General Economics

National Standards in the Quality Infrastructure and their Harmonization with the European Standards

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Abstract: In this paper it is made an analysis on the national standardization activity as a part of quality infrastructure from our country. This analysis is included in a legislation frame in accordance with the principles and stipulations of European and international normative. In the some time it is shown the complex effects that are produced while it must be introduced the European and international standards necessary for a sustainable development.

Keywords: quality, competitively, standardize, equitable trade, harmonization

Jel Classification: H54, R10, R28, R34

1. Introduction

The European Standards System gave to its citizen the certainty of a quality life and a sustainable development into a globalized economy.

In the process of integrating, the main decision persons in our country establish that it is important to develop actions in standardization domain, in accordance with the practice and principle of international recognition of our national products.

This international recognition of our products and the compatibility between the European standards and our national products, economics, environment and trade

standards represent an important indicator of the way to complete integration of our country in the European community. This means to create new organisms of quality infrastructure, the develop compatibility and consolidation according to the European practice, new institutions for evaluation and accreditation in order to integrate in the European standards.

The standards offer a disposition for the organizations, societies, plant products, trade societies by the European organism – that cooperate with national organisms of standardization.

This standard helps to obtain success for the organization, economics agents, societies, that must know all its settlement (European standard in harmonization with the national standards).

2. ISO - International Organization for Standardization

The ISO 9000 has documentation and procedures that allow understanding all the European norms system from ISO 9001....9020...14200. The Standard is a document that establishes a language for all users in order to promote the circuit of products between sales and buyers and to protect the healthy life style.

The guide ISO/CEI 2:1996 establishes that the standard is a document approved by consent to insurance rules, lines, direction of development and results for obtaining an efficient economical activity.

The standard has technical specifications elaborated by important organisms that developed standardizing activities in the domains such as technologies, industries, economics etc.

The national standard is identifying as *Romanian standard* – SR.

The standard incorporates also the intellectual propriety rights and constitutes an entity for author's right. In Romania the standard benefits of protection according to the Law No. 8/1996 - the reproduction or use integrally or partially the national standards (SR) is admissible just in the written approval of ASRO (Romanian Standards Association).

The standards are in every aspects of life and improve our life style.

2.1. Case analysis

The Standard ISO 14063 analyzes the environment management through directives and examples that allow the enterprise to value the performances in the environment protection. These standards show a transparency in all the performance in the environmental protection domain. The standard ISO 14063 allows the communication strategies and the achievement of economical agents in the domain of the pollution risks. This standard can be applied in all societies that implement the environment management.

Other example is in the AFNOR standard (French National Standardization Organism). AFNOR gives a reference text about the equitable trade – agreement AC X50-340, which presents the three principles of **the equitable trade.** These principles result after the analysis made of four commissions: costumers, administration, trade organizations and greatest distributed.

After a pertinent analysis, it results the three principles of equitable trade:

1. the trade equilibrium of the relationship between partners;
2. the trade understanding between the producer and organizations;
3. informing the customers, beneficiary and public about the principles of equitable trade.

3. National Standards in Relation to the European Standards.

The national activity of standardization is making part of quality infrastructure from Romania. At the basis of this activity is a frame of laws, according to the principles of European norms. The main responsibility of the national infrastructure is in charge of the Ministry of Economy and Trade, National Standardization Organism, Harmonization of National Organism, National Laboratory of Evaluation etc.

The activity of National standardization is recognised by the Governmental Decision: OG nr. 39/1998, Law no. 355/2002 and Law no. 177/2005, through HG 985/2004.

ASRO (Romanian Standards Association) has the mission to evaluate the needs, to create new standards, to coordinate and examine the new standards projects, to disseminate, promote and organize courses of perfecting in the standardization

domain. ASRO represents the interest of Romania in the international instances and it also coordinates the activity of national committee competence in standardization domain.

The quality infrastructure is coordinated by the Strategy of Development on Medium Term, approved in Order of MEC no. 634/2004.

ASRO represents the interest of Romania in the International Standardization process and the company can bring trade advantages, if they participate at standardization activity such as:

- the access to all information in domain;

- the influence of technical contain of the standard;

- diminishing risks for the research and development activity.

4. The Advantage of Standard Usage

The adoption and implementation of European standards in the new country (Romania and Bulgaria) is the most important condition to participate at the unique market.

The European standard represents a powerful competitive modality for the growth of the companies. The standards give solutions for solving and facilitating trade and cooperation in the European community; it also helps the protection of health security and the sustainable development.

The standards must represent a major subject for the government, for economy, for economical agency and for costumers. The technical harmonization includes three concepts: Old Approach, New Approach and Global Approach.

The Old Approach is a technical regulation of European Union that describes technical demands for each product at the highest level.

The New Approach represents a technique of settlement for European Union based on technical harmonization and standardization. The Law harmonization includes the essential demands that the product must satisfy for the free circulation in the European Community framework. The technical specifications of the product are established in the European harmonization standards.

The product made in conformity with the harmonization of European standards benefit by essential demands. The European harmonized standards are published in the Official Journal of the European Community. The essential security task establishes the most important elements for public protection and defines the results that must be obtained. Also they included the risks for health, the procedure that must be followed before the products come in the market. The product must be the mark of the European Community that indicates that the product is according to all procedures and to the security demands (Law no. 608/2002 modified by H.G. nr. 487/2002 and H.G. no. 298/2004.

The State is a Member of the E.U and it must accept that the product with the mark (C.E. conformity) can enter without any problem on the European Union market.

The Global Approach is a technique of settlement of the European Union that establishes:

    a.   practical normative for conformity evaluation:

          -   the appliance of quality management and promotion of agreements that refer to certificate, trust and competence.

The standardization is a strategic tool and it helps the firms to obtain access on the markets. The standard EN (Euro norms) and ISO are documents with technical conditions and criteria used as rules, definitions and guidelines that show that the materials, product, processes and services is according to their purpose.

The use of standards helps the economical changes. An efficient distribution of innovations is a condition for economical growth. The standard is a tool for disseminating new ideas, products and technologies and it has a major contribution to the product. The Standards have the capacity to structure the way in which it functions the activity sectors, the dissemination of knowledge and it develops the market. The application of our national standard provides a new openness at national level.

5. Conclusions

The use of standardize contributes to diminishing the costs of sale and product. It gives economical solutions for the technical problems of new products, performances, costs and new characteristics.

The standards insure a positive effect on the buyer power and self security health against chemical materials, radiations, blast etc. The quality management environment is an introduction for a sustainable development. These standards *can be used in* the audit process. It is important for our society to harmonize our national standards with the European standards because it would obtain:

- most sure, healthy and ecological products and services;

- a good compatibility between the services;

- a decrease of the product and services costs;

- a facility access to the greatest number of types of products and services;

- a very good information on the goods and services;

- the full access with services and product on the European Market.

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British Council Project in Romania the South-East European Network of Creative Cities

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Abstract: A Guidebook to Creative Industries in Iasi, Romania, 2006 is a project initiated by the British Council Centre Iaşi concerning "creative industries". After the conferences and workshops – in Plovdiv with the regional partners, in Iaşi and Bucharest with the British and the local consultants, the team has managed to put into practice one of the key projects it set out to achieve: publishing a unified inventory of the main actors of the industrial-creative sector in Iaşi. The purpose of this project is to bring to the attention of the potential partners and supporters the city's potential for economic and image "re-invention", which "unify" Iaşi through its creative energies and resources and to facilitate the creation of new creative/ profitable partnership projects – in Romania, in the UK and in South-East Europe. This guidebook is the tangible sign of the beginning of the journey.

Keywords: creative industries, mapping survey, network, survey.

Jel Classification: R13, R00 L16

1. Project Introduction

This guidebook is the result of several months of research, and it represents the most important product of a project launched in spring 2005, at the regional UK-SEE Forum in Plovdiv (Bulgaria), by an interdisciplinary team, whose membership/composition was suggested and set up by Ecaterina Petreanu, the manager of the British Council Centre in Iaşi.

The project, funded by the British Council in partnership with institutions and businesses from Iaşi, is called "Building on Success: Towards a Creative Hub", and

it has been launched in June 2005, in Iaşi, during an international workshop, with a plan to be implemented between 2005 and 2006.

The project's main purpose is to make Iaşi a relay of expertise and a model of presenting creative industries, both for the North-East Development Region and for other cities in Romania and in South-East Europe. They felt they could achieve it by studying and presenting a few "success stories" from various domains of creativity, which are well-known to the people of Iaşi, but not yet perceived as belonging to this new concept on the Romanian idea market – "creative industries".

The success stories have been highlighted on the background of field studies that have provided information about the number and the diversity of creative industries present in Iaşi, based on which we compiled a guidebook of the companies and actors in the city, illustrating the economic potential of this sector and the need for it to be promoted.

In order to be able to evaluate the project results, it is important to underline the targets set from the outset. During the international project bid in Plovdiv, the Iaşi team set out to have the following results ten months into the project:

- To create a local and regional partnership in order to develop creative industries in Iaşi;

- To achieve a mapping study following a common methodology with other SEE Forum partners based on UK experience;

- Showcase success stories in creative industries in order to advocate Iaşi as a creative hub;

- To raise awareness about the concept of creative industries and their role in regional development;

- To create a local network of creative industry professionals, politicians, business community, public institutions and NGOs.

From this perspective, the evaluation of the economic potential of creative industries and their role in the city's identity and development could not be achieved without a mapping survey that would provide us with the material background, based on which we would later establish, through quantity and quality analysis, whether Iaşi is truly representative for the creative industries and whether its affiliation to the South-East European network of "creative cities" is justified.

2. Iaşi – Romania's Representative in the South-East European Creative Cities Network

The network built by the British Council in South-East Europe (www.uksee.net) includes one city that is considered as representative for the cultural industries and for the creative potential from the following countries: Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Kosovo, Macedonia, Romania and Serbia-Montenegro. The network is the result of the new perspective on cultural and political entrepreneurship promoted by the British Council for the development of this part of Europe, which was the basis for the "UK-South East European Forum" program.

The forum is an initiative that aims to create alliances and common programs of regional cooperation, between the new generation leaders in South-East Europe, based on British expertise and by encouraging partnerships with the UK.

A better grasp of this region and of the continent in the UK and a common action of these countries, together with the UK within an enlarged Europe are both targets of this program. The forum has three strands: People and Politics, Youth Action and Creative Industries.

The three strands each develop their own projects, but they encourage cooperation and the synergic effects of these projects within the Forum, intending to create contacts and to mediate communication between the young leaders in the area from various domains and with different academic or political backgrounds. Intra-regional alliances and cooperation with the UK are keywords of the Forum.

The network of creative cities in South-East Europe is a project within the creative industries strand, which needs a number of cities in the region to launch and support the concept of de creative industries through events, workshops, seminars, publications of specific projects to the local politicians and the local business community, so that we can talk about a new economic activity as a component of local and regional identity, as well as an instrument for the economic development of the city and of this part of Europe.

Iaşi was chosen as the "creative city" to represent Romania and to be a partner in the South-East Europe network after a very interesting meeting organized by British Council Romania, on October 28, 2004.

All teams coming from Bucharest, Cluj, Iaşi and Timişoara had strong cases to present and the day was a great sharing event and networking opportunity at national level.

The South-East Europe network of "creative cities", established after the Conference in Plovdiv, 13-18 March 2005, includes, next to Iaşi, the following partners: Plovdiv (Bulgaria), Split (Croatia), Novi Sad and Belgrade (Serbia/Montenegro), Tuzla (Bosnia), Pristina (Kosovo), Skopje (Macedonia), Tirana (Albania).

In all these cities, between 2005 and 2007, various larger or smaller projects will be launched, in order to turn the spotlight on the creative potential of the area and to try to establish common objectives and interests, so that the importance of developing and supporting the creative industries will become obvious both for the national and for the regional public.

A crucial component of this program is the focus on regional development. Apart from Tirana and Belgrade, the other cities are, usually, ex-capitals or cities occupying a secondary place in the country economy, marginalized by the centralist policies of the capital city, developing cultural prestige projects in an effort to increase their visibility and thus open up a new channel for financing the local community and government by the use of culture. Linking these cities in a regional network is a way of creating partnerships in South-East Europe, as well as a strategy for counter-balancing the power of the "centre" through means adapted to the new, post-modern perspective, which generates more dynamic, more flexible public policies that are at the same time more effective for the "periphery centers".

The orientation towards encouraging the creative industries seems to be an effective way of creating public-private partnerships or for launching cooperation programs and projects in the area, which will be able to support the development of these cities, most often disadvantaged by the discriminatory allocation of public resources and funds at country level, in favor, usually, of the administrative capitals.

3. The Map of Creative Industries in Iaşi. Basic Data

The classification of creative industries and the determination of the activities which can be integrated in this new economic sector are different from country to country, but, as a rule, as all the mapping research has shown so far all over the world, it

includes the following domains whose activity involves artistic or scientific creativity:

- architecture and urban regeneration;

- art and design;

- performing arts;

- film and video;

- photography;

- industrial inventics and artificial intelligence;

- mass media (written on paper, audio or video);

- fashion and apparel design;

- traditional crafts;

- monuments and cultural tourism;

- music;

- advertising;

- software and interactive video games;

- printing and binding;

- web design.

The methodology we used in the survey in Iaşi follows the common principles we established in the meeting in Split (Croatia), in June 2005, in the workshop organized within the framework of the UK-SEE Forum, called "Mapping Creative Cities", and it starts from the principles applied in this type of research by Calvin Taylor, a professor at the University of Leeds.

In order to have a comprehensive view of this sector, we have analyzed both the private businesses and the culture or media institutions financed from public funds, and we also tried to obtain some data from the individual operators that had the potential of being integrated in this sector.

Theoretical Ground over the Cobweb Model

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Abstract: We propose a theoretical analysis of the linear Cobweb model and making some simulations with help of informatics product with multiple applications in economical research, which is Maple.

Keywords: Cobweb model, simulation, Maple program

Jel Classification: O40, O41

Presentation of Cobweb Model

On some markets including industrial goods with a long cycle of fabrication, the offer can not extend immediately for a greater growth. This way, in order to obtain crops, first it must be planted, it grows and then it is harvested. This process asks for a certain period of time.

Cobweb model is the one that took into consideration the offer reaction at the modifications of the demand from a certain market, through the presumption that the offered quantity now Q_t^{of} depends on the price from a previous period P_{t-1}, that is $Q_t^{of} = f(P_{t-1})$, where the basics shows a period of time. The consumer's demands on the same product market Q_t^{cer} depend on the current price, $Q_t^{cer} = f(P_t)$.

In the case of a linear model of the market forces, we will have:

$$Q_t^{cer} = a + bP_t \quad \text{and} \quad Q_t^{of} = c + d\,P_{t-1}$$

Where a, b, c are the specific function parameters of the demand and supply, and the normal goods b is possibly negative.

The balance of the market involves equalization of the demand and supply, which says:

$$Q_t^{cer}=Q_t^{of} \Rightarrow a+bP_t=c+dP_{t-1} \Rightarrow P_t=(\frac{c-a}{b})+\frac{d}{b}P_{t-1}$$

The last relation shows a difference in the equation of first order, because the prices are different with only one time unit.

In legal terms this equation can be generalized as: $X_t=\alpha+\beta X_{t-1}$, where x shows the variable which modifies at a certain time, and α & β are constant measures as: α=(c-a)/b and β=d/b.

The solution of a different equation of first order has two components:

1) **The balance solution**: in Cobweb model it is as the price balance for a long period of time. As the price balance is the same in every period of time, it means that $P_t=P_{t-1}$, that is the balance solution represents a constant measure in connection with variable adjustment which modifies in time.

We designate P* balance price for a long period of time which maintains in every period, so: P*=P_t=P_{t-1}, and substitute in difference equation $P_t=(\frac{c-a}{b})+\frac{d}{b}P_{t-1}$ we will have: P*=$(\frac{c-a}{b})+\frac{d}{b}$ P*, P*=$\frac{a-c}{d-b}$, in equal mode and with the balance price, with only one period.

2) **The complementary solution**: name the way which the variable, the price of Cobweb model modifies from the balance solution by the time. The difference equation $P_t=(\frac{c-a}{b})+\frac{d}{b}P_{t-1}$, can be written as $P_t=\frac{d}{b}P_{t-1}$, because the first element is not changing in time. We presume that $P_t=Ak^t$ where A and k are constants; this function applies for all t values, so $P_{t-1}=Ak^{t-1}$, and substituting the prices in difference equation, we obtain: $Ak^t=\frac{d}{b}Ak^{t-1}$. The value of A can be shown by knowing a certain measure of the price from a certain period of time.

This way, the final solution of a difference equation Cobweb model will be:

P_t =balance solution +complementary solution: $P_t = (\frac{a-c}{d-b}) + A(\frac{d}{b})^t$

3) Numerical simulations

The final form of the model depends on the value of rapport d/b, which, for values that differ from 0 of A, will create three situations:

a) If $|\frac{d}{b}| < 1$, then $(\frac{d}{b})^t \rightarrow 0$ as so t $\rightarrow \infty$. This situation is registered on a stabile market, as so the deviation from the balance price is becoming smaller. We impose the absolute size of the report because b is negative. See figure 1 and 2.

b) If $|\frac{d}{b}| > 1$, then $(\frac{d}{b})^t \rightarrow \infty$ as so t $\rightarrow \infty$. This situation is registered on an unstable market. During the time, the price will deviate from his balance value, with a bigger size, after a initial deviation. See figure 3 and 4.

c) If $|\frac{d}{b}| = 1$, then $|(\frac{d}{b})^t| = 1$ as so t $\rightarrow \infty$. This situation will be registered on a fluctuant market, the price will change between two levels. See figure 5 and 6.
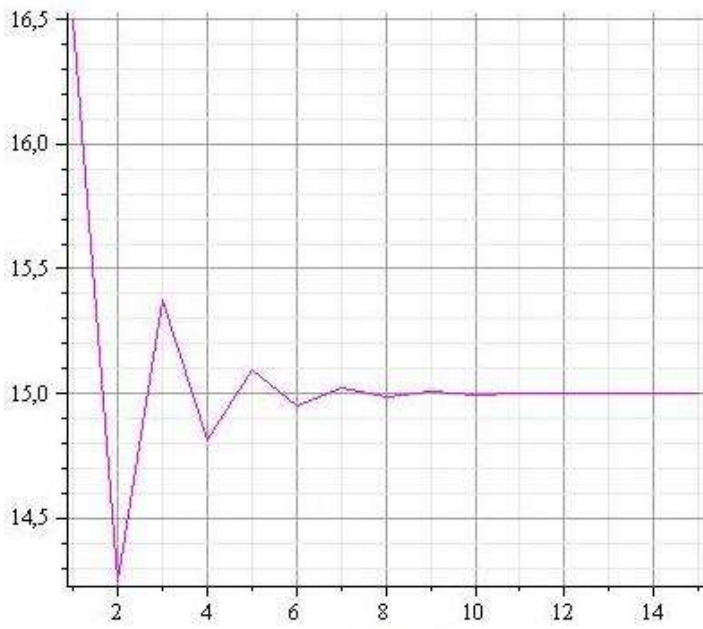
Fig 1 Cobweb Model
convergent-type   k<1
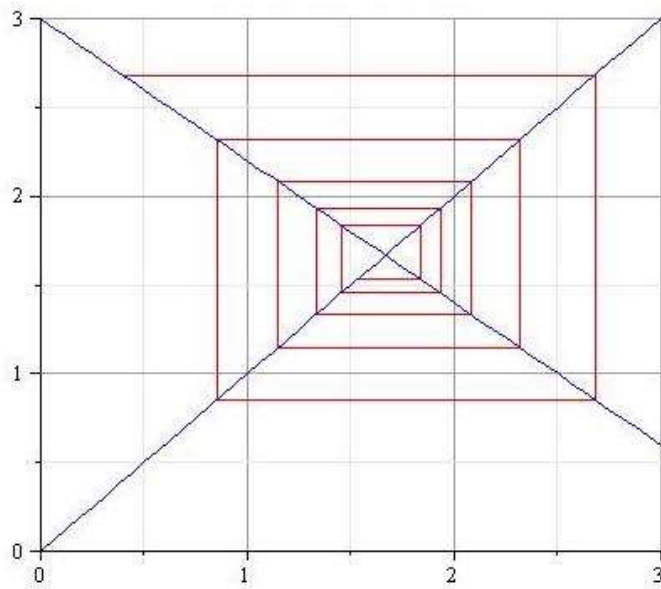
Fig   2   Cobweb Model
convergent-type
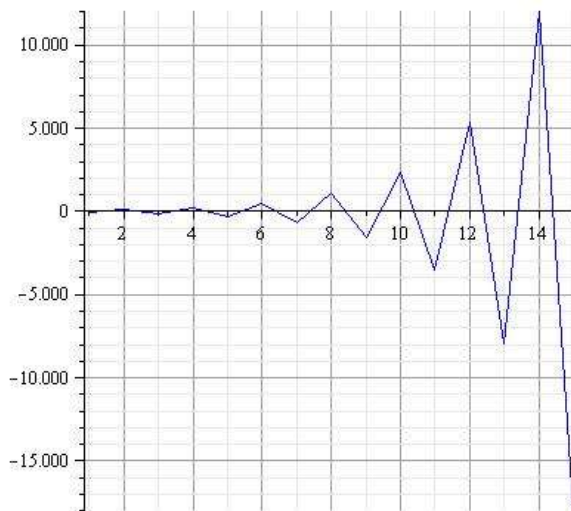
Fig 3 **Cobweb Model**
divergent type k>1
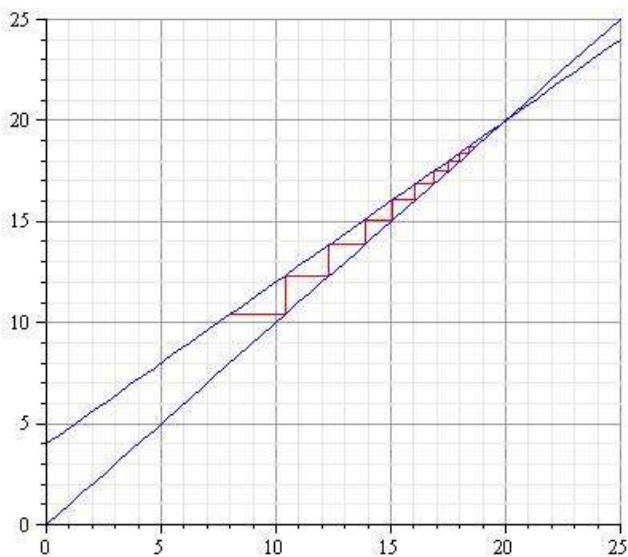
Fig 4 **Cobweb Model**
divergent type
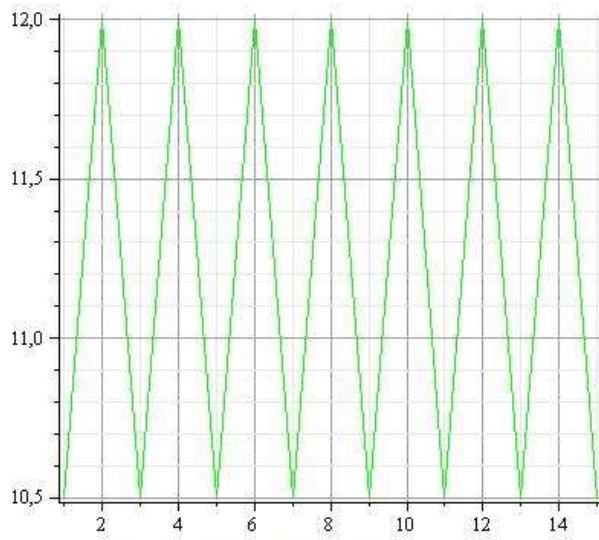
Fig 5   **Cobweb Model**
fluctuant type k=1
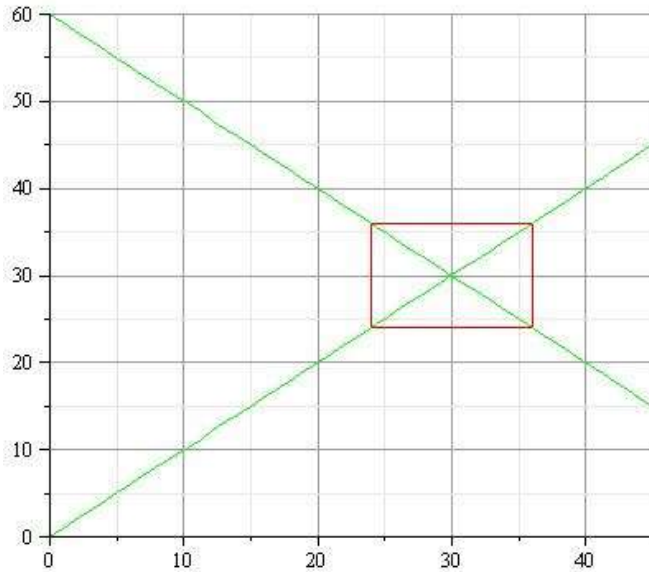
Fig 6   **Cobweb Model**
fluctuant type

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New Methods in Mathematical
Management of Organization

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Abstract: In the first part, we shall unify the principal criterions (Wald, Hurwicz, Savage, Laplace) used in the process of choice the best alternative. After the general theory and few examples who illustrate the drawbacks of the existing criterions, we propose six new choices modalities from other points of view. In the second part, we shall give a new solution for the optimal assignation of workers on jobs from the point of view of execution total time minimization using the Simplex algorithm which can solve the problem using computers instead the known Little's solution. In the third, we shall give a new solution for the optimal assignation of workers on jobs from the point of view of minimization the maximal execution time using the simplex algorithm which can solve the problem using computers instead the known graphical solution. In part four, we shall give a new solution for the optimal assignation of workers on jobs using the Simplex algorithm which can solve the problem using computers instead the known graphical solution. In part five, we shall give a new algorithm instead of Johnson classical in the process of determination the sequence of pieces execution on two installations without initial deliverance times.

Keywords: games theory, Savage, Simplex, assignation, minimization, Electre method

Jel Classification: C70, C35, C30, C15

1.   An Unified Theory Concerning Principal Decision Making Methods

1.1. Introduction

In the process of decision making we have as well as principal methods the following:

- Wald's criterion (the maximin criterion)

- Laplace's criterion

- Hurwicz's optimist criterion

- Savage's regret criterion

Each of these criterions becomes with a series of inconveniences because they broach the problem from a narrow point of view.

For example, let make an analysis of the following problem:

Let a_1, a_2, a_3, a_4 the alternatives and b_1, b_2, b_3, b_4, b_5 uncontrollable states. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	b_3	b_4	b_5
a_1	6	2	8	0	9
a_2	0	3	8	2	3
a_3	0	5	5	1	2
a_4	1	2	3	6	8

If we apply Wald, Hurwicz with 0.1 and Savage we will find that the alternative a_4 is the best, but the Laplace's criterion gives us the alternative a_1.

For the problem:

	b_1	b_2	b_3	b_4	b_5
a_1	8	3	7	2	1
a_2	7	5	3	1	5
a_3	3	4	2	1	9
a_4	5	5	8	2	3

we will find that Wald, Hurwicz with 0.2 and Laplace give us the alternative a_4, but Savage: a_2.

For the problem:

	b_1	b_2	b_3	b_4	b_5
a_1	0	4	1	7	5

a_2	6	9	5	0	2
a_3	8	5	2	5	6
a_4	3	4	5	4	3

we will find that Laplace, Hurwicz with 0.6 and Savage give us the alternative a_3, but Wald: a_4.

For the problem:

	b_1	b_2	b_3	b_4	b_5
a_1	3	7	6	8	3
a_2	1	5	9	9	2
a_3	6	8	1	7	0
a_4	0	9	2	0	0

we will find that Laplace, Wald and Savage give us the alternative a_1, but Hurwicz with 0.7: a_2.

Another example gives us for each criterion another alternative:

	b_1	b_2	b_3	b_4	b_5
a_1	7	2	10	6	2
a_2	9	10	2	1	8
a_3	5	3	6	4	8
a_4	5	6	9	2	6

- Wald's criterion gives us a_3
- Laplace's criterion gives us a_2
- Hurwicz's optimist criterion with 0.6 gives us a_1
- Savage's regret criterion gives us a_4

It is therefore a necessity to broach the problem from two points of view: to create a general criterion applicable on all situations and which recover in particular cases the upper criterions and, on the other hand, to create departing from this general criterion other news.

1. 2. The general problem and criterion

Let $A=\{a_1,\ldots,a_m\}$ the set of the alternatives and $B=\{b_1,\ldots,b_n\}$ the set of uncontrollable states. The payoffs for each pair (a_i,b_j) are c_{ij}, $i=\overline{1,m}$, $j=\overline{1,n}$.

We shall group in what follows the uncontrollable states in $p>=1$ subsets of B: $G_k=\{b_{j_{k-1}+1},\ldots,b_{j_k}\}$, $k=\overline{1,p}$ where $0=j_0<j_1<\ldots<j_p=n$. These subsets can appear, for example, in the process of grouping the states after their origin.

To each group G_k we assign a risk coefficient $\omega_k\in[0,1]$, $k=\overline{1,p}$ and a weight in decision $\eta_k\in[0,1]$, $k=\overline{1,p}$ such that $\sum_{k=1}^{p}\eta_k=1$.

For each state b_j we note with R_j, $j=\overline{1,n}$ the potential gain if we know apriority the occurrence of b_j.

Finally, let group the alternatives A in q subsets: $H_v=\{a_{i_{v-1}+1},\ldots,a_{i_v}\}$, $v=\overline{1,q}$ where $0=i_0<i_1<\ldots<i_q=m$ and for each H_v we assign a coefficient of preference $\lambda_v\in[0,1]$, $v=\overline{1,q}$. Even if at the first sight all the alternatives are equals in probability, in fact the factor of decision has preferences and he split A in the subsets H_v with coefficients of preference λ_v.

We shall define for each row the function:

$$f(i)=sgn\left(1-2sgn\left(\sum_{j=1}^{n}R_j^2\right)\right)\sum_{k=1}^{p}\eta_k\left(\omega_k\max_{j_{k-1}+1\leq s\leq j_k}(c_{is}-R_s)+(1-\omega_k)\min_{j_{k-1}+1\leq s\leq j_k}(c_{is}-R_s)\right)$$

called the expected gain function.

We define the selection group function:

$$g(v)=\lambda_v\max_{i_{v-1}+1\leq s\leq i_v}f(s)+(1-\lambda_v)\min_{i_{v-1}+1\leq s\leq i_v}f(s),\ v=\overline{1,q}$$

The alternative's group finally selected is that H_r for which

$$g(r)=sgn\left(1-2sgn\left(\sum_{j=1}^{n}R_j^2\right)\right)\max_{1\leq v\leq q}\left(sgn\left(1-2sgn\left(\sum_{j=1}^{n}R_j^2\right)\right)g(v)\right)$$

The final alternative is that for which the difference $\left|f(i)-g(r)\right|$, $i=\overline{i_{r-1}+1,i_{r}}$ is minimum.

