized countries. However, statistics show that this move was more significant in Canada: while Canada had one of the highest shares of government performed R&D in 1981, this share became one of the lowest by 2009. Also, the same statistics show that Canada has the highest share of R&D performed by the higher education sector among industrialized countries. At the same time, its share of business performed R&D is one of the lowest among the OECD countries. Considering that S&T and innovation performance of Canada is lagging behind many developed countries [8,16], a question may be raised as to which instruments should be used to spur innovation. Noticeably, the same trend is observed in the current and forthcoming innovation policies of the federal government.

Another question that arises is how successful different S&T players perform in term of spurring innovation, producing and transferring new technologies, and increasing economic growth. One consideration about the S&T policy in Canada is that while we have an understanding of government S&T impacts (for example NRC labs as mentioned in Section 5), we know very little about the impact of university S&T on innovation in Canada despite the fact that they are currently the instrument of choice among policy makers. Assessing the impact of universities and government labs on innovation and economic growth will help the transition of government labs to other sectors.

To conclude, even though government labs are not the main players in S&T anymore, there is still significant role for them to play. The S&T performed by government, universities and industry each responds to different needs and time frames, and often require different skills and a different research culture. This means that in many cases, S&T from one of these sectors cannot be substituted for any of the others. Because of these differences, different performance criteria and standards are also necessary (Boden et at., 2001 [1]). Examples of further work in this area includes self-assessment and peer reviewed publications that are used by many US Government labs (Jordan, 2001 [9]). Also, according to Boden, et al. (2001) [1] the concept of commercialization needs to be redefined so that it accommodates "the primary function of public sector research establishments – that of benefit to the nation rather than simply additional revenue for government". Regarding this, the following actions are suggested to better design policies around government labs:

a. To design better measures to assess the performance of government labs, universities, and the private sector in terms of S&T policies. This helps better assess the impact of different policies in terms of S&T outcomes, and is a prerequisite for evidence-based policies;

b. Frame the principal roles of government labs in the present day. This will help change the structure of government labs more efficiently.

References

Boden, R., D. Cox, L. Georghiou, and K. E. Barker, "Administrative Reform of United Kingdom Government Research Establishments", in Government Laboratories - Transition and Transformation, ed. Cox, D., P. J. Gummett, and K. E. Barker, Amsterdam, 2001.

Council of Science and Technology Advisors, "Building Excellence in Science and Technology (BEST): The Federal Roles in Performing Science and Technology", Government of Canada, 1999.

Crow, M. M., and B. Bozeman, Limited by Design, New York: Columbia University Press, 1998.

Doern, G. B., "The National Research Council of Canada: Institutional Change for an Innovation Policy Era", in Canadian Public Administration, Vol. 43, No. 3, 2000, pp. 270-295.

Doern, G. B., and J. Kinder, "One Size Does Not Fit All: Canadian Government Laboratories as Diverse and Complex Institutions", in Journal of Canadian Studies. Vol. 37, No. 2, 2002, pp. 33-55.

Dufour, P., and J. de la Mothe, "Change, Reform and Capacity: A Review of the Canadian Government R&D Experience", in Government Laboratories - Transition and

Transformation, ed. Cox, D., P. J. Gummett, and K. E. Barker, Amsterdam, 2001.

Government of Canada, "Mobilizing Science and Technology to Canada's Advantage", 2007.

Government of Canada, "Innovation Canada: A Call to Action - Review of Federal Support to Research and Development – Expert Panel Report", 2011.

Jordan, G., "Measuring the Performance of American Science and Technology Laboratories", in Government Laboratories - Transition and Transformation, ed. Cox, D., P. J. Gummett, and K. E. Barker, Amsterdam, 2001.

Kijek, F., R. Nikzad, R. Ghazal, and G. Sedigh, "NRC S&T Economic Impacts and Return on Investment Study", National Research Council Canada, forthcoming.

Laredo, P., "Government Laboratories or Public Institutions of Professional Research? The Case of France", in Government Laboratories - Transition and Transformation, ed. Cox, D., P. J. Gummett, and K. E. Barker, Amsterdam, 2001.

Martin, B. R., "Foresight in Science and Technology", in Technology Analysis and Strategic Management, Vol. 7, No. 2, 1995, pp. 139-168.

Nikzad, R., F. Kijek, R. Ghazal, and G. Sedigh, "NRC's Impact on Canada's Productivity: a Panel Data Analysis", National Research Council Canada, 2012a.

Nikzad, R., F. Kijek, and G. Sedigh, "Impact of Government Research and Development on Business Research and Development", National Research Council Canada, 2012b.

OECD, Main Science and Technology Indicators, Vol. 2010/1, OECD Publishing, doi: 10.1787/msti-v2010-1-en-fr. 2010.

Science, Technology and Innovation Council, "State of the Nation 2010 - Canada's Science, Technology and Innovation System: Imagination to Innovation - Building Canadian Paths to Prosperity", Government of Canada, 2011.

Treasury Board Secretariat, "Report of the Independent Panel of Experts on Inter-Sectoral Partnerships for Non-Regulatory Federal Laboratories", Ottawa, http://www.tbs-sct.gc.ca/fedlab-labfed/docs/2008/tnfl-tglfun/tnfl-tglfun01-eng.asp, 2008.

Zhao, F., "Commercialization of Research: a Case Study of Australian Universities", in Higher Education Research and Development, Vol. 23, No. 2, 2004, pp. 223-236.

THE CRITICAL IMPORTANCE OF THE LOAN PROVIDING FUNDS FOR SMALL AND MEDIUM ENTERPRISES DURING THE RECENT FINANCIAL CRISIS

Chrysanthi BALOMENOU
Hellenic Open University,
e-mail: hjlp6543@hol.gr, balomenou@tutors.eap.gr

Marianthi MALIARI
Hellenic Open University,
e-mail: mmaliari@otenet.gr, mmaliari@ate.gr

Abstract
This work attempts to examine the consequences of the crisis on enterprises and on banks, to study enterprises' problems related their access to fundsability, to examine the phenomenon of corruption in Greece especially in state banks, to highlight the problems and inefficacies of local enterprises and finally to focus on the economic lag and underdevelopment in all the local economic sectors in Regional Unity of Serres. As regard as the empirical research, it deals with the data extracted from a questionnaire addressed to local entrepreneurs. The results are analysed with the help of the methods of descriptive statistics and correlations. The research main conclusion is that the reduction of the funds provided by the banks to the market resulted in the deterioration of the recession. It is worth referring to the fact that the statistical data extracted from the empirical research are similar to those deduced from the results of the researches that have been referred to in bibliography.

Keywords: Financial crisis, Loan providing funds, Local entrepreneurship, Regional Unity of Serres
JEL Classification: R0

Introduction

 It is common knowledge that today's crisis could be compared to that of the 1929's . The consequences of the turmoil on the banking sector are remarkable.
 During the past decades our country has suffered from 4 bankruptcies. An on depth analysis of the consequences' of bankrupts and recessions in Greece helps to study the today's crisis.
The widely extended corruption throughout all the economic activities is one of the main economic problems in Greece as Greece adopts practices from eastern countries (Doole & Lowe 2005). State banks are also considered to be contaminated from corruption. Micro-entrepreneurs' answers in the empirical research confirm that there is a strong belief about the existence of corruption and mistreatment phenomena in state banks as regard as loan providing process.
Apparently the Greek state supported SME's with the implementation of specialised programmes through state guarantees. It is worth mentioning to creation of moral hazards due to state guarantees.
The use of statistical data from the Bank of Greece and the Agricultural Bank of Greece (both state banks up today) communicates the information that banks have drastically diminished loan providing both in individuals and enterprises. Furthermore, the increase on interest rate has deteriorated borrowers' position. As the consequences of the great reduction of loan providing funds to Small and Medium Enterprises (SMEs) are enormous, entrepreneurs have to offer even their own house as collateral when they apply for a loan.

The use of statistical data from Serres Chamber of Commerce and Industry in accordance to our research indicates that in Regional Unity of Serres the economic distress and underdevelopment in all the levels of local economy is obvious. The said findings, are completely verified by the relevant literature. Specifically, according to Samir Amin and to C. Balomenou writings, on turmoil governments schedule programs prefer the criterion of efficiency instead of the criterion of equity (equal and balanced development). Furthermore, as it is well known in Regional Science, in periods of recession, the crisis policy responses, focus on spreading more resources in core regions (Konsolas, 1997) and (Coniglio and Prota, 2011) in order, according to Myrdal theory (cited in Balomenou, 2003, p.132), initially during recession periods, via the procedure of back wash effects (submission of economic resources and mobility of human resources from the periphery to the central / core regions) to straiten the said regions and finally via spread effects (from core/rich central regions to the lagging / poor periphery regions in periods of economical growth to reinforce the lagging areas that are finding it increasingly difficult to cope during economic constructions).

The results of the questionnaire-based research from 74 local entrepreneurs in Regional Unity of Serres are presented in order to indicate the concurrence between the results from the data extracted from local entrepreneurs' answers and the literature. It is worth referring to the fact that we did not use the random sampling method and we focused on these enterprises which received loans in the form of working capital and also we focused on these enterprises which received loans from Greek Guarantee Fund for Small and Very Small Enterprises (TEMPME).The results have been analysing by using descriptive statistical methods, by calculating the mean, the standard deviation and the coefficient of variation. Moreover, the calculation of the statistical moment of distribution, the coefficient correlation was considered necessary for this work.

This work focused on the analysis of the consequences of economical crisis upon SME's. The fact that crisis affected more the new enterprises confirms Porter (1988) writings for new enterprises problems relevant to credit access. In addition, crisis strongly affected also the micro enterprises. Furthermore, the fact that micro entrepreneurs consideration that credit institutions do not support them, confirms Pisaridis cited in Piperopoulos (2007) writings for micro enterprises' defective access to loans.

The main conclusion is that banks decreasing loanable fund providing to the market resulted in the deterioration of the recession.

This paper is organized as follows. In the first part which is the theoretical part are presented the consequences of financial crisis especially upon SME's , corruption in Greece and especially in Greek banks and the statistical data. In the second part which is the empirical one are presented the results of a questionnaire-based research from local entrepreneurs. Finally, the paper ends with the presentation of the research's main conclusions.

Theoretical grounds

Financial crisis and corruption in Greece

Our country, Greece, has suffered from 4 bankruptcies in the past (1827, 1843, 1893, 1932) due to Greece's inability to repay the enormous debt. Global international crisis in the year 1929 was by affected the last bankruptcy (1932).

It is noticeable that ten years ago (2000-2001) a year before Greece's entrance to "Euro zone" Athens's Stock-market collapsed. The so–called "stock-market bladder" affect investor's behavior for the following years.

Today's global credit-finance crisis (2008-2009) has also affected our economy. It is noticeable that international crisis in the year 1929 and today's global crisis both affected credit system and as a consequence many banks were bankrupted.

The Sub-primes may not be the main global-crisis cause, but they were the opportunity for the crisis to appear. Together with the sub-primes, the rising commercial prices, the wide use of derivatives, the lack of transparency on risk apportionment, the fact that credit institutions

have been undertaken too high hazards and hazard's devaluation by rating institutions, the fact that Central banks provided over- liquidity, the decreasing interests, the infected supervisory frame and finally the Hedge funds resulted in the appearance of the recession. Taking under consideration to the above, crisis in United States and in north European Union countries should be characterised as a credit and finance crisis.

On the contrary, crisis in Greece should be characterised as a debt crisis as the main Greece-crisis causes are the failure in fiscal policy which ended in Greece's enormous deficit financing-debt, the lack of plans in production, infrastructure works, education, social security, tourism, agriculture, the increased trade deficit, the incapability of using monetary devaluation and the low effectiveness of Greek economy.

Apparently one of the major economic problems in Greece is the widely extended corruption throughout all the economic activities. According to Doole & Lowe (2005) "In cultures which view bribery as an acceptable business practice, the communication style is more implicit…….In Japan, for example, gift giving practices are wide spread in the business culture…..By contrast, in Northern Europe and the USA managers relay on explicit contract….In some cultures all business gifts are viewed as illegal bribes" (p. 321). Apparently, although Greece belongs in West, in Europe, Greek practises adopt at eastern ones.

As Greece is considered to be one of the "P.I.(I).G.S" in Euro zone, wide corruption takes place almost everywhere –including corruption in state banks. In the second part of this research, the answers to the relevant question "Banks based only on objective and countable criteria to provide funds for an enterprise" 11 up to 16 of the micro enterprises disagreed with this proposal. It is obvious that micro-entrepreneurs believe that other criteria such as bribe are taken into consideration.

It is noticeable to refer to state providing guarantees to enterprises. Greek state supports Small and medium Enterprises (SMEs) with the application of programmes through guarantees. In Greece, the last two years (1-1-2009 up to 7-4-2010) many enterprises took non-interest (at the first Cycle of the program) or low-interest (at the second Cycle of the program) loans through Greek Guarantee Fund for Small and Very Small Enterprises (TEMPME in Greek language). The main condition of the first Cycle is that every enterprise should have 3 profitable financial years in succession during the last three years of their profit and loss accounts. As a result of the previous strict condition, micro and new enterprises were excluded from the benefit of the non-interest funds. The condition of the second Cycle that every enterprise should succeed in achieving a positive profit mean of their last three financial years in succession, in their profit and loss accounts finally allowed more business to benefit from the low-interest loans.

We will analyze in the second part of this research that many businessmen who never received other kinds of loans benefit from the non-interest or low-interest loans taking loans from TEMPME. The use of non-interest funds by businessmen who never received other kinds of loan did not help liquidity to be transferred to real economy. As a consequence to the above, the recession in our country has been deteriorated. Taking into consideration the fact that the Greek government is aiming to provide to the Greek banks guarantees up to 30 billion Euros, state should reassign the terms of guarantee funds.

In addition, it is worth noting the moral hazard due to state guarantees. According to the law, banks use the same criteria in order to provide funds for enterprises whether there are guarantees or not. Unfortunately the banks provide state guarantee funds not only to those enterprises which have the ability to repay their debt, (the credible ones) but to almost every enterprise, even those enterprises which are likely to go bankrupt. During the summer of 2010, the Greek government provided state guarantees to tomato-industries in order to repay the tomato-producer farmers for the year 2009 (that is to say tomato-industries owed money to tomato-producer farmers for a period up to a year). In Serres alone, the guarantees raised to 5 million Euros as it was published in local newspapers. According to recent Under-Minister of Finance Decision, due to financial recession, tomato industries have the faculty to regulate these guarantee loans with the term of repaying the loan from the year 2013 up to the

year 2022 including period of grace for the years 2011-2012. Taking into account the terms of repaying the loans to all the Greek Banks, no bank would ever provide loans to industries such as the above described and no bank would ever provide loans with the above terms.

Additionally, the inequalities firstly on the fund access and secondly on the loan terms between guarantee and non guarantee loans boost corruption in Greece and deteriorate the turmoil.

This part ends with the argument of the ex-president of Commercial Union of Serres: "The problem which micro and small enterprises confront is the low consumption from our customers as they become poorer. Without increasing customers' consumption the only real outcome that will occur for the enterprises is the increasing debt. This debt under those circumstances would probably never be paid-off."

Impact of the Crisis on Banking Sector in Local and National Level

It is unanimously agreed that banks provide funds to enterprises and individuals based mainly on the criterion of the level of the undertaken risk. Each borrower has to succeed in persuading a bank that the undertaken risk, from its loan providing, is acceptable. Turmoil has strongly affected bank policy.

The main impact of the crisis on the banking sector is high reduction of the providing loans. Apart from the fact that there is an enormous reduction of the total revenue of enterprises, furthermore entrepreneurs can not obtain loans based on personal guarantee, and they have to offer their own house as collateral.

According to "Bank of Greece" press release (1st February 2011): «The annual growth rate of total credit granted to the domestic private sector decelerated further to -0.2% in December 2010, from 0.4% in November 2010 and 4.1% in December 2009. This development reflects the decrease of the annual growth rate of credit to enterprises as well as to individuals and private non-profit institutions».

In table1 we depict some data.

Table 1: CREDIT (1),(2)TO THE DOMESTIC PRIVATE SECTOR
  (Outstanding amounts and net flows in EUR millions)

	DEC. 2009	OCT. 2010	NOV. 2010	DEC. 2010
I. TOTAL				
Outstanding amount of credit	253.379	260.992	261.660	257.127
monthly net flow	1.888	-661	-835	300
(%) 12-month change	4,1%	1,0%	0,4%	-0,2%
II. ENTERPRISES				
Outstanding amount of credit	133.745	126.988	127.588	123.072
monthly net flow	1.182	-387	-533	488
(%) 12-month change	5,1%	2,2%	1,6%	1,0%
1. Agriculture				
Outstanding amount of credit	3.962	2.051	2.052	2.060
(%) 12-month change	3,8%	0,8%	-0,3%	1,1%
2. Industry				
Outstanding amount of credit	23.685	25.542	25.383	24.269
(%) 12-month change	-3,5%	-0,8%	-1,6%	-2,9%
3. Trade				
Outstanding amount of credit	33.519	25.663	25.595	25.356
(%) 12-month change	4,2%	-1,9%	-1,5%	-3,5%
4. Tourism				
Outstanding amount of credit	7.358	7.237	7.292	7.355
(%) 12-month change	7,8%	4,3%	3,8%	2,9%
5. Shipping				
Outstanding amount of credit	10.031	17.141	18.108	17.489

(%) 12-month change	4,1%	7,4%	7,0%	4,1%
6. Other financial institutions				
Outstanding amount of credit	6.125	6.408	6.240	6.604
(%) 12-month change	5,4%	3,7%	-1,1%	7,9%
7. Construction				
Outstanding amount of credit	11.441	11.216	11.227	11.327
(%) 12-month change	2,7%	2,7%	1,4%	1,9%
8. Electricity - Gas - Water				
Outstanding amount of credit	4.021	4.684	4.621	5.155
(%) 12-month change	14,7%	23,7%	20,9%	21,6%
9. Transport services excl. Shipping				
Outstanding amount of credit	5.791	5.383	5.331	1.935
(%) 12-month change	25,5%	-0,5%	-1,4%	-2,7%
10. Remaining branches				
Outstanding amount of credit	27.811	21.663	21.739	21.524
(%) 12-month change	10,3%	4,6%	4,4%	4,2%
III. SOLE PROPRIETORS				
Outstanding amount of credit		16.196	16.152	16.233
monthly net flow		-150	-76	69
(%) 12-month change		0,1%	-1,0%	-0,8%
IV. INDIVIDUALS & PRIVATE NON-PROFIT INSTITUTIONS				
Outstanding amount of credit	119.635	117.808	117.919	117.823
monthly net flow	705	-123	-227	-257
(%) 12-month change	3,1%	-0,1%	-0,6%	-1,4%
1. Housing loans				
Outstanding amount of credit	80.559	79.957	80.226	80.429
monthly net flow	507	-94	-81	-49
(%) 12-month change	3,7%	0,7%	0,3%	-0,4%
2. Consumer credit				
Outstanding amount of credit	36.044	35.609	35.431	35.068
monthly net flow	144	-112	-163	-268
(%) 12-month change	2,0%	-2,3%	-3,1%	-4,2%
3. Other loans				
Outstanding amount of credit	3.032	2.242	2.263	2.325
monthly net flow	54	84	16	60
(%) 12-month change	-1,1%	4,3%	3,8%	3,9%

[1] The outstanding amounts include loans, holdings of corporate bonds, as well as securitised loans and corporate bonds. In December 2010 the outstanding amounts of credit to specific sectors (industry, transport services excl. shipping and remaining branches) have been affected by the reclassification of certain public corporations from the private to the genenal government sector, following a relevant decision of ELSTAT (15 November 2010). This reclassification does not affect the growth rates and the net flows of credit expansion.

[2] As of June 2010, credit to sole proprietors constitutes a separate category and is not included in credit to enterprises in accordance to ESA-95.

Source: Bank of Greece- February2011

It is obvious that banks have reduced the providing funds. For example, the loans in Agriculture sector were reduced from 3.962 million Euros in December 2009 to 2.060 million Euros in December 2010. That is to say a farmer who could take by the form of working capital 5.000 € now he can take only the half (2.500 €).

In addition, due to real estate price devaluation, individuals who applying for a mortgage loan, either they have to have at least the 25% of the home value in cash, or they have to offer and a secondary mortgage (for example land). Thus, young couples face difficulties in getting their own house.

Also, as rubber cheques are increasing due to crisis, entrepreneurs who gave cheques for security, now they have to offer more cheques to get the same amount. For example, before

the crisis businessmen offered a 1.000€ cheque to get a loan of 850€, nowadays, they offer a 1.000€ cheque to get a loan of 750€.

Moreover, two years ago Greek banks gave loans (including working capitals) based only on businessman's personal guarantee. Case in point was the so called "Smart Business" in ATEbank. Businessmen could take up to 50.000 € by making use of this particular product without any security for the debt. Nowadays all these flexible loans have been abandoned. Entrepreneurs ought to offer either cheques (with the above described terms) or mortgages as their own house. Besides that, all overdrafts have been prohibited.

Other impact of the crisis on the banking sector is the increasing interest rates. In tables 2 and 3 we depict some data. It is noticeable that all loans based only on variable interest rates. Due to insecure financial environment, Greek banks have cancelled loan products based on fixed interest rates.

Table 2: Interest rates on new euro-denominated deposits and loans

		October 2010	November 2010	December 2010
DEPOSITS	Overnight from households	0.47	0.49	0.50
	Overnight from non-financial corporations	0.34	0.35	0.36
	From households with an agreed maturity of up to 1 year	3.68	3.65	3.68
LOANS	Consumer without a defined maturity	14.29	14.41	14.40
	Corporate without a defined maturity	6.56	6.62	6.79
	To sole proprietors without a defined maturity	9.43	9.47	9.57
	Corporate with a fixed maturity at a floating rate or with an initial fixation period of up to 1 year rate: -loans up to an amount of EUR 1 million -loans above EUR 1 million	5.94 5.32	6.14 4.91	6.32 4.95
	Housing at a floating rate or with an initial fixation period of up to 1 year	3.72	3.67	3.65
	Housing with an initial fixation period of over one and up to 5 years	3.99	3.95	3.95

Source: Bank of Greece- February2011

Table 3: Average interest rates on outstanding amounts of euro-denominated deposits and loans

		October 2010	November 2010	December 2010
DEPOSITS	From households with an agreed maturity of up to 2 years	3.44	3.46	3.47
	From non-financial corporations with an agreed maturity of up to 2 years	3.67	3.55	3.61
LOANS	Housing with over 5 years' maturity	3.68	3.68	3.67
	Corporate with over 5 years' maturity	4.48	4.68	4.75
	To sole proprietors with over 5 years' maturity	5.35	5.42	5.48

Source: Bank of Greece- February2011

The mentionable interest increasing is also depicted on figure 4 below. ATEbank, a state bank announced the huge interest rate increase (approximately 1% on investment loans and working capitals) last August during summer holidays.

Figure 4: Interest rates on euro-denominated loans at ATEbank

	March 2010	**February 2011**
Housing loans	**5,57**	**6,52**
Consumer credit	**6,12**	**6,52**
Investment loans	**7,62**	**8,67**
short-term loan	**7,15**	**6,67**
working capital	**6,67%**	**7,62%**
farmer's working capital	**6,12%**	**6,52%**

Source: Agricultural Bank of Greece- February2011

Coming to conclusion, the huge interest rate increase which took place the last twelve months have deteriorated turmoil in Greece.

Finally a different impact of the crisis on the banks is the fact that banks make efforts to reduce their cost. We will present two examples for two Greek banks which face difficulties in passing the stress tests last July-in fact Atebank failed at the stress test. The first bank, Agricultural bank of Greece (ATEbank) which is characterized as a state bank, decided to reduce services in 50 branches in rural areas (3 of them in Former Prefecture of Serres). In order to avoid local villager's reactions, ATEbank announced that during the first stage these bank branches will not provide loans and at the second stage (after a year or so) the bank will reconsider if these branches will finally close or not. As we will see at the forth part according to local entrepreneurs, the companies which situated near a bank branch consider that the existence of a bank branch not only help them but also supports local development. As a consequence of the great depression, a state bank, ATEbank is planning to close 10% of its branches. It is worth referring to one of these branches, the branch of ATEbank at the village Proti Serron. Proti is the homeland of 2 former Prime Ministers, both named Konstantinos Karamanlis. The first K. Karamanlis was also President for 10 years. In order to reduce cost, ATEbank would probably can not even avoid closing even the branch of Proti. Piraeus Bank is facing its financial problems by initiating a sabbatical leave program for its employees in Greece (approximately 5.000) while this program will be extended to the rest 8.000 employees of the group at a later stage. The bank announced last November that each employee will have the option to leave for 1-3 years. The participating employees will receive 40% of their payroll in the first two years and 50% in the third year, while their position is guaranteed post the finalization of the sabbatical. Piraeus, through this program, aims to achieve the reduction of its cost-base, which is dictated by the challenging operating environment. It also avoids layoffs, which would cause reactions from the unions.

Coming to a conclusion, the main consequence of the turmoil at the banks is the high reduction of providing funds either to enterprises or individuals. As banks do not provide the necessary funds to enterprises or individuals, Greece' economy entered to a vicious cycle of underdevelopment and recession.This part ends with the argument of a local businessman who participated in our research last winter. He stated "When sun shined banks gave me an umbrella and all of the sudden when the rain starts, banks took the umbrella away."

Recession on Regional Unity of Serres [1] - Central Macedonia – Greece
As it is portrayed by the map below, Serres is located at the north Greece, specifically at the Bulgarian border.

Map of Greece

The table below depicts the number or enterprises at prefecture of Serres.

Table1

NUMBER OF ENTERPRISES AT THE PREFECTURE OF SERRES	
COMMERCIAL	4.180
SECONDARY INDUSTRY	4.026
SERVICES	5.897
TOTAL	14.103

SOURCE: SERRES CHAMBER /JANUARY 2010

 (1) Until the end of 2010, Greece consisted of 13 administrative regions known as Peripheries of Greece, which are further subdivided into 3 super-prefectures and 54 prefectures or counties or Boroughs such as Borough of Serres. Recently, from January 2011, Greek government made some serious efforts to shortcut governmental administrative costs, through the new legislation known as "Kallikratis". As a main tool revoke all prefectures and create 13 administrative regions and named them peripheries. In additional former Prefectures named Regional Unities.

The number or enterprises in Regional Unity of Serres 7 years ago (2004) was 14.156 and the enterprises total turnover 6 years ago (2004) was amounted to 1.599.745.459 € and it made up the 0.85% of the total revenue in Greece, while the population of Serres is up to 200.000 (2% of the Greek population).

That is to say, years before the depression, Serres suffered from underdevelopment. In communication with the members of the "Serres Chamber of Commerce and Industry" the number of enterprises in former prefecture of Serres has not fluctuated until today (February 2011). Walking in the commercial streets in the city of Serres we meet numerous of closed and abandoned shops. The given explanation was that enterprises have moved to cheaper Streets or businessmen prefer to situate themselves in cheaper floor apartments. More specifically, enterprises which provide services can no longer afford the high rent of a ground shop.

We conducted a study on "Ditikis Trhakis" street, a commercial street at the city of Serres before the crisis. We found 2 neighbouring shops which closed during the last 6 months. Now, both shops are for rent. The first belonged to a company which sold kitchen cupboards and the second shop belonged to a tailor. We interviewed both of the above shop owners.

Those who sold kitchen cupboards claimed that they forced to move to their private property away from the commercial centre in order not to pay rent and the tailor found a better and cheaper place just across the street. Next to the two reffered above shops, we found other 6 closed shops which now are offered for rent.

In addition, it has been formed a status of an abandoned "Industry Zone". These closed enterprises have laid off hundred of employees last year. According to the state of the president of "Labour Centre of the Department of Serres" Alkis Apidopoulos:"Labors Force Employment Organization announced that unemployment rises on 17.5%. We estimate that real unemployment in our prefecture rises on 35%". The president added "Local labours suffer from blackmails and they force to sign new contracts based on lower wages. The older workers will replaced by younger ones who are satisfied by lower salaries. Many enterprises have already hire Bulgarian labors who work uninsured (black work as they called in Greek language), while all but two of the local enterprises either they have reduce the working days, or they have reduce the working hours per day, or they have reduce the wages."

   It is mentionable to refer to the demographic characteristics of Serres. According to 2001 census (the last on Greece) the 53.1 % of Serres are farmers. That is to say they will not starve during the crisis as they produce either wheat, or meat, or milk, or fruits as cherries, or vegetables or olive oil. Although micro-farmers do not face starvation, they are in fact out of employment as they work less than 200 hours every year.

    Finally, we will end this part with a reference to the connection between crisis and regional development. It is accepted opinion that crisis is deeper at the poor regions of our country. According to Samir Amin (Le Monde-Diplomatique, republished at newspaper "Ta Nea" 1993) "funds and commercials mobility is enormous on capitalism while immigration is restricted. This situation enhances polarity". The same writer supports on Greek American News Agency (25-10-2008) that "Depression is unavoidable". Eventually, according to Balomenou (2003) "While on scheduling programmes for financial development, especially during periods of recession, we should choose the criterion <efficiency>" (p.336). Thus the criterion <equity> comes second. As a result to the above, the underdevelopment area of Serres, regional development will never take place. In the forth part of this research, the answers to the relevant question were that crisis affected more the enterprises situated at towns as New Zihni.

Questionnaire-based Research on local Entrepreneurs

 1. Methodology implementation- Descriptive statistics and correlations

We will analyze the results using either the variables 1 for very much, 2 for little and 3 for not at all (at the questions with 3 choices), or 1 for agree absolutely, 2 for agree enough, 3 for agree a little, 4 for disagree a little, 5 for disagree enough and 6 for disagree absolutely (at the questions with 6 choices). Thus we will calculate the main descriptive statistical measures, the mean, the standard deviation and the coefficient of variation. We will also calculate the statistical moment of distribution, the coefficient correlation.

2. Data

Seventy four entrepreneurs participate in the following research. The research took place from 1-12-2009 to 12-2-2010. There was wide dispersion, according to the size of the enterprises, so there were micro enterprises of self-employed up to medium industries. In additional companies administration buildings were situated either in the city of Serres (population 100.000), or in smaller towns of the county with population 5.000 to 10.000, or even in very little villages (population less than 1.000). The purposes of our research made us not to use the random sampling method. On the contrary, we focused on these enterprises which received loans in the form of working capital and also we focused on these enterprises which received loans from Greek Guarantee Fund for Small and Very Small Enterprises (TEMPME)

3. Results

3a.Results in relation to the consequences of crisis

Taking under consideration to the fact that the research took place during the winter of 2009-2010, before Greece's referring to the help of International Monetary Fund, the 53% of the businessmen considered that the recent turmoil has severely affected their jobs, the 40% of the businessmen considered that the recent turmoil has affected their jobs and only 7% of the businessmen considered that the recent turmoil has not affected their jobs. Businessmen considered that the crisis has not affected their jobs, either they sell basic foodstuffs, or they provide services as repairing shoes and clothes.
The results are depicted at the figure 1, below.

Figure1: Has recent turmoil affected your job?

very much	a little	not at all
39	30	5
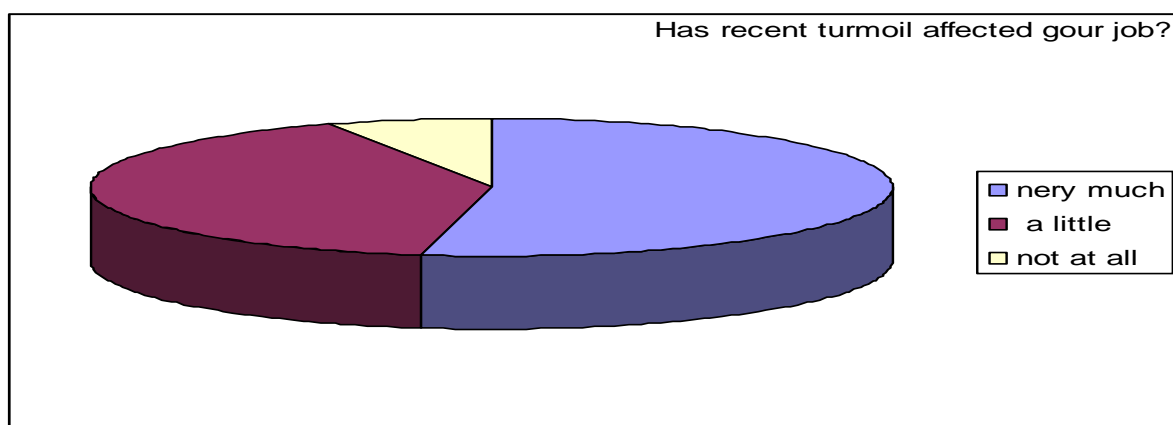
Analyzing the results the average using the variables 1 for very much, 2 for a little, 3 for not at all, the average is 1,54, standard deviation is 16,69 and the coefficient of variation is 10,83. That is to say recent turmoil affected enough entrepreneurs' job.
Four months ago, a local entrepreneur who participated in this research, went bankrupt. His industry produced yoghurt and a variety of white and yellow cheeses. The entrepreneur commented that "customers buy only 100 grams of cheese while before recession they bought kilos".
It is noticeable that the enterprises which were not affected from the crisis are all at the stage of maturity, while enterprises at the stage of introduction, those at the stage of growth and those at the stage of decline have been affected from the crisis. The results are depicted at the figure 2, below.

Figure 2: Has recent turmoil affected your job according to the stages of the life cycle of enterprises?

	very much	a little	not at all
introduction	4	4	0
growth	7	6	0
maturity	11	8	5
decline	17	12	0
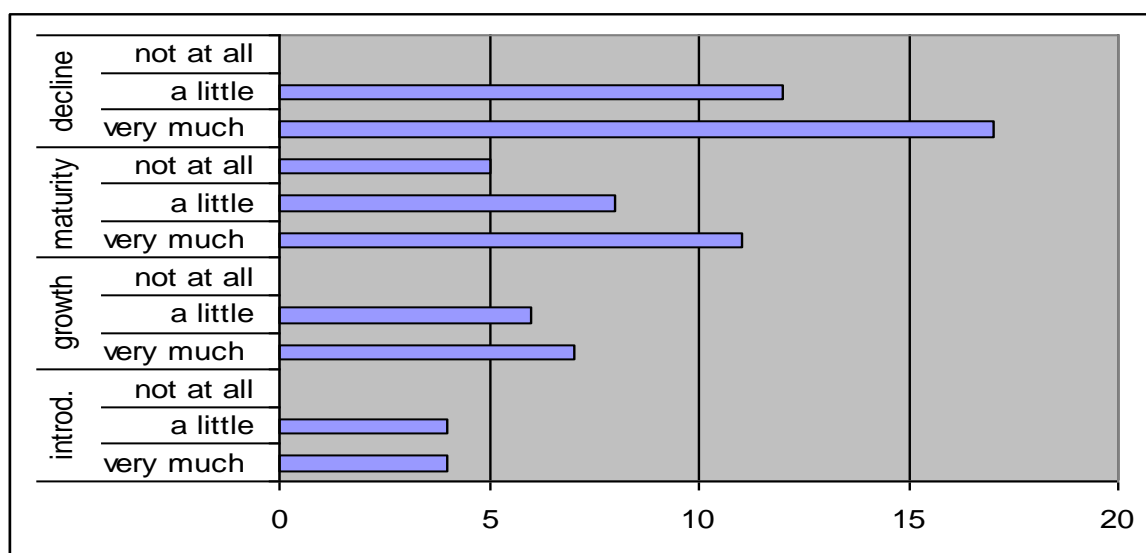
Analyzing the results using the same variables as above 1,2,3, the average at the introduction stage is 1,50, standard deviation is 1,63, the coefficient of variation is 1,08 and coefficient correlation is 0,76, at the growth stage the average is 1,46, standard deviation is 2,77, the coefficient of variation is 1,91 and coefficient correlation is 0,92, at the maturity stage the average is 1,75, standard deviation is 3,85, the coefficient of variation is 2,19 and coefficient correlation is 0,96 and finally at the decline stage the average is 1,41, standard deviation is 6,97, the coefficient of variation is 4,929278 and coefficient correlation is 0,98. It is noteworthy that there is high correlation between the answers given by subgroups of businessmen and the answers given by the whole sample when the sample is of sufficient size. When the sample is too small as the sample of new enterprises (just 8), statistically significant conclusions can not be exported. New entrepreneurs' answers' are just indicative.

We come to the conclusion that crisis affected more intense enterprises at the stage of decline (average 1,41), at the stage of growth and new enterprises (average 1,50). According to Porter (1988,) «As a result of newness, the high level of uncertainty, customer confusion, and erratic quality, the emerging industry's image and credibility with the financial community may be poor»(p. 223). Thus, new enterprises not only face difficulties in accessing to funds but in addition they have been more affected by the crisis than the older ones.

As is has been referred above, it is mentionable that crisis affected more the enterprises situated at towns as New Zihni or city of Serres. Enterprises situated at big villages (population up to 1.000) or small villages (population less than 1.000) have not been affected at the same degree.

The results are depicted at the figure 3, below:

Figure 3: Has recent turmoil affected your job according to where the company's administration buildings situated?

	very much	*a little*	*not at all*
city of Serres	21	23	2
towns	7	2	0
big villages	3	1	1
small villages	8	4	2
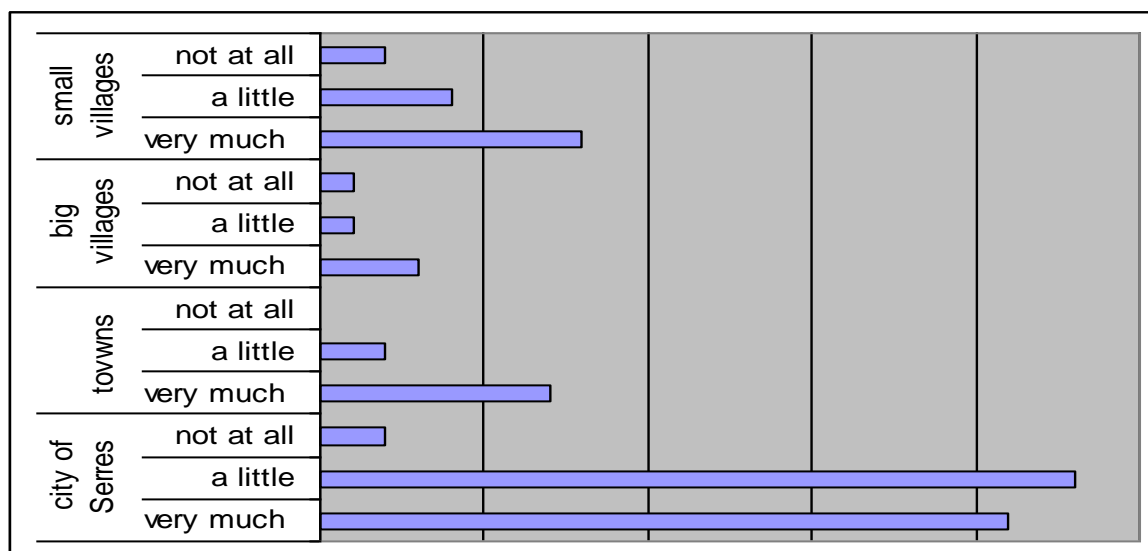
Analyzing the results using the same variables 1,2,3, at city of Serres the average is 1,57, standard deviation is 10,37, the coefficient of variation is 6,53 and coefficient correlation is 0,97, at towns the average is 1,22, standard deviation is 2,43, the coefficient of variation is 1,98 and coefficient correlation is 0,75, at big villages the average is 1,6, standard deviation is 0,98, the coefficient of variation is 0,61 and coefficient correlation is 0,23 (the sample was only 4 enterprises) and finally at small villages the average is 1,57, standard deviation is 2,50, the coefficient of variation is 1,59 and coefficient correlation is 0,91. It is noteworthy that there is high correlation between the answers given by subgroups of businessmen and the answers given by the whole sample when the sample is of sufficient size. When the sample is too small as the sample of enterprises cited on towns (just 9), or big villages (just 4), statistically significant conclusions can not be exported. Those entrepreneurs' answers' are just indicative.

We know that crisis affects more the underdevelopment areas. As it is referred to Bibliography (Samir Amin 1993) crisis affect more the poor regions. The paradox can be explained as there was a lag on crisis' appearance on rural areas (our research took place before Greece's referring to the help of I.M.F.). In additional, Hellenic Statistical Authority announced that 60.000 people returned to their villages last year as in villages they do not face starvation. Unfortunately, in Athens and Thessaloniki, the increasing number of unemployed leads to rapidly increasing poverty. Eventually, only a few enterprises have been remained at the villages. These few enterprises can de outlasted by the recession.

It is noticeable that crisis affected more micro enterprises while small and medium-small enterprises have not been affected at the same degree. On the contrary, medium enterprises either they suffer from the crisis or they became stronger.The results are depicted at the figure 4, below:

Figure 4: Has recent turmoil affected your job according to the size of the enterprise?

	very much	a little	not at all
micro enterprises	9	7	0
small enterprises	16	12	3
small-medium enterprises	10	9	1
medium enterprises	4	2	1
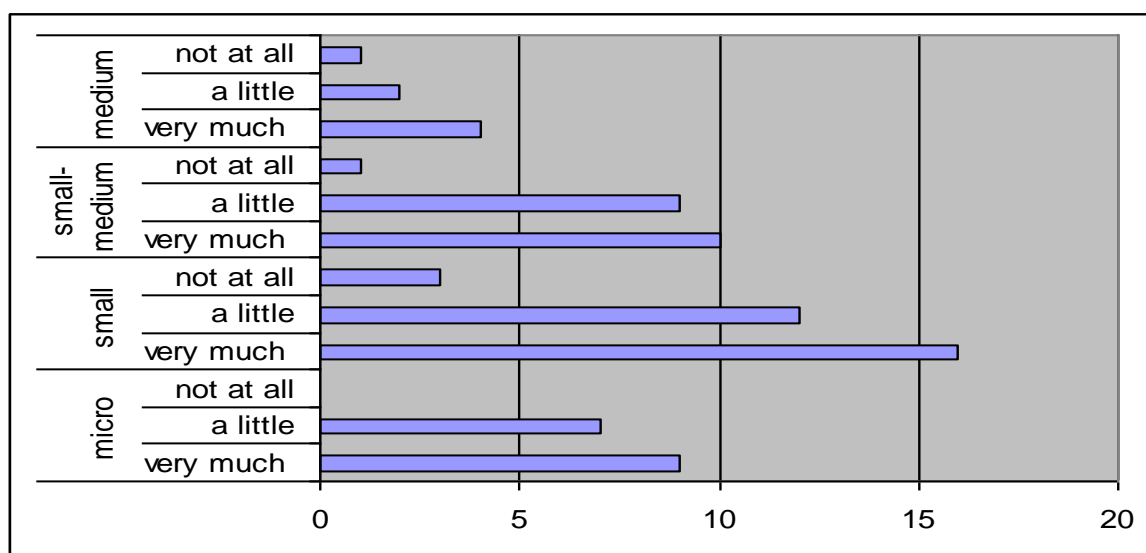
Analyzing the results using the same variables 1,2,3, at micro enterprises the average is 1,43, standard deviation is 3,56, the coefficient of variation is 2.45 and coefficient correlation is 0,94, at small enterprises the average is 1,58, standard deviation is 6,24, the coefficient of variation is 3,50 and coefficient correlation is 0,98, at small-medium enterprises the average is 1,55, standard deviation is 4,08, the coefficient of variation is 2,63 and coefficient correlation is 0,97 and finally at medium enterprises the average is 1,57, standard deviation is 1,17, the coefficient of variation is 0,74 and coefficient correlation is 0,63 (the sample was only 6 enterprises). Again, it is noticeable that there is high correlation between the answers given by subgroups of businessmen and the answers given by the whole sample when the sample is of sufficient size. When the sample is too small as the sample of medium enterprises (just 7), statistically significant conclusions can not be exported. Those entrepreneurs' answers' are just indicative.

According to Pisaridis, cited in Piperopoulos (2007) "in every type of economy, smaller enterprises are punished by facing higher interest rates than bigger enterprises" Thus, smaller enterprises not only face higher interest rates but in addition they have been more affected by the crisis than the bigger ones.

2b. General Results

The main extracts of our empirical research are the followings:

1) All but one of the enterprises cooperates with a bank and the great majority appears to be satisfied with this cooperation. Some entrepreneurs comment that their bank choice is made using the criterion of providing to the maximum service. They added that there are numerous of banks in Greece today to choose the most suitable for them.

2) The majority (73%) received bank loan in the form of working capital and they believe that this method of finance strengthen their jobs. As it is mentioned above we did not use the random sampling method as many enterprises in Greece have no access to loans.

3) As it is mentioned above we did not use the random sampling method. Thus 28 up to 74 entrepreneurs received loans through Greek Guarantee Fund for Small and Very Small Enterprises (TEMPME in Greek language). The majority of those who receive loans from TEMPME believe that TEMPME's assistance was of critical importance. The 50% of those who receive loans from TEMPME took loans up to 100.000 €. It has to be pointed out that bigger enterprises (and not the micro ones) were those who took the non-interest or low-interest funds. Also, 8 up to 9 entrepreneurs who did not manage to benefit from the non-interest or low-interest funds had received other loans. On the contrary, 8 up to 28 entrepreneurs who benefit from the non-interest or low-interest funds have never receive any loan at the past. As it is mentioned on the first part, the use of non-interest funds by

businessmen who never received other kinds of loan did not help liquidity to be transferred to real economy. Thus, state should reassign the terms of guarantee funds.