The table of values and strategies of α and β respectively has the following format:

<div align="center">p groups</div>

q groups	α/β		...	G_k			...	f	g
			...	ω_k / η_k			...		
			...	$b_{j_{k-1}+1}$	...	b_{j_k}	...		
	...	...	...	...	...	...	...	...	...
	H_v	$a_{i_{v-1}+1}$	...	$c_{i_{v-1}+1,j_{k-1}+1}$	...	$c_{i_{v-1}+1,j_k}$	...	$f(i_{v-1}+1)$	
	λ_v	...	...	...	...	...	...	...	$g(v)$
		a_{i_v}	...	$c_{i_v,j_{k-1}+1}$	...	c_{i_v,j_k}	...	$f(i_v)$	
	...	...	...	...	...	...	...	...	...
			...	$R_{j_{k-1}+1}$	...	R_{j_k}	...		$\displaystyle\max_{1\leq v\leq q} g(v)$ $/ \displaystyle\min_{1\leq v\leq q} g(v)$

1.3. Particular cases

We shall present, in what follows, the values of the expected gain function f corresponding at different values of p and R_j, $j=\overline{1,n}$ respectively.

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

p	R_j	f(i)
1	$\displaystyle\sum_{j=1}^{n} R_j^2 = 0$	$\omega_1 \displaystyle\max_{1\leq s\leq n}(c_{is}) + (1-\omega_1)\displaystyle\min_{1\leq s\leq n}(c_{is})$

1	$\sum_{j=1}^{n} R_j^2 \neq 0$	$\omega_1 \min_{1 \leq s \leq n}(R_s - c_{is}) + (1 - \omega_1)\max_{1 \leq s \leq n}(R_s - c_{is})$
1<p<n	$\sum_{j=1}^{n} R_j^2 = 0$	$\sum_{k=1}^{p} \eta_k \left(\omega_k \max_{j_{k-1}+1 \leq s \leq j_k}(c_{is}) + (1 - \omega_k) \min_{j_{k-1}+1 \leq s \leq j_k}(c_{is}) \right)$
1<p<n	$\sum_{j=1}^{n} R_j^2 \neq 0$	$\sum_{k=1}^{p} \eta_k \left(\omega_k \min_{j_{k-1}+1 \leq s \leq j_k}(R_s - c_{is}) + (1 - \omega_k) \max_{j_{k-1}+1 \leq s \leq j_k}(R_s - c_{is}) \right)$
n	$\sum_{j=1}^{n} R_j^2 = 0$	$\sum_{k=1}^{n} \eta_k c_{ik}$
n	$\sum_{j=1}^{n} R_j^2 \neq 0$	$\sum_{k=1}^{n} \eta_k (R_k - c_{ik})$

The selection group function is for q=m ($i_0=0, i_1=1,..., i_m=m$):

$$g(v) = \lambda_v \max_{v \leq s \leq v} f(s) + (1 - \lambda_v)\min_{v \leq s \leq v} f(s) = \lambda_v f(v) + (1-\lambda_v)f(v) = f(v), \ v = \overline{1, m}$$

If q=1 then: $i_0=0, i_1=m$ therefore:

$$g(1) = \lambda_1 \max_{1 \leq s \leq m} f(s) + (1 - \lambda_1)\min_{1 \leq s \leq m} f(s)$$

If $R_j=0, j = \overline{1, n}$ we have that the alternative's group finally selected is that H_r for which:

$$g(r) = \max_{1 \leq v \leq q}(g(v))$$

and if $\exists j = \overline{1, n}$ such that $R_j \neq 0$ follows:

$$g(r) = -\max_{1 \leq v \leq q}(-g(v)) = \min_{1 \leq v \leq q}(g(v))$$

1.4. Known criterions like particular cases

1.4.1. Hurwicz's criterion

For p=1, q=m, $R_j=0$, $j=\overline{1,n}$ we have that: $f(i)=\omega_1 \max\limits_{1\le s\le n}(c_{is})+(1-\omega_1)\min\limits_{1\le s\le n}(c_{is})$ and $g(v)=f(v)$, $v=\overline{1,m}$.

The best alternative is that a_r for which $g(r)=\max\limits_{1\le v\le m}f(v)$.

The extreme values of ω_1 are:

- $\omega_1=0$ who lead us to the expected gain function: $f(i)=\min\limits_{1\le s\le n}(c_{is})$ and after: $g(r)=\max\limits_{1\le v\le m}f(v)=\max\limits_{1\le v\le m}\min\limits_{1\le s\le n}(c_{vs})$ - α showing a pessimistic maximum in the choice of the strategy;

- $\omega_1=1$ who lead us to the expected gain function $f(i)=\max\limits_{1\le s\le n}(c_{is})$ and after: $g(r)=\max\limits_{1\le v\le m}f(v)=\max\limits_{1\le v\le m}\max\limits_{1\le s\le n}(c_{vs})$ - α showing an optimistic maximum in the choice of the strategy.

If the first strategy, corresponding to $\omega_1=0$ is a little realistic (punting on a doubtless gain), the second is totally irrational, α ignoring all the opponent's actions (hoping in the weakest choice of β).

Example

Let a_1, a_2 the alternatives of α and b_1, b_2 the uncontrollable states of β. The payoffs for each pair (a_i,b_j) are c_{ij} and are find out in the following table where with $\omega_1=0,6$ we shall apply the Hurwicz criterion:

	b_1	b_2	$c_i=\min\limits_{j=1,...,n} c_{ij}$	$C_i=\max\limits_{j=1,...,n} c_{ij}$	$0,6C_i+0,4c_i$
a_1	10	20	10	20	16
a_2	-10	100	-10	100	56

The maximum of the quantities in the last column is 56, therefore the alternative a_2 will be the best from the point of view of Hurwicz's criterion.

If we shall carefully analyze the upper table, we shall see that α will win in the situation of a_2 if and only if β will choose the state b_2. On the other hand, β will never choose this strategy, because regardless what α will adopt, he will lose. Like a consequence we can say that the Hurwicz's criterion is good when the values corresponding to the rows of the table will be near on to the other, the differencies between minimal and maximal values being little.

1.4.2. Wald's criterion

The Wald's criterion is a particular case of Hurwicz's for $\omega_1=0$. Like in the preceding criterion, those of Wald neglected much of the information, treating only minimal values on rows.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2 the uncontrollable states of β. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	$\min\limits_{j=1,\dots,n} c_{ij}$
a_1	0,9	100	0,9
a_2	1	2	1

The maximum quantities in the last column is 1, therefore the alternative a_2 will be the best after Wald.

If we shall examine carrefully the upper table, we shall see that α will gain with one unit. It is hard to believe that α not choose the alternative a_1, because this can bring an earning between 0,9 to 100 units.

1.4.3. Laplace's criterion

For p=n and $R_j=0$, $j=\overline{1,n}$ we have: $f(i)=\sum\limits_{k=1}^{n}\eta_k c_{ik}$. If $\eta_k=\dfrac{1}{n}$, $k=\overline{1,n}$ then we obtain:

$f(i)=\dfrac{1}{n}\sum\limits_{k=1}^{n}c_{ik}$. For q=m we have: $g(v)=f(v)$, $v=\overline{1,m}$.

The winner group of strategies will be a_r for which $g(r)=\max\limits_{1\le v\le m} g(v)$.

The Laplace's criterion has like drawback the equal treatment of all actions of β. In fact, β looking at the values can prefer one or other from his alternatives, who leads to an inequality in the probabilities upper considered.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2 the uncontrollable states of β. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	$\frac{1}{2}b_1 + \frac{1}{2}b_2$
a_1	-10	10	0
a_2	-10	20	5

The maximum in the last column is 5, therefore the alternative a_2 will be choosed after Laplace's criterion.

We can easily see that if α will choose the alternative a_2, he will win if β will choose the strategy b_2. On the other hand, β will choose always b_1 that brings it, regardless α 10 units. As a conclusion, the actions of β cannot have equal probability, in the upper case the probability of β to choose b_1 being 1 and for b_2 being 0.

1.4.4. Savage's criterion

For p=1, $\omega_1 = 0$ and $R_j = \max\limits_{1 \le i \le m} c_{ij}$, $j = \overline{1, n}$, respectively q=m we have: $f(i) = \max\limits_{1 \le s \le n}(R_s - c_{is})$ and g(v)=f(v), $v = \overline{1, m}$. The winner alternative will be those a_r for which $g(r) = \min\limits_{1 \le v \le m}(g(v))$.

The Savage's criterion bring us, at the first sight, a new point of view.

A number of remarks appear however: Savage defines the regret like difference between how much can α win if he had known apriori the decision of β and how much he wins in fact. This definition is credible, but pushes this notion to an extreme. Maybe, in fact a best regret's definition can be an average (with differents weights or not) of possible gains. Also, finally the last section of this algorithm uses

the minimax criterion; therefore like in the precedings criterions it not takes in calculus all the values on rows.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2 the uncontrollable states of β. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table:

	b_1	b_2
a_1	-98	101
a_2	1	1
$\max\limits_{1 \le i \le m} c_{ij}$	1	101

The regrets table is:

	b_1	b_2	$\max\limits_{1 \le s \le n}(R_s - c_{is})$
a_1	99	0	99
a_2	0	100	100

After the minimax criterion we find that the alternative a_1 is the best. We can see that this decision has the highest risk (α can win 101 units, but he can loose also 98 units). The alternative a_2 is, in this case a little practical (it guarantees an earning of 1 unit in any situation).

1.5. New criteria

In what follows, we shall suggest a few criterions deduced from the general formulas.

1.5.1. Hurwicz-Savage's criterion

For $p=1$, $\omega_1 \neq 0$ and $R_j = \max\limits_{1 \le i \le m} c_{ij}$, $j = \overline{1, n}$, respectively $q=m$ we have:

$f(i) = \omega_1 \min_{1 \le s \le n}(R_s - c_{is}) + (1 - \omega_1)\max_{1 \le s \le n}(R_s - c_{is})$ and $g(v)=f(v)$, $v=\overline{1,m}$.

The winner alternative will be a_r for which $g(r) = \min_{1 \le v \le m}\big(g(v)\big)$.

This criterion proposes the determination of the best strategy, assigning a risk factor $\omega_1 \ne 0$ in the process of regrets analyzing.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2 the uncontrollable states of β. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table, where $\omega_1=0,6$:

	b_1	b_2
a_1	10	20
a_2	-10	100
$\max\limits_{1 \le i \le m} c_{ij}$	10	100

	b_1	b_2	$c_i = \min\limits_{j=1,\dots,n} c_{ij}$	$C_i = \max\limits_{j=1,\dots,n} c_{ij}$	$0,6C_i + 0,4c_i$
a_1	0	80	0	80	48
a_2	20	0	0	20	12

From the last column we see that the strategy a_1 will be the best following this criterion.

We can see that this example is those from Hurwicz's criterion, the alternative a_1, obtained here, being acceptable in comparasion with those of Hurwicz.

1.5.2. Weight Laplace's criterion

For p=n and $R_j=0$, $j=\overline{1,n}$ we have: $f(i) = \sum\limits_{k=1}^{n} \eta_k c_{ik}$ with $\sum\limits_{k=1}^{p} \eta_k = 1$. For q=m we have: $g(v)=f(v)$, $v=\overline{1,m}$.

The winner alternative will be a_r for which $g(r) = \max_{1 \le v \le m} g(v)$.

The Weight Laplace's criterion is a refinement of the classical criterion, assigning to the strategies of β, differents probabilities.

The principal problem who arrived here is that of the choice modality of the weights η_k, $k=\overline{1,n}$.

1.5.3. Proportionally weight Laplace's criterion

For p=n and R_j=0, $j=\overline{1,n}$ we have: $f(i)=\sum_{k=1}^{n}\eta_k c_{ik}$ with $\sum_{k=1}^{p}\eta_k =1$.

We shall compute first: $\nu_k=\sum_{t=1}^{m}c_{tk}$, $k=\overline{1,n}$ that is the sum of gains corresponding to the k-th column.

If $\max_{p=1,n}\nu_p = \min_{p=1,n}\nu_p$ then ν_k=constant, $k=\overline{1,n}$. In this case, we shall apply the Laplace's criterion with all weights equal: $\eta_k=\dfrac{1}{n}$.

If $\max_{p=1,n}\nu_p > \min_{p=1,n}\nu_p$, we shall compute: $\varepsilon_k=\dfrac{\max_{p=1,n}\nu_p - \nu_k}{\max_{p=1,n}\nu_p - \min_{p=1,n}\nu_p}$, $k=\overline{1,n}$ and, finally:

$\eta_k=\dfrac{\varepsilon_k}{\sum_{p=1}^{n}\varepsilon_p}$,$k=\overline{1,n}$. We have therefore: $\eta_k=\dfrac{\dfrac{\max_{s=1,n}\sum_{t=1}^{m}c_{ts} - \sum_{t=1}^{m}c_{tk}}{\max_{s=1,n}\sum_{t=1}^{m}c_{ts} - \min_{s=1,n}\sum_{t=1}^{m}c_{ts}}}{\sum_{p=1}^{n}\dfrac{\max_{s=1,n}\sum_{t=1}^{m}c_{ts} - \sum_{t=1}^{m}c_{tp}}{\max_{s=1,n}\sum_{t=1}^{m}c_{ts} - \min_{s=1,n}\sum_{t=1}^{m}c_{ts}}}$, $k=\overline{1,n}$.

For q=m we have: $g(v)=f(v)$, $v=\overline{1,m}$.

The winner alternative will be a_r for which $g(r)=\max_{1\leq v\leq m} g(v)$.

The proportionally weight Laplace's criterion propose a rational choice of β's probabilities of action because, how much the values corresponding to a column of β

are less (designiting β's loses) so much the values ε_k will be elder and, implicit, those of η_k.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2, b_3 the uncontrollable states of β. The payoffs for each pair (a_i,b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	b_3	$\frac{1}{3}b_1+\frac{1}{3}b_2+\frac{1}{3}b_3$
a_1	-10	10	6	2
a_2	-15	20	7	4

Applying the Laplace criterion we have that the alternative a_2 is the best.

We can easily see that if α choose a_2, he win if β will choose b_2 or b_3. On the other hand, β will choose always the strategy b_1 that brings a greater gain than or equal with 10 units.

We shall apply now, the proportionally weight Laplace's criterion.

We have first: $\nu_1=-10-15=-25$, $\nu_2=10+20=30$, $\nu_3=6+7=13$, from where $\max\{\nu_1,\nu_2,\nu_3\}=30$, $\min\{\nu_1,\nu_2,\nu_3\}=-25$.

We have therefore:

$$\varepsilon_1=\frac{30+25}{55}=1, \; \varepsilon_2=\frac{30-30}{55}=0, \; \varepsilon_3=\frac{30-13}{55}=\frac{17}{55}$$

and finally:

$$\eta_1=\frac{1}{1+0+\frac{17}{55}}=\frac{55}{72}, \; \eta_2=0, \; \eta_3=\frac{\frac{17}{55}}{\frac{72}{55}}=\frac{17}{72}$$

The table is:

	55/72	0	17/72	
	b_1	b_2	b_3	$\dfrac{55}{72}\,b_1 + 0 \cdot b_2 + \dfrac{17}{72}\,b_3$
a_1	-10	10	6	-448/72
a_2	-15	20	7	-706/72

The maximum value in the last column is -448/72 therefore the best alternative will be a_1 - most rationally because β will choose b_1 and α will loose less.

1.5.4. Proportionally weight with regrets Laplace's criterion

For p=n and $R_j = \max\limits_{1 \le i \le m} c_{ij}$, $j = \overline{1, n}$ we have: $f(i) = \sum\limits_{k=1}^{n} \eta_k (R_k - c_{ik})$ with $\sum\limits_{k=1}^{p} \eta_k = 1$.

We shall compute the weights η_k like in the preceding criterion but, in this case, for the regrets table of β.

First, we shall compute, the regrets: $S_i = \max\limits_{1 \le j \le n} (-c_{ij}) = -\min\limits_{1 \le j \le n} c_{ij}$, $i = \overline{1, m}$ and after we shall build the regrets table of β, having the elements $d_{ik} = -c_{ik} - S_i = \min\limits_{1 \le j \le n} c_{ij} - c_{ik}$, $i = \overline{1, m}$, $k = \overline{1, n}$.

Determining after: $v_k = \sum\limits_{t=1}^{m} d_{tk}$, $k = \overline{1, n}$ that is the sum of gains in the column k, we have that if $\max\limits_{p=1,n} v_p = \min\limits_{p=1,n} v_p$ then v_k=constant, $k = \overline{1, n}$. In this case we shall apply the Laplace's criterion with equal weights: $\eta_k = \dfrac{1}{n}$.

If $\max\limits_{p=1,n} v_p > \min\limits_{p=1,n} v_p$, we compute: $\varepsilon_k = \dfrac{v_k - \min\limits_{p=1,n} v_p}{\max\limits_{p=1,n} v_p - \min\limits_{p=1,n} v_p}$, $k = \overline{1, n}$ and, finally:

$\eta_k = \dfrac{\varepsilon_k}{\sum\limits_{p=1}^{n} \varepsilon_p}$, $k = \overline{1, n}$. We have therefore:

$$\eta_k = \cfrac{\cfrac{\sum\limits_{t=1}^{m} d_{tk} - \min\limits_{s=1,n} \sum\limits_{t=1}^{m} d_{ts}}{\max\limits_{s=1,n} \sum\limits_{t=1}^{m} d_{ts} - \min\limits_{s=1,n} \sum\limits_{t=1}^{m} d_{ts}}}{\sum\limits_{p=1}^{n} \cfrac{\sum\limits_{t=1}^{m} d_{tp} - \min\limits_{s=1,n} \sum\limits_{t=1}^{m} d_{ts}}{\max\limits_{s=1,n} \sum\limits_{t=1}^{m} d_{ts} - \min\limits_{s=1,n} \sum\limits_{t=1}^{m} d_{ts}}} , \ k = \overline{1, n}$$

For q=m we find that: $g(v)=f(v)$, $v=\overline{1, m}$.

The winner alternative will be a_r for which $g(r) = \min\limits_{1 \leq v \leq m}(g(v))$.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2, b_3 the uncontrollable states of β. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	b_3	$\min\limits_{1 \leq j \leq n} c_{ij}$
a_1	-10	10	6	-10
a_2	-15	20	7	-15
$\max\limits_{1 \leq i \leq m} c_{ij}$	-10	20	7	

The regrets table of β (*in terms of gains of α*) is:

	b_1	b_2	b_3
a_1	0	-20	-16
a_2	0	-35	-22

We have therefore:

$v_1=0$, $v_2=-55$, $v_3=-38$, from where: $\max\{v_1, v_2, v_3\}=0$, $\min\{v_1, v_2, v_3\}=-55$.

$$\varepsilon_1 = \frac{0+55}{0+55} = 1, \ \varepsilon_2 = \frac{-55+55}{0+55} = 0, \ \varepsilon_3 = \frac{-38+55}{0+55} = \frac{17}{55}$$

$$\eta_1 = \frac{1}{1+0+\dfrac{17}{55}} = \frac{55}{72}\ ,\ \eta_2 = 0,\ \eta_3 = \frac{\dfrac{17}{55}}{\dfrac{72}{55}} = \frac{17}{72}$$

The regrets table of α will be:

	55/72	0	17/72	
	b_1	b_2	b_3	$\dfrac{55}{72}\,b_1 + 0\cdot b_2 + \dfrac{17}{72}\,b_3$
a_1	0	10	1	17/72
a_2	5	0	0	275/72

The minimum of the last column being 17/72 it follows that the best strategy is a_1.

1.5.5. Regrets Laplace's criterion

For p=n and $R_j = \max\limits_{1\le i\le m} c_{ij}$, $j = \overline{1, n}$, we have: $f(i) = \sum\limits_{k=1}^{n} \eta_k (R_k - c_{ik})$ with $\sum\limits_{k=1}^{p} \eta_k = 1$. If we shall choose $\eta_k = \dfrac{1}{n}$, and after, for q=m, we have that: g(v)=f(v), $v = \overline{1, m}$.

The winner alternative will be a_r for which $g(r) = \min\limits_{1\le v\le m}\big(g(v)\big)$.

Example

Let a_1, a_2 the alternatives of α and b_1, b_2, b_3 the uncontrollable states of β. The payoffs for each pair (a_i, b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	b_3
a_1	-10	10	6
a_2	-15	20	7
$\max\limits_{1\le i\le m} c_{ij}$	-10	20	7

The regrets table of α is:

	b$_1$	b$_2$	b$_3$	$\frac{1}{3}$ b$_1$+ $\frac{1}{3}$ b$_2$+ $\frac{1}{3}$ b$_3$
a$_1$	0	10	1	11/3
a$_2$	5	0	0	5/3

The best alternative from this criterion is a$_2$ but from the facts exposed upper this is not acceptable.

1.5.6. The nostalgia criterion

This criterion alludes, in fact, to the final selection of the alternative. After each of the exposed criterions we obtain a series of values of the function f which in the absence of regrets is maximized, and in the presence - minimized.

In many cases, we can group the alternatives of α in categories, clases after the satisfactions offered in the past. We can also group, for example, after the implement expenses of those (*advertising if the problem study the launching of a product*).

Thus, we shall associate to each q groups of alternatives of α a coefficient of importance λ_v, $v=\overline{1,q}$. We shall after determine the selection function: $g(v)=\lambda_v \max\limits_{i_{v-1}+1\leq s\leq i_v} f(s) + (1-\lambda_v) \min\limits_{i_{v-1}+1\leq s\leq i_v} f(s)$, $v=\overline{1,q}$ acting after like in section 2 that is: the alternative's group finally selected is that H$_r$ for which

$$g(r)=sgn\left(1-2sgn\left(\sum_{j=1}^{n}R_j^2\right)\right)\max_{1\leq v\leq q}\left(sgn\left(1-2sgn\left(\sum_{j=1}^{n}R_j^2\right)\right)g(v)\right)$$

and the final alternative is that for which the difference $\left|f(i)-g(r)\right|$, $i=\overline{i_{r-1}+1,i_r}$ is minimum.

The groups of alterantives will be determined, in principle, arbitrary. We can group, for example, in good, medium or weak strategies after the sum of gains. The coeficcients λ_v will be determined after the method indicated in the proportionally weight Laplace's criterion applied on the rows of the groups.

We have therefore the following steps:

We compute first: v_v, $v=\overline{1,q}$ - the sum of gains of the group v.

If $\max\limits_{p=1,q} v_p = \min\limits_{p=1,q} v_p$ then v_v=constant, $v=\overline{1,q}$. In this case, it follows that isn't a preference for one of the group, and the algorithm will be close like those initial.

If $\max\limits_{p=1,q} v_p > \min\limits_{p=1,q} v_p$, we compute: $\varepsilon_v = \dfrac{v_v - \min\limits_{p=1,q} v_p}{\max\limits_{p=1,q} v_p - \min\limits_{p=1,q} v_p}$, $v=\overline{1,q}$ and, finally:

$\lambda_v = \dfrac{\varepsilon_v}{\sum\limits_{p=1}^{q} \varepsilon_p}$, $v=\overline{1,q}$.

Example

Let a_1, a_2, a_3, a_4 the alternatives of α and b_1, b_2, b_3 the uncontrollable states of β. The payoffs for each pair (a_i,b_j) are c_{ij} and are find out in the following table:

	b_1	b_2	b_3	$\min\limits_{1\le i\le m} c_{ij}$
a_1	10	10	6	6
a_2	-15	-9	7	-15
a_3	-5	40	50	-5
a_4	30	-8	6	-8

If we apply the Wald criterion we have that the best alternative is a_1.

We shall broach in a different way the problem. The sum on the rows is:

	b_1	b_2	b_3	$\sum\limits_{j=1}^{n} c_{ij}$
a_1	10	10	6	26
a_2	-15	-9	7	-17
a_3	-5	40	50	85
a_4	3	-8	6	28

We shall therefore group the alternatives a_1 and a_2 which offer the less prices and a_3 with a_4. Let therefore: $H_1=\{a_1,a_2\}$ and $H_2=\{a_3,a_4\}$.

We have now: $\nu_1=26-17=9$, $\nu_2=85+28=113$ and $\max\{\nu_1,\nu_2\}=113$, $\min\{\nu_1,\nu_2\}=9$.

Because $\varepsilon_1=\dfrac{9-9}{113-9}=0$, $\varepsilon_2=\dfrac{113-9}{113-9}=1$ we obtain: $\lambda_1=0$ and $\lambda_2=1$.

The selection function is:

- $g(1)=\lambda_1 \max_{1\le s\le 2} f(s)+(1-\lambda_1)\min_{1\le s\le 2} f(s)=\min_{1\le s\le 2} f(s)=\min\{26,-17\}=-17$.

- $g(2)=\lambda_2 \max_{3\le s\le 4} f(s)+(1-\lambda_2)\min_{3\le s\le 4} f(s)=\max_{3\le s\le 4} f(s)=\max\{85,28\}=85$.

The winner group is those for which:

$$g(r)= \max_{1\le v\le q}\big(g(v)\big)=\max\{g(1),g(2)\}=85$$

If we compute now the differences: $\left|f(i)-g(r)\right|$ $i=3,4$ we obtain: $\left|f(3)-g(2)\right|=\left|85-85\right|=0$ şi $\left|f(4)-g(2)\right|=\left|28-85\right|=57$ from which the best alternative is a_3.

2. The Optimal Assignation of Workers from the Point of View of Execution Total Time Minimization

2.1. Introduction

The problems of assignation appear usual in the process of targets allocation in an institution.

Let consider $A=\{A_1,...,A_n\}$ the set of workers in an institution and $L=\{L_1,...,L_m\}$ the set of jobs which must be executed at a specific moment. In the execution of L_j, the worker A_i spend a time equal with t_{ij} units (hours, minutes, seconds etc.). Supposing thet it exists workers which can execute a lot of jobs we put the problem of allocation on jobs such that the total time spending in the execution to be minimum.

We shall assign an infinte value to t_{ij} if A_i is not able to execute the job L_j. Also, we shall understand that the number of workers is equal with those of jobs, in the opposite case introducing fictional workers or jobs with infinte times of execution to prevent the allocation of them.

The method of Little suggest the following steps:

Step 1 It is build the table of times (with workers on columns and jobs on rows) and after we shall compute the minimum on each row. After this we subtract these values from those of rows, compute the minimum on each column and after also, we shall subtract these from the values on the columns. After this step, on each row or column is at least one value equal with 0.

Step 2 We shall compute the sum of all elements subtracted from rows and columns and noted with S_1.

Step 3 For each element equal with 0 in the last table, we shall compute the quantities $\mu_{ij}=\min\ \{t_{ik}\,|\,k\neq j\}+\min\{t_{pj}\,|\,p\neq i\}$ or, in other words, the sum of the elements on the row and column corresponding to the null quantity. After this, we shall determine the maximum of that values and the appropriate allocation (s,r). We shall build a tree graph where the initial knot comes with the value S_1. We shall build after a bend where we shall put the activities (s,r) and non(s,r) who will come with the values α_{sr} and $\beta_{sr}=S_1+\mu_{sr}$ respectively.

Step 4 We shall erase the row s and the column r and we shall act like in the first step.

Step 5 We shall compute S_2 like sum of the elements of minimum of rows and columns and we shall modify the indicator $\alpha_{sr}=S_1+S_2$.

Step 6 If the simplified table will has only one row and column the algorithm will close. If not it will be choose the minimum between α_{sr} and β_{sr}. If both values will be equal we shall choose the value α_{sr} appropriate to an allocation and not to a reject of allocation.

Step 7 If the choiced value was α_{sr} we shall return at the step 3.

Step 8 If the choiced value was β_{sr} then we shall consider in the table previously of step 1: $t_{sr}=\infty$ and we shall compute the minimum of row s and column r, subtract these form the appropriate row and column and return at the third step.

We can see that the algorithm is a little hard therefore we shall propose in what follows a new method based on the Simplex algorithm.

2.2. The new method

Let consider $A'=\{A_1,...,A_{n'}\}$ the set of workers in an institution and $L'=\{L_1,...,L_{m'}\}$ the set of jobs which must be executed at a specific moment.

Let therefore $f:A'\rightarrow P(L')$, $f(A_i)=\{L_{i_1},...,L_{i_k}\}$ $\forall i=1,...,n'$ the function who assign to A_i the jobs: $L_{i_1},...,L_{i_k}$ which he can realize if he has the necessary qualification for at least one job and $f(A_i)=\varnothing$ in opposite cases.

We shall restrict the set A' and we shall consider, from the beginning, the subset of those workers for which $f(A_i)\neq\varnothing$ $\forall A_i\in A$. We shall note therefore $A=\{A_1,...,A_n\}$ with $n\leq n'$ (*after a possible renotation of workers*). Let now (*again after a possible renotation of workers*): $\bigcup\limits_{i=1}^{n} f(A_i)=\{L_1,...,L_m\}$ with $m\leq m'$. If $m<m'$ we have that the jobs $L_{m+1},...,L_{m'}$ cannot be executed from any workers, therefore will be excludes.

Finally, let consider: $L=\{L_1,...,L_m\}$ and the new allocation function: $f:A\rightarrow P(L)$.

We shall define a matrix:

$$M=\begin{matrix} & L_1 & ... & L_m & \\ \begin{pmatrix} a_{11} & ... & a_{1m} \\ ... & ... & ... \\ a_{n1} & ... & a_{nm} \end{pmatrix} & & & & \begin{matrix} A_1 \\ ... \\ A_n \end{matrix} \end{matrix}$$

where $a_{ij}=1$ if the worker A_i can execute the job L_j and 0 in the other cases.

Let now consider the matrix $A=(\alpha_{ij})$ where:

$$\alpha_{ij}=\begin{cases} 1 \text{ if the worker } A_i \text{ will nominate in the execution of } L_j \\ 0 \text{ if the worker } A_i \text{ will not nominate in the execution of } L_j \end{cases}$$

We shall, like in the previous section, build the matrix $T=(t_{ij})$ of execution times, assigning $t_{ij}=\infty$ if A_i cannot execute L_j.

In a distinction with Little's method we shall not enjoin restrictions to the number of workers or jobs.

Let now the matrix $B=(\alpha_{ij}a_{ij})$ who's elements belong to the set $\{0,1\}$ and who has the following meaning: $\alpha_{ij}a_{ij}=1$ if A_i will nominate to execute L_j and is also qualified for this thing and $\alpha_{ij}a_{ij}=0$ in the other cases.

Because no one can execute two jobs simultaneously, we have therefore the condition: $\sum_{j=1}^{m} a_{ij}\alpha_{ij} \leq 1 \ \forall i=\overline{1,n}$.

Also, because any job cannot be execute simultaneously by two different workers we have that: $\sum_{i=1}^{n} a_{ij}\alpha_{ij} \leq 1 \ \forall j=\overline{1,m}$.

From the above conditions it follows that: $a_{ij}\alpha_{ij} \leq 1 \ \forall i=\overline{1,n} \ \ \forall j=\overline{1,m}$.