4) The companies which situated near a bank branch consider that the existence of a bank branch help not only them but also supports local development.

5) Enterprises at the stage of growth and maturity are those which received the maximum support, while state applied a common policy with the banks and was indifferent to the increasing financial needs of new enterprises. Thus, as we presented above, enterprises at the stage of maturity have more chances to overcome crisis in comparison to new enterprises.

6) As it already has been referred to the question "Banks based only on objective and countable criteria for provide funds for an enterprise?" micro enterprises rejected the above state, while all medium enterprises approved it. The results are depicted at the figure 2, below.

Figure2: Banks based only on objective and countable criteria for provide funds for an enterprise?

	agree			*disagree*		
	absolutely	*enough*	*little*	*little*	*enough*	*absolutely*
micro enterprises	0	1	4	2	3	6
small enterprises	6	12	5	3	5	0
small-medium enterprises	7	7	3	0	2	2
medium enterprises	2	2	2	0	0	0
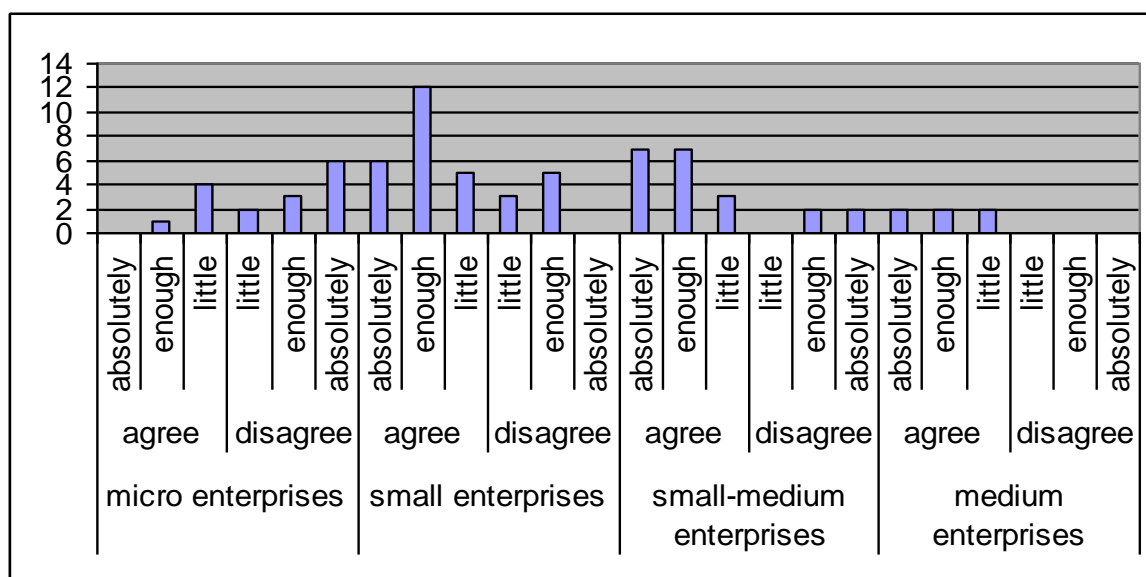
Analyzing the results using the variables 1 for agree very much, 2 for agree enough,3 for agree a little, 4 for disagree a little, 5 for disagree enough, 6 for disagree very much, at micro enterprises the average is 4,56, standard deviation is 1,97, the coefficient of variation is 0,432926 and coefficient correlation is -,26, at small enterprises the average is 2,64, standard deviation is 3,08, the coefficient of variation is 1,17 and coefficient correlation is 0,79, at small-medium enterprises the average is 2,48, standard deviation is 2,31, the coefficient of variation is 0,93 and coefficient correlation is 0,60 and finally at medium enterprises the average is 2, standard deviation is 1,96, the coefficient of variation is 0,98 and coefficient correlation is -0,15. It is noticeable to refer to the fact that no correlation exist between answers given by sub groups and answers given by the whole sample.

7) In the question "Do banks support SMEs?" the bigger the enterprises are the more they consider that banks support SMEs. At figure 3 below we portray the results.

Figure3: Do banks support SMEs?

	very much	*a little*	*not at all*
micro enterprises	1	6	9
small enterprises	5	20	6
small-medium enterprises	7	11	3
medium enterprises	5	1	0
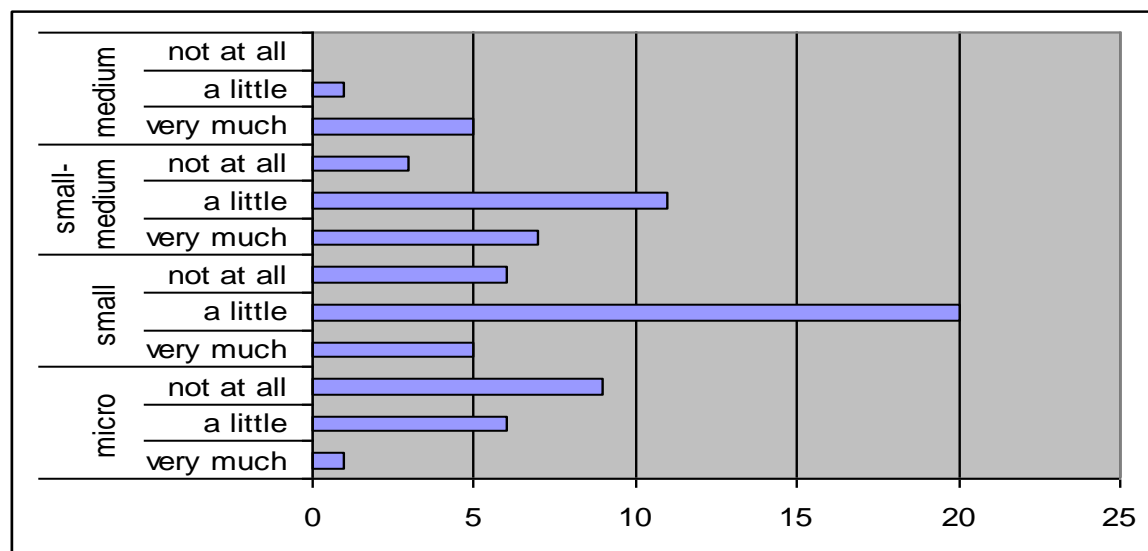
Analyzing the results using the variables 1,2,3 at micro enterprises the average is 2,5, standard deviation is 3,20, the coefficient of variation is 1,28 and coefficient correlation is 0,55, at small enterprises the average is 2,03, standard deviation is 7,03, the coefficient of variation is 3,46 and coefficient correlation is 0,95, at small-medium enterprises the average is 1,81, standard deviation is 3,78, the coefficient of variation is 2,09 and coefficient correlation is 0,92 and finally at medium enterprises the average is 1,17, standard deviation is 1,78, the coefficient of variation is 1,53 and coefficient correlation is -0,14. It is noticeable to refer to the fact that no correlation exist between answers given by sub groups and answers given by the whole sample.

CONCLUSIONS

It is common sense that Greece is in the middle of the greatest post-war financial recession. While the awful crisis, banks do not foster enough to enterprises.

Credit institutions having totally adopted the policy to reduce risks, cooperate mainly with those enterprises which are very credible. In connection with the fact that financial turmoil had severely affected SMEs, as it is deducted from our empirical research and data extracted from Hellenic Statistical Authority, banks decreasing the fund providing to the market resulted in the deterioration of the recession.

Taking under consideration the fact that Greek government provides guarantee funds to enterprises and it is going to provide more 30 billion Euros, there has to be existed a system consisting of lower barriers towards loan able funds to more firms. As it is deducted from our empirical research evidence and the relevant literature, at the recent past, the use of non-interest funds by businessmen who never received other kinds of loan did not help liquidity to be transferred to real economy. So, it is high priority to emphasize the crucial role of industrial policy, and more specifically the necessity of reviewing / reassigning the terms of guarantee funding funds and generally the whole procedure of evaluation and assessment of the investment plans in order to reduce or completely avoid the smouldering moral hazard. It is by definition true that, whenever whoever (entrepreneurs, commercial banks, depositors etc)/in our occasion entrepreneurs, do not need to bear the full consequences of their actions, will behave irresponsibly, in the sense that they take more risk than they would do otherwise. Whereas, the point is that, if the entrepreneurs know that their companies will be bailed out

by the government in case of not being conformed to the terms of the signed guarantees, this fact does not give them much comfort and in this case, guarantees will not create moral hazart on the part of entrepreneurs (Ha-Joon Chang,2000).

Regarding our case study, we observe that crisis is deeper at the poor regions of our Country. Something that is in reliance to the relevant literature (Konsolas, N. 1997), Balomenou. C (2003), (in recession periods, at the great dilemma of regional science << efficiency versus equity>> policy makers prefer the criterion of efficiency). In other words the supporting of core regions). In this view, the underdeveloped area of Serres will not be expected to be reinforced, at least during the next 3 years.

Coming to an end, we would like to underline that, as it is well known, for decades, banks contribution to the supporting of SMEs and consequently to local entrepreneurship and endogenous regional growth was significant. Whereas, nowadays, as it is deducted from our empirical research and the relevant bibliography, due to the economic crisis, the current strategic business plans of the banks, focuses on reducing, via their branches mercers, the existing wide branches' network. Thus, we suppose that banks contribution to regional development is strongly deteriorated. Therefore,

it is doubtful whether banks continue to reinforce SMEs and play their social role in Greece or not, However, we hope that finally banks, after their recapitalization, will come up to the expectations of the society .

REFERENCES

Agricultural Bank of Greece. Available:
  http://www.ate.gr extracted on 2010-05-06, 2011-01-30,2001-02-21
Balomenou, C. (2003).*The Greek Banking System and the Procedures of Evaluating Investment Plans*, Papazisi, Athens
  Bank of Greece. Available:
  http://www.bankofgreece.gr extracted on 2010-05-03, 2011-02-21
Banks news Available:
  http://www.banksnews.gr extracted on   2011-02-18
Citizen of region Thrace magazine. Available:
  politististhrakis.blogspot.com/ extracted on 2011-27-2
Chrystofakis, M. (2003). *Local Development and Regional policy*, Papazisi, Athens
Greek-American news agency extracted on 2011-27-2
    http://www.greekamericannewsagency.com
Doole, I. & Lowe, R. (2005). *Strategic Marketing Decisions in Global Markets*, Thomson, London.
Drucker, P. (1998). *The Effective Executive*, Klidarithmos, Athens
Drucker, P. (1990). *Innovation and Entrepreneurship*, Agricultural Cooperative Publishes, Thessaloniki
European Central Bank. Available:
  http://www.ecb.int extracted on 2010-05-03, 2011-01-29
European Commission, Euro stat, Statistics Database. Available:
  http://epp.eurostat.ec.europa.eu extracted on 2010-05-07, 2011-01-29
Georgada, Z. (2003). *Entrepreneurship & Innovations - The Management of Business Innovation*,
  Anikoula, Thessaloniki
Hellenic Statistical Authority. Available:
  http://web.statistics.gr extracted on 2010-05-04, 2011-01-31
International Monetary Found. Available:
  http://www.imf.org extracted on 2010-05-05, 2011-01-31
Investor's world. Available:
  http://www.kte.gr/ extracted on 30-4-2010

Konsolas, N. *Modern Regional Economic Policy*, Papazisi, Athens
Labour Centre of the Department of Serres. Available:
   http://www.itaes.gr extracted on 2011-2-20
National Bank of Greece. Available:
   http://www.nbg.gr extracted on 2010-05-06, 2011-01-31
Labors Force Employment Organization. Available:
   http://www.oaed.gr extracted on 2011-2-20
Piperopoulos, P. (2007) *Entrepreneurship, Innovation   & Business Clusters»,* Macedonian
  University Publishes, Thessaloniki
Porter, M. (1998). *Competitive Strategy-Techniques for analyzing industries and Competitors*,
  The   Free Press, New York
Serres Chamber of Commerce and Industry. Available:
   http://www.serreschamber.gr extracted on 2010-05-06
Union employers in Agricultural Bank of Greece. Available:
   http://www.seate.gr extracted on 2011-2-2

PARTICIPATORY POLICY MAKING IN FORESIGHT STUDIES AT THE REGIONAL LEVEL A METHODOLOGICAL APPROACH

Anastasia STRATIGEA

Dept. of Geography and Regional Planning, School of Rural and Surveying Engineering
National Technical University of Athens, E-mail: stratige@central.ntua.gr

Abstract

The issue of stakeholders' and citizens' engagement in policy decisions is nowadays at the forefront of participatory planning efforts at the various spatial levels. Involving stakeholders and citizens in participatory planning is always a challenge for planners, which stresses the need for effective tools, capable of dealing with respective planning efforts. The focus of the present paper is on the development of a methodological framework, which builds upon the integration of an analytical scenario planning model – the LIPSOR model, in support of future anticipation and structuring of scenarios, with a tool supporting stakeholders' and citizens' engagement - the Focus Group methodology, which aims at the support of planners in structuring the context of the participatory process and producing the necessary qualitative information, used in the scenario planning process. The use of the proposed framework can guide the efforts of planners to incorporate views and visions of a range of local actors, when exploring future development paths of a region/problem at hand. The experience gained from the application of this framework in a specific case study at the regional level is also presented, drawing upon the advantages and disadvantages of such an approach, while finally some conclusions are drawn.

Introduction

Within a globalized environment, characterized by complexity and uncertainty, the issues of future anticipation and scenario planning are considered as the milestones for taking policy action, which can make desirable outcomes more likely to happen. Moreover, engaging stakeholders and citizens in a participatory planning context can lead to policy decisions that are well consolidated into social acceptance, thus indemnifying consensus and commitment of local societies, which drive the successful implementation of policy actions (Stratigea et al., [1]).

But what should be the *breadth* of stakeholders' and citizens' engagement into such kind of future studies and how should the participatory process be structured? The structure of the participatory process and the type of participants that need to be engaged in a future exercise are of central concern of planners and decision makers, not only because there is a need to produce legitimate, robust and relevant results, but also because these can assure better acceptance in the implementation phase of policy decisions (Handbook of Knowledge Society Foresight, [2], Stratigea et al., [1]).

Along these lines, approaches and tools that support the process of integration of future anticipation and planning efforts with citizens' involvement can add value to the efforts of decision makers and planners in their work (Stratigea et al., [1]).

The *goal* of the present paper is to elaborate on such a participatory scenario planning framework, built upon the integration of a *scenario planning analytical model* – the LIPSOR[61] model – supporting future anticipation and decision making; and a participatory tool supporting *stakeholders' and citizens' engagement* - the Focus Group methodology. The LIPSOR model, constituting the core of the proposed participatory scenario planning framework, needs to be properly fed with information obtained by a range of actors (experts, stakeholders, local administrations, pressure groups and citizens). The identification of *key issues/questions* that need to be addressed in order to gather information that fulfils data needs of the various scenario planning LIPSOR modules demarcates the context, the structure and the type of participants to be considered in the participatory process (Focus Groups discussions), thus feeding LIPSOR with targeted information in support of the structuring of possible future scenarios of the region/problem at hand that incorporate experts' knowledge but also local views and desires.

The *structure* of the paper has as follows: in Section 2 are shortly presented the two tools, upon which the proposed methodological approach is built, namely the LIPSOR scenario planning model and the Focus Group methodology; in Section 3, the integration of these two participatory tools is presented that aims at steering the efforts of planners in structuring the participatory decision making context by identifying the key issues/questions that need to be raised, the type of participants to be involved, the structure of the discussion etc., in order to gather the necessary input, feeding the different stages of the LIPSOR model; in Section 4 is shortly presented the experience gained by the application of this framework in a specific case study at the regional level; while finally, in Section 5, some conclusions are drawn.

Tools Involved in the Proposed Methodological Framework

In the present section are shortly presented the LIPSOR participatory scenario planning approach and the Focus Groups methodology.

The LIPSOR Approach

The LIPSOR model consists of *five discrete modules* (see Figure 1). More specifically:

The *MICMAC module* explores the *key variables* of the study area/problem at hand and formulates the basic questions as to their future states. The scope of this module is to reveal the key driving forces that may affect future developments of the system at hand. Such knowledge is valuable for decision makers in order to define policies that can guide the system towards desired ends. The module is based on a *'structural analysis'* of the system at hand, exploring the *'influence – dependence'* relationships among a set of selected variables. These variables correspond to the attributes of the internal and external environment of the system, while their selection is conducted on the basis of their role as drivers of change of the system at hand. Structural analysis attempts to study the inter-relationships between the variables considered (Godet, [3], [4]), in order to depict those *key variables* of the system, both internal and external, which are capable of driving the system's future states.

The *MACTOR module* is focusing on the study of the *actors' games*[62], exploring the role of the basic stakeholders in the study system. More precisely, the stakeholders involved in the region/problem at hand are studied on the basis of power relationships, goals and objectives, projects in progress, preferences, motivations, internal means of action, past strategic behaviour, constraints, interests, potential strategic moves, attitudes, personal profiles,

---

[61] The LIPSOR approach (MICMAC, MACTOR, MORPHOL, SMIC και MULTIPOL modules and related software) has been developed by Michael Godet in the Laboratory for the Investigation in Prospective and Strategy (LIPSOR).

[62] Actor's games: seek to gauge the balance of power among actors and study their convergences and divergences with a certain number of associated stakes and objectives (Godet et al., [5]).

alliances, strengths and weaknesses, etc. (Godet et al., [5]). The scope of the module is to get insight on:

- The *influence – dependence relationships* among the various actors functioning in the area of concern through a cross-impact analysis of actors, taking into account the actors' profiles. This will provide planners with information on potential alliances–power relationships in the region at hand.
- The *attitudes of the various actors* (convergence or divergence) in respect to the planning *objectives* of the area/problem at hand, i.e. how actors perceive/resist to the objectives set, through a cross-impact analysis of actors by objectives. This knowledge supports planners to refine or even reorient objectives in order to reflect local peculiarities and stakeholders' interests and also define those policies, which will contribute towards conflicts' resolution.

The *SMIC-PROB EXPERT module* supports an *expert-based approach* that aims at gathering experts' opinions on a certain number of hypotheses referring to the study system. The goal of this step is to define single and conditional probabilities of these hypotheses, upon which can be based the structuring of *probable*[63] *future scenarios* of the study region at hand. The SMIC-PROB EXPERT approach belongs to a greater group of explorative approaches, in which the 'cross-impact analysis' concept is used to describe the way that a future state of a system can be considered, through the influence - dependence relationships among different hypotheses.
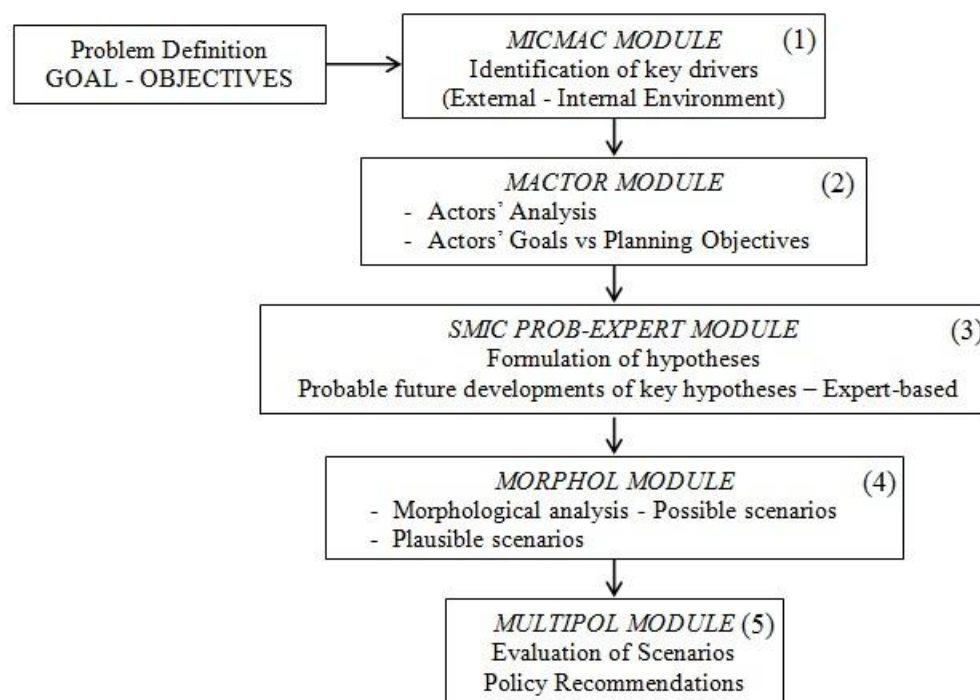
Figure 1: The LIPSOR approach
Source: Godet et al. [5]

The *MORPHOL module* is used for a systematic exploration of *all possible future states* of a system through its morphological analysis[64], structured on the basis of all combinations of possible future outcome of various key components. The total number of combinations

---

[63] It should be bear in mind the distinction among *probable* (trends based scenarios – forecasts), *possible* (all possible future states), *desired* (visionary scenarios) and *plausible* future developments (selected 'futures' on the basis of certain inclusion-exclusion criteria).

[64] The morphological analysis of a system is a generalized method for structuring and analyzing complex problems/systems, which (Erikson and Ritchey, [6]): are inherently non-quantifiable; contain genuine uncertainties; cannot be causally modeled or simulated; and require a judgmental approach.

corresponds to the whole set of possible scenarios i.e. the *morphological space*. The method integrates, at this stage, all kinds of information acquired at the previous LIPSOR modules. It can deal in a systematic way with multi-dimensional problems with non-quantitative dimensions and can (Erikson and Ritchey, [6]):
  - provide the ground for a well-structured discussion concerning complex problems;
  - fit well for carrying out participatory discussion, engaging groups of experts/participants that represent different areas of competence;
  - produce an 'audit trail' and documentation i.e. one should be able to trace what is being done and how certain conclusions are reached;
  - fit well for structuring scenarios and strategy alternatives.
The *MULTIPOL module* supports the *evaluation process* and helps policy makers to make decisions within different decision environments (scenarios). In such a context, it evaluates the scenarios delivered by the previous module (MORPHOL), attempting at the same time to define strategic directions (policies) and choices (actions/measures) for the effective implementation of each scenario. MULTIPOL, as a *multi-criteria evaluation method*, incorporates two different types of evaluation:
  - the *actions/policies evaluation* that evaluates actions (measures) in respect to policies, indicating which actions best fit to each single policy. The output of this process is a classification of all actions (actions' prioritization) as to their performance in each policy; and
  - the *policies/scenarios evaluation* that evaluates policies in respect to scenarios, indicating the policy which best fits to each specific scenario. The output of this process is a classification of all policies (policies' prioritization) as to their performance in each scenario.