The allocation problem will become:

$$
\begin{cases}
\min(\sum_{i=1}^{n}\sum_{j=1}^{m} t_{ij}\alpha_{ij}) \\
\sum_{j=1}^{m} a_{ij}\alpha_{ij} \leq 1 \\
\sum_{i=1}^{n} a_{ij}\alpha_{ij} \leq 1 \\
\sum_{i=1}^{n}\sum_{j=1}^{m} a_{ij}\alpha_{ij} = M \\
\alpha_{ij} \geq 0
\end{cases}
$$

where M is the number of workers proposed for the execution.

Before solving the problem, let remark first that if it isn't a maximal allocation the problem will not have a solution and in other case if it has at the final we shall obtain effective the allocation. The value of minimum will be the searched total time.

The problem will be solved in the following manner: we start with the value M=n. If it has not a solution we diminish M with a unit and we begin again to solve the new problem. Because M is a free term in the upper problem we shall reoptimize the older.

The process is obviously finite because the problem has always a solution at least for M=0: $\alpha_{ij}=0$.

3. The Optimal Assignation of Workers on Jobs from the Point of View of Minimization the Maximal Execution Time

3.1. Introduction

The problems of assignation appear usual in the process of targets allocation in an institution.

Let consider $A'=\{A_1,...,A_{n'}\}$ the set of workers in an institution and $L'=\{L_1,...,L_{m'}\}$ the set of jobs which must be executed at a specific moment.

In the execution of job L_j the worker A_i can spend t_{ij} units of time.

Because each worker can has a multiple qualification, but not all necesary for the entire set of jobs we put the problem of allocation on jobs such that the maximum time spent in the execution to be minimal.

Let therefore $f:A'\rightarrow P(L')$, $f(A_i)=\left\{L_{i_1},...,L_{i_k}\right\}$ $\forall i=1,...,n'$ the function who assign to A_i the jobs: $L_{i_1},...,L_{i_k}$ which he can realize if he has the necessary qualification for at least one job and $f(A_i)=\varnothing$ in opposite cases.

We shall restrict the set A' and we shall consider, from the beginning, the subset of those workers for which $f(A_i)\neq\varnothing$ $\forall A_i\in A$. We shall note therefore $A=\{A_1,...,A_n\}$ with n≤n' (*after a possible renotation of workers*). Let now (*again after a possible renotation of workers*): $\bigcup_{i=1}^{n}f(A_i)=\{L_1,...,L_m\}$ with m≤m'. If m<m' we have that the jobs $L_{m+1},...,L_{m'}$ cannot be executed from any workers, therefore will be excludes.

Finally, let consider: $L=\{L_1,...,L_m\}$ and the new allocation function: $f:A\rightarrow P(L)$.

We shall define a matrix:

$$M=\begin{matrix}L_1 & ... & L_m \\ \begin{pmatrix}a_{11} & ... & a_{1m} \\ ... & ... & ... \\ a_{n1} & ... & a_{nm}\end{pmatrix}\begin{matrix}A_1 \\ ... \\ A_n\end{matrix}\end{matrix}$$

where $a_{ij}=1$ if the worker A_i can execute the job L_j and 0 in the other cases.

We shall build the matrix $T=(t_{ij})$ of execution times, assigning $t_{ij}=\infty$ if A_i cannot execute L_j.

The graphical method of Ducamp, presented in [2], proposes a construction of a simple graph (a decomposition of nodes in two disjoint subsets: workers and jobs) and after an initial allocation a succesion of improvements based on graphical observations. This method is good but cannot be easily implemented on computers.

We shall propose in what follows a new method based on the Simplex algorithm.

3.2. The method of Simplex algorithm

Let now, the matrix $M_t = (a_{ij}^t)$ where:

$$a_{ij}^t = \begin{cases} a_{ij} \text{ if } t_{ij} \leq t \\ 0 \text{ if } t_{ij} > t \end{cases}$$

and $A_t = (\alpha_{ij}^t)$ where:

$$\alpha_{ij}^t = \begin{cases} 1 \text{ if } A_i \text{ will assign to execute } L_j \text{ in a time less than or equal with } t \\ 0 \text{ if } A_i \text{ will not assign to execute } L_j \text{ in a time less than or equal with } t \end{cases}$$

Let now the matrix $B_t = (\alpha_{ij}^t a_{ij}^t)$ which elements belong to $\{0,1\}$ and who has the following significance: $\alpha_{ij}^t a_{ij}^t = 1$ if A_i will be assigned to execute the job L_j in a time less than or equal with t and he is qualified for this thing, and $\alpha_{ij}^t a_{ij}^t = 0$ in the other cases.

Because any worker cannot execute two jobs in the same time we shall have:
$$\sum_{j=1}^{m} a_{ij}^t \alpha_{ij}^t \leq 1 \ \forall i = \overline{1, n}.$$

Also, because any job cannot be executed in the same time by two different workers we shall have: $\sum_{i=1}^{n} a_{ij}^t \alpha_{ij}^t \leq 1 \ \forall j = \overline{1, m}.$

After these conditions follows: $a_{ij}^t \alpha_{ij}^t \leq 1 \ \forall i = \overline{1, n} \ \forall j = \overline{1, m}.$

The allocation problem becomes (for a maximal time t):

$$
\begin{cases}
\max(\sum_{i=1}^{n} \sum_{j=1}^{m} a^t{}_{ij} \alpha^t{}_{ij}) \\
\sum_{j=1}^{m} a^t{}_{ij} \alpha^t{}_{ij} \leq 1 \\
\sum_{i=1}^{n} a^t{}_{ij} \alpha^t{}_{ij} \leq 1 \\
\alpha^t{}_{ij} \geq 0
\end{cases}
$$

Let remark first that the problem has always a solution for a suitable t.

Let now $t_k = \min\{t \mid M_t$ has at least k rows who have an element equal with 1$\}$.

We have obviously: $\min t_{ij} \leq t_1 \leq t_2 \leq ... \leq t_n \leq \max t_{ij}$.

The algorithm will begin with $t=t_n$. If the problem will not have a solution, we shall grow t with one unit until we shall find a maximal allocation.

If we cannot find such allocation, we shall consider $t=t_{n-1}$ and begin again the problem.

One problem can appear after sloving: what is happened if the solutions will not be entire? It is possible, for example, on the i-th row to be a lot of elements equal with 1 (appropriate to the fact that one worker can execute a few jobs), say k elements, and the optimal solution to contains the variables: $\alpha^t{}_{ij_1} = \alpha^t{}_{ij_2} = ... = \alpha^t{}_{ij_k} = \dfrac{1}{k}$.

Because the objective function is $\sum_{i=1}^{n} \sum_{j=1}^{m} a^t{}_{ij} \alpha^t{}_{ij}$ it follows that it will not modify if

we replace all the cited values with, for example: $\alpha^t{}_{ij_p} = 1$ for a $1 \leq p \leq k$.

4. The Optimal Assignation of Workers on Jobs

4.1. Introduction

The problems of assignation appear usual in the process of targets allocation in an institution.

Let consider $A' = \{A_1,...,A_{n'}\}$ the set of workers in an institution and $L' = \{L_1,...,L_{m'}\}$ the set of jobs which must be executed at a specific moment.

Because each worker can has a multiple qualification, but not all necesary for the entire set of jobs we put the problem of allocation on jobs such that they realize too much if it is possible of them.

Let therefore f:$A' \rightarrow P(L')$, f(A_i)=$\left\{ L_{i_1},...,L_{i_k} \right\}$ $\forall$i=1,...,n' the function who assign to A_i the jobs: $L_{i_1},...,L_{i_k}$ which he can realize if he has the necessary qualification for at least one job and f(A_i)=$\varnothing$ in opposite cases.

We shall restrict the set A' and we shall consider, from the beginning, the subset of those workers for which f(A_i)$\neq\varnothing$ $\forall A_i \in A$. We shall note therefore A={A_1,...,A_n} with n$\leq$n' (*after a possible renotation of workers*). Let now (*again after a possible renotation of workers*): $\bigcup\limits_{i=1}^{n} f(A_i) = \{L_1,...,L_m\}$ with m$\leq$m'. If m$<$m' we have that the jobs L_{m+1},...,$L_{m'}$ cannot be executed from any workers, therefore will be excludes.

Finally, let consider: L={L_1,...,L_m} and the new allocation function: f:$A \rightarrow P(L)$.

We shall define a matrix:

$$M = \begin{pmatrix} a_{11} & ... & a_{1m} \\ ... & ... & ... \\ a_{n1} & ... & a_{nm} \end{pmatrix} \begin{matrix} A_1 \\ ... \\ A_n \end{matrix}$$

with column headers $L_1 \ ... \ L_m$

where a_{ij}=1 if the worker A_i can execute the job L_j and 0 in the other cases.

The graphical method presented in [1] proposes a construction of a simple graph (a decomposition of nodes in two disjoint subsets: workers and jobs) and after an initial allocation a succesion of improvements based on graphical observations. This method is good but cannot be easily implemented on computers.

We shall propose in what follows a new method based on the Simplex algorithm.

4.2. The method of Simplex algorithm

Let now, the matrix A=(α_{ij}) where:

$$\alpha_{ij} = \begin{cases} 1 \text{ if the worker } A_i \text{ will execute the job } L_j \\ 0 \text{ if the worker } A_i \text{ will not execute the job } L_j \end{cases}$$

and the matrix B=($\alpha_{ij}a_{ij}$) with elements in the set {0,1}. We have that $\alpha_{ij}a_{ij}=1$ if the worker A_i will execute the job L_j and if he is qualified for this thing and $\alpha_{ij}a_{ij}=0$ if the worker A_i will not execute the job L_j or he is not qualified to do this. How any worker cannot execute two jobs in the same time, we have the condition:

$$\sum_{j=1}^{m} a_{ij}\alpha_{ij} \leq 1 \ \forall i=\overline{1,n}.$$

Because a job cannot be executed in the same time by two workers we have also that: $\sum_{i=1}^{n} a_{ij}\alpha_{ij} \leq 1 \ \forall j=\overline{1,m}$. From these conditions we have now that: $a_{ij}\alpha_{ij}\leq 1 \ \forall i=\overline{1,n}$ $\forall j=\overline{1,m}$.

The problem becomes now the following linear programming:

$$\begin{cases} \max(\sum_{i=1}^{n}\sum_{j=1}^{m} a_{ij}\alpha_{ij}) \\ \sum_{j=1}^{m} a_{ij}\alpha_{ij} \leq 1 \\ \sum_{i=1}^{n} a_{ij}\alpha_{ij} \leq 1 \\ \alpha_{ij} \geq 0 \end{cases}$$

Because $\alpha_{ij}=0$ verify the restrictions we have that the problem has always a solution. One problem can appear after sloving: what is happened if the solutions will not be entire? It is possible, for example, on the i-th row to be a lot of elements equal with 1 (appropriate to the fact that one worker can execute a few jobs), say k elements, and the optimal solution to contains the variables: $\alpha_{ij_1} = \alpha_{ij_2} = ... = \alpha_{ij_k} = \dfrac{1}{k}$.

Because the objective function is $\sum_{i=1}^{n}\sum_{j=1}^{m} a_{ij}\alpha_{ij}$ it follows that it will not modify if we replace all the cited values with, for example: $\alpha_{ij_p} = 1$ for a $1\leq p\leq k$.

Example

Let the workers A_1,A_2,A_3 and the jobs L_1,L_2,L_3 which posibility of execution is in the following table:

Worker	Jobs
A_1	L_1, L_3
A_2	L_1, L_2
A_3	L_2

Considering the matrix $M = \begin{pmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 1 & 0 \end{pmatrix} \begin{matrix} A_1 \\ A_2 \\ A_3 \end{matrix}$ and $A = \begin{pmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} \end{pmatrix}$ we have the

following linear programming problem:

$$\begin{cases} \max(\alpha_{11} + \alpha_{13} + \alpha_{21} + \alpha_{22} + \alpha_{32}) \\ \quad \alpha_{11} + \alpha_{13} \leq 1 \\ \quad \alpha_{21} + \alpha_{22} \leq 1 \\ \quad\quad \alpha_{32} \leq 1 \\ \quad \alpha_{11} + \alpha_{21} \leq 1 \\ \quad \alpha_{22} + \alpha_{32} \leq 1 \\ \quad\quad \alpha_{13} \leq 1 \\ \alpha_{11}, \alpha_{13}, \alpha_{21}, \alpha_{22}, \alpha_{32} \geq 0 \end{cases}$$

with the solution: $\alpha_{13} = 1$, $\alpha_{32} = 1$, $\alpha_{21} = 1$. We have therefore that A_1 will execute the job L_3, $A_2 - L_1$ and $A_3 - L_2$.

5. The Sequence Of Two Installations Without Initial Deliverance Times

5.1. Introduction

The sequence operation in production flows appears in the usual practice for the installations waiting time decreasing when a lot of pieces use the same technology line in the same direction.

Let two installations U_1 and U_2 who process n pieces $P_1, \ldots, P_n$ ($n \geq 2$) in the same order (first U_1 and after U_2). We shall consider that U_1 and U_2 are available from the process beginning and the waiting time to come in execution for U_2 does not implies

other prices. In addition we shall suppose that the pieces do not have a finish ending date.

Let note with t_{ij} the processing time of the j-th piece on the i-th installation.

The problem consists in a determination of the pieces execution beginning order such that the waiting time of the installation U2 to be minimum.

Let the matrix $T=(t_{ij})\in M_{2n}(\mathbf{R})$ of the time processing. The classical algorithm of Johnson consists in the following steps:

Step 1 We choose the least element on the first row. This will give us the first piece who will come in execution.

Step 2 We cut the previous column and we choose the least element on the second row. This will give us the last piece who will come in execution.

Step 3 We cut the previous column and we go again at the first step. After this we will obtain the second piece who will come in execution, and after we go again at the second step and we find the penultimate piece and so on.

The algorithm will continue till we shall finish all the pieces.

5.2. The new method

In the proof of Johnson's algorithm it exists a little but essential error. The author extrapolates a transposition between two consecutive terms to all transpositions. This is the reason that, even if it claim to obtain the optimum, it is not true.

The following method will guide us to the optimum but with a little harder calculus.

Let therefore the table of time processing and a permutation $\sigma=\begin{pmatrix} 1 & 2 & ... & n \\ i_1 & i_2 & ... & i_n \end{pmatrix}\in S_n$ – the group of permutations of n elements and an order of pieces, indexed by σ: $P_{i_1}, P_{i_2},...,P_{i_n}$:

Piece/Installation	P_{i_1}	P_{i_2}	...	P_{i_k}	...	P_{i_n}
U₁	$d_{i_1 1}$	$d_{i_2 1}$	...	$d_{i_k 1}$	...	$d_{i_n 1}$
U₂	$d_{i_1 2}$	$d_{i_2 2}$	...	$d_{i_k 2}$	...	$d_{i_n 2}$

We define: $g_1, g_2, \ldots, g_n \geq 0$ - the pauses before entrence in execution of pieces $P_{i_1}, P_{i_2}, \ldots, P_{i_n}$ on the installation U_2. We have, obviously:

- $g_1 = d_{i_1 1}$ (*from the beginning of the process*)

- $g_2 = \max(d_{i_1 1} + d_{i_2 1} - d_{i_1 2} - g_1, 0)$

- $g_3 = \max(d_{i_1 1} + d_{i_2 1} + d_{i_3 1} - d_{i_1 2} - d_{i_2 2} - g_1 - g_2, 0)$

  ...

- $g_k = \max\left(\sum_{p=1}^{k} d_{i_p 1} - \sum_{p=1}^{k-1} d_{i_p 2} - \sum_{p=1}^{k-1} g_p, 0\right)$

  ...

- $g_n = \max\left(\sum_{p=1}^{n} d_{i_p 1} - \sum_{p=1}^{n-1} d_{i_p 2} - \sum_{p=1}^{n-1} g_p, 0\right)$

  If we note: $B_{i_1 \ldots i_k} = \sum_{p=1}^{k} d_{i_p 1} - \sum_{p=1}^{k-1} d_{i_p 2}$ we have:

- $g_1 = B_{i_1}$

- $g_2 = \max(B_{i_1 i_2} - g_1, 0)$

- $g_3 = \max(B_{i_1 i_2 i_3} - g_1 - g_2, 0)$

  ...

- $g_k = \max\left(B_{i_1 \ldots i_k} - \sum_{p=1}^{k-1} g_p, 0\right)$

  ...

- $g_n = \max(B_{i_1\ldots i_n} - \sum_{p=1}^{n-1} g_p, 0)$

The objective function is therefore: $z = \min_{\sigma \in S_n} (\sum_{k=1}^{n} g_k)$.

We have by iteration:

$$\sum_{p=1}^{k} g_p = g_k + \sum_{p=1}^{k-1} g_p = \max(B_{i_1\ldots i_k} - \sum_{p=1}^{k-1} g_p, 0) + \sum_{p=1}^{k-1} g_p = \max(B_{i_1\ldots i_k}, \sum_{p=1}^{k-1} g_p).$$

But: $\sum_{p=1}^{n} g_p = \max(B_{i_1\ldots i_n}, \sum_{p=1}^{n-1} g_p) = \max(B_{i_1\ldots i_n}, \max(B_{i_1\ldots i_{n-1}}, \sum_{p=1}^{n-2} g_p)) =$

$\max(B_{i_1\ldots i_n}, B_{i_1\ldots i_{n-1}}, \sum_{p=1}^{n-2} g_p) = \ldots = \max(B_{i_1\ldots i_n}, B_{i_1\ldots i_{n-1}}, \ldots, B_{i_1})$ from where:

$$z = \min (\sum_{p=1}^{n} g_p) = \min_{\sigma \in S_n} (\max(B_{i_1\ldots i_n}, B_{i_1\ldots i_{n-1}}, \ldots, B_{i_1})).$$

We have $B_{i_1\ldots i_k} = \sum_{p=1}^{k} d_{i_p 1} - \sum_{p=1}^{k-1} d_{i_p 2} = B_{i_1\ldots i_{k-1}} + d_{i_k 1} - d_{i_{k-1} 2}$ and much generally:

$$B_{i_1\ldots i_k} = \sum_{p=1}^{k} d_{i_p 1} - \sum_{p=1}^{k-1} d_{i_p 2} = \sum_{p=1}^{s} d_{i_p 1} - \sum_{p=1}^{s-1} d_{i_p 2} + \sum_{p=s+1}^{k} d_{i_p 1} - \sum_{p=s}^{k-1} d_{i_p 2} = B_{i_1\ldots i_s} +$$

$$\sum_{p=s+1}^{k} d_{i_p 1} - \sum_{p=s}^{k-1} d_{i_p 2}$$

For the permutation $\sigma = \begin{pmatrix} 1 & 2 & \ldots & k & \ldots & s & \ldots & n \\ i_1 & i_2 & \ldots & i_k & \ldots & i_s & \ldots & i_n \end{pmatrix} \in S_n$ and

$z = \max(B_{i_1\ldots i_n}, B_{i_1\ldots i_{n-1}}, \ldots, B_{i_1})$, let consider a transposition of σ:

$\tau = \begin{pmatrix} 1 & 2 & \ldots & k & \ldots & s & \ldots & n \\ i_1 & i_2 & \ldots & i_s & \ldots & i_k & \ldots & i_n \end{pmatrix} \in S_n$.

If we note with bar all the quantities concerning τ we have:

- $t \neq k, s \Rightarrow \overline{d}_{i_t 1} = d_{i_t 1}$ şi $\overline{d}_{i_t 2} = d_{i_t 2}$

- $t = k \Rightarrow \overline{d}_{i_k 1} = d_{i_s 1}$ şi $\overline{d}_{i_k 2} = d_{i_s 2}$

- $t=s \Rightarrow \overline{d}_{i_s 1} = d_{i_k 1}$ şi $\overline{d}_{i_s 2} = d_{i_k 2}$

from where:

- $1 \leq t < k \Rightarrow \overline{B}_{i_1 \dots i_t} = \sum_{p=1}^{t} \overline{d}_{i_p 1} - \sum_{p=1}^{t-1} \overline{d}_{i_p 2} = \sum_{p=1}^{t} d_{i_p 1} - \sum_{p=1}^{t-1} d_{i_p 2} = B_{i_1 \dots i_t}$

- $t=k \Rightarrow \overline{B}_{i_1 \dots i_k} = \sum_{p=1}^{k} \overline{d}_{i_p 1} - \sum_{p=1}^{k-1} \overline{d}_{i_p 2} = \sum_{p=1}^{k} d_{i_p 1} - \sum_{p=1}^{k-1} d_{i_p 2} + d_{i_s 1} - d_{i_k 1} = B_{i_1 \dots i_k} +$
  $d_{i_s 1} - d_{i_k 1}$

- $k<t<s \Rightarrow \overline{B}_{i_1 \dots i_t} = \sum_{p=1}^{t} \overline{d}_{i_p 1} - \sum_{p=1}^{t-1} \overline{d}_{i_p 2} = \sum_{p=1}^{t} d_{i_p 1} - \sum_{p=1}^{t-1} d_{i_p 2} + d_{i_s 1} - d_{i_k 1} -$
  $(d_{i_s 2} - d_{i_k 2}) = B_{i_1 \dots i_t} + d_{i_s 1} - d_{i_k 1} - (d_{i_s 2} - d_{i_k 2})$

- $t=s \Rightarrow \overline{B}_{i_1 \dots i_s} = \sum_{p=1}^{s} \overline{d}_{i_p 1} - \sum_{p=1}^{s-1} \overline{d}_{i_p 2} = \sum_{p=1}^{s} d_{i_p 1} - \sum_{p=1}^{s-1} d_{i_p 2} - (d_{i_s 2} - d_{i_k 2}) = B_{i_1 \dots i_s} -$
  $(d_{i_s 2} - d_{i_k 2})$

- $t>s \Rightarrow \overline{B}_{i_1 \dots i_t} = \sum_{p=1}^{t} \overline{d}_{i_p 1} - \sum_{p=1}^{t-1} \overline{d}_{i_p 2} = \sum_{p=1}^{t} d_{i_p 1} - \sum_{p=1}^{t-1} d_{i_p 2} = B_{i_1 \dots i_t}$

Let note now: $\alpha_{sk} = d_{i_s 1} - d_{i_k 1}$ and $\beta_{sk} = d_{i_s 2} - d_{i_k 2}$ for $s>k$ and $\alpha_{sk} = \beta_{sk} = 0$ for $s \leq k$. We have now:

$$\overline{B}_{i_1 \dots i_t} = \begin{cases} B_{i_1 \dots i_t} & \text{if } t < k \\ B_{i_1 \dots i_t} + \alpha_{sk} & \text{if } t = k \\ B_{i_1 \dots i_t} + \alpha_{sk} - \beta_{sk} & \text{if } k < t < s \\ B_{i_1 \dots i_t} - \beta_{sk} & \text{if } t = s \\ B_{i_1 \dots i_t} & \text{if } t > s \end{cases}$$

$\overline{z} = \max(\overline{B}_{i_1}, \dots, \overline{B}_{i_1 \dots i_{n-1}}, \overline{B}_{i_1 \dots i_n}) = \max(B_{i_1}, \dots, B_{i_1 \dots i_{k-1}}, B_{i_1 \dots i_k} + \alpha_{sk}, B_{i_1 \dots i_{k+1}} + \alpha_{sk} -$
$\beta_{sk}, \dots, B_{i_1 \dots i_{s-1}} + \alpha_{sk} - \beta_{sk}, B_{i_1 \dots i_s} - \beta_{sk}, B_{i_1 \dots i_{s+1}}, \dots, B_{i_1 \dots i_n})$.

We must determine the pair (k,s) of pieces which will be permuted such that, after the computing of $\overline{z}$ to obtain a value less then or equal z.

How this thing leads us at a great number of calculations, we shall act in this way:

For an arbitrary distribution of pieces, corresponding to a permutation
$\sigma=\begin{pmatrix} 1 & 2 & ... & k & ... & s & ... & n \\ i_1 & i_2 & ... & i_k & ... & i_s & ... & i_n \end{pmatrix} \in S_n$, we shall determine those piece which

permute with the first will lead to the minimization of z. Suppoes now that this thing
is for the first piece.

Let therefore P_{i_s} - the searched piece, who will take the place of the first piece P_{i_1}.
We have therefore:

$\bar{z}=\max(\bar{B}_{i_1},...,\bar{B}_{i_1..i_{n-1}}, \bar{B}_{i_1..i_n})=\max(B_{i_1}+\alpha_{s1}, B_{i_1i_2}+\alpha_{s1}-\beta_{s1},..., B_{i_1...i_{s-1}}+\alpha_{s1}-\beta_{s1}, B_{i_1...i_s} - \beta_{sk}, B_{i_1..i_{s+1}},..., B_{i_1..i_n})$.

We shall continue this process till we cannot diminish the value of z. In this
moment, we shall find the permutation with the second piece and so on.

Let conclude: We build the table where on the rows we have the pieces: $P_{i_1},...,P_{i_n}$
and on columns alone: $P_{i_2},...,P_{i_n}$.

P_{t_1}	B_{t_1}	$d_{t_1 1}$	$d_{t_1 2}$	$\overline{B}_{t_1} = d_{t_1 1}$	$\dots$			$\dots$		$\dots$		
$\dots$	$\dots$	$\dots$	$\dots$	$\dots$								
P_{t_q}	B_{t_q}	$d_{t_q 1}$	$d_{t_q 2}$	$\overline{B}_{t_q} = \sum_{j=1}^{q} d_{t_j 1} - \sum_{j=1}^{q-1} d_{t_j 2}$	$\dots$	α_{s1}	$-\beta_{s1}$	$d_{t_q 1}$	$d_{t_q 2}$	P_{t_q}	$\max_{t \in I, n} a_{i,t_q}$	
						$a_{i,t_q} = \overline{B}_{t_q} + \alpha_{s1}$						
$\dots$	$\dots$					$\dots$						
P_{t_s}	B_{t_s}	$d_{t_s 1}$	$d_{t_s 2}$	$\overline{B}_{t_s} = \sum_{j=1}^{s} d_{t_j 1} - \sum_{j=1}^{s-1} d_{t_j 2}$	$\dots$	$a_{i,t_s} = \overline{B}_{t_s} + \alpha_s - \beta_{s1}$		$a_{i,t_s} = \overline{B}_{t_s} - \beta_{s1}$		$a_{i,t_s} = \overline{B}_{t_s}$	$\max_{t \in I, n} a_{i,t_s}$	
$\dots$	$\dots$					$\dots$		$\dots$		$\dots$	$\dots$	
P_{t_n}	B_{t_n}	$d_{t_n 1}$	$d_{t_n 2}$	$\overline{B}_{t_n} = \sum_{j=1}^{n} d_{t_j 1} - \sum_{j=1}^{n-1} d_{t_j 2}$	$\dots$	$-\beta_{n1}$	α_{n1}	$a_{i,t_n} = \overline{B}_{t_n} + \alpha_{n1}$		$a_{i,t_n} = \overline{B}_{t_n} - \beta_{n1} - \beta_{n1}$	$a_{i,t_n} = \overline{B}_{t_n} - \beta_{n1}$	$a_{i,t_n} = \overline{B}_{t_n}$
				max								$\max_{t \in I, n} a_{i,t_n}$

Fig.1

We shall choose the piece P_{i_k} for which: $z = \min\limits_{s=2,n} \max\limits_{t=1,n} a_{i_t i_s}$.

The next table will contains the new order of pieces where P_{i_1} will change the place with P_{i_k} .

The process will continue till $z = \min\limits_{s=2,n} \max\limits_{t=1,n} a_{i_t i_s}$ becomes greater then those computed in the preceding table.

This thing suggests the fact that any piece cannot be on the first position without grow the total time. If the value of z remains constant, we can act like in the precedings steps for each pieces order.

In the next table, we shall act analogously, but on the column we shall get only P_{i_3} ,..., P_{i_n} corresponding to the new permutation.

The process will continue till the last piece.

Example

Piece/Installation	P₁	P₂	P₃	P₄
U₁	15	6	8	9
U₂	19	3	13	7

Johnson's algorithm propose us:

Piece/Installation	P₁	P₃	P₄
U₁	15	8	9
U₂	19	13	7

Piece/Installation	P₁	P₃
U₁	15	8
U₂	19	13

with the final order: P_2, P_3, P_1, P_4, therefore the new table will be, in order of execution:

Piece/Installation	P_2	P_3	P_1	P_4
U_1	6	8	15	9
U_2	3	13	19	7

with times:

$B_2 = 6$

$B_3 = 6 + 8 - 3 = 11$

$B_1 = 6 + 8 + 15 - 3 - 13 = 13$

$B_4 = 6 + 8 + 15 + 9 - 3 - 13 - 19 = 3$

therefore $z = \max(B_2, B_3, B_1, B_4) = 13$.

Our algorithm consists from the following tables:

Table 1

					P_2		P_3		P_4	
					6	3	8	13	9	7
					-9	16	-7	6	-6	12
P_1	B_1	**15**	**19**	$\overline{B}_1 = 15$	6		8		9	
P_2	B_2	6	3	$\overline{B}_2 = 2$	18		1		8	
P_3	B_3	8	13	$\overline{B}_3 = 7$	7		13		13	
P_4	B_4	9	7	$\overline{B}_4 = 3$	3		3		15	
max					**18**		**13**		**15**	

therefore the piece on the first position is P_3.

Table 2

					P$_2$		P$_1$		P$_4$	
					6	3	15	19	9	7
					-2	10	7	-6	1	6
P$_3$	B$_3$	**8**	**13**	$\overline{B}_3=8$	6		15		9	
P$_2$	B$_2$	6	3	$\overline{B}_2=1$	11		2		8	
P$_1$	B$_1$	15	19	$\overline{B}_1=13$	13		7		20	
P$_4$	B$_4$	9	7	$\overline{B}_4=3$	3		3		9	
max					**13**		**15**		**20**	

The alternative piece on first position can be P$_2$.

Table 3

					P$_3$		P$_1$		P$_4$	
					8	13	15	19	9	7
					2	10	9	16	3	4
P$_2$	B$_2$	**6**	**3**	$\overline{B}_2=6$	8		15		9	
P$_3$	B$_3$	8	13	$\overline{B}_3=11$	21		36		18	
P$_1$	B$_1$	15	19	$\overline{B}_1=13$	13		29		20	
P$_4$	B$_4$	9	7	$\overline{B}_4=3$	3		3		7	
max					**21**		**36**		**20**	

therefore the permutation process for the first position is closed.

We go back to the table 1 and continue with the piece on the second position.

Table 4

					P_1		P_4	
					15	19	9	7
					9	-16	3	-4
P_3	B_3	8	13	$\overline{B}_3=8$	8		8	
P_2	B_2	**6**	**3**	$\overline{B}_2=1$	10		4	
P_1	B_1	15	19	$\overline{B}_1=13$	-3		12	
P_4	B_4	9	7	$\overline{B}_4=3$	3		-1	
max					**10**		**12**	

therefore the piece on second position is P_1.

Table 5

					P_2		P_4	
					6	3	9	7
					-9	16	-6	12
P_3	B_3	8	13	$\overline{B}_3=8$	8		8	
P_1	B_1	**15**	**19**	$\overline{B}_2=10$	1		4	
P_2	B_2	6	3	$\overline{B}_1=-3$	13		3	
P_4	B_4	9	7	$\overline{B}_4=3$	3		15	
max					**13**		**15**	

From the table 5 we have that the step is closed.