It should be noted that the LIPSOR approach enables each module to function both independently and as a stepwise approach, dealing with foresight studies in a coherent, systematic and analytical mode.

The Focus Groups Methodology

As serving society's goals and interests is the main focus of every planning effort, it is quite important to use appropriate tools which will, in an effective and constructive way, incorporate thoughts, feelings, fears and perceptions of the public as to the planning problem at hand. Such an effort calls for the use of more pluralistic and complementary approaches (Godet, [3], [4]), which are capable of providing such kind of information to decision makers and planners. The focus, in such a context, is not only on the results obtained, but also on the way *tools can structure thoughts* and support an *effective communication platform* among participants in a specific theme.

The call for public participation in science builds upon the confidence that lay people are able to discuss complex issues under the condition that they receive adequate and understandable information. The Focus Groups methodology is a promising scientific tool and a suitable social setting for organizing such a social debate (Kasemir et al., [7]). It is also a promising participatory tool for arriving at policy-oriented assessments.

Focus Groups may serve as a platform for *social learning* that brings together scientific knowledge and behavioural patterns of citizens. They can be described as *guided group discussions* that are focused on a specific topic. In contrast to ordinary group discussions, *purposive information on the focal issue is provided as input and/or stimulus to Focus Groups discussions*.

The key attribute of Focus Groups as a research method is the *interaction between the members of a group*, which diversify them from interviews, where interaction is taking place between the interviewer and the interviewee. The whole process is characterized by its

dynamic nature and *synergetic effects*, which results in far more information being generated that in other research methods (Berg, [8]; Stewart and Shamdasani, [9]).

Focus Groups methodology can be defined as a *structured process* of dealing with complex issues, using knowledge from various scientific disciplines and/or stakeholders and lay people, so that integrated insights are made available to decision makers (Rotmans, [10]). The steps undertaken within the Focus Groups methodology are presented in Figure 2. The whole process is divided into three stages, as follows:

- *Stage 1* refers to the *planning of the whole exercise*, including decisions on the: number of sessions and time devoted to each session; selection of participants e.g. type and number of participants; planning of the discussion such as creating an interview guide, preparing the material to be presented to the participants for the issue at stake, selecting and organizing the meeting place and selecting and training the moderator of the whole process.
- *Stage 2* refers to the *running of the whole exercise* on the basis of the predefined interview guide. The process starts with the presentation of the informative material, designed to introduce the issue and motivate discussion, while round discussions within the Focus Group are encouraged, where participants are expressing their views/opinions on a well structured set of questions.
- *Stage 3* refers to the *elaboration of results* and the production of the *final report*. Various tools of qualitative analysis can be useful in this respect (Stratigea et al., [11]).
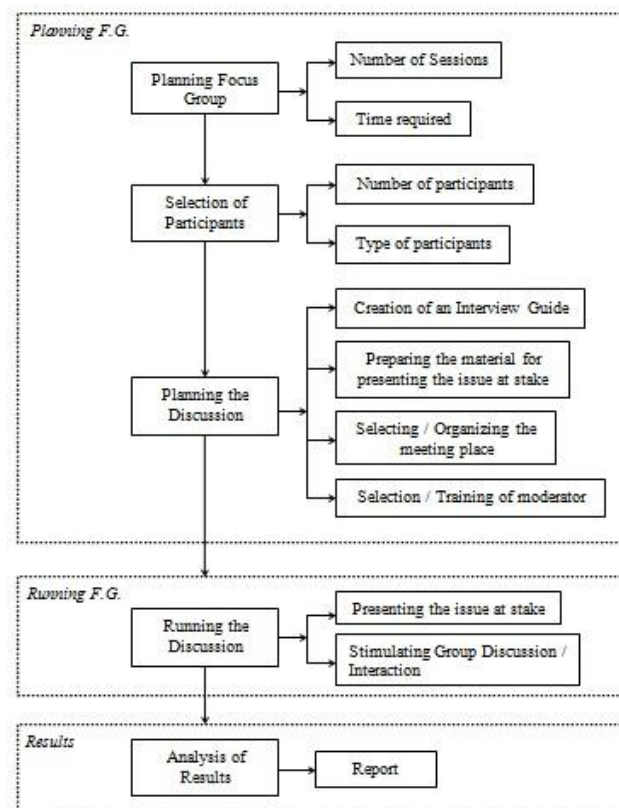
Figure 2: The Focus Groups methodological approach

Based on deliberately presented input and specific rules, Focus Groups can be considered as social experiments, capable of producing collective judgments, revealing communication barriers, studying conflict behaviour, acquiring local knowledge, creating acceptable options of the study theme, synthesizing information, etc. In such a context, the role of Focus Groups is more to increase insights than to produce generalized results (Dürrenberg et al., [12]).

Integrating the LIPSOR and the Focus Groups Approaches

In this section is presented the way in which the LISPOR scenario planning approach and the Focus Group methodology were integrated for the structuring of future development scenarios in a specific case study region (Herakleion-Crete) (Stratigea et al., [1]). Towards this end, the *issue* of concern lies on the identification of the *key issues/questions* that need to be addressed in a Focus Groups participatory exercise, so that the information delivered by participants can feed the various modules of the LIPSOR scenario planning model. The knowledge of the *key issues/questions* is of importance for defining the *context of participation*, and can orient planners to properly:

- define the *context* of the Focus Groups participatory process, in order to produce the desired output (guide the structuring of the discussion, identify issues to be addressed, etc.);
- engage the right *group of participants* (experts, decision makers, local administration, pressure groups, lay persons, etc.), based on the type of data demanded at each stage of the participatory planning exercise;
- prepare an *interview guide*, stimulating fruitful *discussions / interaction* among participants; and
- select *informative material* as a stimulus to Focus Groups discussions.
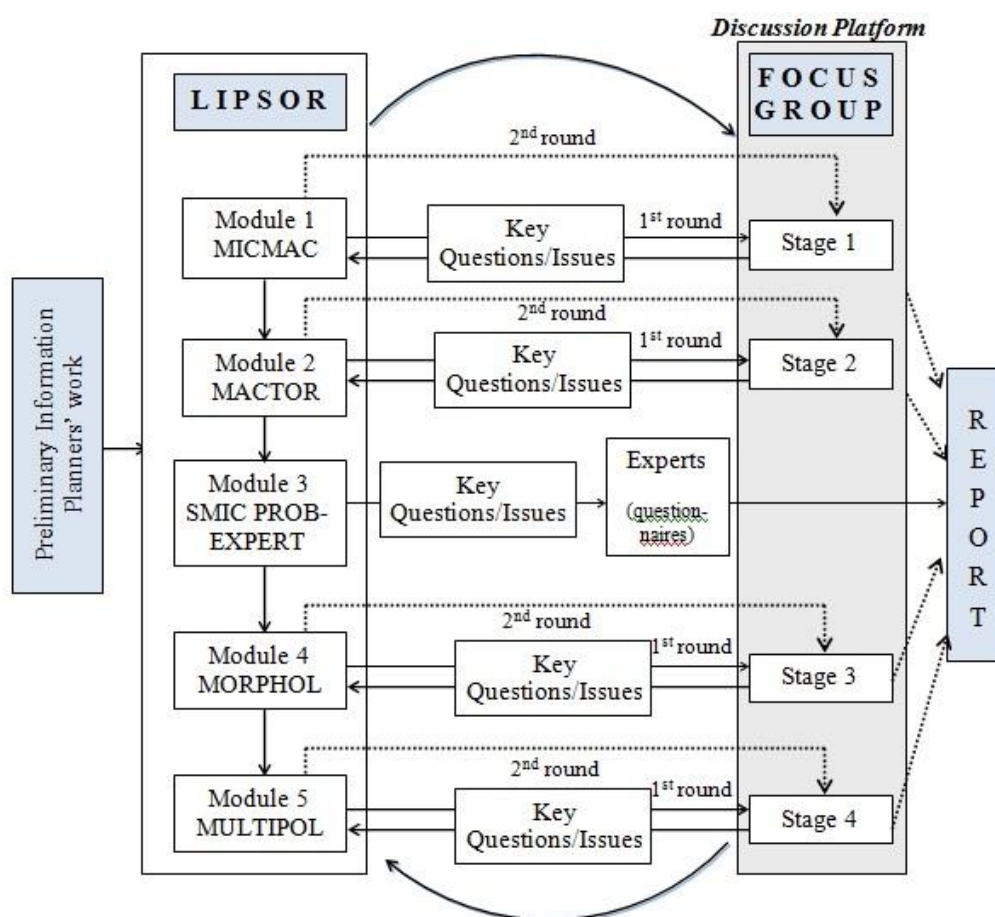
Figure 3: Integrating the LIPSOR and Focus Groups tools in participatory planning

More specifically, the integration of the two previously described approaches (LIPSOR model and Focus Groups methodology) in the specific case study (Herakleion-Crete) was accomplished by following two discrete steps (Figure 3):

- *Step 1*: a first round of interaction has taken place between planners on the one hand and decision makers and participants on the other (stakeholders, experts or citizens, depending

- on the scope of each module). Based on the planners' preliminary work, participants are getting informed on the issue at hand and are provided with a first round of the LIPSOR model results for further discussion. These results are elaborated by them in a Focus Groups context in order to provide planners with information on their reactions, perceptions, opinions, ideas, proposals, objections, dreams, etc. The output of the Focus Groups discussion enriches planners' understanding of the system at hand by providing information on the views of participants in respect to the issues raised. This information provides the ground for a second round of calculations by the LIPSOR model and the production of new, more refined results.

- *Step 2*: the refined results produced in the first stage are subject to a *new round of Focus Groups discussions*, where further refinements are taking place, which lead to the production of the final outcome of each stage to be forwarded to the final report, being the output of the whole process.

The above two steps are taking place within every single module of the LIPSOR model, since each of them serves a different purpose of the planning process and has module-specific data needs, calling for a different context of Focus Groups discussions and eventually a different target group (synthesis of participants) in order to yield the desired output that supports the different stages of the LIPSOR scenario planning process.

In the following is presented a step by step description of the stages of the proposed methodological approach of Figure 3, aiming at the integration of the LIPSOR analytical scenario planning model with the Focus Group methodology, placing emphasis on the participatory context that will provide information for feeding the LIPSOR model. More specifically, light is shed on; the *key issues/questions* raised at each different stage; the *scope* of each stage of the Focus Groups participatory process; the *type of participants* involved; and the *final outcome* expected out of each Focus Groups discussion.

The MICMAC Module

The main focus of the MICMAC module is on the definition of a set of *variables* describing the system at hand and its environment, together with the *influence-dependence relationships* among these variables, presented in the form of a 'structural matrix' (Table 1). Filling this matrix with information presupposes to give answer to a large number of questions, defining the influence – dependence relationship between each pair of variables considered; and the intensity of this relationship. This process can provide a very good insight of the system at hand and its environment, on the basis of the examination of causal relationships between every single pair of variables involved. Questions posed cover all four kinds of the following influence-dependence relationships:

- influence-dependence relationships among *internal variables* of the system at hand (Box I of Table 1) – intensity of relationship;
- influence-dependence relationships between variables of the system at hand and variables of its external environment (Box II of Table 1) – intensity of relationship;
- influence-dependence relationships between variables of the external environment and variables of the system at hand (Box III of Table 1) – intensity of relationship; and
- influence-dependence relationships among variables of the *external environment* (Box IV of Table 1) – intensity of relationship.

-                    **Table 1**: Structural matrix

Source: Godet [3].
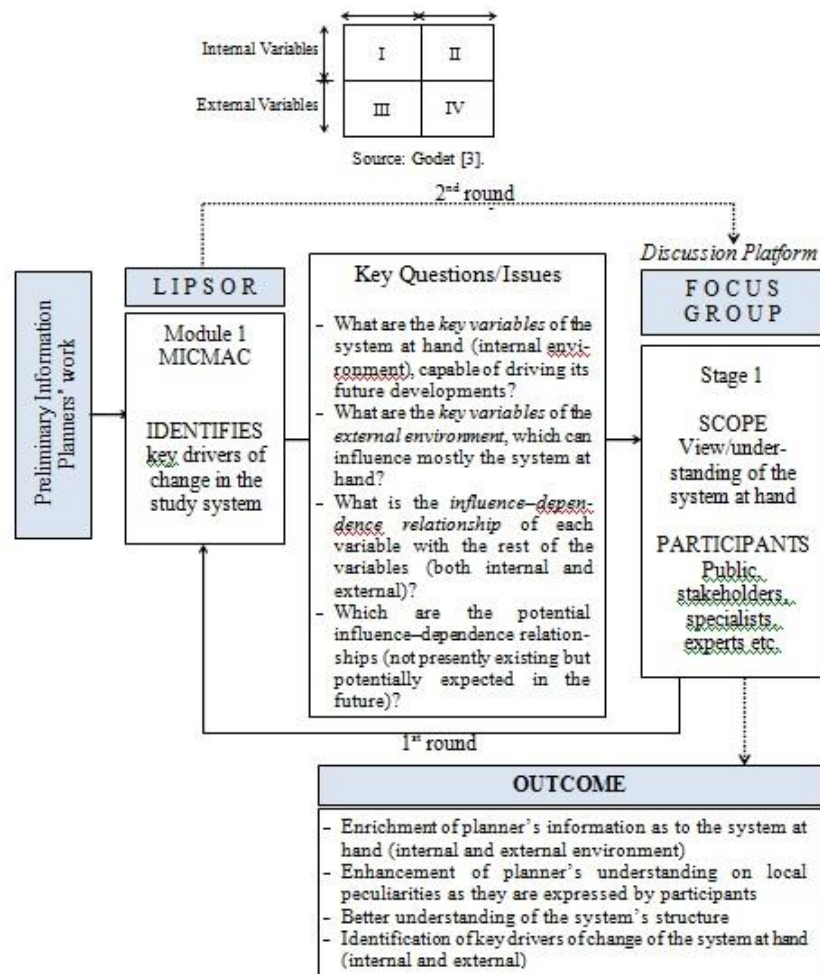
Figure 4: Participatory context aiming at feeding with information the MICMAC module

The structural analysis of the study system (region) is conducted in a Focus Groups *participatory mode*, with various actors actively participating in the process (stakeholders, public administration, lay people, specialists, pressure groups, etc.). The aim of the participatory process at this stage is to refine the preliminary information describing the study system, as this is predefined by planners. Thus the *tasks of participants*, entering the Focus Groups discussions, are to:
  -        enrich the *range of variables* entering the structural matrix, i.e. the variables better describing the system at hand and its external environment; and
  -        refine the *content (data)* of the structural matrix provided by planners i.e. values attached to each cell of the structural matrix, which is a good point for stimulating interaction within the Focus Groups discussion.

The context of participation, designed to produce data input that feeds the MICMAC module, is perceived as an *iterative process*, running in two steps (Figure 4):
  - The *first step* provides participants with information on the external and internal environment of the study system, as perceived by planners, upon which are based a first round of MICMAC results. Based on these results, a *first round of group discussion* among Focus Groups participants takes place. This discussion enriches planners' understanding of the study system, providing valuable information on the key drivers (variables) of the internal and external environment, as perceived by the participants. During the participatory process, certain ideas can be revised, new ideas can emerge, new

-   variables can emerge that were previously considered as unimportant, preconceived ideas can be questioned, etc.
-   In the *second step*, the refined information obtained from the first step, feeds back the MICMAC module and a *second round of analytical calculations* is taking place. Results of these calculations are subject to further refinement by participants, in a second round of Focus Groups discussion. The output of this process provides information on the *key drivers of change* of the system at hand, both internal and external, which is forwarded to the report stage, as the final outcome of this module, but is also used as input for the next stages of the planning process.

The MACTOR[65] Module

This module aims at getting insight into the power relationships among stakeholders (actors) activated in the study system and their perception/attitude as to the planning objectives (convergence or divergence). This knowledge is quite important for planners as it can provide information on potential *conflicts* both among stakeholders in pursuing their goals as well as among stakeholders' objectives and planning objectives set in a certain study. The impact of these conflicts on the planning process depends on the *balance of power* among actors and will largely determine the future development of the system at hand towards the one or the other direction. Thus identifying and resolving conflicts is of crucial importance for the successful implementation of policy decisions.

The *actors*[66] considered are stakeholders, selected on the basis of their direct or indirect control on the key variables of change in the system at hand, as these are identified by the MICMAC module. Actors' information can be gathered by *qualitative interviews*. In such an effort, planners can cope with problems as to the willingness of actors to provide accurate information or information in respect to their goals, strengths and weaknesses, strategic moves, etc.

As long as this information is gathered, further elaboration is undertaken in a Focus Groups context. Participants can be *'experts as representatives of groups of stakeholders'* (Godet [3], p. 106). The discussion starts with the description of the planning goal for the system at hand, which is further analyzed by certain objectives. Then the Focus Groups *participatory process* develops in two steps, namely (Figure 5):

-   The *first step* aims at getting insight into the role and actions of stakeholders in the study system, which can reveal power relationships of stakeholders, their objectives, strengths and weaknesses, strategic moves, etc. The analysis is based on the: qualitative information gathered on stakeholders considered; information on the influence-dependence relationships among actors ('actor by actor' cross-impact analysis); and the information on influence-dependence relationships between actors and planning objectives ('actor by objective' cross-impact analysis). The above information represents the planners' understanding, upon which are based the *first round of analytical calculations (MACTOR results)* that are also presented to experts. Then experts are invited to an exhaustive discussion in respect to the role and specific characteristics of stakeholders, relevant to the key variables of the system under study, while they are also invited to further elaborate on the 'actor by actor' and 'actor by objective' influence-dependence relationships, which will refine planners' input and will feed back the MACTOR module for a *second round of analytical calculations*.
-   In the *second step*, the refined results obtained from the second round of calculations are subject to a second round of experts' Focus Groups discussion, where these are subject to further refinement, aiming at drawing final conclusions as to:

---

[65] MACTOR method – Matrix of Alliances and Conflicts: Tactics, Objectives and Recommendations, developed by Michael Godet in 1985.

[66] Experience shows that a total of 10-20 actors constitute a realistic and operational number for analysis in the MACTOR module (Godet, [3]).

✓ the *power relationships* among the various actors functioning in the study area; and
✓ the *attitudes (level of resistance)* of the various actors in respect to the objectives of the study;

which are forwarded to the report stage, as the final outcome of the MACTOR module.
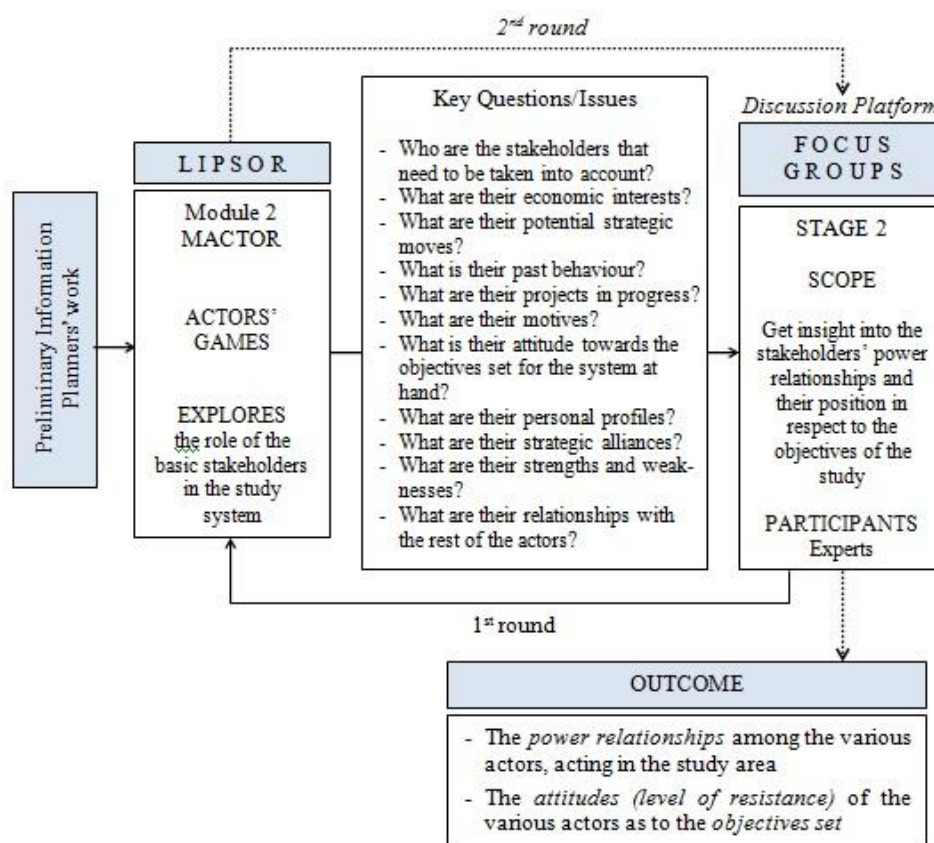
Figure 5: Participatory context aiming at feeding with information the MACTOR module

The SMIC[67] PROB-EXPERT Module

The application of the SMIC PROB-EXPERT module calls for a *participatory approach*, where participants are *experts* in various fields. The scope of their involvement is to estimate the probability of certain hypotheses to occur on the basis on their professional expertise. Experts are selected to represent different fields / sectors, depending on what are the issues that have to be explored (e.g. government, entrepreneurial, international, etc.) (Figure 6). The method rests on *interviewing a group of experts* in the most rational and objective way possible (Godet, [3]). Experts' opinions are gathered through a *mailed inquiry*, thus allowing the elimination of subjectiveness due to the researcher's presence. Firstly, five to six basic hypotheses are formulated by planners**,** based on the good knowledge of the system at hand and its external environment as well as the results obtained by MICMAC and MACTOR modules. Each of the experts has then to determine the 'simple'[68] and 'conditional'[69] probabilities of these hypotheses.
Each expert has to revise his assessment several times until *consensus* (convergence of results) is reached. He/she also has to reveal the implicit coherence of his/her reasoning

---

[67] SMIC: Cross-Impacts Systems and Matrices.
[68] 'simple' probability (Pi): the probability of a hypothesis to be materialized in a predefined time horizon.
[69] 'conditional' probabilities (Pi/j) and (Pi/nonj): the probabilities of: a) a hypothesis i to be materialized, if another hypothesis j has been materialized before; and b) a hypothesis i to be materialized, if another hypothesis j has not been materialized before.

(Godet, [3]). The principle of the SMIC method is to *adjust experts' unprocessed opinions* in such a way so that *coherent final results*, i.e. results satisfying the normal constraints bounding probabilities, can be obtained.