For the piece on third position:

Table 6

					P$_4$	
					9	7
					3	-4
P$_3$	B$_3$	8	13	$\overline{B}_3=8$	8	
P$_1$	B$_1$	15	19	$\overline{B}_2=10$	10	
P$_2$	B$_2$	**6**	**3**	$\overline{B}_1=-3$	0	
P$_4$	B$_4$	9	7	$\overline{B}_4=3$	-1	
max					**10**	

The process is closed. The order will be: P$_3$,P$_1$,P$_2$,P$_4$ with total time: 10.

If we come again at the table 2 and continue with the piece on the second position we have:

Table 7

					P$_1$		P$_4$	
					15	19	9	7
					7	-6	1	6
P$_2$	B$_2$	6	3	$\overline{B}_2=6$	6		6	
P$_3$	B$_3$	**8**	**13**	$\overline{B}_3=11$	18		12	
P$_1$	B$_1$	15	19	$\overline{B}_1=13$	7		20	
P$_4$	B$_4$	9	7	$\overline{B}_4=3$	3		9	
max					**18**		**20**	

Because we obtain a value greater than 13 the process will closed also.

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Knowledge Economy – the Economy of the Future

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Abstract: In these times with strong changes, a so called "knowledge revolution" is on the way and this designates the evolution from the primarily physical labour based economy to a predominantly knowledge economy. The entire world is dealing, in the dawn of this new century, the 21st one, with a series of major changes: social, economic and technological. Consequently, if the 2nd industrial revolution was initiated in the industry based on intensive production labour "by the pioneers of automobiles such as Ford, it is clear that the 3rd revolution will take place in the economic sector of the knowledge based services."[1]

Keywords: knowledge economy, physical labour, economic resources

Jel Classification: D8, D83

Of great novelty is the knowledge phenomenon, considered as being *"the miracle of the human universe"*, that has had a long and complex history and it will have a similar future. In this new society, an information society, the basic economic resources are no longer investment, real estate or physical labour, instead it is and will be knowledge - the knowledge that has acquired, comparing to classic and modern knowledge philosophies, new and complex meanings and significations. It is no longer considered just "a mental human process, but as well one of artificial intelligence systems, of industrial, economic and social corporations, of organizations composed of people dealing with software, intelligent robots and the

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[1] Bohn, R., *Measuring and Managing Technological Knowledge*, quoted by Drăgănescu, M., in the study for the SI-SC Project of The Romanian Academy, *Societatea Informaţională a Cunoaşterii. Vectorii Societăţii Cunoaşterii,* 2001.

Internet, of intelligent and conscious artefacts (in perspective)"[1] that are dealing with or without human intervention.

In the past, fortune and power depended on one's ability of controlling different physical resources, and the production factors were predominantly physical, and all the aforementioned together cause a reduced need to own, develop and use knowledge. The fortune and the power of the third millennium will surely be mostly produced due to intangible intellectual resources, due to the knowledge assets.

Experts define knowledge as "cumulative stocks of information and abilities produced as a consequence of the information use of the receiver. Knowledge always contains information that is not only an input for knowledge development, but also a knowledge communication form."[2]

Generally in organizations, knowledge has also been found in the *human assets* (work force), *client assets* (in the client requests and preferences), concerning *structural capital* (concerning its products, processes, capabilities and systems) which means that knowledge value (intangible) can significantly surpass the value of tangible assets.

Experts believe that, on an organizational level, three **major processes[3]**, knowledge related, are developing, which should be treated with the same consideration:

- *Acquire and obtaining knowledge* – that takes places through organization employees learning processes;

- *Creating knowledge*, as inventions, innovations etc;

- *Using knowledge,* throughout all decision taking activities and actions, which have as end product goods, services, and new knowledge ready to be marketed profitably.

In theory, organizations are or at least used to be, until recently, concerned only with the use of knowledge, however, experts have shown that knowledge use is significantly conditioned by creating and acquiring knowledge, which are equally important, and in the absence of which using knowledge is out of the question.

Peter F. Drucker stated in his paper "Post-capitalist Society" that: "The new society – and this is already a reality - is a post-capitalist society, and this new

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[1] Drucker,P*., Societatea postcapitalistă*, Bucureşti, Ed. Image, 1999.
[2] Nicolescu, O., Plumb, I., Pricop, M., Vasilescu, I., Verboncu, I., (coord.), *Abordări moderne în managementul şi economia organizaţiei*, Ed. Economică, Bucureşti, 2004, vol. 1, p. 33.
[3] *Ibidem;* OECD, *The Knowledge-Based Economy*, Paris, 1996.

society will make use of the free market as of a certified economic integration mechanism. It will be an "anti-capitalist society the basic economic resource, "the production means" – is neither capital nor natural resources, nor "labour". It is and it will be knowledge." [1]

The new society, specialist claim, will be an era of advanced information and technology, a world of specialists, of *knowledge workers* – the ones possessing, disseminating, protecting and using information and knowledge, vital to the new society – a knowledge based society. In this society more and more knowledge accumulates, knowledge that is one of the main sources of power.

Trying to define a knowledge economy is a difficult undertaking even for experts due to the wide variety of successful concept implementation, but also due to the typology of the countries that have witnessed certified and important progresses.

Debates during the **WASME** World Organization for Small and Medium Enterprises, organized in Bucharest, between the 15th and the 18th of May 2005, dealt with "Internationalizing and switching over to a knowledge economy" and have reaffirmed that at the present time, on a world scale and especially in developed countries, the knowledge revolution is taking place. *"Studies and analysis prove that the knowledge revolution has deep and complex economic, social and political inference, just as the industrial revolution had, that led to the widely spread industrial economy and democracy nowadays."*[2] The result of this new revolution is the new knowledge economy that radically distinguishes it from previous economy types known to mankind.

Basically, this new economy type, *knowledge economy,* has as a feature converting knowledge to raw materials, capital, produce – essential production factors of economy – and to economic processes where "*producing, selling, buying, learning, depositing, developing, dividing and protecting knowledge grow predominant and condition profitability and ensuring company sustainability in the long run."*[3]

World Bank experts, trying to give form to transition strategies to a knowledge economy have developed a *compulsory framework* applicable to any country, *which requires*[4]:

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[1] Drucker, P*., op. cit.*

[2] Nicolescu, O., Plumb, I., Pricop, M., Vasilescu, I., Verboncu, I., *op. cit*., p. 13.

[3] Nanoka, I., *The Knowledge Creating Company*, Oxford University Press, New York, 1995.

[4] Convenţia Mondială WASME a IMM – Bucureşti, 15-18 mai, 2005.

• *An economic and institutional regime* relatively stable that stimulates the efficient use of existing knowledge and innovations and promotes free initiative;

• *An educated and experienced population* that may create, share and use knowledge;

• *A dynamic informational infrastructure,* which ensures effective communication, dissemination and information processing;

• *An efficient system promoting innovation* in enterprises, research centres, in schools and universities, among consultants, to assimilate the knowledge stock required, to adapt it to the existing needs and to develop new technologies.

Knowledge economy is categorically *a new economy type,* totally different from the industrial or post-industrial economy, an economy functioning during the last decades in developed countries.

OCDE members have stated the following definition for knowledge economy, "*the economy based primarily on the production, distribution and use of knowledge and information*"[1], a definition adopted by many developed countries, used to predict the economic future and that has triggered numerous debates about the new economy type.

Knowledge economy presents ***features***[2] that essentially set it apart from other economy types previously known:

- The primordial importance of knowledge in all domains of the economic activity, due to its vital impact that these have on functionality and performance;

- Focusing economic activities on processing information, acquiring knowledge and producing knowledge;

- Transferring the economic activities' basis from intangible resources to the tangible ones, partially represented by the knowledge and intellectual resources;

- The knowledge capital is a special, intangible, fluid capital that generally is not exclusively owned, but that may be assumed and reused;

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[1] Torriel, P., *Nouvelle Economie et Financement*, I. T., Otawa 1994, pp.1-2, www.oecd.org., accessed in December, 2006.

[2] Nicolescu, O., Plumb, I., Pricop, M., Vasilescu , I., Verboncu, I., (coord.), *op. cit*., pp.36-38; Toriell, P., *op. cit.*, pp. 1-2, I.T., www.oecd.org., accessed in December, 2006.

- The proliferation of symbolic equipment and products, alongside with the ratio reduction of physical goods;

- The constant decrease of serial production ratio and the focus on reduced, personalized ballot production, towards this goal the first steps have been taken by using "*just in time*" systems, a computer integration based process;

- The progressive elimination of frontiers between activities within organizations and those within branch, regional, national, and international organization level;

- The fundamental team activity planning, task interchangeability, multiple qualifications;

- Excellent skills acquired by creating, exploring and perfecting technologies become a major feature for successful organization results and achieving a competitive advantage;

- Increasing the services ratio in the economy as a whole to the disadvantage of the production sector;

- Developing and increasing exports, due to decreasing or eliminating differences between national markets, and progressively removing institutional, time and spatial barriers between countries;

- Increasing the small enterprises sector, simultaneously with the relative reduction of large enterprises, since the former can rapidly adapt to contextual developments;

- The superior put to use of a knowledge portfolio by differentiating between economic associations: enterprises network, clusters and industrial parks.

In the following figure the main feature of a knowledge based are illustrated.
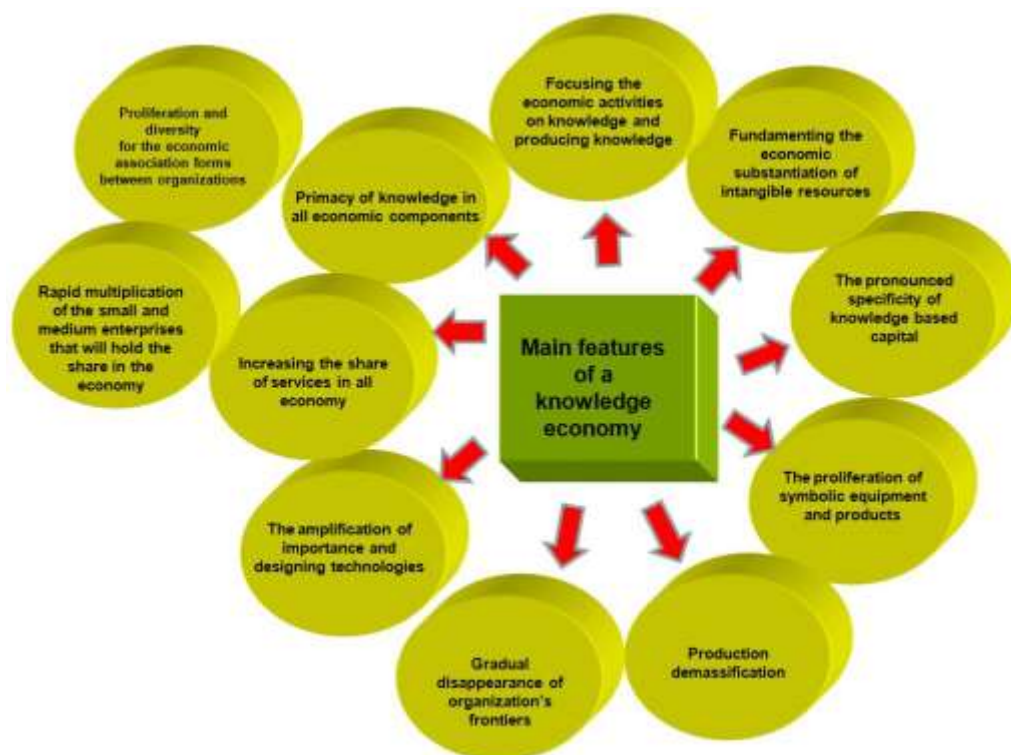
Fig.1. Main features of a knowledge economy[1]

It is worth mentioning that these features reflect the significant differences that appear between the knowledge economy and the other types of traditional economies. Some of these, though they can be more difficult to perceive, due to the strictness and the absorption capacity involved, allow for the stress of the distinctive feature of the knowledge economy and the current economy observed in developed countries.

The current European and global context imposes upon Romania a strict necessity towards increasing economic competitiveness, on realizing that in the 3rd millennium the competitive upper hand can only be acquired through *innovation*, *highly qualified* work force and a large scale *use* of knowledge, in other words through a knowledge economy.

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[1] Nicolescu, O., Plumb, I., Pricop, M., Vasilescu, I., Verboncu,I., (coord.), *op. cit.*; *Managementul general al organizaţiei*, Bucureşti, Ed. Economică, 2003, p. 37.

The Romanian reality is though undoubtedly the following: the economy in Romania is still, largely, under the effect of the industrial and agrarian, product manufacturer and service economy era, that nowadays are hardly competitive on the global markets and, even more, on the national one.

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The Choice of Optimal Decisions in Uncertin Situations

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Abstract: The Electre method is a classical algorithm for the decidence of a suitable choice in the process of launching on market of some products. In this paper I shall give a variation of the last part of the algorithm in the direction of simplifying the finally computations.

Keywords: Electre method, minimisation, maximisation

Jel Classification: C70, C35, C30, C15

In many practical situations, it exist many informations refered to the actions which can be developed, but for each action choice there are many possibilities. The Electre method gives us a way which will make out between different possibilities. Let therefore n choices V_1, V_2,...,V_n for a decident. We have also m criterions $C_1,C_2,...,C_m$ who have, each of them, a weighty coefficient (by rule subjective assigned) $k_1,k_2,...,k_m$. For each pair (V_i,C_j) we have a numerical value (if it is a qualitative estimation we shall convert in hierarchy numbers).

The algorithm will determine the best choice of action.

Step I

We settle, for the beginning the method nature: maximisation or minimisation. We shall add two lines under the table, on which will compute the maximum and the minimum of all numbers on columns.

Step II

We shall determine the utilities U_{ij} corresponding to all pairs (V_i,C_j):

♦ for the maximisation problem: $U_{ij}=\dfrac{v_{ij}-\min\limits_{k=1,\ldots,n}v_{kj}}{\max\limits_{k=1,\ldots,n}v_{kj}-\min\limits_{k=1,\ldots,n}v_{kj}}$;

♦ for the minimisation problem: $U_{ij}=\dfrac{\max\limits_{k=1,\ldots,n}v_{kj}-v_{ij}}{\max\limits_{k=1,\ldots,n}v_{kj}-\min\limits_{k=1,\ldots,n}v_{kj}}$.

and after we shall draw the table with these results.

Step III

We shall compute the correspondence indicators: $c(V_i,V_j)=\dfrac{\sum\limits_{\substack{p=1,\ldots,m\\U_{ip}\ge U_{jp}}}k_p}{\sum\limits_{r=1}^{m}k_r}$ and

after the disunity indicators: $d(V_i,V_j)=\max\limits_{p=1,\ldots m}(U_{jp}-U_{ip},0)$.

Step IV

We shall draw a new table for each pair (V_i,V_j) where on each cell we shall write on the left the correspondence indicator and on the right the disunity indicator.

Step V

We shall establish two values p and q (with a significance of complementary probabilities) such that $p,q\in(0,1)$ and $p+q=1$ which will extent the admissible limits for correspondence, respectively disunity. We shall say that V_i is better than V_j if

$$\begin{cases} c(V_i,V_j)\ge p \\ d(V_i,V_j)\le q \end{cases}$$

Let now the matrice $G=(g_{ij})\in M_n(\mathbf{R})$ such that: $g_{ij}=1$ if V_i is better than V_j and 0 in the other situations. If it exists a row i with all elements equal with 1 it follows that V_i is better than all others therefore it will be preffered. If it not exists such a V_i we shall diminish the value of p (and o course increase q) till we shall obtain the better choice.

In what follows I shall present another way to choice p and q.

The system: $\begin{cases} c(V_i, V_j) \ge p \\ d(V_i, V_j) \le q \end{cases}$ can be written as: $\begin{cases} c(V_i, V_j) \ge p \\ d(V_i, V_j) \le 1 - p \end{cases}$ therefore:

$$p \le \min(c(V_i, V_j), 1 - d(V_i, V_j))$$

We shall compute $\min_{j=1,n} c(V_i, V_j)$ and $\min_{j=1,n} (1 - d(V_i, V_j))$ from where:

$$p \le \min(\min_{j=1,n} c(V_i, V_j), 1 - \max_{j=1,n} d(V_i, V_j))$$

In the last table, we shall add therefore three columns, on which we compute $\min_{j=1,n} c(V_i, V_j)$, $1 - \max_{j=1,n} d(V_i, V_j)$ and the minimum of these two values. The better choice will be those who give the maximum value on this last column.

Example

Let the following problem (of maximisation):

Criterion Choice	C_1 ($k_1=0,4$)	C_2 ($k_2=0,4$)	C_3 ($k_2=0,2$)
V_1	1000	0	50
V_2	800	1	56
V_3	600	2	60
V_4	700	1	54
V_5	500	2	58

Criterion Choice	C_1	C_2	C_3
V_1	1000	0	50
V_2	800	1	56
V_3	600	2	60
V_4	700	1	54

V$_5$	500	2	58
min	500	0	50
max	1000	2	60
max-min	**500**	**2**	**10**

The utilities table is:

Criterion Choice	C$_1$ (k$_1$=0,4)	C$_2$ (k$_2$=0,4)	C$_3$ (k$_3$=0,2)
V$_1$	1	0	0
V$_2$	0,6	0,5	0,6
V$_3$	0,2	1	1
V$_4$	0,4	0,5	0,4
V$_5$	0	1	0,8

And the table of correspondence indicators and the disunity indicators:

	V$_1$		V$_2$		V$_3$		V$_4$		V$_5$	
V$_1$	1	0	0,4	0,6	0,4	1	0,4	0,5	0,4	1
V$_2$	0,6	0,4	1	0	0,4	0,5	1	0	0,4	0,5
V$_3$	0,6	0,8	0,6	0,4	1	0	0,6	0,2	1	0
V$_4$	0,6	0,6	0,4	0,2	0,4	0,6	1	0	0,4	0,5
V$_5$	0,6	1	0,6	0,6	0,4	0,2	0,6	0,4	1	0

If we try for p from 1 back to 0 we shall obtain that, for the first time, we shall have for p=0,4 and q=0,6:

$$G = \begin{pmatrix} 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 1 \end{pmatrix}$$

therefore each of V_2 and V_4 is better than the others.

I shall suggest at this last step the following:

	$\min\limits_{j=1,n} c(V_i, V_j)$	$1 - \max\limits_{j=1,n} d(V_i, V_j)$	min
V_1	0,4	0	0
V_2	0,4	0,5	**0,4**
V_3	0,6	0,2	0,2
V_4	0,4	0,4	**0,4**
V_5	0,4	0	0

therefore each of V_2 and V_4 is better than the others, but without consecutive tests.

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Business Administration

Romanian Tourism Facing Labour Shortage

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Abstract: The purpose of this paper is to present the main tendencies in the Romanian tourism and their impact on the labour market. The first part of the paper presents the main tendencies in travel and tourism sector. The second part of the paper focuses on the challenges of the labour market in the hotel sector, highlighting essential aspect related to the declining of population, shortage of the workforce, emigration, financial compensations. The final part exposes few ideas and possible suggestions that can be applied into the travel and tourism sector in order to better manage the multiple dimensions of growth.

Keywords: labour shortage, tourism, economy growth

Jel Classification: L83, L80, L8

1. The Multiple Dimensions of Growth

Romania is among the European countries with the most important economic growth during the last years. The GDP has witnessed a steady growth in the last 8 years. In 2007, the Romanian GDP grew by a robust 6%. For 2008, the trend will be also ascendant, but at a slightly lower pace due to the US and international slowdown.

Tourism sector is no exception of this overall ascending trend. According to World Travel and Tourism Council (WTTC) 2008 Country Report, in 2007 Romania was

ranked number 7th worldwide, with an annualized real growth rate of 7.4% in a list of countries that expect to grow their Travel and Tourism demand most rapidly within the next 10 years. In the new country Report for 2008, Romania climbed one position, being ranked number 6 worldwide, with an annual growth rate of 7.1%.

Regarding the Travel and Tourism Economy growth over the next 10 years, the estimations place Romania in the top of the EU countries, with a rate of 6.7%, reconfirming the emerging country status for the country in the region. Table Nr. 1 shows a comparative perspective by main regions.

Table no. 1

	Romania	**European Union**	**Worldwide**
Growth of Travel and Tourism Economy in 2009-2018	**6.7%**	**2.8%**	**4%**

Source: WTTC, *The 2008 Travel & Tourist Research Romania,* 2008

In support of this tendency stand other indicators such as contribution of Travel and Tourism to the GDP, demand, visitor export, capital investments, government expenditures, etc, that reveal a steady contribution to the overall increase of the Travel and Tourism sector in Romania.

The situation of the arrivals during the last year confirms the ascending path of the Romanian sector. The average increase of the arrivals in 2008 compared with the same period in 2007 is of 8.2% as showed in Table Nr. 2. Going deeper with the analysis, the internal tourists count for 79.08% of the total number of tourists, but the highest increase has experienced by the foreign tourist with 9.7% increase vs. 7.8% increase for internal tourist.

Table no. 2

	Arrivals 01.01-29.02.2008	Arrivals 01.01-28.02.2007	Increase 2008 compared to 2007 in January and February %	Structure of the arrivals by Romanians and foreigners tourists in 01.01-29.02.2008 %
Total	824,000	761,700	**108.2**	100
Romania Tourists	651,700	604,600	**107.8**	79.08
Foreign Tourists	172,300	157,100	**109.7**	20.92

Source: National Institute of Statistics, Press Release Nr. 63/01.04.2008

This reveals the fact that the interest of the foreigners has slightly increased in the last year as a consequences of the admission of Romania into the European Union and also on the ground of an increased interest of the foreign investor in the Romanian market. The special cultural project – Sibiu – *European Cultural Capital* in 2007 has also contributed in promoting the image of our country abroad.

2. Are we prepared to cope with the growth in tourism?

Worldwide, the specialists consider tourism as the service sector generating the highest wealth and the most employment. Romania, by its positive indicators confirms this general premise. All the increasing indicators translate into a parallel raise of employment. A higher demand and a steady increase of the sector imply new jobs creation.

The question that arises is how many new jobs would be created? According to the data provided by the WTTC, the number of direct jobs from the travel and tourism in Romania, in 2008, is estimated at 304,000, representing 3.5% of the labour force of the country. By 2018, the travel and tourism employment is forecast to grow by 72,000 jobs and reach 376,000 jobs representing 4.5% of the total employment in Romania.

Table no. 3

	Number of jobs estimated		New jobs created in 2008-2018	Increase rate 2018/2008	Percent of the total number of jobs in economy	
	2008	2018	Δ2018/2008	2018/2008	2008	2018
Direct T&T Industry	304,000	376,000	72.000	8.08%	3.5%	4.5%
T&T Economy	600,000	705,000	105,000	8.51%	6.9%	8.4%

Source: WTTC, The 2008 Travel & Tourist Research Romania, 2008

In 2008, the sector of travel and tourism in Romania is estimated at 600,000 employees (direct and indirect), representing 6.9% or 1 out of 14.5 jobs. In the following 10 years, the number of jobs in the travel and tourism sector is estimated to grow to 705,000, representing 8.4% from the total jobs, or 1 out of 11.9 jobs. The Table Nr. 3 data reveal that the supply of jobs will have a sustained and upward trend in the following 10 years, with a growth potential of 10,500 jobs per year.

Are we prepared to cope with the growth in this sector? This is the question that many specialists and employers ask themselves. Romania, like other European countries experiencing sustainable economic growth is confronted with a shortage of labour force, especially with trained and qualified workers. In order to sustain the rate of growth and to maintain the competitiveness, the Romanian companies have to find innovative and non-conventional solutions and to adapt rapidly to the challenges concerning the human capital.

There are several causes behind the shortage of employees in Romania. In this paper we will present the most relevant ones.

1. The labour force shortage

A short overlook at the statistical data in Table Nr. 4 show that between 1996 and 2006 the number of employed persons has decreased by 1,622,000, due to emigration, but also due to a diminishing fertility rate, which is actually under the level of replacement rate. At the same time, the active population has a tendency to

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shrink, being somehow compensated by a diminishing unemployment rate which was registered during the last years, and an increase in the participating rate.

Table 4 Thousands of employees

	1996	**1997**	**2002**	**2003**	**2004**	**2005**	**2006**
Employed population	10935	11050	9234	9223	9158	9147	9313

Source: National Institute of Statistics, Annual Indicators, 2006

2. Emigration of labour force

The emigration of the Romanian workforce to the European countries that faces the same challenges with regards to the labour shortage (like Italy, Spain, etc.) is also an important cause to the present situation on the labour market. The integration of Romania in the European Union has allowed an easier transfer of the human capital. Moreover, the diversified offer, the higher wages and benefits have determined Romanians to apply for jobs abroad.

3. Low level of compensation

Also, the tourism sector is one of the lowest pay sectors of the economy. A recent report issued by the National Institute of Statistics reveals that the average net salary registered in February 2008 in Hotels and Restaurants sector was 660 lei/month. The average net salary in February for the whole economy was 1134 lei/month, almost double the salary in the tourism sector.

4. Lack of coherent statistical data

Unfortunately, there are very few data available regarding the actual situation of the shortage of the labour force. Also, there is no standard, unique methodology to calculate the shortage of the labour force. Each company calculates the indicator using its own methodology. According to the Minister of Labour, the official number of open positions in March 2008 is between 85.000 and 100.000, mostly in the construction, textile, sanitation and tourism sectors. The employers and representatives of the professional associations and trade union are waving higher numbers. Only in the construction sector, the President of the Romanian Association of the Constructors estimates that the shortage in this sector is estimated at 150,000 employees. The huge contradiction between the data provided by the official and the practitioners (employees) reveals one more time that there is an urgent need for a standard methodology to collect and calculate the labour market indicators.

3. Recommendations and conclusions

The human resources specialists from the tourism sector are already faced with a shortage of qualified personnel, mainly for the specialized positions such as chambermaids, waiters, barmen, cooks, pastry cooks. The skilled stuff is becoming scarcer, while the number of jobs in tourism is increasing from one year to another and the number of qualified people on the labour market is diminishing every year.

The authorities and the employers are taking into consideration few ideas and solutions that can be implemented in order to decrease the pressure on the labour market.

a. "Internal" solutions

- A better use of the internal resources of the companies which translates into an increase in the productivity and multi-skill employees are ideas which are already applied by the employers to compensate the shortage of the human capital.

- The development and training of human capital are some of the most important ways to retain and motivate the employees and better use their potential.

- The advance use of technology should be applied throughout the organization processes.

- Flexible work schedules will become a model, and not an exception.

- Re-viewing and re-defining the benefits packages should be a priority for the employers in this sector.

b. "External" solutions

- Outsourcing used to insure work force for positions that imply repetitive or labour–intensive tasks such as: housekeeping, laundry, stewarding, food and beverage service, accounting, payroll, maintenance, etc., is gaining a solid ground and perspectives look good for the future of this sector.

- Few categories of population – the students, the retired people, and the population from remote areas with higher supply of workforce (such as Moldavia Counties) – will be attracted into the hiring process.

- The attraction of the Romanian employees that work abroad or the employment of foreign workers that represents other two options which are taken into consideration by the companies.

- A strong relationship and continuous communication should be developed between employers and education centres (vocational high schools, universities).

- The government authorities have to be more pro-active in taking concrete measures to ensure a constructive, efficient and sound legal framework for the employees, employers and society in its holistic approach.

However, there is no unique model or strategy to be implemented and the list of recommendations is not exhaustive, but important is to be aware of the challenges and learn from the experience of other countries that confronted with similar problems.

In conclusion, these data represent an alarm signal to be taking seriously into consideration both by the private investors and by the government officials. Successful companies will be those which will identify, in the most rapid way, the permanent changing market demand, and which will be innovative in adapting to the challenges of human resources. As a matter of fact, the practice shows that the human resources are those that make the difference between success and failure in this business.

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Features of European Tourism

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Abstract: At the beginning of the XXI century, it has started to record a series of tendencies in the Spanish touristic sector, through the reduction of tourism participating in GNP, including the contribution of international tourism. This change of demand and offer from the last decade is coinciding with a scenario where the touristic offer is marked more and more by the accelerated process of urbanizing from the Mediterranean, Baleares and Canaries area. The natural and cultural environment quality is the main attraction of this area. The itineraries wish to offer an exclusive alternative to the locals, valuing the touristic potential of the regions and to offer new touristic products.

Keywords: tourism, Mediterranean basin, touristic tradition

Jel Classification: H8, L83, L80, L8

The main worldwide touristic basin – the Mediterranean Sea is characterised trough its "own identity", beyond the particular identity of the states that are common; it separates as a region of the antic civilization and modern civilization of twin ship.

The natural and cultural environment quality is the main attraction of these areas. The itineraries wish to offer an exclusive alternative to the locals of valuing the touristic potential of the regions and to offer new touristic products.

The statistics show that this area is annually visited by about 1/3 international touristic circulation. If it will be counted that sufficient travellers have destination to the Helio Marin treatment, it will be concluded the fact that the Mediterranean littoral is, far from being the first place in the aestival destinations.

The Mediterranean, known in roman period as the Nostrum Sea, is suffusing the littoral of 3 continents: Europe, Africa and Asia. The states which are located on shore benefit of an unusual beauty, the wealth of the lands, but especially of the sunny climate known in the whole world. The water of the sea is medium deep, but with accentuated salinity. It includes a lot of islands such as: Sicily, Sardinia, Corsica, Malta, The Greeks islands from the Egee Sea etc. Its arms are: The Tirenian Sea in the West of Italy, The Adriatic Sea between Italy and Balkan Peninsula, The Ionic Sea in the West of Greece and The Egee Sea between Greece and Turkey. Marseille (France), Barcelona (Spain), Genoa (Italy) and Haifa (Israel) are holding the status of main ports. From this point of view the Mediterranean Sea plays a strategic role by being the gate between numerous states.

From the political point of view, it can be three distinct locations on shore: the states that are pertaining to Europe, states which are pertaining to Africa and those to the Middle East. The best individualized is the tourism from the old continent. In defiance to the declaration of the State secretary for Commerce and Tourism of Spain, according to which: "The Mediterranean states offer similar products and that's why it is logical that they should cooperate", they can't pass unnoticed the distinction between political, economical and social order. Of course, the cooperation between states is necessary in an age of globalization, but the European shores are passing beyond as number of emplacements, age, degree endowment, and the other areas. Starting from the fact that area such as: France and Italy are known for few decades and until the ample problematic of the management in the coast line is solved, it can be easily affirmed the importance of the European states over the Africa or Asia.

The most wanted areas for the littoral tourism are the French Riviera, Italian Riviera, and then the Spanish coast which attract a lot of tourists. The touristic tradition of the European countries from the Mediterranean basin was created at the middle of the XVIIIth century, when British aristocracy and then the continental, were travelling in winter to the South of the Continent. For the Mediterranean Europe, the touristic fashion was demanding that the voyages must have places in the cold season, the tourists escaping from the country of origin in seeking of a warm climate, and not in a special way for the sun, from that the fashion asked to protect. The mutations from the value system of tourism determined by the fashion, medical opinion, and development of sportive activity in free air they brought the revelation of sunny destinations particularly appreciated especially for their offer of type "3S"- Sun, Sea, Sand.