Based on all possible combinations of hypotheses, *probable scenarios* of the region/problem at hand can be structured, while resting on the single and conditional probabilities of the hypotheses set, the SMIC method determines also the probabilities of all probable to happen scenarios, thus facilitating the selection of the most probable of them, which are also compatible to both the internal and the external environment of the study region/problem at hand.
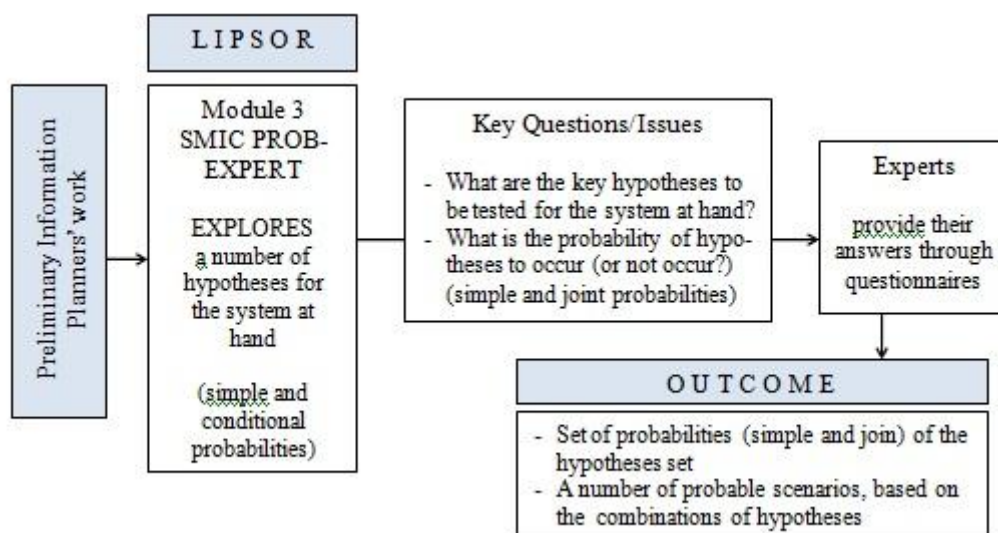
Figure 6: Participatory context aiming at feeding with information the SMIC PROB-EXPERT module

As depicted in Figure 6, the participatory process structured in case of the SMIC PROB-EXPERT module differs from those previously described, in the sense that experts-based information is gathered by mailed inquiry, excluding thus the organization of an experts' Focus Group for carrying out lively discussion on the issues raised. In this respect, there is no interaction among experts neither between planners and experts in this process. The outcome of the participatory process is a *set of probabilities* of the hypotheses considered, which can be further elaborated by planners in order to conclude with a number of probable scenarios, as produced by the SMIC PROB-EXPERT module.

The MORPHOL[70] Module

The *goal* of the MORPHOL module is to scan the field of *all possible future developments* (scenarios) (Godet, [3]). Scenarios, in this respect, are built on the basis of certain components (or dimensions or domains), which are considered as exhibiting a high degree of uncertainty in respect to their future developments, e.g. oil price or demographic developments. These domains can be further analyzed into certain variables, which are subject to future changes. For example regional structure, as a domain, can be analyzed in terms of economic structure and population (variables). For each of these variables, different configurations can be built, reflecting different future evolutions of them. Scenarios then are constructed as different combinations of such configurations. Usually, five to six basic variables are sufficient for scanning future uncertainty in terms of scenarios, for each of which two to four different configurations can be formulated (Godet, [3], [4]).

---

[70] MORPHOL Module – Basic Principle: the system or function under study is divided into subsystems or component parts, which are as independent as possible, while they represent the totality of the system at hand.

Previous steps of the LIPSOR methodological approach provide useful information, which supports the selection of different components to be used for the scenario building process.
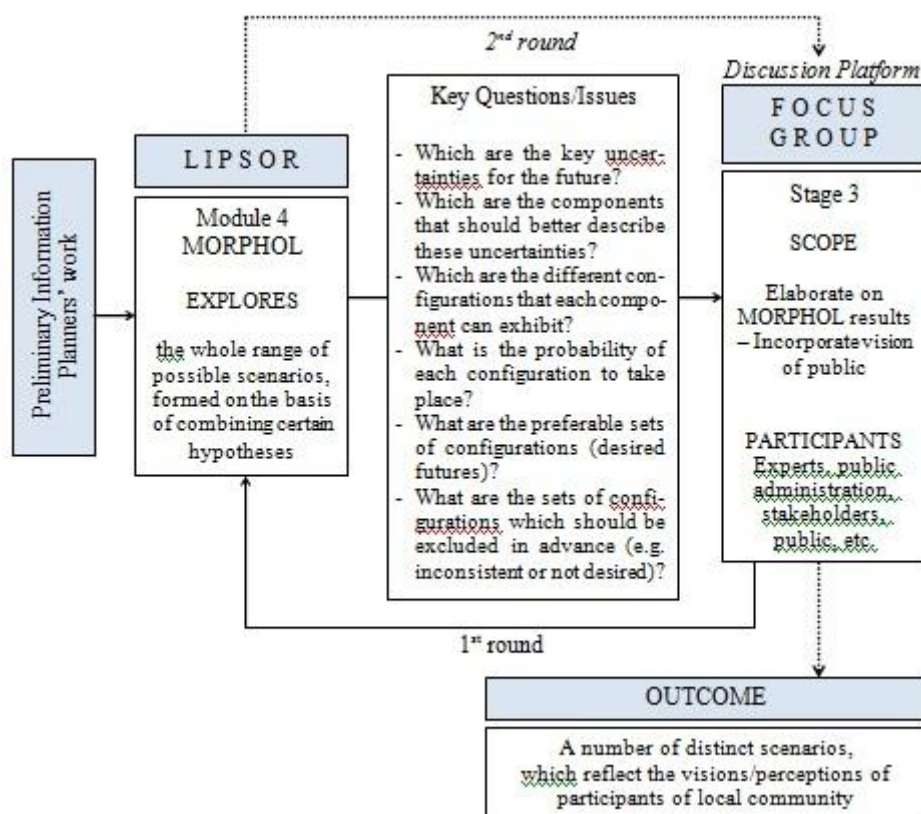
Figure 7: Participatory context aiming at feeding with information the MORPHOL module

Building scenarios in a participatory context by use of the MORPHOL module incorporates participatory work, undertaken in the Focus Groups participatory discussion platform (Figure 7). This work can follow two successive steps:

-            *Step 1*: the organization of an *expert workshop* (specialists in different disciplines) as a productive forum for structured discussions on the problem at hand. The role of participants in such a workshop is to discuss first round MORPHOL results produced by planners, by contributing to:

   a) The *elaboration of variables*, selected by planners, to be used as building blocks of the future developments (scenarios), based on the LIPSOR analysis undertaken so far;
   b) The *elaboration of potential future developments* of these variables (different hypotheses set for each variable by planners), taking advantage of the expertise of each expert involved in the process;
   c) The elaboration of *exclusion criteria*, which form the basis for excluding scenarios that are not relevant or cohesive or even consistent to the peculiarities of the study system at hand.

The outcome of this participatory process is the further refinement of variables and hypotheses, which feed the MORPHOL module for a second run of analytical calculations. The results obtained are subject to a second run of group discussion in an expert workshop, for further elaboration in order to make all necessary adjustments and conclude with several *plausible scenarios* for further discussion in a public workshop. This elaboration may refer to e.g. removal of scenarios with very low probability, removal of scenarios which are very close to each other and their presentation in one scenario, etc.

-         *Step 2*: refers to the organization of a *public workshop involving all parties of local society* - stakeholders, public, public institutions, local administration, experts, etc. – where plausible scenarios are presented and elaborated according to the views/opinions/visions of the participants involved. This Focus Groups participatory process aims at the further refinement of scenarios and their enrichment with the views of local society.

Scenarios produced at this stage enter into the next step for evaluation.

The MULTIPOL Module

MULTIPOL is the final stage of the LIPSOR scenario planning model. The scope of this step is to *evaluate scenarios* obtained by the previous module. The outcome of the evaluation process is not one prevailing scenario on the basis of certain evaluation criteria. On the contrary, the evaluation process aims at shedding light on a policy framework - policies and actions (measures) - which are more effective for reaching each different scenario context. In other words, evaluation aims at providing decision makers with the necessary input (relevance of policies/actions) in order to be prepared to cope with each different plausible future outcome.

The main issues entering the MULTIPOL evaluation process are:
- a number of distinct *scenarios*, as defined in the previous step (MORPHOL module);
- a *pool of policies* (paths), i.e. different strategic directions for reaching objectives set; and
- a *pool of actions* (policy measures), which can serve different policies.

The aim of the Focus Groups discussions at this stage is multifold. More specifically, these may serve one of the following goals (Figure 8):
a) *refinement* of policies and actions;
b) *setting priorities* in the evaluation process, which reflect local society's values and visions; and
c) assessing the *impacts* of each specific policy direction and policy measure.

The accomplishment of the above goals calls for the involvement of different groups of participants, ranging from experts to stakeholders, citizens, public agencies, pressure groups, etc.

The participatory process at this stage has as follows:
- At first, *policies and measures* can be set by the decision makers and planners running the whole planning exercise. These policies can be subject to an *experts' Focus Groups discussion*, in order to get feedback for further refinement.
- After the finalization of policies and measures, the issue of *setting priorities* comes to the fore. At a first round, priorities are set by decision makers/planners, based on the knowledge of the system at hand, but also on reactions of experts. Results obtained by a first run of the MULTIPOL module need then to be refined by the views/opinions of the local society. This step aims at informing the public, but also getting their reactions and views on priorities considered. These call for the organization of a second *Focus Groups discussion*, where participants are selected from a broader audience (stakeholders, public agencies, public, pressure groups, local administration, etc.), having the task to set priorities, i.e. attach *weights* to the evaluation criteria, policies and scenarios, which are reflecting the values and visions of the local community.
- Finally, the evaluation of actions, policies and scenarios in respect to certain evaluation criteria is carried out i.e. the assessment of the impacts of actions, policies and scenarios, which, together with the set of priorities, is expected to feed the MULTIPOL module with the information required to conclude to a policy framework that prioritizes policies and

- actions better serving each specific scenario context. This calls for an *experts' Focus Groups discussion*, involving thus participants with a certain expertise on the issues tackled.
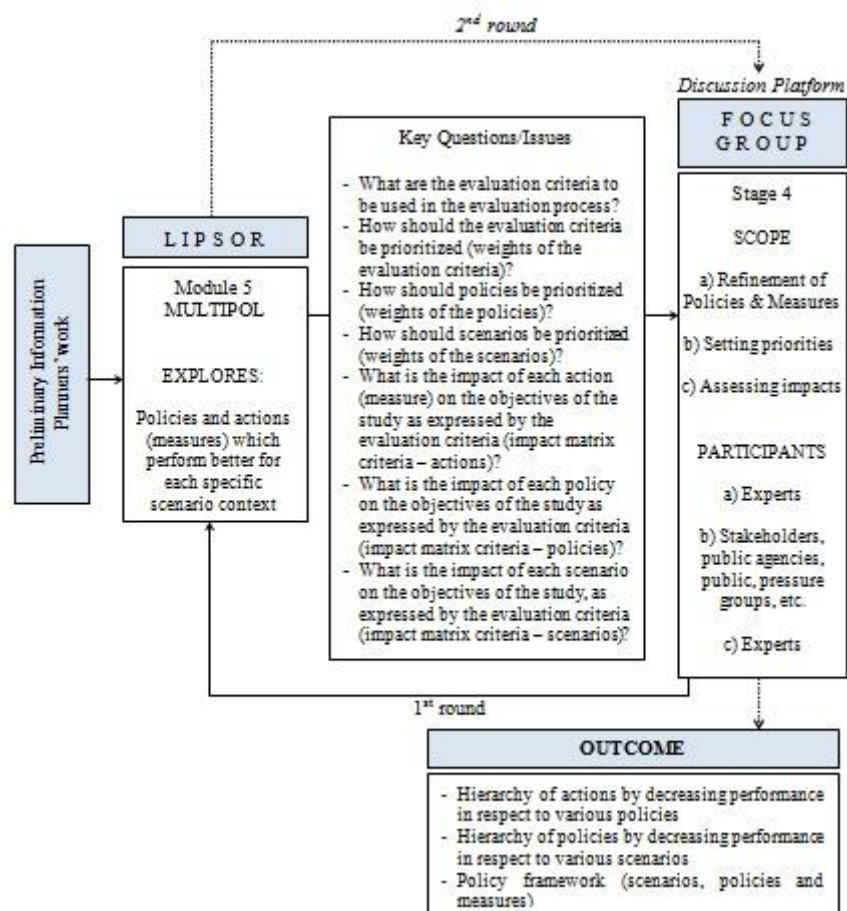
Figure 8: Participatory context aiming at feeding with information the MULTIPOL module

Experience Gained from the Application of the Proposed Framework

The above described methodological framework was used in the context of a scenario planning exercise of a specific region of the Greek territory, the Herakleion-Crete region. The aim of this exercise was the structuring of participatory scenarios for the integrated future agricultural development of this region (Stratigea and Giaoutzi, [13]). In the following, is summarized the experience gained from its application in the specific case study.

The *value added* by the application of the proposed methodological approach in the scenario planning process, as experienced in the Herakleion-Crete foresight exercise (Stratigea and Giaoutzi [13]), lies mainly on:

✓The establishment of a *discussion platform* within the Focus Groups part of the planning exercise (Figure 3), within which are properly elaborated all key questions/issues that need to be addressed in the scenario planning process, supported by the LIPSOR approach. The running of a number of Focus Groups sessions, involving each time a number of different types of participants, has led to fruitful discussions and interaction between planners and participants, which have:
- enriched the *planner's insight* on the system at hand and influence-dependence relationships among external and internal drivers and among actors that may affect its future states, guiding thus the scenario development process; and

- increased the *effectiveness* of the whole scenario planning exercise, as the information gathered in these discussions was integrated in the planning output, leading thus to future developments which are anchored to the specific local socio-economic environment.

✓The support provided to planners as to the *more effective structuring of Focus Groups discussions,* since the 'interface' created between the two tools has provided useful guidance on: the context of the Focus Groups participatory process; the key issues/questions that need to be addressed in the discussion; the preparation of an interview guide, structured on the basis of key issues identification; the right choice of the types of participants to be involved in each specific Focus Groups discussion, relying on the issues that need to be tackled in each specific LIPSOR module, etc. These have led to more effective and targeted Focus Groups discussions, and a more focused information gathering, thus strengthening the scenario planning process and enhancing the anchoring of the scenario planning results, produced by the LIPSOR model, in the local society and its visions.

✓The mobilization of a *'learning process'* among planners, decision makers, local stakeholders and citizens, which has further:
  - increased *transparency* of the scenario building process;
  - increased *knowledge share/exchange* among all parties involved in the foresight exercise, i.e. planners, decision makers, local stakeholders, local administration, citizens, etc.;
  - supported *mutual understanding* of different views/perceptions of local participants involved;
  - reduced *conflicts* among different interests in the local society, acting thus as a 'conflict resolution mechanism';
  - created a *common ground* for discussion and brainstorming on the future development of the region in general and the agricultural sector in particular;
  - enhanced *ownership* of participants in respect to the outcome of the whole planning effort;
  - strengthened their *commitment* towards the final planning 'product' (scenarios, policies and actions);
  - increased *awareness* of local society as to a range of issues that are crucial for the future development of the specific region; and
  - prepared the ground for *successful implementation* of policy decisions.

✓The *setting of priorities* in various choice problems in the scenario design process, which largely reflect local expectations, values, goals, traditions etc. of the local society. As a result, the whole planning process was better adjusted to the specific local socio-economic environment.

In respect to the *difficulties* that have to be dealt with in applying the proposed methodological framework, as these were experienced in the specific case study, there could be mentioned:
  - the *communication gaps* among participants of different background, which can place tension in the participatory process;
  - the *conflicting interests* of the various groups of the local society, which can also place a certain tension in the whole process. In coping with this tension, the experience of the moderator and the very scholastic organization of the whole participatory process are stressed.
  - the *time-consuming processes* involved for organizing the Focus Groups discussions in the sense of the organizational work involved, the preparation of the necessary material, the running of the process and the elaboration of qualitative results;
  - the effort devoted in the *'translation'* of the qualitative information obtained from the Focus Groups sessions into the data input format of the LIPSOR model;
  - the participants' *identification/recruitment* efforts, which have to cope with certain difficulties in both stages (identification and recruitment), where the latter have also to

- deal with a sort of unwillingness of all participants identified to take part in the participatory process;

Conclusions

In the present paper the focus is on the integration of an analytical scenario planning framework – the LIPSOR model – with a participatory tool – the Focus Group methodology. The scope of this effort is to establish 'bridges' that support the interaction of planners' work with the local society, thus increasing the quality of the planning outcome and meeting expectations and visions of the society. This framework will support the gathering of local experts' intelligence but also common knowledge of the local setting, which can strengthen the performance of foresight studies at the regional level.

The methodological approach presented, aims at creating the 'interface' between the two frameworks in support of planners to effectively address key issues that need to be dealt with in structuring participatory future development scenarios of a study system. Such an interface can place the *context of participation*, i.e. the identification of key questions/issues to be addressed in a participatory process, the guiding of the discussion serving specific demand for data input, the number and type of sessions required, the identification of the types of participants to be involved in the various sessions etc., through which a more effective *discussion platform* is created, allowing effective interaction among participants involved and serving the qualitative data demands for feeding the LIPSOR scenario planning tool.

The scope of the proposed methodological approach is to support planners' and decision makers' with tools that can both: deal with complexity and uncertainty; and enhance their understanding on views, aspirations and visions of local societies in the planning process for making policy decisions. The application of this framework implies the adoption of more pluralistic approaches in the planning process, which can lead to the increased transparency of the whole process as well as the production of results that are legitimate, robust, relevant and cohesive.

References

Stratigea, A., Papadopoulou, Ch.-A. and Giaoutzi, M., "A Methodological Framework for Foresight Analysis in AG2020: The Case of Herakleion - Crete Region". Paper presented at the AG2020 Experts' and Stakeholders' Workshop, Florence, 6-9 October, 2008.

Handbook of Knowledge Society Foresight. European Foundation for the Improvement of Living and Working Conditions, 2003.

Godet, M., *"From Anticipation to Action: A Handbook of Strategic Perspective"*, UNESCO Publishing, ISBN 92-3-102832-4, 1994.

Godet, M., *"Creating Futures: Scenario Planning as a Strategic Management Tool"*, Economica Ltd, London, 2001.

Godet, M., Monti, R., Meunier, F. and Roubelat, F., *"Scenarios and Strategies: A Toolbox for Problem Solving"*, Cahiers du LIPSOR, Laboratory for Investigation in Prospective and Strategy, Paris, 2004.

Eriskon, T. and Ritchey T., "Scenario Development using Computerized Morphological Analysis", Paper presented at the Cornwallis and Winchester International Operational Research Conferences (www.swemorph.com), 2002.

Kasemir, B., Jaeger, C. and Dürrenberg, G., "Embedding Integrated Assessment Models in Social Discourse", *Science and Public Policy*, 23, 2, 1996, pp. 124-125.

Berg, B., "Qualitative Research Methods for the Social Sciences", Pearson Education Company, USA, 1989.

Stewart, D. and Shamdasani, P., *"Focus Groups: Theory and Practice"*, Sage Publications, 103-424-465, London, 1990.

Rotmans, J., "Methods for IA: The Challenges and Opportunities Ahead", *Environmental Modeling and Assessment*, 3, 1998, pp. 155-180.

Stratigea, A., Grammatikogiannis, E. and Giaoutzi, M., How to Approach Narratives in Foresight Studies: Qualitative Data Analysis. In E. van Leeuwen, M. Giaoutzi and P. Nijkamp (Eds.), Future Perspectives for Sustainable Agriculture, *International Journal of Foresight and Innovation Policy* (IJFIP), Special Issue, Vol 8, Nos 2/3, DOI: 10.1504/IJFIP.2012.046112, 2012, pp. 236-261.

Dürrenberg, G., Behringer, J., Dahinden, U., Gerger, A., Kasemir, B., Querol, C., Schuele, R., Tabara, D., Toth, F., van Asselt, M., Vassilarou, D., Willi, N. and Jaeger, C., *"Focus Groups in Integrated Assessment - A Manual for a Participatory Tool"*, Darmstadt, Technical University of Darmstadt, ZIT Center for Interdisciplinary Studies in Technology, 1998.

Stratigea, A. and Giaoutzi, M., "Scenario Planning as a Tool in Foresight Exercises: The LIPSOR Approach", in M. Giaoutzi and B. Sapio (Eds.), *Recent Developments in Foresight Methodologies*, Springer, New York, pp. 215-235, 2013.

GEOPOLITICAL ANALYSIS OF THE GREATER MIDDLE EAST SYSTEM IN THE PRESENT JUNCTURE

Ioannis Th. MAZIS

National and Kapodistrian University of Athens, Faculty of Turkish Studies and Modern Asian studies, e-mail: mazis@her.forthnet.gr

Abstract

This paper presents a systemic analysis of the Greater Middle East Geo-complex, in the light of the geopolitical factor of the Islamist movement –both Shiite and Sunnite. We consider that the geostrategy practised by the Anglo-Saxon actors of the Super-system of this specific geo-complex aims at the containment strategy of the Russian and Chinese actors from the Mediterranean Sub-system, along with their ally states of Qatar, Turkey, Saudi Arabia and some of the UAE (e.g. Abu Dhabi). Furthermore, with the rise to power of the Sunnite Islamist governments in the region, a "remote" threat is tried to be exerted against both of the aforementioned actors in order to increase the negotiating benefits of the dipole of the London-Washington Special Relationship, in view of the provoked redrawing of the borders of the former nation-state regime.

Moreover, the US appear willing to create strong and permanent territorial strategic bases in the Middle East, in order to guarantee, both for Israel and the US, the strategic depth that is desirable for their security. We are making reference to the gradually developing strategic plan for the creation of an Independent Kurdistan, that would be able to serve western security interests, as well as the energy-related interests of the Anglo-Saxon, and European oil consortia, but also Washington's power projection to the Russian Near Abroad and the Chinese Northwest region of Xinyiang, increasing the power gap once again, in favour of the US, at the centre of the Rimland.

A. The Geopolitical Factor

The geopolitical factor of the present analysis is the Sunnite and Shiite Islamist movements as a power redistribution factor within the examined geo-complex that is analysed in the Systems described below:

The redistribution of power in question is examined within the Geographical Complex/System of the Greater Middle East, the Maghreb and the sub-Saharan Africa according to the geopolitical factor of the Islamist movement.

B. Determination of Systemic Grades

I. The System: Greater Middle East, Maghreb, and Sub-Saharan Africa.

II. The Sub-systems:

1) The first subsystem: the Qatar - Saudi Arabia - Turkey triangle, as the operator of the geopolitical factor of the Islamist movement
2) The second subsystem: Maghreb, Mali, Egypt
3) The third subsystem: Iran - Syria - Lebanon - Israel - Palestinian territories.

II. The Acting Super-system:

The US, the UK, Russia, France and China. The EU, as a whole, is clearly influenced by the London - Washington Special Relationship. The UN as a Super-systemic factor is functionally neutralised in the short-term, due to the existing policy diversions among the three Security Council members and the Russia-China Dipole.

C. Analysis of the Sub-systems

1. Analysis of the first (operating) sub-system (Qatar-Saudi Arabia and Turkey)
Qatar cooperates closely with the Egyptian Muslim Brotherhood of Mohamed Morsi, as well as with Iran and Turkey. It does so, by competing the hegemonism of Saudi Arabia, on the one hand, and by pursuing a powerful position among the Arab state factors in the Gulf and within the Arab-Muslim world, on the other. In fact, Qatar together with Iran exploit their common South Pars-North Field deposit (see Map 1) in the Arab-Persian Gulf [71]. The geopolitical factor used by Doha to pursue these goals is the Islamist movement as represented by the Society of the Muslim Brothers by:
1) cooperating with Tehran in Bahrain and Yemen, where the Shiite element is dominant at a population level,
2) cooperating with Turkey[72], with the aim to overthrow the Syrian Baathist regime (competing Saudi Arabia on the same Syrian territory), and
3) cooperating with former and active members of Al Qaeda, operating even within the Turkish territory, close to the Syrian-Turkish borders, a territory that Qatar uses on an operational level in the battlefields and in subversive activities via guerilla wars or uprisings in the territory of the targeted states where Doha intervenes. In fact, Qatar intervenes in Syria, Lebanon, Egypt (in the case of the overthrow of Mubarak and currently in strengthening "Brother" Mohamed Morsi), Libya, Tunisia, Yemen (creating destabilising conditions for the Wahhabi regime of Riyadh which are critical for the West) and the financing of the Turkish "mediation" in the Syrian question. Qatar's cooperation with (questionably) former members of Al Qaeda (such as Abdelhakim Belhadj, who also "worked" in Libya against the Ghaddafi regime), that have now been transferred on Qatar's expenses (as Belhadj himself) to Turkish territory close to the Syrian borders, in order to organise the anti-Assad insurgency within Syria. These activities are extremely dangerous. Nevertheless, they are also followed by similar, equable yet presumably competitive, activities of Saudi Arabia, that is worried about Qatar's power projection in the region, since Doha cooperates covertly with Tehran.

### 2. Analysis of the Second sub-system (Maghreb, Mali and Egypt)
The recent developments in Libya prove that the destructive interference of the Islamist movement is leading the country into a break-up. On March 6, 2012, Cyrenaica declared its

---

71   "The estimations for the Iranian part of the deposit reach the 500 trillion cubic feet (14 trillion cubic meters) of the in place natural gas and around 360 trillion cubic feet (10 trillion cubic feet) of recoverable natural gas, that represents 36% of the proven Iranian deposits of natural gas and 5,6% of the proven global natural gas deposits [Iran-The Geology.- APS Review Gas Market Trends.- April 2, 2007]. The estimations regarding the deposits that belong to Qatar are 900 trillion cubic feet (25 trillion cubic meters) of recoverable gas, that represents around 99% of the proven deposits of Qatar and 14% of the proven global deposits. [*Qatar Petroleum Annual Report 2005, p.25*]. According to the *Oil & Gas Journal*, (January 1, 2011), Qatar has 25,4 barrels of proven reserves in oil and is the 16th larger exporter of crude oil globally (based on the 2009 data), while it is 11th in the list among the exporters of crude oil among the 12 members of the Organization for Petroleum Exporting Countries (OPEC) [Qatar Energy Data, Statistics and Analysis - Oil, Gas, Electricity, Coal 1 of 10 file:///Z:/NewCABs/V6/Qatar/Full.html]. The production of the North Field/Dome is estimated, based on the data of 2011, to approach the range of 23 billion cubic feet. [*QatarGas, RasGas, Qatar Petroleum and Internet*]", in: <http://en.wikipedia.org/wiki/South_Pars_/_ North_Dome_Gas-Condensate_field>.

72   "Members of the main Turkish opposition party, the Republican People's Party, say Libyan and Saudi militants are freely entering Syria via Turkey's border. They also said that Turkish military escorts and protects the militants on their way to join terrorist groups in Syria. Analysts believe the move is part of an anti-Syria plot hatched by the US, Qatar and Saudi Arabia to fuel the unrest in the country by increasing the number of militants fighting against the government. "There are terrorists going through Turkey to get into Syria. They are all criminals and prisoners; Qatar and Saudi Arabia took all prisoners out of jails and sent them to Turkey to go to Syria to join terrorists there. There are 3,000 al-Qaeda members at the border, they fight in Syria and cause tension in Turkey and they are trying to ignite fire of war," said Adnan Turkkan, political analyst and editor-in-chief of ULUSAL TV. <[http://www.presstv.ir/detail/2012/12/25/280115/turkey-helps-militants-enter-syria/>.

autonomy, based on the opposition of its armed insurgents towards the Ghaddafi regime, as well as of the tribe leaders that live in its territory. Sheikh Ahmed Zubair al-Senussi, cousin of King Idris who was expelled in 1969 by the Ghaddafi coup, was elected leader of the Cyrenaica region by a local transitional council, with responsibilities for the administration of the affairs of Cyrenaica and for the defence of the rights of its people. It is important to note that the National Transitional Council of Libya does not recognise this autonomy, while on the contrary the former is "recognised" by the autonomous administration of Cyrenaica[73].

Currently, there are numerous hardcore jihadist Islamist organisations that operate without control in Libya, under Qatar funding, e.g. the *Groupe Islamique Combattant Libyen* [Libyan Islamic Fighting Group (GICL/LIFG)], that was created in the early 1990s in Afghanistan. The official declaration of its foundation took place in 1995 and it constituted one of the root components of Al Qaeda, along with the Egyptian *Al-Gama'a al-Islamiyya*, the Yemeni *Al Gehad*, the Pakistani *Al Hadith*, the *Lebanese Patriotic Movement/LLP*, the Jordanian *Beith al Emâm* and the Algerian *Islamic Salvation Front/FIS*. Islamists with a significant terrorist past, such as Anas al Liby (who was responsible for the attacks of August, 1998 on the American embassies in Dar es Salaam of Tanzania and Nairobi), and Abu Faradj al Libi, member of the Al Qaeda Military Council, who was arrested in Pakistan in 2005, are all members of this organisation[74]. Under these circumstances, nobody could prescribe a stable future for Libya, particularly since, under this developments and especially in the light of the uncontrolled armaments of of radical cells in Libya, an Islamist dominance is observed in all of the North Mali in collaboration with hardcore cells of Al Qaeda that are now acting freely in Sub-Saharan Africa, putting into danger the stability of Algeria, and probably, in the near future, of Mauritania and Morocco. In addition, the situation in Tunisia is not particularly stable and many analysts cast doubt on the sincerity and the "modesty" of the Islamic Al Nahda party now in power in Tunis.

Map 1[http://www.hydrocarbons-technology.com/projects/qatargas/qatargas4.html]

---
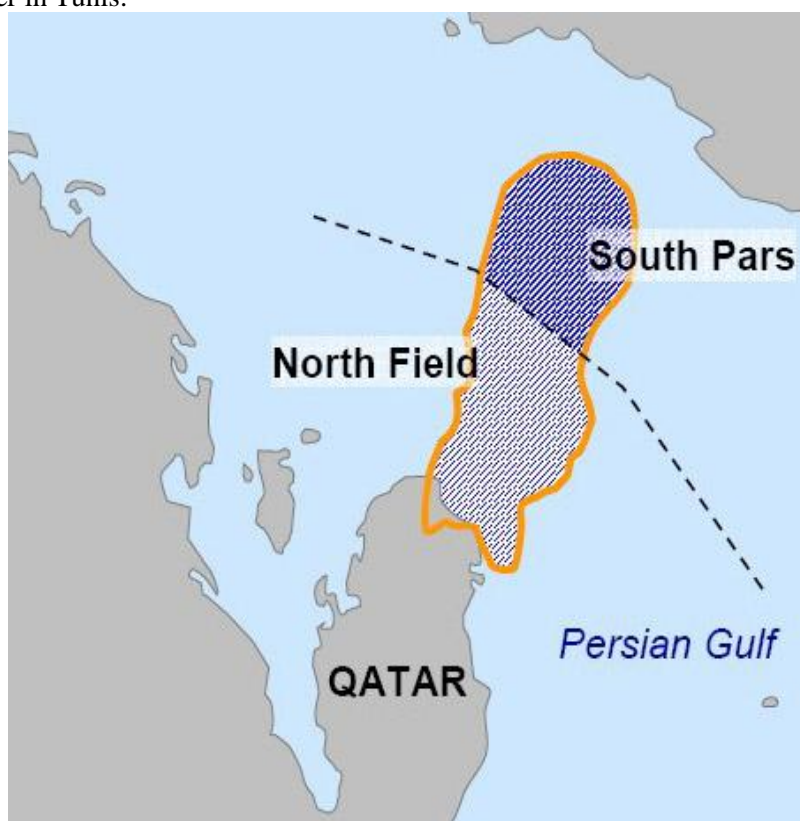
73   See: <http://fr.wikipedia.org/wiki/Cyr%C3%A9na%C3%AFque>.
74   RODIER, Alain, 28-02-2006, Note d'actualité N°29, "Le Groupe Islamique des Combattants Libyens/(GICL)" <http://www.cf2r.org/fr/notes-actualite/le-groupe-islamique-des-combattants-libyens-gicl.php>.

3. Analysis of the Third Sub-system (Iran - Syria - Lebanon - Israel - Palestinian Territories)

As it might have become clear from the analysis above, Syria constitutes the key part of this sub-system. The collapse of the Tehran-Damascus-Hezbollah and the Tehran-Damascus-Hamas axes constitutes a strategic relief for the West for resolving the Palestinian issue on diplomatic terms, without external explosive influences. Also, such a scenario would greatly facilitate the appeasing of the explosive atmosphere in the Middle East and would prevent a significant amount of speculative actions by Qatar, Saudi Arabia and the neo-Othoman Turkey.

Undoubtedly, we have to take into account the rise to power of the Muslim Brotherhood in Egypt, even under a slightly "Tukish-Kemalist" model. This development leads to second thoughts on the issue of Gaza, which was occupied by Israel in 1967. Since Hamas is currently a subsidiary organisation of the Muslim Brotherhood, an upgrade of its relation with Cairo and a downgrade of Tehran's influence in Gaza is to be expected. The nature of this relationship (Hamas – Cairo), which is not yet clear, will greatly influence the resolution of the Palestinian issue with regard to the Two-(independent)-State solution: a Palestinian and an Israeli one. This plan seems to have now been placed on track, even if in an embryonic state yet, with resolution A/RES/67/19 of the UN General Assembly, in view of accepting the Palestinian entity with a non-member observer status.

It is obvious that the international community wanted to strengthen the moderate wing of the Palestinian Authority, that of President Mahmud Abbas, which was being led to isolation and de-legitimization by Hamas, especially after the international repercussion of the recent Israeli military reprisal operation "Pillar of Cloud" against Gaza (14/11-21/11/2012). My estimation is reinforced by the statement[75] of Thomas Mayr-Harting, chief of the EU delegation at this specific Assembly. On the other hand, the "international community" certainly took also into account the fact that Hamas was seriously weakened after the strikes it suffered, even against some of its leading military officials (Ahmed al-Jabari was assassinated on 14/11/12 during the "Pillar of Cloud" operation), and that on a logistic level, its leadership (Ismail Haniya and Khaled Meshaal) had shown its intention to align with Mahmoud Abbas on the case of the recognition of the Palestinian entity as an observer state by the UN General Assembly. A study of the justification of the positive votes in the relevant Report on the UN resolution, convinces us that the decision was taken in the context of a dominant "two Peoples- two States" culture, living in peace with one another. It is, however, important to note that the consultations between Israel and Hamas for ceasefire and termination of the "Pillar of Cloud" Israeli operation took place with the mediation of Morsi's Egypt and not with that of Ankara, despite the latter's keen desire to intervene. As we have already mentioned, peace in the region will depend highly on the resolution of the Palestinian issue.

3.1. The Kurdish factor and the role of Abu Dhabi and Israel

The reaction of the Kurdish population in Syria remains a significant problem, since they do not wish the prevalence of the Muslim Brotherhood without a guarantee for their national, political and cultural freedoms. The Kurds constitute an ethnicity of 32 million people spread in four neighbouring states (Turkey, Iran, Iraq and Syria). Among them, only the Iraqi Kurds enjoy the above-mentioned freedoms. Furthermore, they have no trust in the Syrian revolutionary Council, due to the influence that the Muslim Brotherhood, with the aid of Qatar, has over it. The Kurds are constantly making moves towards their self-determination, as I write these lines. The destabilising forces are intense and systematic, also with the financial and logistic support of Abu Dhabi through an immense investment scheme in the

---

75   *QUESTION DE PALESTINE,* Rapport du Comité pour l'exercice des droits inaliénables du peuple palestinien (A/67/35), Rapport du Secrétaire général (A/67/364), Déclarations.

Autonomous Kurdish Administration of N.Iraq[76]. However, the relations of Abu Dhabi with the US, the UK and Israel are all well known. It is also well known, that Abu Dhabi, along with Saudi Arabia, are not positively disposed towards a possible hegemony of the Muslim Brotherhood in Syria, which along with a possible prevalence in Egypt, Tunisia and Gaza Strip (through Hamas), would constitute the possible base for a Middle Eastern Caliphate, with Qatar as its logistic core and Morsi's Egypt as its headquarters. Under the threat of such dynamics, the geopolitical factor of the Islamist movement assumes a dissolving role, tending towards fragmentation of 1) the Alawite, Ismailite and Shiite Twelvers populations (around 2,2 to 2,5 million, i.e. 10-11% of the total population), on the one hand, and their concentration in areas close to coastal Syria; 2) the Kurdish population (around 2 to 3 million, i.e. 9 to 10% of the total population) and concentrations of Kurds towards the NE Syrian borders, adjacent to the Autonomous Kurdish Government; and 3) the Arab Sunnite population (around 60 to 70% of the total population, that is approximately 13,8 to 16 million), that will occupy the rest of the Syrian territory (See Map 2).
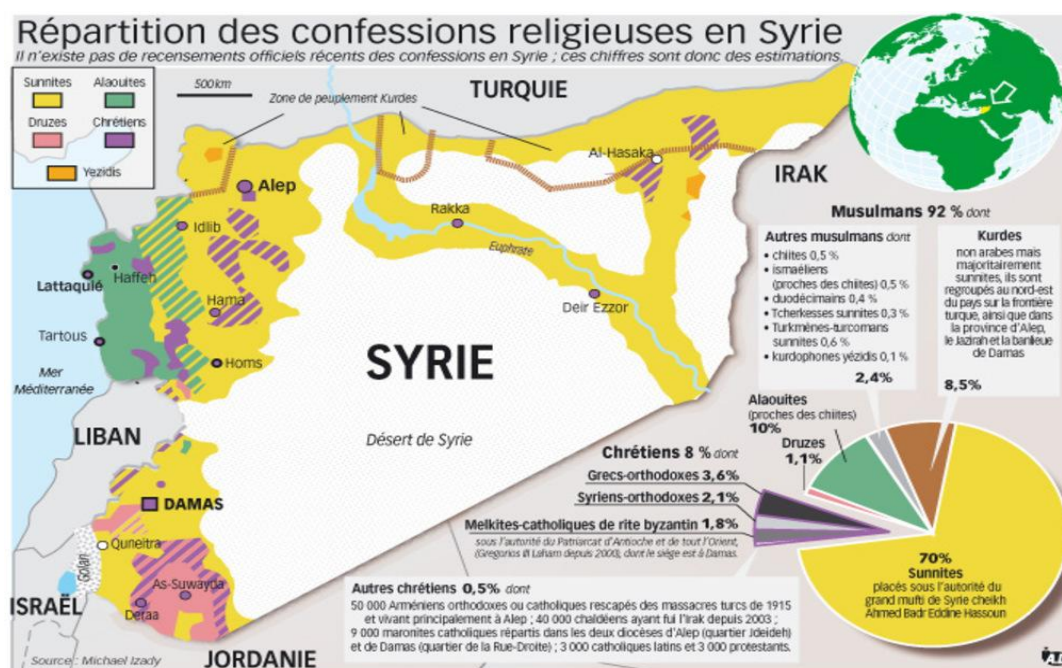
Map 2 [http://www.la-croix.com/Religion/Spiritualite/La-situation-de-la-mosaique-religieuse-en-Syrie-_NP_-2012-11-09-874105]

With regard to Israel and its relations with the Autonomous Kurdish Government (Herermi Kurdisani / Iraqi Kurdistan in the Kurdish language), we must highlight the fact that, since 1965, these relations have long been established and are and could be characterized as good or even excellent. In particular, "since the 2003 Iraq war, relations between Israel and Iraqi Kurds have continued to grow, as both sides see that mutual cooperation to serve their best

---

76   See: i) Tamsin Carlisle, «Oil strike in Iraq holds promise for Abu Dhabi», June 5, 2011, [http://www.thenational.ae/featured-content/channel-page/business/energy/oil-strike-in-iraq-holds-promise-for-abu-dhabi],   ii) Isabel Coles, UPDATE 2- "Abu Dhabi's TAQA in talks for Iraqi Kurdistan oil stake", Mon, Nov 12 2012 <http://uk.reuters.com/assets/print?aid=UKL5E8MC7GX20121112> iii) "For Kurdistan, the strategy is clear. In part by getting its oil industry scaled up, it hopes "to carve out more autonomy," says Joost Hiltermann, deputy Middle East director for the International Crisis Group. "That's the minimum. Ideally they want to be independent. They make no bones about that." (In an article in Foreign Affairs, Hiltermann argues that "the Kurds will remain stuck in Iraq, but more and more on their own terms.") In line with that aim, the Kurds are reported to be in advanced talks with Abu Dhabi National Energy for a majority stake in a producing oilfield called Atrush." see: <http://qz.com/26804/baghdad-and-kurdistan-both-need-big-oil-on-their-side-but-only-the-kurds-know-how-to-attract-it/>"; and iv) «Abu Dhabi Buys Into Kurdish Power Plant» <http://www.iraq businessnews.com/2012/04/09/abu-dhabi-buys-into-kurdish-power-plant> *(Sources: Reuters, Bloomberg, The National).* "KRG-controlled parts of Iraqi Kurdistan are estimated to contain around 45 billion barrels (7.2×10^9 m3) of **oil**, making it the sixth largest reserve in the world. Extraction of these reserves began in 2007. Iraq's former Baath regime controls the resources of Kirkuk and some parts of Mosul, cities claimed by the KRG to be included in its territory. As of July 2007, the Kurdish government solicited foreign companies to invest in 40 new oil sites, with the hope of increasing regional oil production over the following 5 years by a factor of five, to about 1 million barrels per day (160,000 m3/d). Gas and associated gas reserves are in excess of 100 TCF." <http://www.skyscrapercity.com/showthread.php?t=1259429>.

national interest. It is important to note that Israelis have generally demonstrated sympathy toward Iraqi Kurds, and historically there was hardly any enmity between the two sides. By and large, both Israel and the Kurds have at one point or another faced common hostility from Arab states. At present the Israeli army has stepped up its military activities in Iraq's autonomous Kurdistan Region. In August 2011 Israeli unmanned aerial vehicles were stationed in Iraqi to operate against Iran (2). Barzani gave Israel the green light to deploy them in northern Iraq without gaining the approval of the Iraqi central government in Baghdad, which has no diplomatic ties with Tel Aviv. Israeli intelligence agents and military advisers, equipped with special transmission devices, were reported to be sent to Mosul to train Kurdish security forces. President Barzani has reportedly agreed to the concession in return for the admission of a number of Iraqi Kurd students to Israeli universities. On March 25, *The Sunday Times* published the article called *Israel Spies Scour Iran in Nuclear Hunt*[77] (3). As the story goes Israel is using a permanent base in Iraqi Kurdistan to launch cross-border intelligence missions in an attempt to find "smoking gun" evidence that Iran is building a nuclear warhead. According to Western intelligence sources, the Israelis have been conducting such operations for several years. These risky intelligence missions have been intensified to an unprecedented degree in the past few months"[78]. The French press has also published related articles[79].

Such a redistribution of power will ignite the chain reaction of the Kurdish irredentism within Turkish territory as well. From that point on, Turkey will be obliged to cooperate closely, once again, with Iran, in order for them to jointly contain the Kurdish liberation dynamics, and to re-isolate itself from the West. However, if Iran proceeds to relevant provisions to the Kurdish element of its territories, giving prominence to its racial kinship with the Kurdish element since the Kurds form part of the Iranian ethnicity, it will manage to sustain no losses from this situation, leaving Turkey alone to counter the Kurdish separatist move, taking revenge at the same time for Ankara's stance towards Syria up until now. Furthermore, we already observe and predict a strengthening in the relations of Baghdad and Tehran on a religious base (Shiite populations), to the disappointment of the Kurds living in N. Iraq and Syria. This fact strengthens the explosiveness of the Kurdish ethnic element in the region. Tehran aims to substitute strategically Syria with Iraq, in case the regime of Damascus falls.

Conclusively, the results of such a successful chain reaction that will lead to a number of cessations and ethogeneses will allow Washington to regain most part of its lost influence in the whole region of the Middle East and the Russian Near Abroad, especially now that the US are going to be confronting a constantly growing financial problem that is extremely difficult to address. Furthermore, it will offer Israel a safe territorial strategic depth, currently provided only by the Republic of Cyprus and Greece, with the Aegean and the Ionian Seas. We should not overlook the fact that, in the future, the Kurds could control the territories of the springs, half of the course of the Tiger and the Euphrates, as well as the oil reserves of Mosul and Kirkuk. In any case, the new emerging basis for the power balance that is being formed also favours Washington, London and Jerusalem.