The ample centres or touristic poles of the Mediterranean basin are getting between 10 and 15 million tourists annually, which are going to in particularly to Azure Coast, Lido Coast (from Adriatic Sea), Brava Coast (Spanish Catalonia) and Coast del Sol (Malaga). Alongside this cost regions from Mediterranean basin are also included the islands of Cyprus (Turkey-Greece), Corfu, Crete and Cyclades (Greece). The tender of the Mediterranean country contains alongside the coast area and also the touristic area of continental type. This is having a pronounced cultural and relaxing pattern and it is located in urban centres which annually receive between 5-10 million tourists. Cities such as Rome (including Vatican), Venice, Florence, Granada, Cordoba, and Athens owe their development to the touristic, cultural and transcultural offer of the Mediterranean civilization. Beside their littoral offer of the "big city", it is valued the whole time of the year, the seasonal oscillations being insignificant after confronting with other areas of the littoral.

The tourist industry of the Mediterranean basin is developed, and it has an integrated pattern trough the hotelier chain in its full expansion and it is valued into diversified assortments, for the mass and the elitist tourism. The Egypt is attracting trough the Nile River Valley, where annually over five million tourists discover the antic artefacts of the antic world. The traditional tourist offer is also including the cities of Cairo, Port Said, Alexandria, which attract massive amount of tourists. The North African littoral and also Morocco, Tangier, Al Hoceima, Sidi Reruch and at Hammamet - Tunisia, Monastir and Djerba represent the touristic locations in full development, with a diversified offer of international quality. The main international touristic basin is located in Europe and it contains the next regions:

1. The Occidental Europe:

    -   The Mediterranean area;

    -   The area of North Atlantic facade.

2. The alpine arch from the central Europe

3. The central Europe and Eastside

The demand for the transport service and touristic in the European Union was evaluated at 2. 149 billion USD and predicted of reaching the level of 3.529 in the course of a decade. The contribution of T&T (Travel and Tourism) in the total GPD of EU had situated at approximate 3,9% in 2006. In EU the industry of T&T is generating 8,6 mil. Work places (4,2% from the total of the work places existent at the EU level).

The exports of T&T represent approximate 13% from the total exports of EU from 2006. The investments of capital in T&T had the value approximate 241 billion USD in 2006, 88,6% of the volume of the international region.

The Mediterranean area, which is mobilizing 1/3 from the word wide tourist is approximate ½ from the offer of the regional touristic, is representing the biggest tourist concentration in the world.

The specialization in Mediterranean offer is following the natural features of this area (climate, littoral, flora etc.) of the ones activity is, answering in present to the principal motivation from summer time of the European tourists, specifically to those from the North continent.

The main international tourist destinations among European countries riverside resident of the Mediterranean Sea are:

1 Spain – cashing 38,495 mil Euro;

2 France – cashing 33,981 mil Euro;

3 Italy- cashing 28,453 mil Euro.

Near France and Italy, Spain is a famous state for the touristic industry. Getting an annual number of tourist's average of 50 million, Spain is on the second place in world after France (according to the appreciations ONT). Spain is confronting to overcrowding, especially in the warm season. With all of this the littoral tourism is contributing to the income of this industry.

With the Mediterranean Sea of 1670 km, Spain is having numerous famous resorts, which appeared and evolved in the same time with traditional locations, for example, Valencia. Although the massive arrangements of the littoral area were accomplished hardly over 1950, from the point of view of the quality resources and the services labour conscription, we cannot speak about a significant difference between resorts from this place and those from France for example.

The first area and the most important is The Costa del Sol, with an impressive length, around 300 km, between the Gibraltar rock and Cabo de Gata. It gives more beauty to Andalusia, famous trough its history and cultural traditions.

The quality of water and air, nebulousness extremely low and the endowment attract numerous tourists. Some results draw attention: Torremolinos, Nerja (the Mediterranean pearl), Acipino, Merbella, La Linea (the oldest Iberia beach). It adds the beaches with sand very thin and white from the Plaza Degetares, Algeciras, El

Rincancillo, Malaga, the capital of the province with the same name, is an old place, dating from the 12th century BD. The colony of Cartage, then of Rome and not at the last time moor; it is still keeping the marks of the old civilization (including those of a Moor fortress). Encouraged by the subtropical vegetation rich in palm tree, Malaga, is today a modern city, renamed aside the tourism and for wine production, sugar or textile.

Forwarding form the frontier, to the south, is laying Costa Brava, with its unique landscape, formed by a multitude of gulfs with sand, where the water is penetrating calmly, is the second area of Coast line littoral of Spain, as beauty and tourist attraction. The little villages had transformed gradually in very crowded resorts such as Lloret de Mar with more than 100 hotels, San Feliu de Guixols, Palamos, Tossa de Mar or Blanes. It must be mentioned Barcelona, as a main touristic centre of Spain, where it may be rediscovered a series of monuments and cultural elements such as the Sagrada Familia Cathedral, the biggest in the world in modern style, with a interesting history, yet undetermined (opera of the famous artiest Antonio Gaudi), between Costa del Sol and Costa de Brava, reference points for the touristic wave of summer. It may also be found other four "costs": Costa Dorada - with the resorts Mataru, Garrof, Bara, and Tarragona. Costa del Azahar with the city of flowers Valencia (having the biggest botanic garden in the world) and resorts as: Denia and Alicra, Costa Blanca, with the capital at Benidorm, one of the most known littoral resorts of Spain, with a beach with golden sand of 5 km, and with Calpe (spectacularly rocks), Torrevieja and Costa de Los Pinos, an area with less improvements.

At 200 km of Spanish coast is finding a group of five islands Los Baleares. The climatic regime extremely favourable (10-25 Celsius degrees), the air purity because of the emplacement in the wide sea; it makes this area the most pleasant destination for beach in Europe. The carstic phenomenon is all around and the human had put its imprint trough beautiful and relaxing ports and places. The best known, most and most look daring is the island of Mallorca, with the main touristic centre Palma de Mallorca, with beautiful beaches and roman architectures and the Ibiza island, the favourite destination of German tourists.

Ibiza knew a development in the last years concerning the tourism. Without having demands of an extremely expensive destination, it gathers lots of visitors. A characteristic of this island is the fact that wherever you are (especially when travel by car) you are never far away from the beaches and from the isolate gulfs. Ibiza is reuniting over 30 beaches arranged around the cities.

One of them is Talamanca, situated in the golf, very close to the Ibiza City. With all of this it remains quite a resort with sandy, beautiful beaches which makes it so popular. It has 900 m length and 25 m wide. The waters penetrate the golf line, ideal for swimming (including for children). Some other possibilities of recreation are the bicycle or courses at the windsurf school. All the hotels have a view on the old side of Ibiza city which can be seen spectacularly in the night, when is illuminated.

At the beginning of the XXIst century has started to record a series of tendencies in the plan of Spanish touristic sector, translated trough the reduction of tourism participating in GPD including the contribution to international tourism. This fact is coinciding with the relative loss of competitiveness at international level of a whole new line of products and tourist destination. Although it had registered an increase of international touristic, the average income didn't increase, by comparing with the one of the 1999. The foreign tourists spend more and more time in Spain, they are auto - organizing quickly, respective, trough the internet, contacting directly the offer of touristic services and transport service at low cost, spending more time in their own residences, or to friends' or in rented residences, what it means an obvious breakup of the model of classic Spanish tourism of the type of beach and sun.

This change from the demand and to offer from the last decade is the same with a scenario where the touristic offer is seen as marking more and more the accelerated process of urbanizing from the Mediterranean area, Baleares and Canaries.

There was the loss of the external market from Spain for the other Mediterranean countries specialized in offers of sun and beach products. After 40 years of continuous growth of the touristic performance from the region, the first regress sign have manifested trough the deterioration of particularly touristic areas and a slowing down of the rhythm of increasing the demanding for the touristic products with increased added value, compared with another destinations of the Mediterranean competitors for the same line of touristic products, especially from the closer Orient.

The reduction of the companies' profit activate in a succession of subsectors and the reduction of the socio-economic contribution of the tourism.

The gradual loss of the advantage trough price is a competitive element.

Between the 70's, 80's and 90's the prices acted in a decisive way in the meaning of multiplying the international tourist arrival, diversion from a low level of the life costs, wages costs and supplying tourism reduction, sustained by the offered advantages in some moments of the devalued pesetas. At the middle of the 90's the touristic cashing of Spain advanced favourably and under the influence of the

reduction of competition in the area, that is the reduction of attractiveness of the Oriental Mediterranean as following from the geopolitical instability from the area.

In exchange, in the last years, the economical growth registered by the Spanish economics and the approaches of life cost registered in other European states, have made the price for goods and service at the Spanish market for approaching for the ones from the source country of the tourists, losing in this way the competitiveness of the price, in comparison with the offer of the oriental states from the Mediterranean area for the demand.

The factor of influence - elements of demand:

- The influence of the macroeconomic scenery with excess of financial liquidity and reduced levels of the rate of the interest at credits in all Europe, with consequence over the acquisition capacity for families and companies;

- The expectation of increased the profitableness, in the touristic immobile domain associated with the good results in Spanish tourism obtained until the year 2000;

- The powerful and constant increase of the vacation resident prices in the coast line area, including the ones under the pressure of short terms exercise by publicity in the real estate domain, the disturbance of stock market in the year 2004 and the low profitability of other financial active with a fixed rent;

- The accentuation of the preference to leave in areas with a pleasant climate and more closely to the sea manifested an increase of Spanish population and European after the pension;

- The explosion and the diversification of the air route at low cost had two effects:

    - the tendency of buying/sale numerous residential homes in the coast line area where there are better connections towards the air line with low cost;

    - shorter visits and a level of more reduced expenses of the tourists which use the low cost company transportation.

Elements of the offer:

    - the intensification of estate company investments in vacation house as result of strategies and diversification of the offer line;

- the deficit budget of local authorities, as a result of intensification of investments in some local services of infrastructure (security service and guard, sanitary service and of the local network transportation;

- the strategies of territorial planning - a good part of the urban plan for the touristic areas; they have in view the increase of urban level without foreseeing, the limits and without including a long term strategy, which represents a threat of the sustainable feature of Mediterranean area from the socio-economical point of view.

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Types and Forms of Tourism

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Abstract: For the study of tourism, the most suitable method from the geographic point of view is typify it, because it allows the delimitation of tourist areas. Tourist areas are characterized by a specific type of travel or by a reunion of some types that may vary dynamically over time. The types of tourism result mainly from the different motivations of the journey, i.e. the purpose of doing. Each type of tourism is distinguished by such specific purpose and it is specific to those regions where fixed purpose can be achieved by the existence of some specific facilities.

Keywords: relaxing tourism, health care tourism, leisure tourism

Jel Classification: L84, L83, L80, L8

1. Introduction

Typifying tourism first appeared in Poser in 1939, the paper: *"Der Fremdenverkehr im Riesengebirge"*. Here, Poser distinguishes several types of tourism: tourism by transit, summer relaxation, winter sports, short distance relaxation.

Hunziker and Krampf, 1941, distinguished several types and forms of tourism: travel for rest and treatment, pilgrimage, and scientific knowledge, etc.

Finally, in 1965, Jülg, Ruppert and Maier in 1970, admitted the existence of six types of tourism: tourism recreation, therapy, visitation, reduced distance relaxation, transit by tourism and professional tourism.

2. Types of Tourism

The types of tourism are dynamic in time, they vary a lot. The types of tourism presented in a given period are generated by the needs of its objectives, the level of cultural and social facilities and the existing means of transport.

Spatial feature of tourism is the kind of tourism resulting from mixing more types of the same territorial unit. Mixing types of tourism is, however, regional or local importance as a factor for progress in proportion to their number, but at the same time affected by the season.

In accordance with the purposes, each type of tourism is going towards those areas where the purpose may be achieved either through the potential facilities, either due to the climate or specific traditions of the place.

In general, one may distinguish six types of tourism:

- Relaxing tourism;

- Relaxing and health care tourism;

- Visiting tourism;

- Transit tourism;

- Reduced distance tourism;

- Professional tourism.

If the first five types of tourism practiced during holidays, professional tourism is closely linked to the productive activity. Some authors, such as Hunziker and Krampf, exclude professional tourism of the types of tourism, because it binds to a gainful activity, being far from the meaning of a classic leisure activities or health care. Including professional and tourism within the general framework of tourism it results in a "Tourism generally speaking" that cannot be excluded from any performed analysis.

In terms of choosing the tourist destination, we distinguish:

- volunteer tourism - the destination is chosen by free will of the beneficiary of tourist services (tourism, relaxation, visiting tourism, and reduced distance tourism - for leisure);

- forced tourism - the destination is chosen from various requirements by others (tourism, relaxation and health care - on the medical recommendation, transit tourism – out of the need of transportation objectives, professional tourism - at the request of the unit where the beneficent of tourism services is working)

Unlike the types of tourism, the forms of tourism represent the way to conduct the tourism depending on the causes and the external influences.

The forms of tourism have as their differentiation the properties of tourism.

We distinguish several forms of tourism based on the following criteria:

1) The criteria of the initial area and the destination:

a)   Domestic tourism;

b)   International Tourism

2) The criterion number of participants:

a)   Individual tourism;

b)   Group tourism.

3) Organizational criterion:

a)   Organized tourism;

b)   Unorganized tourism;

c)   Semi-organized tourism.

4) Criterion Season:

a)   Continuous tourism;

b)   Discontinuous tourism.

5) Temporal Criterion:

a)   Tourism for a very long period of time;

b)   Tourism of long duration;

c)   Tourism of reduced duration

6) The criteria of transportation vehicles:

a)   Tourism by train;

b) Tourism by auto;

c) Marine tourism;

d) Air tourism;

e) Other forms of tourism (cycling, walking, etc.).

7) Social criterion:

a) Private tourism;

b) Social tourism

8) Criterion of the age and occupation of the tourist:

a) Youth Tourism;

b) Specific to adults tourism;

c) Specific for older generation tourism

9) The criterion for the type of destination:

a) Mountain tourism;

b) Season tourism;

c) Other

Depending on the reasons for travelling, which are very different because of the influence of psycho-sociological factors, of health or life, there may be distinguished more types of tourism.

Their determination is made based on the average length of stay and distribution of tourist flows during the year.

3. Types of Tourism Related to Leisure

Leisure tourism (holiday)

Currently, tourism leisure (holiday) predominates in terms of participation, the most important type of tourism. This part especially the urban population - especially those in major economic centres - because of stress accumulated in the deployment of dynamic economic processes today. In rural areas, this type of tourism is still in a

reduced practice on the one hand and reduced mobility of people in these areas, but relatively low income status.

Tourism holiday may consists of either a period of almost total rest (held in an area very quiet, with few attractions in the surrounding area), either as an active resting period in which everyday activities are replaced by others, usually complementary (people providing intellectual work usually chosen sports, walks, excursions, etc.. while men work mainly with individuals in chosen activities with more movement towards intellectual).

Tourism, recreation and is also a tourism course, without appeal, as with tourism and recreation to health care, to medical treatment. Tourism demand in this case resulting from the two categories of needs: needs for recreation and the change of scene.

Tourism has a strong holiday season. It is focused, especially during periods of leave and holidays of adults conducted in the student's special summer or winter (around the winter holidays). For this reason, it appears correlated with a long term stay (1-2 weeks).

Tourism holiday lasting very long (3-4 weeks) are not at present attractiveness that had half a century. Dynamics of the contemporary world marks this factor also; the tourist prefers to switch places rather to visit only a certain place.

In the analysis of holiday tourism is essential to take into account several factors. On the one hand, it involves a crowded of traditional tourist areas (summer - tourism season, winter - mountain tourism), and routes to transport them. Shortcomings of the promotion of travel agencies or higher rates charged by these contributions to increase tourism sometimes unorganized which increases congestion phenomenon above. It should be kept in mind that favourable places of relaxing tourism activity are those characterized by a peaceful climate, with adequate facilities to spend the holiday. As a result of these considerations in the management of such areas there should be undertaken all efforts to increase tourism offer.

Another factor to be taken into account is that the distance of travel during holidays. There is here a strong dependence of tourism demand for a specific area of travel and duration to the destination.

If the destination is at a distance greater than the origin area, if it is accompanied by the appropriate needs of tourist attractions in a particular historical period of time, it was observed that the tendency of their choice related to offset shortfalls shipping.

Another factor influencing tourism demand for a recreation area is the income level of the citizens. It features very sophisticated area of tourism can lead to a greater demand from tourists that have significant income, while other areas with fewer facilities, but with a natural environment can be adequately searched by tourists with modest incomes.

Relative to the age structure of tourists should be noted that older people will seek quiet places May (mountain proper walk, meditation, resorts in the forested areas at the edge of lakes, etc.), while young age population in general searches genial amusement resorts (coastal), rising mountain to practice sports, etc.

Tourism and recreation to health care

This type of tourism is known since antiquity, being one of the oldest types. Traces of practice of relaxing tourism and health care were found in some of our resorts balneal-climatic, for example, Herculane Spa, Spa Geoagiu, Baile Felix, May 1, etc.

Economic and social conditions of modern life in which stress factor becomes more pregnant, have led to an amplification of this form of tourism. Pollution in large urban centres, the townspeople sedentary life, illnesses manifested in various forms the most nutrition increasingly distant from the natural lead to the need for tourism recovery of health.

Place of destination of this type of tourism is the resorts Spas pursuing recreational functions, features and functions mixed treatment on the basis of climatic factors, basin (thermal and mineral springs, sea water etc.).

The value of these resources with prophylactic and therapeutic properties is ensured by the arrangement of facilities for providing medical treatment. Since participation in this type of tourism takes place in most cases based medical references, he has an organized being so devoid of seasonal oscillations and with a smoothing of the distribution of tourists. Tourism demand is closely linked to supply and diversification of services provided only as a basis financial that can lead to amplifying this type in a specific area.

The need for treatment of medical prescriptions under conditions of long duration of this type of tourism, at least three weeks.

Due to various resorts going towards prevention and treatment of disease, the most closely related to therapeutic factors, the existing psycho-sociological factors have a role in choosing the place of destination which is much reduced. It occurs because of

a reduced mobility of tourists because of their close links with the resort, they are dependent on the provided services.

Since health care involves the need for rest, recreation, this type of tourism can be considered a more complex variant of tourism holiday (recreation). However, the primary role in this type of tourism lays healthcare.

Tourism visitation

Tourism visitation is a mix of several types of tourism. It is also a recreational tourism, having a strong cultural side. The people choose this type of tourism in the acute need to broaden the horizon and the general culture. The beneficiaries are mainly the intellectuals, because of their desire to continue the accumulation of new knowledge.

Unlike the two previous treaties travel, tourism visitation is characterized by a small number of participants, lacking character and weight.

An important factor which has favoured the development of this type of tourism is to use an increasingly wide range of cars as a means of transport, which contributes to a greater mobility of tourists, resulting in the same time and duration in general short of this type of tourism. Increased mobility but it also induces a greater unpredictability practiced routes, tourists could permanently change the options according to the new points arising from the tourist route.

Tourism visitation has long shown greater in the summer season, route changes can be easily modified because of the relative factors of climate in relation to periods of spring-fall (rain, cold weather etc.) or the winter (abundant snow, winds, frosts, etc.).

Where tourism is practiced visiting at weekends, it will have a short term event and an area not too far from the place of residence of the tourist. In both cases, however, it is distinguished by a very brief presence in the visited places.

The distances to the places visited are closely associated with leisure available. The objectives of this type of travel differ from those of the movement for recreational tourism, as represented by the physical and geographical landscapes particularly attractive, for different available anthropogenic items (cultural, economic, etc.), the customs, etc. Through a country it implies a strong embranchment tourist flows. The destination is mainly the cities, the places of anthropogenic concentration.

Rural areas represent items of interest for this tour through the ethnographic traditions and folklore as a very important factor in the internationalization of this form of tourism.

One factor to be taken in the tourism visiting fashion that is influenced by current cultural and media promotions can lead to important affluxes tourists to certain areas that lacked a search in the past and, conversely, lower interest of areas that no longer respect the needs of modern man.

Deeply humanitarian character of such travel is essential; it contributes to broadening international contacts, the better mutual knowledge and respect of people.

One side of tourism is visiting and the visiting relatives or acquaintances. This type of tourism has a longer period than that applied to the knowledge of various sightseeing places, but is manifested by a lower mobility, reflected by higher average length of stay in a town. In many cases, this type of tourism does not take into account tourist services in localities. This type of tourism does not depend on the season, but may find a certain periodicity of individuals to visit those places. However visiting various tourist attractions in the locality or area in question does not bring large benefits for travel agents in the area.

Often this type of tourism that link to for recreation followed visiting tourists in transit for sightseeing along the route. Tourism visitation also blends with tourism, recreation and professional to health care.

An out-of-date cultural tourism is the religion. Today it is manifested in the world famous places such as Jerusalem.

Transit Tourism

Tourism transit is not an independent type of tourism being wove with any of the other types. Tourism is a transit, in particular, where the tourist destination is at a great distance from town of residence of the tourist.

Thus, a journey through the territory of transit between the origin and the destination can be conducted with or without interruptions at different points situated along the route. Moving means self favouring the emergence of more of this type of tourism, because the free choice of stopovers on the route of travel.

Transit Tourism is usually short lasting, in some cases even below 24 hours. Almost all cases it combines with tourism visitation, separation of which is almost impossible. In this case, tourism, transit receives a longer and shorter stays by default that mixing especially interesting in the places of the tour.

Seasonal distribution of this type of tourism depends on other types mentioned above (tourism, recreation, tourism, visiting, etc.). In the light of these and the direction of progress, the development of this type is conditioned by the geographical situation, i.e. the favourable position in terms of shipments.

Uneven distribution in time of tourists, with maximum frequency in the summer season and especially during the peak of it, causes difficulties in the operation of tourist facilities.

Reduced Distance Tourism

Tourism distance has reduced many considerations to common events at the recreation and health care.

Due to industrial development of cities, labour is increasing and it involves a factor of great routine, becoming more and more citizens feel the need for recreation at weekends.

Tourism distance so reduced shall be conducted under the need for power regeneration in physical and intellectual work breaks.

Reduced distance relaxation falls in the short term, characterized by movements that require a period of several hours to a day or even in a day. Demarcation basic types of recreation reduced distance is not so dependent on the purpose and reasons for it, but depending on your time. There are two areas of accessibility of this type of tourism. Thus there is a settlement area and a peripheral area somewhat removed whose size depends on the paths of communication, means of transport and material welfare of citizens in the area.

Due to reduced distance of these areas compared to urban centre and as such due to time and lower costs of transport, much of the urban population to participate relaxation time low, these areas for recreation as large masses of population.

Depending on the temperament of the inhabitants of this type of recreation it can be extended from individual events to the collective group.

The number of tourists that attend the recreation of small distance is inversely proportional to the distance from the urban areas. In this situation, the crucial fact of life returns, expenses and difficulties of transport must not exceed a certain limit.

The first definition of this phenomenon relaxation believes that reduced the distance is a recreation of short duration, achieved by a trip to the place of destination, where they run fine without spending.

Even if the share spent without recreation is less than that spent by the efforts of companies that provides travel services should be directed to just this kind of tourism because it is obvious that the benefits will be higher.

Synthesizing the above, it concludes that relaxation in reduced distance is performed, in most cases, the end of the week, the peripheral area of large urban centres (which represent the main emitters of tourists), aimed relaxation force work or visit. She carries a landscape less than the transformation of relaxation long.

The recreation of distance is very low and in terms of tourism demand balance, avoiding seasonal oscillations, thus contributing to a more efficient use of materials.

In large urban centres, small relaxation distance recorded during the time developed. The apparent close relationship with the city expansion in the territory has forced the use of this area at increasing distance, and the development of transport.

Construction of railways which conditioned the establishment of recreation areas for short-along these lines and auto transport which enabled turning the territory between them have resulted in increasing the distance between town and recreation areas.

So the last two include extra recreational areas and is in fact the place of tourism to the reduced distance. However, unlike the immediate surroundings, which marks the place of holiday with maximum duration of one day. Studies have shown that the need for spent at distances greater than 100 km.

Using one or other areas suitable for recreation reduced distance depends both on subjective factors and objective factors. In this sense come into consideration both the time needed to take the distance between the origin and destination, and the rest of the destination.

Differences that appear in the attendance of different areas are caused by the tourists, by age groups, that depend largely on their recreational habits. In this respect, some attendance areas play an important role for the tourist so they must be equipped. Differences do occur and they depend on the structure of professional

tourists. But the fact is that the attendance of the better endowed areas increases according to the size of income.

The reduced distance of recreation is closely related to season, weather conditions and type of relaxation.

The reduced distance relaxation is used especially by people from urban centres. The Studies on this phenomenon show that approximately one third of the population in the European cities prefers recreation of reduced distance. Participation rate varies in proportion to the size of cities.

As regards the structure of age group, the predominant group is between 20-45 years, characterized by the highest mobility, the rest being composed of recreating between 45-65 years (representing over one third) and those reported by 65 years, is less.

Tourism-related work

Unlike the types of travel shown above, the movement of tourist business is not tied to the annual leave or weekend work. It occurs Rather throughout the year, showing in most cases a uniform distribution over the time. It is established between the different administrative and cultural institutions, and between economic relationships that exist between collaboration. Professional Tourism includes all movements so with official institutions organized by the administrative, scientific, cultural and the economic enterprises, commercial etc. As such, this type of tourism takes place between different administrative centre, cultural, economic, etc. depending on the number of these institutions and enterprises. In this type of tourism can be put scientific and technical tourism and to some researchers, given that types are independent.

In terms of tourist origin, and destination, large economic centres are both providing and receiving tourists.

Unlike travel for recreation, those undertaken in the interests of the service usually have a short duration (2-3 days) in accordance with the nature of their problems awaiting resolution, such as, for example, participation in international fairs. These trips only under certain conditions have a medium or long term, for example, scientific tourism (e.g. attending conferences, travel for training, exchange of experience etc.).

To determine whether a settlement that a tourist accommodation enjoys a travel professional, is not sufficient just an issue constantly and spent a uniform operating capacity of accommodation during the year. To this end must occur and a shorter duration of stay, because the presence of isolated first two characters may indicate the presence of another type of tourism.

Unlike leisure tourism in the professional distance of travel and choice of destination city no longer plays an important role in tourism. These results weaken the influence exerted on this type of travel by psycho-sociological factors, which action sometimes becomes invalid. Instead, it is important for institutions and enterprises to ensure the best of what the move, seeking to offer a fast transport without loss of time and at the same time comfortable and suitable conditions of accommodation. It leads to significant expenses for travel and accommodation expenses incurred by the issuing institution or enterprise. This type of tourism is very effective for the various tourism facilities, especially for the accommodation, which in turn requires the stimulation of the science in particular. Professional Tourism uses the full range of tourism services from the accommodation, recreation and sports to the market and targeting tourists. It links to this issue and by visiting various tourist attractions in the town of tourist activity itself, and tourism is a professional movement of transit. This type of tourism can also combine with tourism visitation.

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Transport Costs and their Impact on Trading through Simulations in a Specified Dornbruch-Fischer -Samuelson Model-1977

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Abstract: We propose here a brief presentation of the Ricardian model with continuum of goods known as the Dormbusch-Fischer-Samuelson-1997, named by the ones who created it. Starting from this theoretical basis we will create numerous examples made by an informatics program and we will focus over the impact on transport costs at the level of countries .We want to measure the transport impact over the countries specializations and over the range of good trades.

Keywords: Ricardian model with continuum of goods, transport costs, specialisation, trading, numerical simulation

Jel Classification: L9, L90, L98, L91

A brief presentation of the model

The Ricardian model with continuum goods, D.F.S., means an extension of the classic comparative advantage model, which Paul A. Samuelson was appreciating it as "the most beautiful idea from the economic science."

D.F.S model shows the existence of two countries, which we will use it as I.T. (internal country) and E.C. (external country), with only one production element (work); its offer is designed by L and L*.

Every country is able to produce and waste a big number of goods, any good being individualised by a symbol that belongs to the brake [0,1] that asks for a specific work measure, obviously they are different between countries. For example, for good z, a(z) means the unit requirement of label in I.C., and a*(z) means the unit

requirement of label in E.C. We can define a report as: A(z)=a*(z)/a(z) meaning measuring ratio in I.C. comparing with E.C.

$$A(0) \geq A(z) \geq A(1) \text{ and } \frac{\mathrm{d}}{\mathrm{d}z} A(z) < 0$$

Using this dispose of goods in decreasing order, we make a hierarchy based on comparative advantage of the I.C. We can graphically display the relationship between relative rate of wages or relative productivity and a specified good, showed by index z, which can be found on A(z) curb created by an infinity of goods, which will have a continuum and a decreasing form.

The cost of production for a good z in I.C is Wa (z),W represent the wage in this country, in same time the same good will have a cost in E.C. W*a*(z),W*, being the wage in this country. Ny consequence the good z will be a little cheaper in being made in I.C., comparing E.C., if is fulfilled the inequation:

Wa(z)<W*a*(z) or through modifications if W/W*<a*(z)/a(z) or A(z)>W/W*

This way, basing on A(z) curb and rate of wage W/W* it can be studied the origin of countries' specialisation for an infinity of goods. See figure 1.
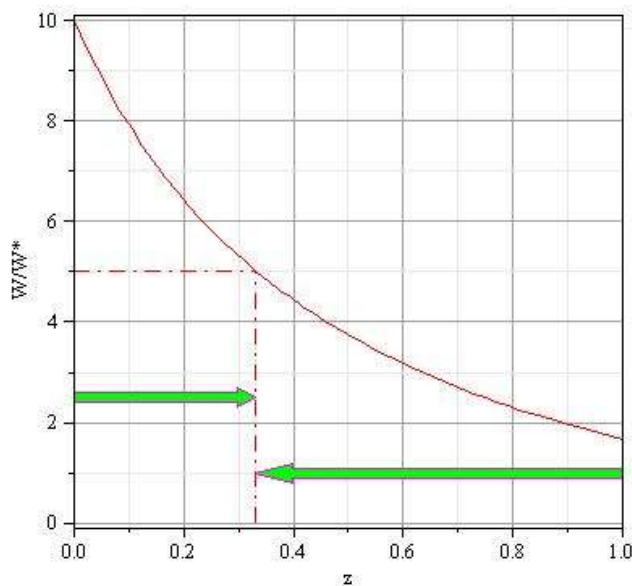

Fig 1 The ratio between the wage W/W* and the goods symbols z

It will be a good (limit) z1 where the inequation will become equation A(zl)=W/W* and it will generate all good shaving clues smaller than z1 will be made in I.C, and also, all the other goods with clues bigger than z1 will be made in E.C.; see the arrows in figure 1.

We presume that the measure of waste for purchasing a good has a constant weight in income, and by consequence we admit that a weight b(z) from world income is spend on purchasing good z.