D. Analysis of the Acting Super-system

a. Analysis of the Russian Power Pole of the Super-system

Russia has three very important reasons to not allow the deposing from power of the Assad regime and the Baath Party "without equivalent geostrategic returns": 1.the deep waters port of Tartus, which Moscow has been using as a naval base for the Soviet Navy and the Fifth Soviet Navy Squadron, according to the 1971 Soviet-Syrian Agreement, that covered

---

77   *"The Sunday Times",* March 25, 2012, «Israel Spies Scour Iran in Nuclear Hunt» <http://www.thesundaytimes.co.uk/sto/public/sitesearch.doquerystring="Israeli+spies+scour+Iran+in+nuclear+hunt"§ionId=7>.
78   *"Le Mossad utilise pour cela la région autonome du Kurdistan irakien, où ses agents ont renforcé leurs infiltrations.Les Israéliens, utilisent les opposants kurdes au régime iranien qui sont réfugiés dans les régions kurdes d'Irak»* <http://www.lefigaro.fr/international/2012/01/09/01003-20120109ARTFIG00640-l-iran-defie-l-amerique.php>.
79   AKULOV, Andrei, (SCF), "Greater Kurdistan: a New Actor on Middle East Map?", Sun, 9 Dec 2012 <http://ikjnews.com/?p=5801>.

Moscow's needs when its naval bases were withdrawn from Egypt in the late 1970s. Back then, Tartus became the 229th Support Naval Base of the Soviet Navy. During the mid-1980s, and up until 1991, Tartus was upgraded to the 720th Support Base of the Soviet Navy. Afterwards, Russia, successor of the USSR, erased 73% of Syria's debt to Soviet Moscow (13,4 billion US dollars), and maintained, on the one hand, its rights in using the port of Tartus, preserving also its role as the main arms supplier of Assads' Syria[80].

Turkey's violation of the 1936 Montreux Convention transformed the Dardanelles into a Turkish strait, one that since 1982 Ankara can open and close in its discretion, in times of war or peace. This means that, for Russia, the only strategic naval base in the Mediterranean is the port of Tartus. This became clear when lately (in the spring of 2012), the Russian aircraft carrier Kuznetzov crossed the straits of Gibraltar and sailed into the port of Tartus with its submarine escort. Also, in July 2012, another group of Russian warships entered again the Tartus port. It is very important to consider President Putin's visit to Israel (July 1, 2012) under the light of the subsequent loan of €5 bn which Moscow issued to Cypriot banks a few days later. If Moscow does not gain important benefits from the "West/NATO side" for the loss of the naval base of Tartus, probably acquiring a naval base in Cyprus, it will not leave Assad and his government helpless in Damascus. 2. The second great interest of Putin's Moscow in Syria is that of the Russian arms trade to Damascus. Both these strategic Russian interests will be dealt with a lethal blow if the Baath regime in Damascus is replaced by another one, and especially if it is a Muslim Brotherhood one. 3.The third issue that will arise for Moscow is the proximity of a Sunnite Islamist movement with the area of its Muslim cultural basis in the Near Abroad, i.e. the in central Asia. Moreover, such a proximity would lead to a possible destabilisation of Iran, due to the Kurdish explosion caused by the probability (or the fact) possibility of an Islamic Syrian government. Iran is not a threat to Russia - quite the contrary. However, its destabilization could cause an expansion of the Sunni Islamic movement in Central Asia.

b. Analysis of the Chinese Power Pole of the Super-system

Iran is China's principal oil and gas supplier. It is also an important area for investment by Beijing in the energy sector. Lately, for example, Sinopec, the largest and most important Chinese petrochemical company, signed with Tehran (on December 9, 2011) a USD 2 bn. net worth contract, for the exploitation of the Iranian field of Yadavaran, on the SE of the country. This field could produce around 85.000 barrels of crude oil per day (b/d) during its first four-year exploitation period, and around 100.000 b/d during the following three years. According to the contract clauses, Beijing is obliged to purchase USD 100 bn - worth oil and LNG from Tehran, during the following 25 years[81].

There are, however, reasons of geostrategic security, similar to those concerning Moscow, that oblige Beijing to support the Shiite cleric regime of Tehran against the Sunnite radical movement, represented by the Muslim Brotherhood, and supported by Qatar and Turkey with the tolerance of the US and the UK. Namely, the separatist Muslim movement of the Uyghurs in the NW Chinese region of Xinjiang, bordering with Kazakhstan, where there the construction of a pipeline is planned, terminating in Shanghai, to supply China with gas. Turkey supports this movement in every possible manner, so that in case the region of Xinjiang decides to break away from China, the supply with natural gas from Russia and Kazakhstan to China would no more be possible, due to the territorial interference of an independent Xinjiang. Furthermore, we should not forget that the region of Xinjiang is very rich in minerals (122 minerals in total, of which 70 are non metallic), and in water resources (yearly flow of 88.5 billion cubic meters of surface waters and 25.3 billion cubic meters of exploitable sub-surface water resources). Water resources originating from glaciers have been calculated to 2.581 billion cubic meters. Furthermore, the estimated anthracite deposits

---

80   SYNOVITZ, Ron., 23 June 2012, "Why is Access to Syria's port at Tartus so important to Moscow" <http://www.thecuttingedgenews.com/index.php?article=74460&pageid=13&pagename=Analysis>.
81   <http://www.jeuneafrique.com/Article/LIN16127liranesioni0/Actualite-Afrique--l-iran-joue-la-carte-chinoise.html>.

constitute more than 38% of the total country's deposits, while the estimated oil and natural gas deposits are 30 billion tons, that is more than 25% of the country's total. A change of regime in Iran could radically change the balance of power in the wider region, placing siginficant pressure on China through the promotion of the Sunnite Islamist movement in the region of Xinyiang, which is rich in resources and strategically important for the energy connection between Russia and China. During the 2000 census, the Uyghur population was 8.399393 million[82].

C. Analysis of the Pole of the "Special Relation" of the Super-system

The already analysed activity of the first sub-system, has as its allies an economically weak Washington and the Obama administration in a pre-election period, thus not being in position to present itself as belligerent, while the whole of the "Special Relation" desires to contain the expansion of the Russian influence in the Mediterranean, and particularly the South-eastern Mediterranean, which abounds in vast deposits of natural gas, in the Levant and the Herodotus (SE of Crete) Basins, and are estimated to surpass 6 trillion cubic meters.
Therefore, it is an Anglo-Saxon containment policy that the US, Germany, and the UK used during the 1990s also in the Balkans, aiming once more to contain Russia's descent to the warm waters of the Mediterranean. Nevertheless, such policy decisions are erroneous and irreversible, particularly when Washington, attempting to affiliate with the radical Islamist elements of the region, and following the dogma that "the enemy of my enemy is my friend", does not hesitate to assign to the American information services to arm these radical Islamic terrorist cells to overthrow, for example, Assad's regime in Syria[83], without taking into account that afterwards, it will be unable to control the Islamist government that may come to power in Damascus, or the possible fragmentation of Syria into three separate entities (Kurdish, Alawi-Shia and Sunnite). Unless, of course, this is well within Washington's aims, and Ankara does not have the slightest idea!

A conclusive question

Therefore, we ought to put forward the following, evident question: is that, that once again, this Anglo-Saxon policy, inspired by the late period of the theories of Nicolas J. Spykman – and through the 'kind services' of Qatar, Saudi Arabia and Turkey- is actually leading to the creation of a most powerful Golem that will unleash Armageddon in the Mediterranean and will lead to an explosive and violent redrawing of borders in the Middle East and Maghreb?
Unless, of course, this is the result that is actually… intended! And that the concern is to contain the Russian and Chinese interests away from the Mediterranean, especially now that the global economic crisis does not allow to the "Special Relationship" the luxury to maintain in power "pro-Western" totalitarian regimes in the region.

References

APS *Review Gas Market Trends*, April 2, 2007.
AKULOV, Andrei., (SCF), «Greater Kurdistan: a New Actor on Middle East Map?», Sun, 9 Dec 2012 <http://ikjnews.com/?p=5801>.
Carlisle,Tamsin., "Oil strike in Iraq holds promise for Abu Dhabi", June 5, 2011 <http://www.thenational.ae/featured-content/channel-page/business/energy/oil-strike-in-iraq-holds-promise-for-abu-dhabi>.

---

82   *Tabulation of the 2000 Population Census of the People's Republic of China.* China Statistics Publishing House (2002), 218–221.
83   As Barry Rubin mentions: "Of course, a large part of the problem with Obama's policy is that he not only treated enemies as friends and did not pressure supposed friends that acted like enemies, he joined them. Thus, Turkey, Qatar, and Saudi Arabia are arming anti-American Islamist forces in Syria with U.S. intelligence officers supervising the weapons' supplying. The only restriction is that the guns don't go to groups affiliated with al-Qaida. Otherwise, it doesn't matter how extremist they are. In Libya, one of the groups—treated as "good guys"– supplied with guns by the United States during the civil war there went on to kill the U.S. ambassador" <http://www.gloria-center.org/2012/12/a-paradox-of-u-s-middle-east-policy-the-friend-who-acts-like-an-enemy-is-an-enemy/> (accessed January 2, 2013).

Qatar Petroleum Annual Report 2005.

Qatar Energy Data, Statistics and Analysis - Oil, Gas, Electricity, Coal 1 of 10.

Question de Palaistine, Rapport du Comité pour l'exercice des droits inaliénables du peuple palestinien (A/67/35), Rapport du Secrétaire général (A/67/364), Déclarations.

RODIER, Alain, 28-02-2006, Note d'actualité N°29, "Le Groupe Islamique des Combattants Libyens/(GICL)" <http://wwwcf2r.org/fr/notes-actualite/le-groupe-islamique-des-combattants-libyens-gicl.php>.

SYNOVITZ, Ron, 23 June 2012, "Why is Access to Syria's port at Tartus so important to Moscow", <http://www.thecuttingedgenews.com/index.php?article=74460&pageid=13&pagename=Analysis>.

"Tabulation of the 2000 Population Census of the People's Republic of China", China Statistics Publishing House, 2002.

The Sunday Times, March/25/2012, "Israel Spies Scour Iran in Nuclear Hunt" <http://www.thesundaytimes.co.uk/sto/public/sitesearch.doquerystring="Israeli+spies+scour+Iran+in+nuclear+hunt"§ionId=7>.

<http://www.jeuneafrique.com/Article/LIN16127liranesioni0/Actualite-Afrique--l-iran-joue-la-carte-chinoise.html>.

<http://www.lefigaro.fr/international/2012/01/09/01003-20120109ARTFIG00640-l-iran-defie-l-amerique.php>

<http://www.skyscrapercity.com/showthread.php?t=1259429>.

<http://fr.wikipedia.org/wiki/Cyr%C3%A9na%C3%AFque>

<http://www.iraq businessnews.com/2012/04/09/abu-dhabi-buys-into-kurdish-power-plant/> (Sources: *Reuters*, *Bloomberg*, *The National*).

<http://qz.com/26804/baghdad-and-kurdistan-both-need-big-oil-on-their-side-but-only-the-kurds-know-how-to-attract-it/>.

<http://uk.reuters.com/assets/print?aid=UKL5E8MC7GX20121112>.

A METHOD FOR FORECASTING POPULATION CHANGES IN ALPINE, SEMI-ALPINE AND LOWLAND COMMUNITIES OF EPIRUS REGION IN GREECE

Georgios XANTHOS
Technological Education Institute of Crete, Greece
xanthosg@ret.forthnet.gr.

Christos Ap. LADIAS
University of Central Greece
caladias@otenet.gr

Christos GENITSAROPOULOS
University of Central Greece and
Technological Education Institute of Lamia, Greece.
cgenits@ucg.gr

Abstract

The prediction to the extent possible of the future size of the population of a region and its distribution among the settlements of the region is evidently significant for regional planning. In this paper, deriving data from population censuses, we attempted to predict the population of alpine, semi-alpine and lowland settlements of the Epirus Region. To perform the prediction, we applied a modified version of the shift and share method. In addition to applying the method, we evaluated its predictive ability in relation to a) the fixed share method, b) the fixed magnifications share method and c) the classical shift and share method, suggesting the relevant statistical tests.

Keywords: prediction of population shift-share method.
JEL classification: R10, R58.

1. Introduction

Assessing the future total population of a region and its distribution among the settlements is necessary for regional planning (Bendavid 1991, Klosterman 1990, Isard 1970). To begin with, the difficulties of this attempt derive from the difficulty to find regional data in both time and space. Moreover, the difficulty is increased due to the fact that the prediction does not only pertain to the total population size of a region, but it also pertains to its distribution among the settlements. These difficulties have led to the use of methods which are based on "poor data" (Isard 1970, Wang 2007) and do not have any special computational requirements. One of these methods is the shift share method (Helman 1976, Isard 1970, Kurre 1989). Although this method was invented for the purpose of analyzing mainly employment changes at a regional level (Dunn 1960), it was modified (Esteban-Marquillas, 1972) and its applications were expanded. Moreover, modifications (Bergeg 1984, Knudsen1991, 2000, Nissan 1994) pertaining to the method's weakness to accept statistical tests, were suggested. In this paper, we will use its modified version (Nissan 1994) to perform population predictions, but we will differentiate the stochastic hypotheses that have been set forth. The region on which we will apply the method is the Epirus Region. We will compare the results of the method with the results of other simple and frequently used methods, which do not have any special computational requirements and are also based on poor data.

2. The model

Let the random variables P_{ij0}, P_{ij1} concerning the population size of the settlement $i = 1,2,3,..,n$ which belongs to the category j, be at times zero (0) and one (1) respectively. We then expect that the population size P_{ij0} is connected with the population size P_{ij1} via a linear relationship with a positive slope. The population difference between the two times is represented as:

$$P_{ij1} - P_{ij0} = (\hat{P}_{ij1} - P_{ij0}) + (P_{ij1} - \hat{P}_{ij1}) \quad (1)$$

Where $\hat{P}_{ij1}$ is the expected population of the settlement, based on the following relationship

$$\hat{P}_{ij1} = a + b * P_{ij0} \quad (2)$$

With $(P_{ij1} - \hat{P}_{ij1})$ being the random term which expresses the difference between the observed population size P_{ij1} and the expected one according to (2). The estimation of the parameters of (2) result from $\hat{b} = r * (S_{Pj1} / S_{Pj0})$ and $\hat{a} = \mu_{j1} - \hat{b}\mu_{j0}$, where r is the Pearson's linear correlation coefficient, μ_{j1}, μ_{j0} are the numerical average populations of the category j settlements at times one and zero, and S_{pj1}, S_{pj0} are the corresponding standard deviations. By substituting (2) in (1) and after adding and subtracting the mean value μ_{j0} we have:

$$(P_{i1} - P_{i0}) \equiv [(\mu_{j1} - \mu_{j0}) + (\hat{b} - 1)(P_{ij0} - \mu_{j0})] + (P_{ij1} - \hat{P}_{ij1}) \quad (3)$$

Identity (3) is a different expression of the shift-share method[84] and it breaks the difference $(P_{ij1} - P_{ij0})$ into a sum of three components. The first component $(\mu_{j1} - \mu_{j0})$ pertains to the part of the change which can be attributed to the effect exerted on the settlement by the change in the total population of the category to which the settlement belongs[85]. The second component pertains to the part of the change which can be attributed to the net effect exerted on the formation of the difference by the initial population size of the settlement. The third component, despite the fact that it is essentially treated as a random variable, pertains to the part of the change which is formed under the influence of random and non-random factors.

If $(P_{ij1} - \hat{P}_{ij1}) > 0$, the settlement has changed its population size faster than what (2) predicts and reversely if $(P_{ij1} - \hat{P}_{ij1}) < 0$. We applied model (3) to analyze into components the change of population data of alpine, semi-alpine and lowland settlements of the Epirus Region during the period 1971-2001. We used the components of the change to make predictions. Finally, we assessed the predictive ability of (3) in relation to the following models. (a) Fixed share model, (b) Fixed magnification share model and (c) Shift share model. These three models belong to the general category of "ratio" models and its central hypothesis is that the population of a small area or a settlement is proportionate to the population of a broader metropolitan area. If $p_{i,-1}^{S}, p_{i,0}^{S}, p_{i1}^{S}$ are the populations of the small area and $P_{-1}^{L}, P_{0}^{L}, P_{1}^{L}$ are the populations of the larger area at times minus one (-1), zero (0) and one (1) respectively, then the algebraic expression of the three models a, b, c is (United Nations 1974 , Wang 2007,Smith 2002):

---

[84]The hypotheses from which model (3) is derived in the current study are not exactly the same as the ones set by Nissan and Carter. The current study maintains the main hypothesis that variables P_{ij0}, P_{ij1} are random, but it does not adopt the hypothesis of the joint normal distribution.

[85]j=1,2,3 where 1= Alpine- 2= Semi-alpine- 3= Lowland communities in the current study.

(a): $p^S_{i,1} = P^L_1 \left(\dfrac{p^S_{i,0}}{P^L_0} \right)$

(b): $p^S_{i,1} = p^S_{i,0} + \left[(P^L_1 - P^L_0) \left(\dfrac{p^S_{i,0} - p^S_{i,-1}}{P^L_0 - P^L_{-1}} \right) \right]$

(c): $p^S_{i,1} = P^L_1 \left[\dfrac{p^S_{i0}}{P^L_0} + \left(\dfrac{p^S_{i,0}}{P^L_0} - \dfrac{p^S_{i,-1}}{P^L_{-1}} \right) \right]$

3. Areas of Application

We applied the model to lowland, semi-alpine and alpine communities of the Epirus Region. Epirus has an area of 9203 square kilometers, with just 10% of its land being lowland, thus rendering it the most alpine region of Greece[86]. According to the population censuses of the years 1971-1981-1991-2001 the picture of the development of the real population of Epirus, per category of alpine, semi-alpine and lowland communities is displayed on table -1-:

Table-1- Development of the Real Population of Epirus

	Census year 1971	Census year 1981	Census year 1991	Census year 2001
Population of Alpine Communities	119.531	119.222	109.115	108.714
Population of Semi-alpine Communities	52.933	57.168	62.012	63.785
Population of Lowland Communities	137.873	148.151	168.599	181.321
Total Population	310.337	324.541	339.726	353.820

The reduction in the population of alpine communities is evident. During the period 1971-2001, the Alpine communities had an average annual rhythm of population loss that equaled 0.31%. In contrast, Semi-alpine and Lowland Communities increased their population with an average annual rhythm of 0.62% and 0.92% respectively, for the same period. In its total, the Epirus Region increased its population with an average annual rhythm of 0.438%. This rhythm is significantly slower compared to the corresponding rhythm of the country, which is 0.748% for the period 1971-2001. For the application of model (3), we used the data of the real population of the settlements based on the censuses.

Table -2- displays: The value of the difference between the average values $\mu_{j1} - \mu_{j0}$, as well as the estimation of the difference $\hat{b} - 1$.

---

[86]Greek Geographical Encyclopedia volume A, Editions TEGOPOULOS MANIATEAS

Table-2-

Alpine Settlements	$\mu_{j1} - \mu_{j0}$	$\hat{b} - 1$	Number[87] of Settlements
1971-1981	-3.80	-0.077	701
1981-1991	-13.30	-0.023	733
1991-2001	-1.10	0.043	730
Semi-alpine Settlements	$\mu_{j1} - \mu_{j0}$	$\hat{b} - 1$	**Number of Settlements**
1971-1981	21.40	0.193	171
1981-1991	18.20	0.099	182
1991-2001	6.70	0.193	189
Lowland Settlements	$\mu_{j1} - \mu_{j0}$	$\hat{b} - 1$	**Number of Settlements**
1971-1981	63.60	0.085	134
1981-1991	140.70	0.224	105
1991-2001	88.10	0.088	146

4. Tests for the application of the model

In this study, the limiting hypothesis of the joint normal distribution of random variables P_{ij0}, P_{ij1} has not been adopted. For this reason, the tests that will follow are based on Spearman and Kendall's rank correlation coefficients (Cooper 1983, Gopal, 2006). The first test concerns the independence of random variables P_{ij0}, P_{ij1}. The second test concerns the acceptance or not of the linear relationship between the variables (2). This test is necessary because, even though the likely rejection of H_0 at the first test will lead us to conclude that there is a monotonic association between the variables, the existence of monotony alone does not entail a linear relationship between the variables. Finally, the third test concerns the components of (3). Due to the fact that the limiting hypothesis of the joint normal distribution of random variables P_{ij0}, P_{ij1} has not been adopted, the significance test of the components' contribution to the difference $(P_{ij1} - P_{ij0})$ will be performed with the non-parametric analysis of variance, which pertains to correlated samples (Friedman 1937, Siegel 1956). For the first two tests, the relevant statistics in large samples for Spearman and Kendall's correlation coefficients are $TS = r_s \sqrt{n-1}$, and $TS = \tau / \sqrt{2(2n+5)/9n(n-1)}$ respectively. For the third test, we use the statistic $\chi_r^2 = \frac{12}{nk(k+1)} \sum_{j=1}^{k}(R_j)^2 - 3n(k+1)$ (Gopal 2006, Siegel 1956). At the level of significance $a = 0.05$, the test of the H_0 was applied: Variables P_{i0}, P_{i1} are mutually independent, with H_1 as an alternative hypothesis: Variables P_{i0}, P_{i1} are not mutually independent. On the basis of our data, the H_0 hypothesis was not accepted. Then, again, for $a = 0.05$ the second test was performed for the acceptance or not of a linear relationship between the variables (2). The test pertaining to the H_0 hypothesis: that no linear relationship exists between the variables will not be applied by testing the Spearman correlation coefficient, because it presupposes normal distribution. The test was performed with the Kendall coefficient (Gopal, 2006) and the H_0 hypothesis is rejected. Therefore, the linear relationship is accepted. To reinforce the relevant linearity hypothesis, Pearson's linear

---

[87]The number of the settlements is different due to differences in the volumes of the censuses of the Hellenic Statistical Authority.

correlation coefficient, as well as the elementary correlation coefficient (eta) were calculated, and their values do not differ significantly, pleading for the linearity hypothesis. Table 3 exhibits the values of the Spearman, Kendall, and Pearson correlation coefficients, as well as the value of the elementary correlation coefficient.

Table-3-

Period 1971-1981	Alpine Communities	Semi-alpine Communities	Lowland Communities
Kendall τ	0.700	0.803	0.851
Spearman r_S	0.862	0.935	0.935
Pearson r	0.941	0.970	0.997
$\sqrt{\eta} - eta$	0.999	0.998	0.997
Period 1981-1991	Alpine Communities	Semi-alpine Communities	Lowland Communities
Kendall τ	0.771	0.830	0.839
Spearman r_S	0.918	0.940	0.934
Pearson r	0.965	0.983	0.997
$\sqrt{\eta} - eta$	0.999	0.998	0.997
Period 1991-2001	Alpine Communities	Semi-alpine Communities	Lowland Communities
Kendall τ	0.779	0.869	0.879
Spearman r_S	0.931	0.971	0.964
Pearson r	0.973	0.983	0.999
$\sqrt{\eta} - eta$	0.999	0.998	0.997

The third test pertains to the components of (3). At the level of significance $a = 0.05$, the zero hypothesis, which has been tested, is: H_0: the three components have no significantly different effect on the formation of the difference $(P_{ij1} - P_{ij0})$. The alternative hypothesis is H_1: the three components have significantly different effect on the formation of the difference $(P_{ij1} - P_{ij0})$. The relevant test led to the rejection of the hypothesis. Consequently, the individual components, into which (3) has been divided, contribute statistically significantly to the difference $(P_{ij1} - P_{ij0})$.