By consequence we are measuring the weight that is spend from world income for purchasing goods made in I.C., goods that will have smaller index hierarchy than z1.The weight of world income spent for all the goods made in I.C. will be:

$$G(zl)=b(1)+b(2)+b(3)\ldots\ldots\ldots+b(zl) = \int_{0}^{zl} b(z)\, dz$$

The total value of spending circumstance of goods purchase made in I. C. l will be G(z) multiplied with world income, but this is equal with the product between wage and the number of workers in this country, so we have: W L=G(zl) world income.

But the world income is the only production factor that it is shown by the sum of income wages such as: world income = W L +W*L*

This way, previous relation it retyped as: W L =G(zl)(W L+W*L*) or by rearranging W/W*=B(zl)(L*/L), where B(zl)=G(zl)/(1-G(zl)

This last relation shows that B(z1) will be bigger, when income will be smaller and z1 is rising, that is it will be the same way to modify z1 and B(z).There will be more goods that I.C. will produce and waste; so E.C., as much as relative dimension for work is bigger in I.C, which will be shown by a bigger rate of wage. We obtain a relationship between relative rate of wage and indexes of goods, which graphic is shown in figure 2, showing the dimension composition in this model:
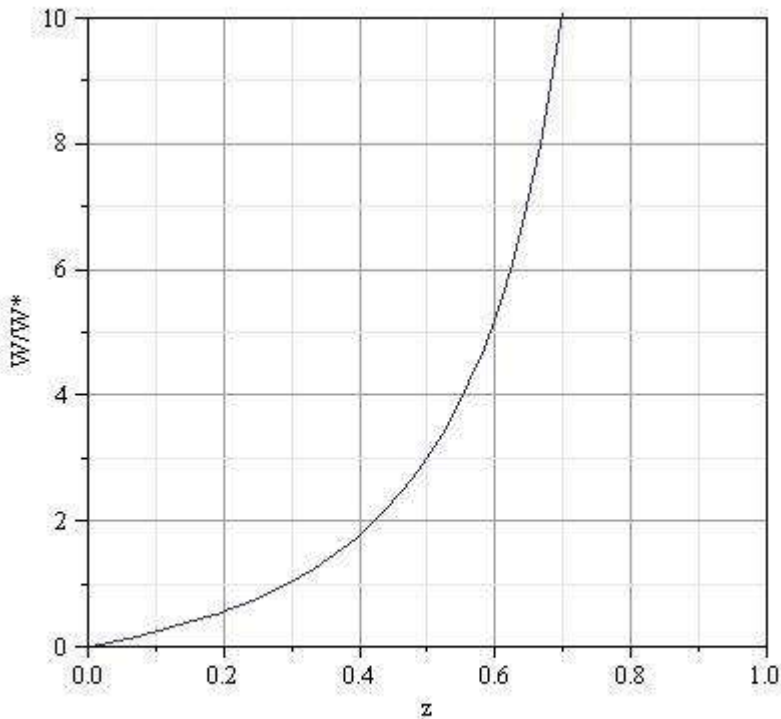
Fig 2 The relation between relative wage and the symbol of goods, the component of the demand.

From the turn of the two curbs it will appear a level of relative wage rate and an index of limit good, which will show the structure of goods made in I.C and E.C.

In terms of goods lines, the origin of specialisation is made for I.C. by $A(z) > W/W^*$, when for E.C by $A(z) < W/W^*$.

3) The introduction of transport costs

The introduction of transport costs in D>F>S model are achieved through the presumption that those are like "icebergs", meaning from a unit of goods send just a fraction $t(z)$ reaches effectively at its destination, the rest of it "melting" on the way. Also, we impose, the condition that the measure of transport costs is the same for all goods $t(z) = t$ and it is independent of the goods flux between the countries.

In this situation, I.C. will produce and export these goods and the equation will be solved: $wa(z) \leq (1/t)w^*a^*(z)$ or that can be retyped as $w/w^* \leq A(z)/t$.

In mutual way, E.C. will make and export these goods which for the measure of unitary costs of work it is smaller than the one of imported goods, respective when the inequation will be solved: in figure there are represented by A(z) curbs - interrupted blue- adn A(z)/t-continuum red, depending on z and the relative salary.
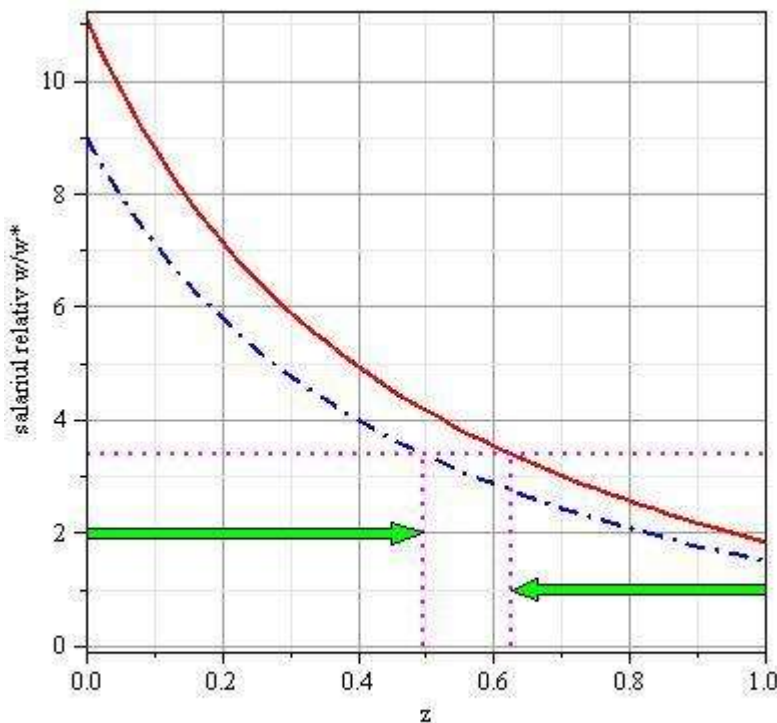
Fig 3   The impact of bringing transportation cost
on the I.C. produced goods

This way, for a relative given wage, I.C. will produce and export all the goods in the left side of A (z)/t curb, arrow to right, both countries will produce intermediate goods, uncovered by arrows, and T.E. will produce and export the goods from the right side of A(z)/t, and the arrow to left.

As the transport costs t is defined, as a fraction from a unit that reaches the destination, that means that the smaller the value of t is, the bigger is the transport cost, the good "melting" on the way, and figure 4 shows the extension of commercialized goods.

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4) Numerical simulation:

We can explain this function: $\quad A := \dfrac{c - d\,z1}{(e + f\,z1)\,t} \qquad AA := \dfrac{(c - d\,z2)\,t}{e + f\,z2}$

$$\lambda 1 := \int_{z1}^{1} b(z)\,\mathrm{d}z \qquad \lambda 2 := \int_{0}^{z2} b(z)\,\mathrm{d}z \qquad b(z) := 2 - 2\,z$$

That keeps the properties given by the model which will permit the numerical simulations, for different measures of the coefficients: c, d, e, f and of the parameters L1, L2 and t.

This way, for $_{c=10, d=5, e=1, f=2, L1=10,}$ L2=10 and transport costs between 0.75 and 0.95 we obtain next specialisations origins, see table no.1.
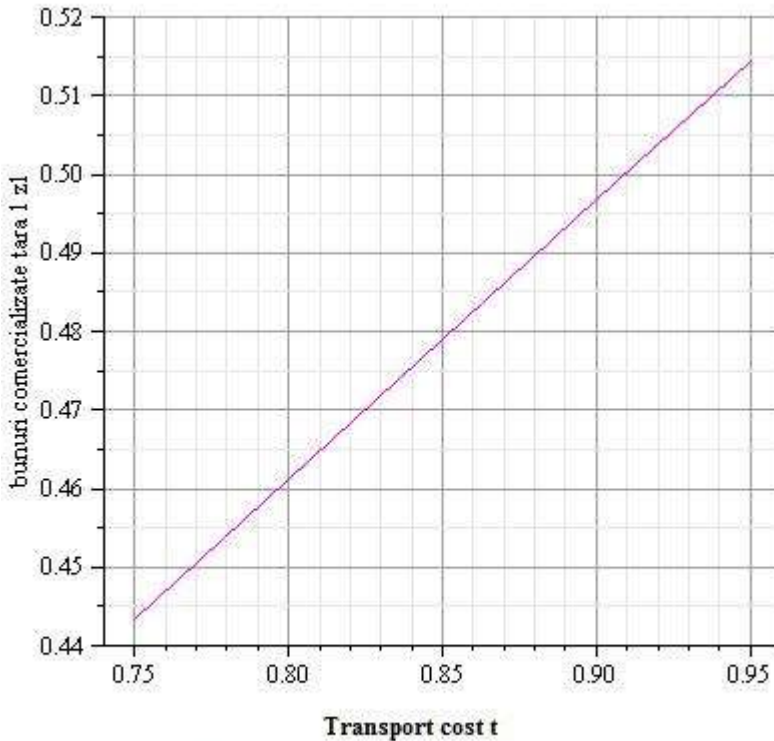
Fig. 4 The dependence between the transport costs and
the series of goods commercialised by the country 1

Table no. 1 Basic model

transport cost	0.75	0.80	0.85	0.90	0.95
Goods exported by the I.C.	0,44337	0,46117	0.47899	0,49671	0,51427
Goods exported by the E.C.	0,79657	0,73479	0,67785	0,32528	0,57666

If we would record a growth on work offer of I.C., presumptive L1=L2, all the remaining measures have not changed, we will obtain information from table no. 2.

Table no.2 A growth in work offer of I.C.

cost de transport	0.75	0.80	0.85	0.90	0.95
Goods exported by the I.C.	0.41141	0.43058	0.44969	0.46864	0.48736
Goods exported by the E.C.	0.76234	0.70230	0.64708	0.59622	0.54926

We can see smaller domains for commercialised goods by I.C., while the goods of E.C. are extending. If we would register a growth of work productivity, it would show a shortening of coefficient e and f, presumed to be e=0.75 and f=1.5 in the condition of keeping to the other values constant, the information being centralized in table 3.

Table no. 3 A growth of work productivity in I.C.

cost de transport	0.75	0.80	0.85	0.90	0.95
Goods exported by the I.C.	0.49268	0.50837	0.52419	0.54003	0.55580
Goods exported by the E.C.	0.84835	0.78421	0.72484	0.66983	0.61881

We can see a growth of exported goods by I.C. and a decrease of the exported goods domain by E.C. while the work productivity does not modify.

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Agro tourism, One of the Main Factors in Rural Development

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Abstract: The paper describes the steps in projecting agro-tourism activity and it presents the issues and opportunities that show the importance of agro tourism activity as source of improving the income of small agricultural households. This paper examines the effects of agro tourism activity on standard small agricultural household - A and it is presented the empirical evaluation of agro tourism effects on resource distribution within a small agricultural household A as on net income.

Keywords: agro tourism, rural tourism, touristic potential

Jel Classification: L84, O18

1. Introduction

Agro tourism comprises all the touristic activities unfolded in the rural area, outside the areas destined to "the tourism of lights" (in cities), "the blue tourism" (the seaside), "the health tourism" (in spas), and "the white tourism" (in mountainous areas).

The agro touristic potential in the Romanian village is extremely complex, comprising natural and cultural-historic elements of great variety and touristic attraction.

Through this, Agro tourism is a mean of integral utilization of rural environment, with its agricultural, touristic, anthropic and techno-economic potential. Apart from other types of rural tourism and countryside vacations spending, Agro tourism does not comprise anything else but the activities through which the family that accommodates tourists

obtains income from this, not only from the accommodation activities, but also from the agricultural ones.

Thus, two agricultural households were analysed, each of them having different activities, one of them performs the agro touristic activity besides the agricultural one.

2. The Analysis of Income and Costs at the Agrotouristic Pension (Household A)

The agrotouristic pension is situated in Chiril Village, Crucea Township, 29 km from Vatra Dornei Municipality. It is located at the feet of the Rarău Mountains and also on the course of Bistriţa River.

The pension is placed in an area that offers very good conditions of spare time spending. It has an accommodation capacity of 20 places, in 2 and 3 persons room as it follows: 4 family rooms, 4 double rooms, equipped with all utilities necessary to perform this activity. The management staffs are represented by the members of the family and there are two more persons hired, one full time and one part time.

Table 1 Total investment in Agritourism activity

	Investment in:	Unit-$	Value	Percents
1.	Pension building	$	26052	91,59
2.	Facilities (showers, etc)	$	1302	4,58
3.	Fence (wall)	$	466	1,64
4.	Inventory	$	622	2,19
5.	Other	$		
	Total		28443	100,00

The initial capital requirement is usually higher in relation to average agricultural household income. Because the agricultural household A cannot afford it, it is a need to barrow money from bank or other sources.

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For paying back the investment value in this projection was used the actual interest rate (14 %) from the Romanian Bank from investment in RON currency.

Because the risk is increasing in case of borrowing money, farmers that want to implement agritourism activity in agricultural household should examine the particulars of their own situation; the agricultural household location, the characteristics of their land and natural resources and the potential consumer population of the surrounding area. They should also assess their own individual strengths and interests regarding agritourism activity. Implementing new activities it may also reflect the financial needs and liquidity problems of the agricultural household.

Table 2 Agri-tourism expenditure (4 double rooms)

	Item	Unit	Value	Percents
1	Energy	$	397	11,35
2	Employers expense	$	2239	6,39
3	Tax for social protection	$	671	1,92
4	Medical fees	$	156	0,448
5	Raw materials	$	13435	38,391
6	Drinks	$	10076	28,79
7	Repairs, maintenance	$	622	1,77
8	Tax for added value	$	4467	12,76
A.	Total direct costs	$	21210	60,61
9	Interest rate	$	12738	36,39
10	Administrative expenditure	$	933	2,66
11	Miscellaneous	$	113	0,324
B.	Total variable costs	$	13784	39,39
	Total	$	34995	100,00

The exploitation situation is:

The surface of agricultural land owned by the agrotouristic farm is 2,50 ha, of which 96.8% is arable land that is exploited in order to obtain production, part of them for domestic consumption, and the difference for capitalization through Agro tourism.

Table 3 Land use

Land use	Surface of agricultural land	%
Agricultural land	2,42	96,8
Non- agricultural land	0.08	3,2
Total	2,50	100

The animal force is formed by 2 cows, 2 calves, 2 pigs, 20 hens and 20 chickens (table 4). The only product sold on the market in order to obtain profit, are the dairy product and a part of meat product.

Table 4 The number of animals

Effective structures	Number	Stock Value (RON)
Cows	2	5400
Calves	2	3000
Pigs	2	600
Hens	20	240
Chickens	30	90

The value of a cow is 2,700 RON, thus the value of cows stock is 5,400 RON, also 1 calf represents 1,500 RON, resulting, thus, a value of 3,000 RON for 2 calves. The value of pigs stock is 600 RON which represents that a pig costs 300 RON. Concerning the value of bird stock, a hen is 12 RON and chicken is 3 RON/piece. Thus it results that the total value of animal force income is 9,330 RON.

Concerning the destination of animal production, this is mainly for domestic consumption and Agro tourism activity, the rest for marketing.

The zoo technical sector is for obtaining products of animal origin necessary for the Agro tourism activity. The obtained products are: milk, beef, pork, chicken, eggs. A part of the obtained products in this sector is destined to marketing, which has a favourable influence on the increase of household profit. The income in the zoo technical sector obtained from product sale on the market and from Agro tourism values 11,100 RON.

The agricultural production profit, compared to zoo technical production, is 4,102 RON higher, and, the profit obtained from agricultural product marketing and its use in the agro touristic activity, is of 15,202 RON compared to 11,100 RON, the profit of zoo technical production. This fact is owed to the marketing, in a higher proportion, of agricultural product, than that of zoo technical one, because buying alimentary products made of meat implies higher expenses.

The touristic activity performed by this household leads to an annual revenue influenced by the accommodation cost which includes a meal and by the pension's extent of occupancy.

The extent of occupancy

When establishing the accommodation costs, there must be taken into account the personal expenses and the costs perceived by the other pensions in the area, as well as the expenses of raw materials and consumer goods.

Out of 365 days in a year, the pension is occupied only for 205 days; nevertheless, the profit obtained from accommodation is of 52,550 RON. The household has total annual revenue or:

Ti = income from zoo technical production + Income from agricultural production + Income from tourism activity

Ti = 11,100 + 15,202 + 52,550

Ti = 78,852 RON

The household costs are distributed and the incomes too, on categories: costs of zoo technical production, costs of agricultural production and costs of tourism activity.

Costs of animal production

The total costs of animal production are of 6,161 RON, with annual revenue of 11,100 RON. Regarding the costs of production on crops, these are determined: costs of fertilizers and seeds or saplings, of transport of the products from the harvesting place to the 3rd storage, these costs include costs of fuel, labour, costs of mechanical field works (harvesting), costs of seasonal labour, all these depending on crop and on fluctuating costs (table 3).

The structure of the costs of production on crops

The highest costs of production are recorded at fodder plants, 1,545 RON, followed by potato crops with 1,125 RON. The fee on property is 450 RON, total on the whole arable surface.

The value and structure of costs in tourism activity

The presented data shows that the highest weight (one third) is represented by costs of salaries, followed by the costs of electricity (16.38%), costs of food acquisition (12.72%), annual liquidation (11.37%), insurance and social services (9.10%), restorations (2,95%) and advertising (2.28%) out of the total costs.

At the agro touristic pension, the costs added are those of agro touristic activity: 43.940 RON, thus the total costs are of:

c = costs of zoo technical production + costs of crops production + costs of agro touristic activity

c = 6,161 + 3,884 + 43,940

c = 53,985 RON

Analysis of profit and costs in an agricultural household (household B)

In the first household practises, the agro touristic activity and owns a land surface of 2.50 ha, the second analysed household practises only agriculture, the income resulting from agricultural product marketing (milk, meat, potatoes, vegetables).

The modality of land use

The agricultural land is designated to potato crops, a very small surface to corn beans, onion, other vegetables and annual fodder plants. The surfaces occupied by these crops are different in size.

The structure of crops

It is noticed that the largest land surface is occupied by fodder with 0.62 ha (38.75%), followed by potato crops with 0.6 ha (37.5%); vegetables occupy a surface of 0.20 ha (12.5%), the corn with 0.1 ha (6.25%) and onion with 0.1 ha (5.0%) out of the total surface of 1.60 ha.

Most of these crops are designated to marketing; the rest is used for domestic consumption, animal feeding and seeds.

The total profit of agricultural production is 4,498 RON, quite low the annual revenue compared to that of the agro touristic pension.

The household's animal force is a total of 56: 3 cows, 2 calves, 1 pig, 30 hens and 20 chickens.

The total economic efficiency of the analysed households

One of the most important indicators of economic efficiency in Agro tourism is profitability. Defined as a relation between the obtained result and the used means, profitability is an indicator under the basis of which are estimated the obtained performance, and also the possibility of making profit. Profitability is a currency excess, the balance between total returns and total costs.

The profitability of the activity is analysed on the basis of the indicators expressed in relative size, but also on the basis of those expressed in absolute size. Among the expressed indicators in absolute size, it can be mentioned:

- gross profit – expressed as a difference of total revenue and total costs;

- net profit – calculated as a difference of gross profit and income profit.

The difference of profit between the two households can be easily noticed, household A being the most profitable due to practising Agro tourism; in this case, the

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income is remarkably much higher so the resulted gross profit is 24,867 RON and the net profit is 3978.72 RON, compared to the second household which does not perform Agro tourism activities, and it has a gross profit of 9,795 RON and a net profit of 1567.2 RON. From the efficiency point of view, the first household (agro touristic pension) has a higher profitability.

As in other economic activities, in Agro tourism too it is pursued obtaining a sufficient high profit so that it can ensure the payment of capitals, the maintenance of existent economic potential and the increase of the economic efficiency according to the evolution of touristic market and to the random factors.

An important role, in the analysis of the profitability of activity, plays the indicators expressed in relative size.

Among these is remarked the rate of profit calculated according to the formula:

R = P/RS x 100 or R = P/C x 100 where

R – rate of profit

P – profit

RS – rate of sales

C – total costs

- household A has a rate of profit of:

R = P/C x 100

R = 24,867/53,985 x 100

R = 46.06%

- household B has a rate of profit of:

R = P/C x 100

R = 9,795/8,423 x 100

R = 116.28%

The economic profitability means the efficiency of total or part of the assets usage. It is expressed through the rate of economic profitability which should be superior to the rate of inflation. A sufficient high rate of economic profitability should allow the renewal and the increase of fixed assets in a short time. The rate of economic profitableness is based on the profit for a period of time and the total assets, thus:

PR = (profit for the period before taxation/total assets) x 100

- household A has an economic profitability of:

PR = (24,867/35,600) x 100

PR = 69.85%

- household B has an economic profitability of:

PR = (9,795/11,750) x 100

PR = 83.36%

The financial profitableness is estimated through the rate of financial profitableness of long term capital, and through the rate of profitableness of personal capital calculated according to the formulas:

FPr = (Profit for the period before taxation / long-term capital) x 100, where: long-term capital = personal capital + medium or long-term credits

- household A has a financial profitability of:

FPr = 24,867/42,750 x 100

FPr = 58.17%

- household B has a financial profitability of:

FPr = 9,795/21,400 x 100

FPr = 45.77%

From the presented data it can be noticed that both of the households are lucrative, but the agro touristic pension has a higher profitability compared to the common household. Having a net profit of 3978.72 RON and a rate of economic profitability of 69.85%, the pension can afford to invest in new objectives.

The social-economic efficiency can be entirely studied at the level of a touristic complex product or of a company, but it can also be analysed at the level of each constitutive activity of touristic product (result).

Table 5 Size and structure of the categories of utilization

Specification	UM	Surface	% from total
Total surface	ha	50	100
Agricultural	ha	47,5	95
Arable	ha	30	63,15
Pastures	ha	10	21,05
Meadows	ha	5,5	11,57
Vegetables	ha	2	4,23
Non-productive	ha	2,5	5

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3. Conclusions

The Agri-tourism activity has two major purposes:

- The first is to provide leisure and recreation for the public;

- The second is to increase farmers' income using their own products and avoiding in this case the expenses of transport and taxes, if we compare with another kind of tourism.

The standard small agricultural household can be motivated to implement new activities because there are a lot of other advantages:

- Agri tourism activity builds rural development and increases the job opportunities;

- Assuring continuity of agricultural activity in mountain regions where the agriculture is very poor;

- Authentic products and unique experience are made available to the agricultural households;

- Providing opportunities to show which products will be important in future, established crops that are needed for consumption in restaurant;

- Agri-tourism activity has potential for new sources of revenue from products and services that can be incorporated as part of "working" agricultural households;

- Agri-tourism activity can generate revenues and important cash flow during the off-season;

- Agri-tourism activity also, provides opportunities to create recognition of the landowners that practice this activity;

- Increasing the level of social behaviour in the relationships among another members from same or another community;

- To grow-up the aesthetic spirit that can improve also the hygienic-sanitary situation.

In conclusion Agri-tourism activity can provide additional income to farmers and rural community. It can provide additional supplement revenue that can make a difference between a profit loss for agricultural producers, agribusiness and rural community. It is a way to "add value" to crops and livestock currently developed on the farm. It also has the potential for building relationships between agriculture and industry.

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Finance and Banking

Earning Power Analysis on The Basis of
the Intermediary Balances of Administration

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Abstract: The profit and loss account, within the basic (developed – version) system, allows the establishment of the intermediary results account or of the intermediary balances of administration. Indices involved in the case of the intermediary balances of administration are necessary in making decisions both at the firm level and at that of third parties that are economically and financially related to the firm.

Keywords: profit, results account, margin, intermediary balances

Jel Classification: M41, H42

The step-like structure of indicators, which starts from the most comprehensive (i.e. accounting period production and mark-up) and ends with the most synthetic one (i.e. accounting period net profit), suggests that these indices formed a series referred to as *a cascade of intermediary balances of administration.* Each such balance reflects the financial administration result at the respective accumulating stage[1].

The intermediary balance of administration stands for the difference between two values. By way of repeated subs tractions, several indices are obtained i.e. indicators describing profitableness and firm management (some are found as such in the profit

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[1] Stancu I., *Finanţe. Teoria pieţelorfinanciare. Finanţele întreprinderilor. Analiza şi gestiunea financiară (in translation.: Finances. Financial Markets Theory. Firm Finances. Financial Analysis and administration),*Ed. Economică Pbsh., Bucharest, 1996, p.329

and loss account others are calculated as it is in the case of intermediary balances of administration). Absolute magnitude-describing profitability indicators are as ponderous in consequence as those to be further dealt with i.e. useful indices in firm administration assessment.

The margin, as net profitability indicators must be made one of in the economic and financial analysis, is dealt with in such terms as[1]:

- The **production cost margin** i.e. the difference between the selling price of goods and their production costs.

- The **commercial margin or mark-up** i.e. the difference between the selling price of firms' goods and their historical costs.

- The **margin of variable costs,** which reflects the difference between the selling price and the variable costs.

The direct cost margin, which stands conspicuously for the difference between the sale price and the direct cost (thus, it includes the indirect cost in the profit) is calculated at product level and it does acquire the significance of **contribution margin**.

The **financial period production** is an indicator which is mostly applied to industrial units and is made the use of in measuring the global volume of activity i.e. the sold output, the stocked production and the immobilized production.

The value added is the encashment over plus that exceeds the value of third parties' consumption, namely the wealth originated in turning firm (technical, human, financial) resources to account, or, to put it differently, it stands for the amount of labour factor, capital factor and state factor remuneration[2].

It is calculated by using two different methods:

1. **the substractive method** (i.e. the difference – based or synthetic method), which is of two types:

   - the value added stands for the difference between the financial period output and the intermediary consumption;

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[1] Mărgulescu D., Cișmașu I.D., Vâlceanu G., Șerban C., *Analiza economico-financiară (in translation: Economic and Financial Analysis)*, România de Mâine Foundation Pbsh., Bucharest, 1999, p.201

[2] Mărgulescu D., Niculescu M., Robu V., *Diagnosticul economico-financiar (in translation: Economic and Financial Dyagnosis)*, Romcart Pbsh., Bucharest, 1994, p.182

- the value added is found by subtracting the intermediary consumption from the rate of turnover; intermediary consumption values are difficult to assess.

2. **the additional or earmarking method**, which stands for summing up staff, paying off and interest – oriented expenses, levies and taxes, dividends and the net output in the whole financial period.

The gross operation excess (deficit). This indicator mirrors the gross economic output at firm level; it is influenced only by the operating activity and not by the paying off or provision – concerned system, by the fiscal policy or dividend – earmarking manner.

The gross operation excess is the monetary surplus virtually resulted from the operating activity, which derives in cash collections (either immediate or subsequent) and in operating expenses involving urgent or subsequent payment operations. Operating revenues followed by encashment are made up of the selling output and the operating subventions.

Operating expenses involving payments consist in: the purchasing cost of sold commodities, third party consumptions, levies, taxes and similar payments as well as staff expenses (wages, personal insurance and social protection).

The gross operation excess or taken operating gross deficiency must be taken for the difference between the value added – possibly increased by operation – oriented subsidies received by the company – and the staff – concerned expenditure, which is to be rounded with fiscal expenses (except for the tax on profit)[1].

The gross operation excess is made use of in the analysis process in making resemblances (both in space and dynamics) with the output of firms with the same activity.

The balance sheet method is the one used in the structural analysis of such indicators as: the market supplement (or mark-up), the operating term output, the value added and the gross operation excess.

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[1] Chebac N., *Informaţiile contabilităţii în procesul de analiză şi decizie* (in translation: Acconting Informations in the Decision-Making and Analysis Process), Alma Publishing House, Galati, 2002, p.157

As the different types of output (profit or loss) are shaped up under different factors, it is factor analysis to be approached in such a context[1].

The evolution of the indicators included in the Balance sheet and in the Profit and Loss Account is depicted in table 1. The above account is structured on three levels that explain the obtained result, according to the structure of activity in a firm, in operating, financial and manifold other terms. The profit and loss account allows the calculation of light intermediary balances of administration that stand for as many steps in "moulding" the net output in the financial period: the mark-up, the operation output, the value added, the financial period production, the financial period current output, the egregious result and the net result of the financial period[2].

To conclude, one could state that intermediary balances of administration are magnitudes, results i.e. indicators obtained through economic, "cascade" calculations as in tables 1. and 2:

Table no 1.   **ROL Thousand**

REVENUES	**Financial period**		
	2002	**2003**	**2004**
1. Commodity sales	247.957	-	-
2. Sold output	72.765.004	85.741.658	91.626.837
3. Stored output	-	-	-
4. Immobilized production	-	-	-
5. Subtotal I (5=2+3+4)	72.765.004	85.741.658	91.626.837
6. Financial period output	72.765.004	85.741.658	91.626.837
7. Operating subsides	-	-	-
8. Subtotal II (8=6+7)	72.765.004	85.741.658	91.626.837
9. Value added	18.945.220	12.552.435	7.976.027
10. Operating subsides	-	-	-

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[1] Țole M., *Analiza economico-financiară a firmelor* (in translation: Economic and Financial Analysis of Firms), România de Mâine, Foundation Pbsh., Bucharest, 2000, p. 189
[2] Chebac N., Op.cit., p.155

11. Subtotal III (11=9+10)	18.945.220	12.552.435	7.976.027
12. Gross operation excess	13.485.706	6.765.178	2.030.984
13. Revenues from operating provisions	-	-	50.000
14. Other operating revenues	37.754	1.913.610	74.230
15. Subtotal IV (15=12+13+14)	13.523.458	8.678.788	2.155.214
16. Operation result (profit)	8.855.932	4.062.415	-
17. Financial revenues	19.630	9.283	258.032
18. Subtotal V (18=16+17)	8.875.562	4.071.698	258.032
19. Egregious revenues	-	-	-
20. Current operation result (profit)	8.874.579	4.066.580	-
21. Egregious result (profit)	-	-	-
22. Operation result before taxation	8.874.579	4.066.580	-
EXPENSES			
23. Cost of sold commodities	247.957	-	-
24. Third parties' operation consumption	50.622.299	69.267.602	79.665.547
25. Expenses with third party-made works	3.197.485	3.921.621	3.985.263
26.Subtotal I (26=24+25)	53.819.784	73.189.223	83.650.810
27. Taxes, levies and similar payments	258.523	161.100	66.528
28. Staff expenses	5.200.991	5.626.157	5.878.515
29. Subtotal II (29=27+28)	5.459.514	5.787.257	5.945.043
30. Gross operation deficit	-	-	-
31. Paying off and provision			

expenditure	2.668.717	2.896.337	2.493.039
32. Other operating expenses	1.998.809	1.720.036	-
33. Subtotal III (33=30+31+32)	4.667.526	4.217.668	2.493.039
34. Operation result (losses)	-	-	337.825
35. Financial expenses	983	5.118	586.065
36. Subtotal IV (36=34+35)	983	5.118	923.890
38. Egregious expenses	-	-	-
39. Current results of the financial period (losses)	-	-	65.858
40. Egregious result	-	-	-
41. Tax on profit	2.456.608	1.030.445	-

Intermediary Balances of Administration

Table no 2   ROL Thousand

Tabular of Administration Balances	2002	2003	2004
Rate of turnover	73.012.961	85.741.658	91.626.837
Mark-up	-	-	-
Operation production	72.765.004	85.741.658	91.626.837
Value added	18.945.220	12.552.435	7.976.027
Gross operation excess	13.904.230	6.765.178	2.030.984
Operation result	8.855.932	4.062.415	-337.825
Current result of the financial period	8.874.579	4.066.580	-665.858
Egregious result	-	-	-

Financial period result before taxation	8.874.579	4.066.580	-665.858
Financial period result subsequent to taxation (net profit or loss)	6.417.971	3.036.135	-65.858

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L'intégration Monétaire de la Roumanie
entre Couts et Bénéfices

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Résumé: Il n'y a pas dans notre pays de stratégie qui concerne bien techniquement l'adoption de l'euro. Il s'imposerait d'essayer, quoiqu'il soit très téméraire, d'identifier le moment opportun pour l'introduction de l'euro. Ce n'est pas facile mais il faut s'y mettre puisqu'il s'agit de faire suivre l'évolution et l'identification des tendances d'intégration de la Roumanie dans la zone euro, de faire également attention aux modèles d'intégration monétaires développés en Europe et bien entendu de mettre en place des scénarios alternatives pour la Roumanie. Et tout cela tout en évaluant de près les coûts et les bénéfices de l'adoption de l'euro car l'intégration monétaire de la Roumanie est bien importante et le fait d'envisager aussi où l'on est avec les coûts pourrait nous faire éviter certains pièges. Dans notre communication, nous essayons justement de mettre en discussion notamment ces derniers aspects.

L'intégration monétaire se transpose dans la dénomination du processus de formation d'une zone monétaire, d'un espace où les monnaies de plusieurs pays sont soit irrévocablement liées entre elles où chaque monnaie se relie irrévocablement d'une monnaie «ancre» en fonction d'un certain rapport, soit les monnaies nationales sont remplacées par une seule monnaie, qui sera utilisée dans toute la zone. Autant dans un cas que dans l'autre, on se retrouve devant un processus d'unification monétaire.

L'intégration européenne d'une économie nationale suppose à tout prix et son intégration dans l'union monétaire, la monnaie unique européenne étant seulement une des composantes du paquet d'instruments qui sont utilisées, à l'échelle de l'Union, pour assurer l'équilibre macro-économique.

L'introduction de l'euro impose la formation de la condition de l'appartenance des membres de l'union monétaire à un espace monétaire unique et oblige tous les citoyens de reconnaître la monnaie unique comme symbole du droit d'obtenir en échange une partie des biens et services offerts en vente dans l'intérieur de l'Union. Cette reconnaissance se double avec la croyance collective que le système qui l'introduit a la capacité de garantir et de l'individualiser par rapport à d'autres monnaies. La monnaie unique nominalise son espace de fonctionnement dans le concert des monnaies contemporaines, elle donne du nom à la communauté et lui porte au monde entier l'identité[1]

Les partisans de l'architecture européenne mise en place par le Traité de Maastricht ont eu de leur côté le fait que l'humanité se retrouvait après une longue période d'instabilité, qui a mené à de l'inefficacité et même au désordre économique. Ils ont apporté comme argument positif l'existence de la fierté nationale aux peuples de l'Europe, fierté qui constitue un stimulent dans la compétition pour l'inscription sur l'une des trois marchés de l'Europe unie[2]. Si l'Europe s'engage pleinement dans une politique d'instabilité, aucun pays ne reste en dehors et n'encourage pas l'instabilité[3]. De l'autre côté, on retrouve les pessimistes, qui ont contesté la possibilité d'arriver à la stabilité dans l'Europe unie. De cette manière, on a toujours critiqué l'absence d'un traitement profond de l'unification politique du continent, tout en considérant que les différents aspects économiques et monétaires de l'unification ne peuvent pas être envisages correctement que sur le fonds d'une organisation politique.

La proximité géographique et culturelle rapide du commerce ont permis aux pays de l'Europe Centrale et de l'Est de régler les déséquilibres résultés de l'économie centralisée et d'orienter leurs flux commerciaux vers l'Europe de l'Ouest. La stabilisation macro-économique et les réformes structurelles du secteur financier ont assuré le retour aux marchés de capital internationaux et l'attraction des investissements étrangers directs.

Pour les nouveaux et prochains pays membres de l'Union Européenne, on pose la question de la réalisation de la convergence nominale et réelle. Selon le pays, ils sont arrivés aux différents stades où l'on parle du passage de trois pays à la monnaie

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[1] Silaşi, G. – *Integrarea monetară europeană – între teorie şi politică*, Timişoara, Ed. Orizonturi Universitare, 1998, p. 6.

[2] Toma, R. – *Euro, moneda unică: între naţional şi internaţional*, Sibiu, Ed. Continent, 2004, p. 55.

[3] Acad. Kiriţescu, C. C. – *Idei contemporane în acţiune*, Bucureşti, Ed. Enciclopedică, 1997, p. 51.

européenne: la Slovénie (depuis le 1er janvier 2007 et la Malte et le Chypre à partir du 1er janvier dernier).

Certains spécialistes (Eichengreen, B., Ghironi, F., *EMU and Enlargement,* Conference on Economic and Monetary Union, Brussels, march 2001) insistent sur la nécessité de l'adoption tout de suite après la participation pendant deux ans dans le cadre de MRS 2, à partir des considérants suivants: ces pays ne bénéficient pas de possibilité de rester en dehors de la zone euro après l'adhésion (clause *opting out*). Pendant que le Danemark et la Grande Bretagne ont pu négocier de rester en dehors de la zone euro, les nouveaux pays membres sont obligés d'accepter les conditions prévues dans le Traité de Maastricht, voire se préparer pour l'union monétaire et adopter la monnaie au moment où ils se considèrent préparés. D'un côté, ils conviennent moins aux critères d'une zone monétaire optimale, comparé à la manière où les anciens membres de l'Union l'ont fait. Il y a des pays à dimensions réduites, des relations commerciales avec l'Union Européenne plus ou moins développées, qui s'attendent à obtenir des bénéfices suite à l'introduction de l'euro.

Il y a aussi des voix qui recommandent l'introduction de la monnaie unique après une période de plus de deux ans après l'adhésion à l'UE (De Grauwe P., Lavrac, V. – *Inclusion of Central European Countries in the European Monetary Union,* Kluwer Academic Publisher, Boston-London, 1998). Leurs arguments s'appuient sur le fait qu'un pays à peine rentré dans l'Union Européenne puisse faire face à la compétition sur le marché unique et aux défis du marché global de capital. De l'autre côté, ces pays se caractérisent par des niveaux de développement différents, plus bas que ceux de l'Union, devrant obtenir la convergence nominale et réelle.

La théorie classique des *zones monétaires optimales* développée par Mundell, R. (*A theory of Optimum Currenncy Areas,* MacMillan, New York, 1961), McKinnon, R. (*Optimal Currency Areras,* American Economic Reviw, No. 53, 1963), Kenen, P. (*The theory of Optimum Currency Areas: An Eclectic View,* University of Chicago Press, 1969) définissent la zone monétaire optimale comme une région géographique où les pays membres doivent utiliser des taux de change fixes ou une monnaie unique. L'explication des critères de la zone monétaire optimale consiste dans le fait que, en général, dans une économie touchée par des choques extérieurs, l'ajustement réel a lieu s'il y a des rigidités nominales. De cette manière, le taux de change flexible sera le seul choc asymétrique absorbé. L'absence de la mobilité du capital nécessite un autre mécanisme d'ajustement. Quoique Mundell n'ait pas mis en évidence un autre bénéfice du taux de change fixe (minimisation des coûts de transaction), il a supposé que si le coût de l'ajustement pour un pays n'était pas

grand (si l'on respecte les critères de la zone monétaire optimale) c'était mieux de choisir le taux de change fixe, pour bien bénéficier da la stabilité de la monnaie.

Une question sensible de l'union monétaire est, en général, liée aux coûts impliqués par une telle démarche. On considère que les coûts les plus importants sont localisés au niveau macro-économique et s'envisagent puisqu'on perd des instruments importants de la politique économique. Bien évidemment, l'ampleur des coûts associés à la perte des instruments de politique économique dépend des différences existantes entre les différents pays. Des économies pareilles devraient ainsi avoir des stratégies alternatives aux instruments monétaires pour éliminer les chocs. Il est très utile de mettre en évidence qu'elle serait la probabilité de l'apparition des chocs asymétriques et quels instruments alternatifs pourraient être utilisés lorsqu'il manque le taux de change et le taux d'intérêt. Les coûts augmentent quand il se manifeste des chocs de la demande ou de l'offre qui affectent différemment les économies participantes à l'union monétaire – les chocs symétriques, lorsqu'il y a des préférences différentes pour le chômage et l'inflation, des différences entre les taux de croissance ou quand les mécanismes d'ajustement ne fonctionnent pas (il n'y a pas de systèmes d'ajustement des chocs, les institutions du marché du travail ne fonctionnent pas différemment ou l'on maintient des différences entres les systèmes fiscaux, de Grauwe, 2003).

A l'autre extrême, on retrouve les défendeurs de la monnaie unique, qui mettent en avant les bénéfices qu'une union monétaire peut bien impliquée, tout en dénigrant la persistance à long terme des coûts éventuels. Si, en principe, les coûts de la monnaie unique sont liés du niveau macro-économique, ses bénéfices réclament plutôt le niveau micro-économique. En gros, les bénéfices de la monnaie unique supposent l'élimination des coûts de transaction associés au taux de change, ainsi que l'élimination du risque généré par l'incertitude concernant l'évolution prochaine des taux de change.

Les conditions pour réaliser une zone monétaire optimale sont très difficilement mesurées, ce qui implique une analyse envisageant les coûts et les bénéfices, par ailleurs très difficilement à réaliser. Tout de même, les spécialistes qui ont testé empiriquement la théorie des zones monétaires sont d'accord que l'Union Européenne ne représente pas de zone monétaire optime. Suite au Traité de Maastricht, les opinions des analystes économiques et politiques ont continué à être différentes en ce qui concerne les effets concrets de l'abandon de leur propre politique monétaire nationale. On a fait référence aux suivantes conséquences majeures de l'introduction de la monnaie unique euro: croissance de la transparence

et de la compétitivité; un seul marché, plus fonctionnel; des marchés de capital où la monnaie soit l'euro; la croissance du degré de capitalisation des banques, diminution du nombre d'investisseurs ou les banques qui accordent des crédits pas chers; disparition des politiques nationales pour ce qui est les devises; relaxation des pressions sur le marché financier suite à la disparition des taux de change; la baisse des coûts déterminés par le risque; une nouvelle devise, en compétition accrue avec le dollar et le yen, réduction des tendances inflationnistes. L'adoption de la monnaie unique a déterminé des unifications et des intégrations majeures sur les marchés européens. Pourtant, par exemple un souci pour tout le monde et notamment les investisseurs en euro, est représenté par les rigidités structurelles et les nombreux problèmes liés au chômage puisqu'à long terme, les effets de l'euro sur le taux de chômage demeurent controversés. D'un côté, certains spécialistes considèrent que l'euro représente un avantage pour trouver de nouveaux emplois, de l'autre, il y en a d'autres qui sont les adeptes de l'idée que sans marchés flexibles de la main d'œuvre ou des transferts fiscaux entre les pays européens et encore qu'il manque des ajustements indépendants des taux de change, l'euro peu apporter à coup sûr de l'instabilité, par la perte de millions d'emplois[1]. Les données empiriques montrent par contre que dans la zone euro le taux de chômage a diminué, en moyenne générale, après l'adoption de la monnaie euro, entre 1994 et 2007.

Le principal bénéfice de l'union monétaire peut être considéré la facilité de l'ajustement au choc. Les bénéfices d'une monnaie unique se retrouvent au niveau micro-économique et on considère qu'il ne sont pas épuisés jusqu'au moment ou l'on y comprend tous les pays du monde entier (voire aussi dans le passé l'initiative du premier ministre allemand de suggérer une union douanière avec les Etats-Unis, en tant que première étape d'intégration). Il y a quatre bénéfices des taux de change fixés d'une manière irrévocable: la baisse des coûts de la volatilité du taux de change, la réduction des coûts de transaction, de l'incertitude, mais aussi la baisse de la «préférence locale». Même si la politique monétaire est perçue comme pas efficace à l'égard de l'influence des variables réelles à long terme, l'UE peut être approchée d'une zone monétaire optimale. L'actuelle zone euro peut avoir des bénéfices nets positifs, à mesure que les mécanismes d'ajustement fonctionnent mieux, et l'économie devienne plus flexible.

De cette perspective, une possible approche en ce qui concerne les avantages, les désavantages, voire les coûts, à l'égard de l'intégration d'une économie nationale dans la zone euro, pourrait avoir plusieurs points de repère: les coûts de l'intégration

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[1] Socol, C., Socol, A., *Adoptarea euro: costuri sau beneficii*, www.ectap.ro/articole/181.pdf.

économique, tout comme ceux de l'intégration monétaire, appréciés soit de la perspective macro ou micro-économique, peuvent être diminués par des mesures de politique de préparation des environnements cible qui tentent de rentrer dans un nouveau stade de l'intégration, habituellement plus rigoureux, du point de vue des conditions, et il est également recommandable qu'on établisse au niveau macro-économique, de la gestion de ces mesures et politiques, une correspondance, dans le sens de l'obtention du degré le plus élevée possible de neutralisation ou réduction des effets des coûts et désavantages par ceux correspondants aux opportunités et aux avantages.

Les mêmes questions concernant les avantages et désavantages, voire opportunités et coûts, concernant la Roumanie, pour ce qui est de l'intégration monétaire doivent être prises en discussion. De ce point de vue, si l'on fait référence à l'évolution, jusqu'à présent, de la zone euro, on peut constater que les tendances, ascendants ou descendants, n'ont pas de régularité et ne peuvent être associés à de certaines explications correspondant à un certain processus ou phénomène mais, plutôt, celles-ci peuvent être associées à l'insuffisance de la capacité d'une seule politique macro-économique unifiée, voire politique monétaire – d'assurer l'équilibre macro-économique. Il est probable que cette formule évolutive ait des tendances d'augmentation et décroissance, mais qui, du point de vue des valeurs des indicateurs macro-économiques, ne représentent pas de menaces à l'adresse des économies nationales ou de celles communautaires, ces valeurs-là pouvant être inscrites, sans faute, dans la caractéristique dimensionnelle de la variation, qui devient habituelle, pour une période d'environ 10-15 ans dorénavant, avec des évidentes tendances d'atténuation des petits chocs, et cela grâce aux processus, déjà démarrés, au niveau des pays membres, d'harmonisation, dans la direction de l'unification, des autres composantes du système de politiques macro-économiques. En gros, l'intégration monétaire européenne doit être considérée comme un étape intermédiaire nécessaire dans la direction de l'accomplissement des objectifs du processus d'intégration européenne et les avantages sûrs de celle-ci, tout en découlant de la croissance de la sûreté et de l'efficacité des opérations dans les conditions d'un marché libre, représentent les prémisses du progrès, comme formule évolutive adoptée, par concept, par les documents de constitution de l'UE.

Par conséquent, tel qu'il se dégage de ses documents de constitution, l'Union Européenne, comme zone économique formée par l'intégration, a en vue, principalement, des objectifs liés au progrès socio-économique général, de la communauté. Du point de vue économique, cet itinéraire, qui doit être parcouru, par

l'union, depuis la première étape de l'intégration, jusqu'à l'accomplissement des objectifs finals, l'harmonisation des rythmes de développement et l'approchement du niveau de vie, dans l'ensemble de la communauté a, comme premier objectif, d'atteindre le stade de macro-stabilisation économique. La macro-stabilisation économique est un stade, intermédiaire et indispensable, du processus de développement durable, réalisée suite à la gestion, efficace, d'un système complexe de politiques macro-économiques. Les objectifs finals, de l'intégration européenne sont conçus à être réalisés seulement dans la mesure de l'accomplissement du processus d'intégration, c'est-à-dire quasiment actuellement lorsqu'il s'agit des actuels pays membres y compris les deux pays rentrés, intégrés dans une formule élargie de l'actuelle union économique et monétaire européenne. En même temps, la macro-stabilisation du système communautaire européen est propre seulement à l'union économique et monétaire, étant un résultat de la projection et de l'application d'un système complexe de politiques macro-économiques uniques. De ce point de vue, l'union économique et monétaire européenne a encore beaucoup d'étapes à franchir jusqu'à la réalisation du stade de la macro-stabilisation économique, moment à partir duquel on pourra considérer démarré le processus de développement économique durable – processus qui faudra mener à l'accomplissement des objectifs finals de l'intégration européenne. Ainsi, l'état actuel de l'économie européenne, de l'union économique et monétaire européenne, ne peut pas être du tout considérée un état de macro-stabilisation économique étant donné le fait que les seules politiques macro-économiques totalement unifiées sont: la politique monétaire et celle des devises; ce qui veut dire que ce n'est pas encore réalisée la condition de combinaisons d'un nombre minimum de composantes (considérés à être: la politique monétaire, la politique des devises, la politique fiscale et la politique budgétaire), du système de politiques macro-économiques, dont la gestion efficace mène à la réalisation du stade de macro-stabilisation du système économique. Heureusement, on est train de poursuivre les démarches pour l'harmonisation d'autres composants principaux du système de politiques macro-économiques notamment celles fiscales et budgétaires, dans la direction de l'unification, moment qui facilitera, du point de vue administratif, le suivi des principaux indicateurs macro-économiques relevants. Et nous voilà 27 membres et il y en a d'autres qui attendent. Dans ce contexte l'extension de l'union monétaire européenne se fait normalement tout en prenant en compte de petits groupes de pays candidats, par rapport à l'extension de l'union économique européenne, la différence pouvant être mise dans le sens de la réalisation, par les pays candidats, du 5ième critère, d'ailleurs le plus dur, pour l'adoption de la monnaie

unique: la participation, pour au moins deux ans, à l'ERM 2, sans dévalorisations unilatérales. Des effets économiques non-désirables peuvent être ressentis tel que: la modification des valeurs des indicateurs macro-économiques relevantes, la baisse du taux de change de la monnaie unique, la diminution des quotas sur les marchés de capital pour des compagnies résidentes dans la zone euro, ainsi que des effets inverses pourraient apparaître dans le cadre d'autres systèmes macro-économiques, tels que: la croissance du taux de change des principaux compétiteurs internationaux de la monnaie unique, la croissance des quotas sur les marchés internationaux de capital etc.[1]

Tout au long des dernières années, on a enfin vu des situations rentrées plus sur la voie de la normalité de l'économie de marché, et mieux ciblés dans le sens des résultats aussi vers l'intégration monétaire. Des questions telles que l'élimination des industries inefficaces et du coup l'arrêt des subventions pour celles-ci ou les projets d'infrastructure à peine démarrés, la bureaucratie notamment quand il s'agit de l'environnement d'affaires, etc. se sont posées et l'on voit à présent un peu plus clairement le chemin. Tout cela par plus de persévérance politique et contraintes extérieures, ce qui met plus visiblement en évidence une comparaison entre les coûts et les bénéfices, surtout que le coût le plus dur et toujours ressenti par la population, traduit dans les défaillances sociales, par ailleurs bien prévisibles.

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The Financial Instruments for Risk Management
on the International Financial Markets

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Abstract: The international financial market is extremely volatile because of the influence of a numerous objective and subjective factors. Because of these, in their fight for maximizing the profit, the credit institutions confront permanently with all sorts of risks. It is important to know that the risk is generated by numerous operations and procedures. From these cause, at least in the financial field, the risk must be considered as a complex web of risks, in the sense that they can have common causes, and producing a risk can generate a chain reaction that would lead to other risks. As a consequence, these operations and procedures can permanently generate an exposure to the risk. The risk management is the key function of the financial institution, which acts on the international financial market. For doing this, it must be used some important instruments that can lead to avoiding risks or dimensioning them.

Keywords: the international financial market, profit, credit, risk management

Jel Classification: P34, P43

The dimensioning and the financial risks effects needs to do some financial operations in order to assure the diminishing of the negative effects or covering possible losses.

The main instruments for risk management on the international financial markets are:

a) Forward – Forward – is considered to be an operation based on a contract through which an operator buys a future rate of interest to a credit or to a banking placement. Forward – Forward in quality of interest risk management financial operation, allows to an entity which wants to contract a loan or to realize a placement to a further date (determined period of time) to evaluate the loan cost or the placement output.

Forward – Forward of contracting a loan differs by the fact that a bank commits itself to grant a credit to a big enterprise or to a debtor in a certain size, period of time and to an interest rate prior fixed.

The bank

The credit

Ensured interest
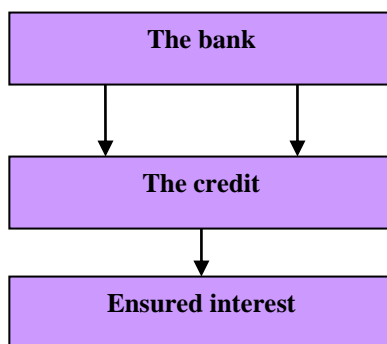
In the frame of a *Forward – Forward placement*, the investor commits to make a placement to a bank or to another credit institution, of a certain size on a period of time and to an interest rate prior fixed.

Investor

Placement

Ensured interest
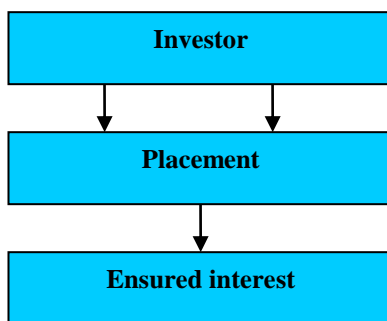
The rate to the Forward – Forward operation (Rf) depends on the loan interest (Li), on the loan duration (Ld), placement interest (Pi), placement duration (Pd) and the operation duration (Od).

$$Rf = \frac{(Li \times Ld) - (Pi \times Pd)}{O_d \times \left(1 + \dfrac{Pi + Pd}{360 \times 100}\right)}$$

b) Forward Rate Agreement (FRA) represents a financial technique through which the two sides of a contract follow to protect itself against interest rate variation.

The Forward Rate Agreement buyer follows to protect itself against the interest rate increases, and the seller follows it's protection against the interest rate diminish.

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                        ┌─────────────────┐
                        │    Contract     │
                        └─────────────────┘