5. Predictions and conclusions

The assessment of the predictive ability of model (3) was based on the comparison of results from the three models we have already mentioned. The central hypothesis for the application of the three models above is that each time we have a good estimation of the future total population of Epirus. Thus, given that the total future population of Epirus has been estimated with great accuracy, the prediction process was performed as follows: with the population data of censuses 1971-1981, we attempt a prediction for year 1991; with the data of censuses1981-1991, we attempt a prediction for year 2001; and finally, with the data of censuses 1991-2001, we attempt a prediction for year 2011. Similarly, for model (3) estimations of $\mu_{j1} - \mu_{j0}, \hat{b} - 1$ were used for the prediction of both the total population of each category of settlements, and the distribution of the population predicted in the settlements of each category. The evaluation of the methods with regard to the prediction was performed on the basis of three criteria. The first one is the mean absolute percentage error

(*MAPE*). The second one is concerned with which method gives the smallest absolute percentage difference in the total population of each category. The third criterion uses Kendall's correlation coefficient, so that we can establish the degree of agreement in the ranking order between real values of population per settlement and predicted values per settlement. The following tables 4 and 5 exhibit for each settlement category the MAPE values, the values involving the absolute percentage error (absPE) for the total population of each category to which the settlement belongs, and finally, the values of the Kendall coefficient.

Table-4- Alpine Settlements

	Prediction for 1991			Prediction for 2001			Prediction for 2011		
	MAPE	absPE	Kendall	MAPE	absPE	Kendall	MAPE	AbsPE	Kendall
Fixed share method	42.86	14.4	0.758	30.97	4.5	0.794	78.84	30.8	0.743
Fixed magnification share method	74.48	9.0	0.618	49.89	8.3	0.665	110.06	38.1	0.677
Shift Share Method	75.75	8.8	0.614	55.15	10.5	0.635	88.48	24.9	0.622
Suggested method	43.86	7.3	0.758	25.14	8.9	0.795	95.80	36.9	0.743

Table-5- Semi-alpine Settlements

	Prediction for 1991			Prediction for 2001			Prediction for 2011		
	MAPE	absPE	Kendall	MAPE	absPE	Kendall	MAPE	AbsPE	Kendall
Fixed share method	28.88	3.5	0.797	33.29	1.3	0.861	89.09	2.0	0.597
Fixed magnification share method	43.39	0.5	0.717	51.05	4.3	0.806	99.94	0.55	0.561
Shift Share Method	25.78	12.6	0.797	28.58	7.9	0.806	90.15	1.1	0.597
Suggested method	38.03	2.2	0.797	33.81	2.8	0.861	148.41	4.4	0.597

Table-6- Lowland Settlements

	Prediction for 1991			Prediction for 2001			Prediction for 2011		
	MAPE	absPE	Kendall	MAPE	absPE	Kendall	MAPE	AbsPE	Kendall
Fixed share method	22.58	8.0	0.70	23.87	3.2	0.786	58.0	11.8	0.835
Fixed magnification share method	35.82	6.0	0.659	41.93	4.3	0.736	90.61	0.9	0.792
Shift Share Method	37.82	5.6	0.653	43.95	4.6	0.730	85.27	9.0	0.787
Suggested method	22.61	6.9	0.70	115.52	5	0.786	63.87	0.3	0.835

Taking all the aforementioned into consideration, we will underline the following. As for the alpine communities, all $\mu_{j1} - \mu_{j0}$ differences are negative. They therefore represent the trend towards the reduction of the total population of the alpine communities. This trend seems to

be generalized for decades 1971-81 and 1981-1991, given that the component of the population size of the settlement also has a negative sign. In contrast, while for the decade 1991-2001 the total population of the alpine communities continues to decrease, this decrease is decelerated. For lowland and semi-alpine communities, all $\mu_{j1} - \mu_{j0}$ differences are positive, thus indicating the upward trend, even marginally, in the total population of semi-alpine and evidently in lowland communities. This trend is reinforced by the fact that the component of the population size of the community contributes positively, reinforcing the trend. As for the predictive ability of the model, in all three community categories the results of the model are similar to the results of the fixed share model, as long as the prediction for the total population of Epirus is accurate enough. If the population of Epirus is entered with a 5% error, the suggested method prevails, with the exception of the prediction involving year 2011. However, its lagging behind may be attributed to the fact that the population data of 2011 concern the permanent population, as opposed to the real population of the censuses. In closing, we can conclude that the suggested model provides useful information with the division of population changes into components on the one hand, and it provides satisfactory prediction for both the total population of the region and the distribution of the population among the settlements of the area, on the other hand. Moreover, it is not demanding in terms of data; neither does it require laborious calculations, providing useful information for regional planning with simple statistical tests.

References

Berzeg Korhan., "A note on statistical approaches to shift share analysis", Journal of Regional Science, Vol. 24, No 2, 1984.

Bendavid val Avrom., "Regional and Local Economic Analysis for practitioners", Praeger Publishers, 1991.

Dunn Jr ES., "A statistical and analytical technique for Regional analysis", Papers of the regional Science Association ,6,1960.

Esteban-Marquillas JM., "Shift and share analysis revisited", Regional and Urban Economics, 2,1972.

Friedman M., "The use of Ranks to avoid the assumption of Normality implicit in the analysis of variance", Journal of American Statistical Association, Vol. 32,1937.

Gopal K. K., "100 Statistical Tests" Sage Publications London, 2006.

Helman D., "Shift Share Model as predictive Tool", Growth and Change 1976, Vol. 8, Issue 3,1976.

Isard W., "Methods of Regional analysis : an Introduction to Regional science" The MIT Press, 1970.

Kurre J., Weller B., "Forecasting the local Economy using time series and shift share techniques", Environment and Planning A., Vol., 21,1989.

Klosterman R., "Community Analysis and Planning Techniques", Rowman & Littlefield Publishers co, 1990.

Knudsen D., Barf R., "Shift share analysis as a linear model", Environment and planning A, 23,1991.

Knudsen D., "Shift share analysis: further examination of models for the description of economic change" , Socio economic Planning Sciences ,34,2000.

Nissan E., Carter G., "An Extension to the shift share techniques for predicting and evaluating changes in Employment Growth", Regional Science Perspectives, Vol. 24, No 2,1994.

Smith S., Tayman J., Swanson D., "State and Local Population projections Methodology and Analysis", Kluwer Academic Publishers,2002.

Siegel S., "Non Parametric Statistics for the behavioral science", McGraw Hill New York,1956.

United Nations "Methods for projection of Urban and Rural Population, manual on methods of estimating Population (manual VIII)", New York,1974.

Wang X., Rainer vom Hofe., "Research Methods in Urban and Regional Planning", Springer, 2007.

Announcements, Conferences, News

5TH INTERNATIONAL CONFERENCE
THE ECONOMIES OF BALKAN AND EASTERN EUROPE COUNTRIES IN THE CHANGED WORLD
Conference Overview[88]

The 5th International Conference entitled "The Economies of Balkan and Eastern Europe Countries in the changed world", the program of the EBEEC, occurred in Istanbul, Turkey, in May 9-12, 2013. The Conference has been organized in association with Kavala Institute of Technology, Department of Accountancy, Greece and Istanbul University, Department of Economics, Turkey.

The economies of Balkan and eastern European countries can be seen a great deal of change and reform since the past two decades. This has stressed significant difficulties, and has highlighted the particular problems that the countries of the particular region face. Reform and change has led to different sates and patterns of growth and enhancement of the economies.

The objectives of the conference was to discuss and evaluate the results of the economic policy that have been applied during the last two decades, examining potential challenges and researching the policies which are considered necessary for   the countries to be successful in the future.

The issues examined were:

- Economic policy ,Public economy, Monetary policy
- International economic relations (International trade)
- Accounting, Auditing, The role and the importance of EU
- Changes in the labour market, Immigration
- Knowledge economics
- The role of new technologies and information technology
- Multinational companies, Financial developments
- Business Informatics
- Management and marketing policies in the Balkan and the Black sea area, Health economics, education economics, European crisis and Greece, E.U. and Turkey

Organizing Committee was: Aytuğ Bolcan, Chatzoudes Dimitrios, Kazanidis Ioannis, Kladou Stella, Perdiki Fotini, Theodosiou Theodosios and Valsamidis Stavros. Keynote Speakers was Professor George Petrakos.

---

[88] **Conference overview by Antonia Obaidou, Aristotle University of Thessaloniki, Greece**

5TH INTERNATIONAL SCIENTIFIC CONFERENCE
"TOURISM TRENDS AND ADVANCES IN THE 21ST CENTURY"
Conference Overview[89]
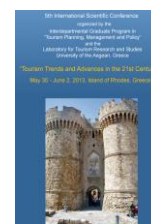
The 5th International Scientific Conference entitled "Tourism Trends and Advances in the 21st Century" organized by The Interdepartmental Graduate Program in 'Tourism Planning, Management and Policy' and the Laboratory for Tourism Research & Studies (ETEM) University of the Aegean, Greece. The Conference has been organized in May 30-June 2, 2013 in Rhodes, Greece.

The Themes of the Conference were:

1. Contemporary tourism challenges· Tourism　economics· Global competition and low-cost companies in tourism· Transport　and tourism·

2. Tourism in the service of society (socio-economic, ethical, environmental, cultural, technological etc aspects of tourism)· Local sustainability and sustainable tourism·

3. Tourism policy and planning (top-down and bottom-up). Tourism impacts on the land/ land uses/ landscape· The role of transnational organizations intourism and public governance· Institutional issues in tourism·

4. Tourism training and prospects of higher education in tourism.

5. Special-interest and alternative forms of tourism· The local factor·Contemporary Mediterranean Tourism in Greece/ Rhodes·

6. Tourism theory and research: advances and challenges· Perspectives into the future of tourism science· Technological and multimedia applications in tourism·

7. Tourism entrepreneurship, management and marketing: tourism Management and management of tourism enterprises; service and quality management in hotels; human resource management in the hospitality sector; strategy and leadership in hotels; marketing tools and strategies.

Despite the on-going trends and established patterns, contemporary global tourism continues to grow and thrive in diversity and transformation. However, new forces are increasingly coming into play: terrorism, economic crisis, climatic change, lifestyle changes, etc. All of the latter are opening up a new era in global tourism demand and supply, as well as diverse responses to questions of tourism planning, management, research and development. This happens under interdisciplinary and globalized levels of analysis, policy-making and intervention. This conference aimed to capture the growing dynamism of 21st century tourism and to respond to the imperative need to secure its growth in concerted, integrated and sustainable ways. Looking ahead, it tried to address both internal and external factors impinging on the direction of global tourism growth, bridging the past with the future and making the most of the present. Its goals and objectives, thus, focused on recent developments in tourism, at all levels and areas of analysis, calling for novel, innovative and often imperative tools, strategies and approaches.

---

[89] **Conference overview by Eftychia Vali, University of the Aegean , Greece**

Academic Profiles

Cristina Lincaru is a mechanical engineer, specialized in Fine mechanics, optical and biomedical apparatus (Polytechnic University Bucharest, 1992) and also Doctor in Management since 9th December 2005 with the thesis: "Labour market in Romania (The Bucharest Academy of Economic Studies). Organizing, working and directions to ameliorate its performances", under the coordination of Prof. Univ. Dr. Gheorghe Raboaca. She has been working as a scientific researcher at INCSMPS Romania since 1996. Her scientific career on the long term is aimed at achieving high expertise in the field of quality in employment in the knowledge based society context in transition countries.

She is Member in the Editorial Board E-Journal of International and Comparative LABOUR STUDIES, ADAPT International School of Higher Education in Labour and Industrial Relations, Member in the The Board of the HELLENIC ASSOCIATION OF REGIONAL SCIENTISTS H.A.R.S. 2011-2012. National validator for Romania" in the METRIS I and II Project: Monitoring European Trends in Social Sciences and Humanities funded by: European Commission, DG Research, EC. Member of RSA Regional Studies Association (2010), member in RRSA Regional Studies Association (2011), member in European Association of Labour Economics (2011) and Member in the Romanian Society of Statistics RSS.

Working papers

- ✓ Vasilica Ciuca & Cristina Lincaru & Gabriela Tudose & SperanÂ»Ãµa PâˆšÃ†rciog & Liliana Grecu & Ion StegÆ'Ã‰roiu, 2011. "**Key skills development at firm level in regional perspective â€šÃ„¬case study for Romania**," ERSA conference papers ersa10p458, European Regional Science Association.
- ✓ Cristina Lincaru & Mihaela GhenÂ»Ãµa & Draga Atanasiu & Vasilica CiucÆ'Ã‰ & CodruÂ»Ãµa DrÆ'Ã‰goiu & Beatrice Chiriac, 2011. "**The regions development characterisation by diversity/variety of the firms â€šÃ„¬ study case for Romania**," ERSA conference papers ersa10p455, European Regional Science Association.
- ✓ Dr.Lincaru, Cristina & Dr.Predosanu, Gabriela & ms.Brinza, Raluca-Catrinel, 2008. "**Process of transition from school-to-work: generator for the initial stage of path dependence in career development**," IRISS Working Paper Series 2008-13, IRISS at CEPS/INSTEAD.

Articles

- ✓ Dr. Cristina LINKARU: & Dr. Vasilica CIUCĂ & Mat. Draga ATANASIU & Dr. Cătălin GHINARARU & Dr. Gabriela TUDOSE & Liliana GRECU, 2012. "**Gross Worker Flows Estimation At European Level**," Regional Science Inquiry, Hellenic Association of Regional Scientists, vol. 0(1), pages 95-104, June.
- ✓ Ciuca, Vasilica & Lincaru, Cristina, 2010. "**Strategic Development Prospects for the Labor Market in Romania, as Introduced by the Europe 2020 Strategy**," Journal for Economic Forecasting, Institute for Economic Forecasting, vol. 0(5), pages 100-119.
- ✓ BULEARCA, Marius & RAGALIE, Stefan & RUSSU, Corneliu & BADILEANU, Marina & SIMA, Cristian & NEAGU, Cornelia & HORNIANSCHI, Nicoleta & FISTUNG, Daniel & ANTONESCU, Daniela & VASILE, Dan & ISAIC-MANIU, , 2005. "**Analiza situatiei economice actuale si identificarea factorilor de competitivitate (sinteza)**," Revista de Economie Industriala (Journal of Industrial Eonomics), Centre for Industrial Economics and Services, vol. 3(1), pages 7, March.
- ✓ BULEARCA, Marius & RAGALIE, Stefan & RUSSU, Corneliu & BADILEANU, Marina & SIMA, Cristian & NEAGU, Cornelia & HORNIANSCHI, Nicoleta & FISTUNG, Daniel & ANTONESCU, Daniela & VASILE, Dan & ISAIC-MANIU, , 2005. "**Analiza SWOT a domeniilor si sectoarelor economiei nationale (sinteza)**," Revista de Economie Industriala (Journal of Industrial Eonomics), Centre for Industrial Economics and Services, vol. 3(1), pages 9, March.

By Antonia P. Obaidou, Aristotle University of Thessaloniki, Greece

Joel Ian Deichmann is Associate Professor of Bentley University. He teaches Global Regions ("World Regional Geography"), Contemporary Europe, International Transportation and Tourism, International Perspectives (study tours to Prague and Berlin), and Geographic Information Systems.

In his long research he has focused on international flows of investment (FDI) and tourists, with special emphasis on transition economies of Europe. He has recently published in peer reviewed journals including Comparative Economic Studies, Eastern European Economics, Journal of Business and Economic Studies, and Journal of Tourism Studies.

Professor Deichmann is a founding member of the interdisciplinary and International Data Analytics Research Team ("DART"), which in its first five years has published more than ten articles, including "Geography matters: Kohonen classification of determinants of foreign direct investment in transition economies" in the Journal of Business Strategies.

He's also Editorial Board Member for Regioinal Science Inquiry, Academic Board and Editor (peer-reviewed quarterly) for Studia Buuro Analiz Sejmowych (Bureau of Research).

His most recent publications include (2006-2013):

Recent Publications

- Deichmann, J. I., Haughton, D. M., Malgwi, C. A., Soremekun, O. (2013). Kohonen Self-Organizing Maps as a Tool for Assessing Progress toward the Millennium Development Goals.. *Journal of Human Development and Capabilities*. Forthcoming
- Deichmann, J. I., Senjalia, S. R. (2013). Public Perceptions of Political and Economic Transformation in Croatia and Bosnia-Herzegovina: A Pilot Study. *Regional Science Inquiry,TBA*(TBA).Forthcoming.
- Deichmann, J. I. (2012). Historical Legacies as Determinants of Foreign Direct Investment in Bosnia-Herzegovina. *South East European Journal of Economics and Business,17*,(1),7-18.
- Deichmann, J. I., Malgwi, C. A. (2012). The Geography of Foreign Direct Investment in Africa: Mid-Point for the UN Millennium Goals of 2000. *African Journal of Business and Economic Research/Adonis and Abbey Publishers, Ltd., 7* (2-3), 45-80.
- Deichmann, J. I. (2010). Origin-Effects and Foreign Direct Investment in the Czech Republic: The Role of Government Promotion Abroad. *Comparative Economic Studies (Palgrave),53*,(2),273-285.
- Deichmann, J. I., Eshghi, A., Haughton, D. M., Woolford, S. W., Sayek, S. (2007). Measuring the International Digital Divide: An Application of Kohonen Self-Organizing Maps. *International Journal of Knowledge and Learning, 3* (6), 552-575.
- Deichmann, J. I. (2007). International Tourism from the Perspective of Czech Hospitality Professionals: A Pilot Study for Exploring Origin-Specific Stereotypes. *E-Review,of,Tourism,Research,5,*(a).
- Deichmann, J. I., Eshghi, A., Haughton, D. M., Sayek, S., Teebagy, N., Topi, H. (2006). Understanding Eurasian Convergence 1992-2000: Application of Kohonen Self-organizing Maps. *Journal of Modern Applied Statistical Methods, 5* (1), 72-93.
- Deichmann, J. I., Eshghi, A., Haughton, D. M., Masnaghetti, M., Sayek, S., Topi, H. (2006). Exploring Break-points and Interaction Effects Among Predictors of International Digital Divide. *Journal of Global Information Technology Management, 9* (4), 47-71.
- Deichmann, J. I., Eshghi, A., Haughton, D. M., Masnaghetti, M., Teebagy, N., Sayek, S. (2006). Determinants of the international digital divide: an analysis using MARS. *Journal of Global Information Technology Management, 9* (4), 47-71.

Books

- Deichmann, J. I. *International Tourism in St. Petersburg, Russia*. College of DuPage, Illinois.

Book.Chapters

- Deichmann, J. I. (2012). Origins of Foreign Direct Investment in Croatia: Application of an Expanded Gravity Model. In Anastasios Karasavvoglou and Persefoni Polychronidou (Eds.), *Balkan and Eastern European Countries in the Midst of the Global Economic Crisis* (pp. 3-21). Springer (Physica-Verlag)
- Deichmann, J. I, Haughton, D. M, Phong, N, Ting, P. S. (2001). Correlates of Living Standards: a Graphical and Statistical Analysis. In Dominique Haughton, Jonathan Haughton (Eds.),. Hanoi:. UNDP and GSO.

By Antonia P. Obaidou, Aristotle University of Thessaloniki, Greece

Book Reviews
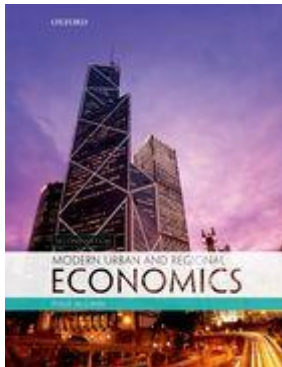
Modern Urban and Regional Economics
Second Edition

By Philip McCann

## Oxford, ISBN: 978-0-19-958200-6

Philip McCann's "Modern Urban and Regional Economics" is now considered as a "must have" book for those working on issues of urban and regional science, either students or researchers and practitioners. Using a combination of model-based approaches and theoretical arguments, the book discusses various modern issues of Urban and Regional economics within a coherent and integrated framework, emphasizing the importance of geographical and spatial factors.

The second edition of the book has two new chapters on spatial data analysis and globalisation and global regions, an incorporation of new research, policies and examples and also it provides access to the Online Resource Centre that includes PowerPoints and figures from the book for lecturers, and questions and cases for students.

In more detail, the book contains the following chapters:

1: A World of Cities and Regions

2: Industrial Location: The Location of the Firm in Theory

3: The Spatial Distribution of Activities

4: The Spatial Structure of the Urban Economy

5: Regional Specialization, Trade, and Multiplier Analysis

6: Regional and Inter-Regional Labour Market Analysis

7: Regional Growth, Factor Allocation and Balance of Payments

8: Cities and Regions in the Modern Global Economy

9: Modern Urban and Regional Economic Policy Analysis

Book Review by Vasilis Avdikos University Central Greece
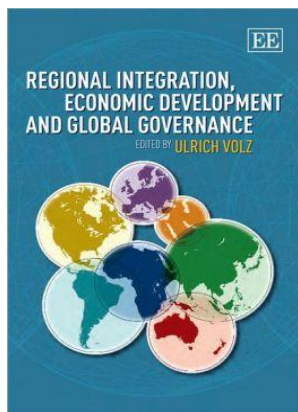
Regional Integration, Economic Development And Global Governance

Edited by Ulrich Volz

Edward Elgar Publishing, 2011, ISBN: 978 1 84980 914 6

This book is an edited volume that puts forward the concepts of regional integration and economic development in the framework of the globalized economy. In more detail, the central argument of the most of the chapters is the issue of regionalism and the ways regionalism has enabled the integration of different economies with different institutional and governance structures. The book is divided in five parts that cover topics such as i) integration experiences in different regions, ii) regional integration and the multilateral trading system, iii) regional trade and FDI, iv) regional financial integration, v) topics in monetary integration.

The list of contributors contains the following scholars: R. Baumann, R.U. Das, P. Draper, T. Hartzenberg, Y. Huang, J. Kubny, R. Kumar, D. Malungisa, J. McKay, F. Mölders, L. Mühlich, V. Nitsch, P. Nunnenkamp, J.A. Ocampo, E. Ogawa, M. Pomerleano, M. Qobo, J.J. Reade, J.J. Schott, U. Volz, R. Wölfinger, Y. Zhang

Book review by Vasilis Avdikos University Central Greece