┌─────────────────┐                       ┌─────────────────┐
│    FRA buyer     │ ◄──────────────────► │    FRA seller    │
└─────────────────┘                       └─────────────────┘
         ▲                                         ▲
┌─────────────────┐                       ┌─────────────────┐
│ Protection against the │                │ Protection against the │
│ interest rate increase │                │ interest rate diminish │
└─────────────────┘                       └─────────────────┘
```
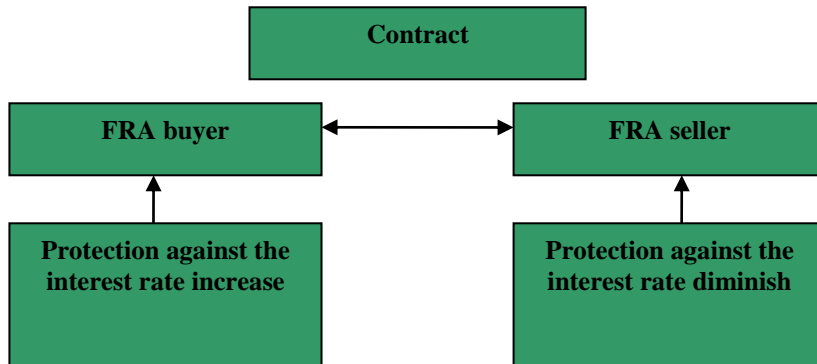
The interest difference at a certain financial technique (D) depends on the operation nominal value (C), on the ensured interest rate (rg), on the market interest rate (rp) and on the number of days (T).

$$D = \frac{C \times (rg - rp) \times T}{r_m \times T + 360 \times 100}$$

In the case of a covering risk operation through Forward Rate Agreement it is fixed the interest rate for a future credit or placement.

In quality of financial instrument, Forward Rate Agreement is used for reducing the loan cost or to improve the output of a money placement for a certain period of time.

Forward Rate Agreement can be practiced between an enterprise and a bank, or between two banks.

c) The swap – is defined as the transaction toward which the two parts switch between them the financial assets[1]. In general, the swap represents financial operations by which are changed claims, debts or elements which results from claims or debts.

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[1] Claude Dufloux, *Financial markets*, Economic Publishing House, Bucharest, 2002, p. 286.

The swap is defined as an operation by which a transaction on the term market is completed by a simultaneous transaction on the sight market.

The swap is represented a financial operation by which is realized the change of claims or debts between two parts, which can be represented by enterprises, banks, countries. In quality of financial operation, the swap can take different forms, in function of the nature of the assets that are changing, as well as of the parts implicated in realizing the operation of change of claims and debts.

The swap of change represents that financial operation by which a value title holder (A) gives it up to a third party (B) in change of another title, with the same value, through which the parts follow the title quality improvement or the capitalizing of the anticipated changes of title output on the international financial market.

A		B
Value title	⟷	**Value title**
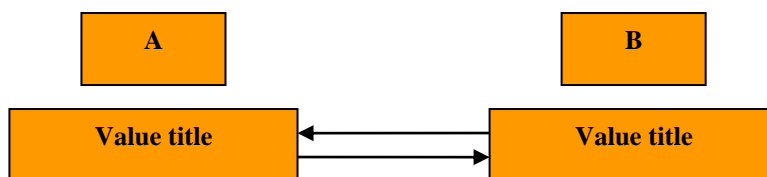
The swap of claims and debts can have different forms:

- debt equity swap represents a financial operation by which is assured the conversion of some claims direct investments. Through this operation a part capitalizes its claims and the other part clears its debts;

- debt for debt swaps differs through the fact that a part which detains claims can convert them in bonds issued by the other part;

- a specialized organism redeems claims and changes them in certain conditions.

The swap between banks reflects the operations through which a central bank opens a credit line in its currency to other country central bank, and these opens in its turn it opens to the first one country a credit line in its own currency.

The currency swap represents a foreign exchange agreement between two parties to exchange a given amount of one currency for another and, after a specified period of time, to give back the original amounts swapped. Currency swaps can be negotiated for a variety of maturities up to 30 years. Unlike a back-to-back loan, a currency

swap is not considered to be a loan by United States accounting laws and thus it is not reflected on a company's balance sheet. A swap is considered to be a foreign exchange transaction (short leg) plus an obligation to close the swap (far leg) being a forward contract.

Unlike interest rate swaps, currency swaps involve the exchange of the principal amount. Interest payments are not netted (as they are in interest rate swaps) because they are denominated in different currencies.

The interest rate swap is a derivative in which one party exchanges a stream of interest payments for another party's stream of cash flows. Interest rate swaps can be used by hedgers to manage their fixed or floating assets and liabilities. They can also be used by speculators to replicate unfunded bond exposures to profit from changes in interest rates. As such, interest rate swaps are very popular and highly liquid instruments.

In an interest rate swap, the counterparty agrees to pay either a fixed or floating rate denominated in a particular currency to the other counterparty. The fixed or floating rate is multiplied by a notional principal amount. This notional amount is generally not exchanged between counterparties, but is used only for calculating the size of cash flows to be exchanged.

The most common interest rate swap is one where one counterparty A pays a fixed rate (the swap rate) to counterparty B, while receiving a floating rate.

d) The hedging represents a financial operation trough which is initiated on the financial and foreign currency market in incertitude conditions of exchange rate or financial titles course.

The hedging is considered a financial technique of covering the risk of price fluctuations on the international financial markets. On the other hand, the hedging represents a method of reducing the risk of loss caused by price fluctuation. It consists of the purchase or sale of equal quantities of the same or very similar commodities, approximately simultaneously, in two different markets with the expectation that a future change in price in one market will be offset by an opposite change in the other market.

e) The options on the interest rate

Cap, floor and collar represents contracts on the interest rate negotiated on the financial markets which assures gains from the relative anticipate of the interest rate evolution, as well as the assurance of a maximum interest to a new loan or to a

minimum interest to a money placement on a certain period of time. The buyer of an interest rate option wants to protect itself from an interest rate increase on the international financial market to a certain moment.

CAP or Ceiling represents a contract on the interest rate, which is practiced in the case in which is contracted a loan to a variable rate interest and there is the risk of its increase. Through this operation it is limited the value of the interest that must be paid for obtaining that loan.

Superior limit of the interest rate

The interest rate difference received by the CAP buyer

The loan interest
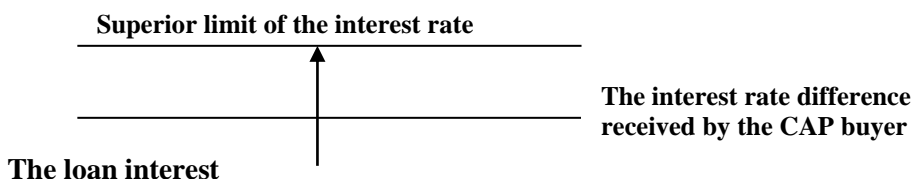
Floor represents a contract through which the buyer assures itself a minimum interest rate in the case of a money placement in change of paying a premium, to a size and a determined period.

In the case in which it is anticipated a diminishing of the interest rate, an operator that made a money placement in bonds can cover itself by buying a floor to an exercise rate and with a premium.

If on the market, the interest (i_1) descends under the exercise level, the floor buyer receives from the seller the difference between the exercise rate (i_e) and the market rate.

Market interest

i1

The interest difference received by the floor buyer

i2

Exercise interest
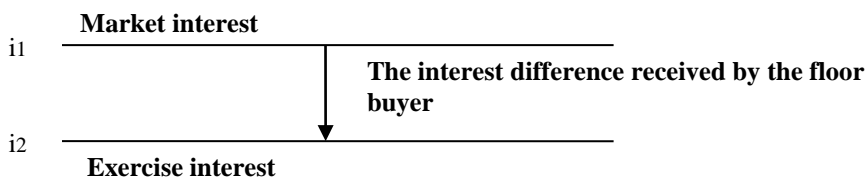
Collar represents the operation through which a debtor follows to protect himself against the interest rate increase, by buying and selling simultaneous a CAP and a Floor, wanting that the premium received for selling to compensate partially or total the pied one for buying.

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Covering risk strategy	**Reducing selling risk strategy**

Interest rate tunnel

CAP buying	←→	**FLOOR selling**	→	**COLLAR buying**
FLOOR buying	←→	**CAP selling**	→	**COLLAR selling**
↓		↓		
Paid premium (P1)		**Received premium (P2)**		**Cost P2-P1**
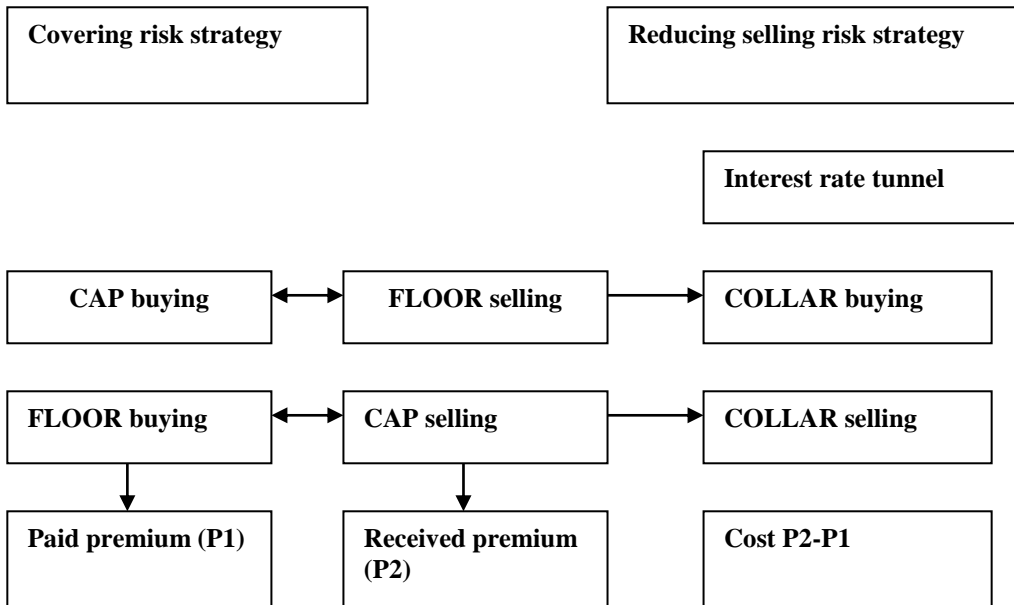
Buying a Collar represents the combination of buying a CAP and selling a Floor. Selling a Collar supposes a combination between a CAP selling and a Floor buying.

f) Complex strategies of speculative nature from the international financial markets

STRADDLE represents a complex strategy of intervention on the international financial markets, which realizes through options combination on the financial market.

Straddle buying (Long Straddle) expresses a strategy of intervention on the international financial markets that initiates itself in the moment in which is anticipated the volatility of the support asset course through combining buying a CALL and a PUT option at the same exercise price. Practicing such an intervention strategy on the international financial markets generates a loss represented by the paid premiums and unlimited gain chances, depending on the support asset course evolution on the international financial markets.

Straddle selling (Short Straddle) in quality of intervention strategy on the international financial markets represents the combination of selling a CALL and a PUTT option of the same exercise price. Straddle selling assures for the one who

practices it a limited gain and a probable loss, depending on the support asset evolution on the international market.

STRANGLE represents another strategy that is realized on the international markets that combines buying and selling CALL and PUT options, with identical due dates, but with a CALL exercise price higher than the PUT one.

Strangle buying (Long Strangle) represents a strategy which is practiced in the case of volatility increase of the support asset course; it supposes a combination between CALL and PUT options but at different exercise prices.

The protection against the volatility of the support asset course is realized in the following way:

-       against the course increase it is bought a CALL option at the exercise price which wanted not to be overreached;

-       against the course diminish it is bought a PUT option at the minimum exercise price.

The buying strategy of a Strangle supposes a minimum loss limited to the value of the premium and a unlimited gain depending on the variation of the title courses on the international financial market.

Strangle selling represents the combination between the selling of a CALL and PUT option with different exercise prices. The gain is limited to the premium, and the loss is unlimited.

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The International Government Bond Market

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Abstract: The international financial market is formed by ensembles of markets on which are transacted primary instruments and derivate instruments. In this whole the international government bond market has a central role, assuring the mobilization of some important financial resources, on a long period. Much more complex, the bond issuing on international market is realized by a specific and complex mechanism. The international government bond market isn't a new creation, the bonds issued by governments being transacted on the international market from hundreds of years. The bonds remain the main financing channel, accessible unfortunately mostly to the developed countries, even though more and more emergent markets became attractive to investors. The financing trough bond issuing represents the most complex and efficient way of international financing, assuring the mobilizing and circulation of an important volume of financial resources.

Keywords: international government bond market, financial resources, international market

Jel Classification: P34, P43

1. Introduction

Governments bonds are usually referred to as risk-free bonds, because the government can raise taxes or simply print more money to redeem the bond at maturity. Some counter examples do exist where a government has defaulted on its domestic currency debt.

The international government bond market isn't a new creation, the bonds issued by governments being transacted on the international market from hundreds of years. Kings and emperors were loaning for financing their wars. For example, in the XIXth century, Edward Ist financed his wars by selling bonds in Italy, those being subscribed by the famous families of local bankers. Some centuries after, the big

coalition formed against Louis XIV and lead by Wilhelm of Orania was financed by a group of Holland families from Hague. Later, the Rothschild family became famous through the help that they shown in supporting the Englishmen efforts against Napoleon I[st], through the European family lath.

Even though, the public debt financing always had an international feature, there isn't yet a unified international government bond market. The international government bond market can be divided in four different markets:

- Internal government bond markets – the titles are issued by internal issuers and are denominated, usually in national currency;

- External government bond markets – the titles are issued by foreign issuers and are denominated, usually in the internal currency. The issuing and transaction of the external bonds are being done under the settlements and supervision of the market authorities from that country;

- Eurobond markets – the titles are subscribed by a multinational syndicate of banks, and are placed in more countries, generally in jurisdictions outside the currency country in which is denominated the issuing.

- Global bond markets – the titles are registered by the Securities and Exchange Commission in United States and are issued and transaction in North America, Europe and Asia. This market developed as a consequence of the globalization process, in the investor base as well as in the issuing currency, for surpassing the compulsions and the barriers between markets.

The external government bond issues on the national markets have a long history. The most important government bond external markets are represented by centres such as: New York, Tokyo, Zurich or London. The bond transaction on the international financial markets have specific names, like "Yankee" in United States, "Samurai" in Japan, "Rembrandt" in Holland, "Bulldog" in Great Britain or "Matador" in Spain. External bonds can include also external issues in other currencies than the national currency of the internal market. For example, "Shogun" bonds represent external bond issuing launched in Tokyo in other currencies than the Japanese yen. What differences the government bond external markets from the internal ones from the same countries is the lustre imposed by the settlement authorities between the two legislative systems. These differences can include

different taxations, restraints regarding the structure of the issued bonds, the title volumes that can be sold, different requirements regarding the kind of information which the issuers must reveal to investors before the issuing, restrains regarding who can buy or subscribe bonds.

2. The difference between foreign bonds, external bonds and Eurobonds

The disappearance of exchange controls and restriction of capital flows made the distinction between Eurobonds and other bonds less relevant. However, the distinction between Eurobonds and foreign bonds is important.

Foreign bond - a foreign bond is a bond issued in a domestic market for a foreign borrower. Foreign bonds tend to be more regulated than Eurobonds and are usually issued by a domestic group of banks.

External bond - it is also important to notice that, strictly speaking, external bonds are neither foreign bonds nor Eurobonds. External bonds include foreign currency denominated domestic bonds, like the Japanese Shogun bonds, for example. They also include Eurodollars bonds, either issued by Japanese corporations (known as "Sushi bonds") or with an embedded currency option (known as "Heaven and Hell" bonds).

3. The international government bond market

Eurobond market is an off-shore market on which the creditors and debtors meet grace to the lower transaction costs, and to the lack of settlement. Eurobond market represent only a segment of what the specialists call "Euromarkets", that is off-shore capital markets, in the sense that the denomination currency of transactions is different by the currency of the country in which take place the transactions. From the beginning of the 80's, the transaction volume realized on the Eurobond markets surpassed the transactions on the government bond external markets, because this market isn't submissive to the settlement restrains from the internal markets. Beside the fact that the restrictive measures make internal markets less competitive than the supranational market, the technology advanced and the globalization process

determined the financial centres demand on the world, contributing to strengthen the Euromarkets position.

Eurobonds represent financial titles that certify a debt relationship between the debtor and the creditor, similar to the debt titles used on the government bond internal markets. Among the main characteristics of this instruments are the following ones:

- Eurobonds register the debtor obligation to pay the interest and the capital rates, to the specified dates in the issuing prospect;

- Eurobonds are launched to long and medium due dates;

- Eurobonds are transferable instruments, being issued in un-externalized form as well as on the bearer;

- Eurobonds are created for being transacted on the secondary market;

- Eurobonds are launched, generally through a public offer and are listed to a stock exchange.

Each Eurobond must follow certain terms and conditions, which represent its structure. A typical structure includes about 20 terms and conditions as these. Some conditions are adapted to each mission, for reflecting the situation from the Eurobond market, the issuer characteristics or the particular circumstances of that kind of financing. Other clauses like the issuing form, making interest payments after the tax deduction, remain unchanged from a mission to another and are considered to be "the market practice". The sovereign states issue this instrument, mainly under three forms:

- Eurobonds

- Euro Medium Term Notes

- Euro Commercial Paper – instruments on the monetary market with a due date smaller than 90 days.

The participants on the Eurobond market are the issuers - the sovereign states and the governmental agencies, intermediaries and the investors. The investors are generally, important institutional investors from the developed countries, but there are a significant number of individual investors. Allowance funds represent the main category of investors, and the demand exercised by these is prefigured to increase at once with the total assets, and specially, the extreme assets of these funds. The second important category of institutional investors is represented by the assurance

companies, followed by the investment funds and by the commercial banks departments specialized in managing clients trust funds. Individual investors represent powerful segments on certain markets, as Japan and Belgium.

The function and the settle of the Eurobond market are assured by its intermediaries. Their association, which has a self-regulatory role of the market is called International Securities Market Association (ISMA) and replaced the Association of International Bond Dealers (AIBD). There is an association of the main subscribers on the primary Eurobond market – International Primary Market Association (IPMA), having also a self-regulatory role of the market.

The Eurobond issuing on the primary market, are taking place simultaneously in more international financial centres. Even though, as we already mentioned, the market is relatively free from governmental settlements, in some countries must be asked the authority permission before launching a bond issuing. Eurobond are listed, generally on the London or Luxembourg stock exchange, but their transaction is mainly realized on the decentralized Over the Counter Market, the investors being able to buy or sell titles in any country.

International Securities Market Association (ISMA)

A self-regulatory organization and trade association originally located in Zurich, Switzerland, that encourages systematic and compliant trading in the international securities market. It also promotes the development of the Euromarkets and is acknowledged as a designated investment exchange by the Financial Services Authority, which regulates the financial services industry in the U.K.

ISMA helped to establish standardized trading procedures in the international bond market. It had 430 members in 49 different countries, representing the major securities firms' entire active in the secondary international debt market.

The International Primary Market Association (IPMA) represents the lead managers of equity and debt securities in the global market of capital. Many big European banks and financial institutions have taken the membership of IPMA.

The main objectives of the IPMA are:

- To develop an efficient capital market in Europe.
- To provide protection to the investors of the capital market.

Basically, the International Primary Market Association looks after all the activities happening in the global primary market.

In 2005, the International Primary Market Association merged with the International Securities Market Association and formed the *International Capital Market Association* (ICMA), which develops the regulatory framework for the financial activities in Europe. The ICMA has over 400 members in almost 50 countries across the globe.

ICMA members are not only geographically widespread; they also vary considerably in size and type of activities. They range from the largest global investment banks with a presence in numerous countries, to small regional banks primarily servicing retail bond investors.

There is no central location where trading in the international capital market takes place. Despite the substantial development of electronic trading systems in the recent years, the majority of transactions are still executed 'over the counter' by market participants who are likely to be located in different countries. The market is also characterized by a wide variety of issuers, issuing currencies, credit quality, and the technical specifications of the securities themselves. ICMA maintains standards of good market practice in the primary markets and has developed standard documentation for new issues leading to greater efficiencies and cost savings for issuing banks. Due to its inherent cross border nature, the international capital market is not subject to the same degree of regulation that governs domestic primary and secondary markets. In this marketplace ICMA has, for some 40 years, performed a crucial central role by providing and enforcing a self-regulatory code of industry-driven rules and recommendations which regulate issuance, trading and settlement in the international capital market.

Investment Considerations

Investment decisions involve understanding the potential risks involved, particularly when investing internationally.

Foreign Exchange Risk - When investing in foreign currency Eurobonds, it is important to remember that exchange rates do fluctuate, sometimes dramatically, which will affect the total return on these investments in Canadian dollars. This fluctuation is partly priced into the international bond and currency markets - any

excess yield on investments in one currency is normally accompanied by an expected decrease in the relevant forward exchange rate.

Political and Economic Risks - Political and economic change in foreign markets can have large implications for affected Eurobond issues. Such risks are also partly reflected in the yield on certain Eurobond issues.

Investment Specific Risks - Although most Eurobonds are issued by large, credit worthy companies or responsible, trustworthy governments, there are specific risks involved with any investment. It is important to be aware of any such risks - remember higher yields are usually a compensation for a greater level of risk.

International Long-Term Government Bond Yields

Below we highlight the 10-year yields on government debt for six international markets. With the exception of Australia, interest rates have been in steady downtrends since last spring. However, in many of these markets there are signs that this downtrend may be nearing an end, which could be a signal that investor aversion to risk may be waning.

While Treasury yields in the US, Canada, and Japan still have some room before breaking their downtrends, bond yields in Europe and the UK have already made higher highs.
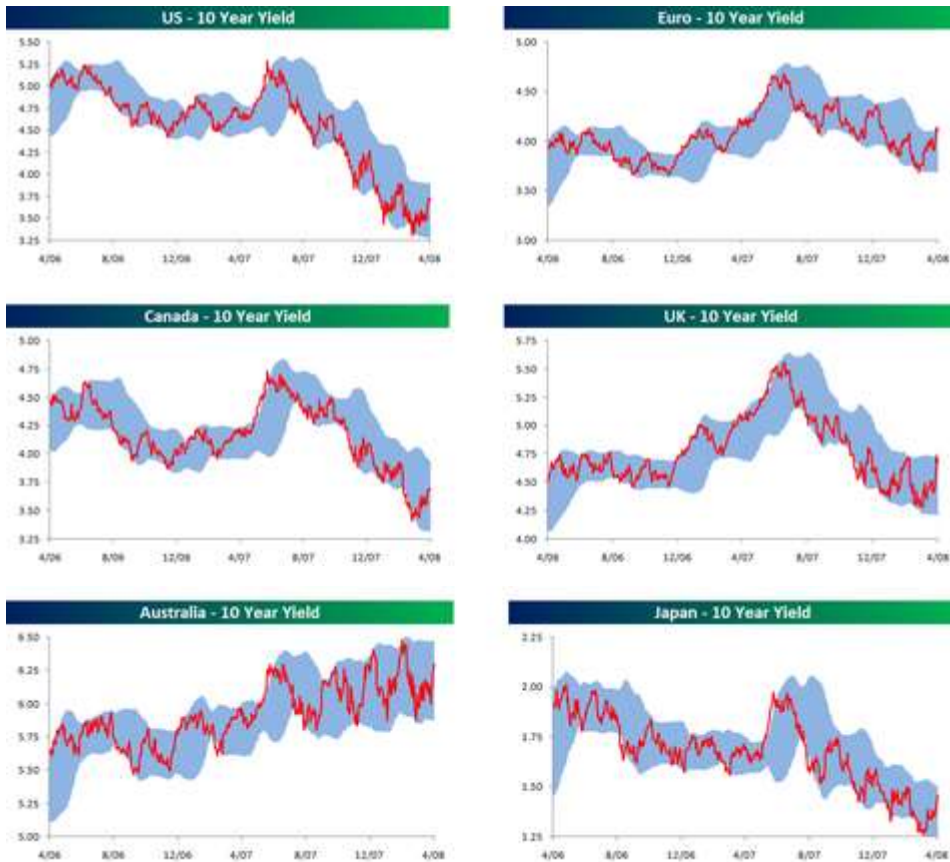
Source: www.worldbank.org

The Eurobonds global market

The Eurobonds global market tries to resolve one of the major lacks of the Eurobonds issuing, and that is the lower liquidity. During many years, the Eurobonds issuers tried to access the more liquid internal markets like the one of United States and Japan. Obviously, the access on more markets facilitates the launching of some higher issues, which, if it is well placed, it assures a better liquidity, transaction spreads lower than on the secondary market and so, lower financial cost for the issuer.

Beside the settlement problems which were made by the "Yankee" market, there were also the one linked to the bearer form of many Eurobonds series. The World Bank realized a study, which showed that for many international investors the

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"anonymous statute" isn't so important. Based on this conclusion and on the changes occurred in the "Yankee" market settlement, the World Bank launched in 1989, a series of Eurobonds with a 10 years due date, simultaneously on the denominated Eurobond market in dollars and on the "Yankee" market. Those Eurobonds were the first global bonds. The main distinguish characteristic was the registered form, which respected the United States settlements. The global bonds were, though absolved by respecting the others requirements from the Glass Steagall law. The issue registered a big success, being transacted on the secondary market with low outputs than the World Bank bonds issued in United States or on the Eurobond market. More and mere states and companies copied the success of the World Bank, issuing global bonds.

Bond markets and long-term interest rates in non-euro area member states of the European Union

In the following tables it will be presented the market size in the in some non-euro area member states of the European Union, in January 2008, at the end of period stocks, on nominal value.

ROMANIA

                                                                    Table 1

Instrument types					
	Total amount outstanding	**Money market** **Short-term**	**Bond market Long-term**		
Sector of the issuer		t < 1	1 < t < 5	5 < t < 10	t > 10
	€ millions				
Central government and other general government	3,451.1	0.0	449.6	1,656.3	1,345.2
Monetary Financial Institutions	1,357.2	515.0	836.4	5.7	0.0

Non-monetary financial corporations	-	-	-	-	-
Non-financial corporations	69.4	0.0	69.4	0.0	0.0
Total	4,877.7	515.0	1,355.4	1,662.0	1,345.2

Sources: National Bank of Romania, Ministry of Economy and Finance

BULGARIA

Table 2

Instrument types					
	Total amount	**Money market**		**Bond market**	
	outstanding	Short-term		Long-term	
Sector of the issuer		t < 1	1 < t < 5	5 < t < 10	t > 10
	€ millions				
Central government and other general government	3,578.3	0.0	199.1	961.7	2,417.5
Monetary Financial Institutions	450.6	15.0	292.6	143.0	0.0
Non-monetary financial corporations	428.5	179.0	197.4	50.7	1.5
Non-financial corporations	349.6	0.0	127.6	222.1	0.0
Total	4,807.0	194.0	816.6	1,377.4	2,419.1

Sources: EbJirapCKa HapOflHa 6aHKa (Bulgarian National Bank)

DENMARK

Table 3

Instrument types					
	Total amount outstanding	**Money market Short-term**	**Bond market Long-term**		
Sector of the issuer		**t < 1**	**1 < t < 5**	**5 < t < 10**	**t > 10**
	€ millions				
Central government and other general government	71,873.1	5,721.6	0.0	18,610.9	47,540.6
Monetary Financial Institutions	393,297.2	18,485.8	86,340.2	82,805.2	205,665.9
Non-monetary financial corporations	1,350.8	0.0	41.5	1,107.7	201.7
Non-financial corporations	19,016.1	743.0	1,152.4	5,244.4	11,876.2
Total	485,537.1	24,950.4	87,534.1	107,768.2	265,284.4

Source: Denmark's National bank

HUNGARY

Table 4

Instrument types					
	Total amount outstanding	**Money market Short-term**	**Bond market Long-term**		
Sector of the issuer		**t < 1**	**1 < t < 5**	**5 < t < 10**	**t > 10**
	€ millions				
Central government and other general government	53,846.1	8,517.8	8,858.0	14,199.1	22,271.2
Monetary Financial Institutions	7,733.5	42.6	707.9	4,685.4	2,297.6
Non-monetary financial corporations	247.7	0.0	247.7	0.0	0.0
Non-financial corporations	121.6	0.0	1.0	36.2	84.4
Total	61,948.9	8,560.3	9,814.6	18,920.7	24,653.3

Sources: Magyar Nemzeti Bank, KELER Rt, ÂKK (National Bank of Hungary)

POLAND

Table 5

Instrument types					
	Total amount	**Money market**	**Bond market**		
	outstanding	Short-term	Long-term		
Sector of the issuer		**t < 1**	**1 < t < 5**	**5 < t < 10**	**t > 10**
	€ millions				
Central government and other general government	113,281.6	6,622.4	15,070.4	34,375.4	57,213.4
Monetary Financial Institutions	10,993.2	5,962.6	717.6	1,472.6	2,840.4
Non-monetary financial corporations	1,159.2	310.6	790.7	54.3	3.7
Non-financial corporations	3,622.4	966.6	818.7	1,123.7	713.4
Total	129,056.4	13,862.1	17,397.4	37,026.0	60,770.9

Sources: Ministry of Finance, Narodowy Bank Polski, National Depository for Securities

SLOVENIA

Table 6

Instrument type					
	Total amount outstanding	**Money market Short-term**	**Bond market Long-term**		
Sector of the issuer		**t < 1**	**1 < t < 5**	**5 < t < 10**	**t > 10**
	€ millions				
Central government and other general government	7,470.9	350.5	581.4	1,780.5	4,758.5
Monetary Financial Institutions	3,149.2	1,815.3	382.9	566.3	384.7
Non-monetary financial corporations	50.4	0.0	4.2	46.2	0.0
Non-financial corporations	412.8	0.0	18.0	213.4	181.4
Total	11,083.3	2,165.8	986.5	2,606.4	5,324.6

Sources: Central Securities Clearing Corporation, Bank Slovenije, Ministry of Finance.

SLOVAKIA

Table 7

Instrument types					
	Total amount outstanding	Money market Short-term	Bond market Long-term		
Sector of the issuer		t < 1	1 < t < 5	5 < t < 10	t > 10
	€ millions				
Central government and other general government	11,129.7	0.0	1,760.2	4,947.6	4,421.9
Monetary Financial Institutions	2,314.7	130.0	533.7	1,338.6	312.4
Non-monetary financial corporations	206.5	0.0	81.6	109.5	15.4
Non-financial corporations	638.7	0.0	46.9	465.3	126.5
Total	14,289.6	130.0	2,422.4	6,861.0	4,876.2

Sources: Agentura pre riadenie dlhu a likvidity, Nârodnâ banka Slovenska, (National Bank of Hungary)

UNITED KINGDOM

Table 8

Instrument types					
	Total amount outstanding	Money market Short-term	Bond market Long-term		
Sector of the issuer		t < 1	1 < t < 5	5 < t < 10	t > 10
	€ millions				
Central government and other general					
Government	609,165.9	29,051.7	18,123.8	87,721.7	474,268.6
Monetary Financial Institutions	955,671.2	482,072.8	312,354.5	161,243.9	-

Sources: Debt Management Office, Bank of England.

4. Conclusions

Despite the complexity associated with the bond market, a bond is simple and it might be consider a bit boring when compared with a stock. After all, a stock represents a piece of a company's wealth. An evaluation of a stock requires an evaluation of the entire company's worth. An ordinary bond is an agreement that merely entitles one party to make and another to receive a series of cash flows. While differences among forms of equity are small, there is a wide range of bonds; innovative financial engineers are creating new fixed-income securities almost continuously.

The Eurobond market has had a fantastic growth during the past 30 years. At its inception, in the early 1960s, the Eurobond market was mainly a Eurodollar bond market, that is, a market for USD bonds issued outside the U.S. Today, the Eurobond market comprises bonds denominated in all the major currencies and several minor currencies.

Together the foreign bond and Eurobond markets make up the international bond market.

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Miscellaneous

A Condition for a Sasakian Manifold to Be
of Constant Curvature

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Abstract: In this paper we give a generalization of some results due to T. Takahashi [5] and M. Okumura [4]. Explicitly, we study an equation of the form R(X,Y)A=0 where X,Y are arbitrary vector fields on a Sasakian manifold and A a (1,3)-tensor field which generalizes the Riemann curvature tensor, Weyl conformal curvature tensor, Weyl projective curvature tensor and Yano concircular curvature tensor. The result which we obtain says that in complementary conditions the manifold is of constant curvature.

Keywords: Riemann curvature tensor, Yano concircular curvature tensor, constant curvature

Jel Classification: C70, C35, C30, C15

1. Introduction

In this paper we give a generalization of some results due to T. Takahashi [5] and M. Okumura [4]. Explicitly, we study an equation of the form R(X,Y)A=0 where X,Y are arbitrary vector fields on a Sasakian manifold and A a (1,3)-tensor field which generalizes the Riemann curvature tensor, Weyl conformal curvature tensor, Weyl

projective curvature tensor and Yano concircular curvature tensor. The result which we obtain says that in complementary conditions the manifold is of constant curvature.

2. Preliminaries

Let $M=M^m$ a C^∞-differentiable connected manifold with dim $M=m=2n+1$.

Definition M is said to have an almost contact structure if it admits a field of endomorphisms, named φ, of the tangent spaces, a vector field ξ and a 1-form η satisfying:

$$\eta(\xi)=1$$

$$\eta(\varphi X)=0 \ \forall X \in X(M)$$

$$\varphi^2 X = -X + \eta(X)\xi \ \forall X \in X(M)$$

$$\varphi\xi=0$$

Definition M has an almost contact metric structure if it admits an almost contact structure (φ, ξ, η) and a Riemannian metric g such that:

$$g(\varphi X, \varphi Y) = g(X,Y) - \eta(X)\eta(Y) \ \forall X,Y \in X(M)$$

$$g(X,\xi) = \eta(X) \ \forall X \in X(M)$$

where ∇ is the Levi-Civita connection corresponding to g.

Definition A manifold M with a normal contact metric structure is called Sasakian manifold.

On a Sasakian manifold we have:

(1) $R(X,Y)\xi = \eta(Y)X - \eta(X)Y \ \forall X,Y \in X(M)$

(2) $R(\xi,X)Y = g(X,Y)\xi - \eta(Y)X \ \forall X,Y \in X(M)$

In what follows all the tensors are defined locally and we shall consider only the restrictions of tensor fields on neighborhoods of the manifold points.

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Let $E_1,...,E_m$ an orthonormal basis for X(M) and let $\lambda^1,...,\lambda^m$ be the dual 1-forms for E_i, i=1,...,m. We have $\lambda^i(E_j)=\delta^i_j$, i,j=1,...,m. We define the Ricci tensor Ric: X(M)$^2\to F$(M):

$$\text{Ric}(X,Y)=\sum_{i=1}^m \lambda^i(R(E_i,X)Y) \ \forall X,Y\in X(M)$$

and the Ricci operator ric:X(M)$\to X$(M): g(ric X,Y)=g(X,ric Y)=Ric(X,Y) $\forall X,Y\in X$(M).

The scalar of curvature is:

$$S=\sum_{i=1}^m \text{Ric}(E_i,E_i)=\sum_{i=1}^m \lambda^i(\text{ric}E_i)$$

From (2) we have on a Sasakian manifold:

(3) $\text{Ric}(\xi,X)=(m-1)\eta(X) \ \forall X\in X(M)$

(4) $\text{ric } \xi=(m-1)\xi$

Let (M,g) a Riemannian manifold and p$\in$M. Let X,Y$\in T_p$M independent vectors. We define the sectional curvature k(X,Y) by

$$k(X,Y)=\frac{g(R(X,Y)Y,X)}{g(X,X)g(Y,Y)-g(X,Y)^2}$$

If k is independent of the choice of p$\in$M and X,Y$\in T^p$M we call M with constant curvature.

Theorem (F.SCHUR) A connected Riemannian manifold M with dim M$\geq$3 for which the sectional curvature is constant at every point has constant curvature. In this case, we have:

(5) $R(X,Y)Z=k[g(Y,Z)X-g(X,Z)Y] \ \forall X,Y,Z\in X(M)$,

k being the constant curvature.

On a Sasakian manifold we have ([1]) that k(X,ξ)=1 for X$\perp\xi$ therefore if a Sasakian manifold has constant curvature these must be 1.

3. Main theorem

Let A:X(M)$^3\to X$(M),

(6) A(X,Y)Z=R(X,Y)Z-a[Ric(Y,Z)X-Ric(X,Z)Y]-b[g(Y,Z)ricX-g(X,Z)ricY]+
     c[g(Y,Z)X-g(X,Z)Y] $\forall$X,Y,Z$\in$X(M), $\forall$a,b,c$\in$F(M), a$\neq$-1.

• For a=b=c=0 we obtain the Riemann curvature tensor

• For a=$\dfrac{1}{m-1}$,b=c=0 we have the Weyl projective tensor P

• For a=b=0, c=$-\dfrac{S}{m(m-1)}$ we have the Yano concircular curvature tensor

• For a=b=$\dfrac{1}{m-2}$, c=$\dfrac{S}{(m-1)(m-2)}$ we obtain the Weyl conformal curvature

tensor.

If M is a Sasakian manifold, we have:

(7) A(ξ,Y)Z=[1+c-b(m-1)]g(Y,Z)ξ+[a(m-1)-1-c]η(Z)Y-a·Ric(Y,Z)ξ+b·η(Z)·ricY
     $\forall$Y,Z$\in$X(M)

(8) A(ξ,Y)ξ=[1+c-(a+b)(m-1)]η(Y)ξ+[a(m-1)-1-c]Y+b·ricY $\forall$Y$\in$X(M)

     From [3] we know that we can consider R(X,Y) operating on the tensor
algebra like a derivation. Therefore, let the equation:

(9) R(X,Y)A=0 $\forall$X,Y$\in$X(M)

     From (6),(9) we have:

(10)   0=(R(X,ξ)A))(ξ,Y)Z=R(X,ξ)A(ξ,Y)Z-A(R(X,ξ)ξ,Y)Z-A(ξ,R(X,ξ)Y)Z-
     A(ξ,Y)R(X,ξ)Z $\forall$X,Y,Z$\in$X(M)

     Using now (1),(2),(3),(4),(6),(7),(8) we have that (10) becomes:

(11)   R(X,Y)Z=-a(m-1)η(Y)g(X,Z)ξ-(a-b)(m-1)η(Z)g(X,Y)ξ+(1+b-bm)g(Y,Z)X-
     (1+a-am)g(X,Z)Y+b(m-1)η(Y)η(Z)X-bη(Y)η(Z)ricX+(a-b)η(Z)Ric(X,y)ξ+
     aη(Y)Ric(X,Z)ξ-aRic(X,Z)Y+bg(Y,Z)ricX

     If in (11) we put X=E$_i$, apply λ^i in both sides of the equality and summing
for i=1,...,m, we obtain:

(12)   (a+1)Ric(Y,Z)=bη(Y)η(Z)(m^2-m-S)+g(Y,Z)[(m-1)(a+1)-b(m^2-m-S)]
     $\forall$Y,Z$\in$X(M)

     Introducing (12) in (11) we obtain:

(13) $R(X,Y)Z = \dfrac{2b(a-b)(m^2-m-S)}{a+1}\eta(X)\eta(Y)\eta(Z)\xi + [g(Y,Z)X-$

$g(X,Z)Y] + \dfrac{b(m^2-m-S)}{a+1}[b(\eta(Y)\eta(Z)X-g(Y,Z)X+\eta(X)g(Y,Z)\xi)-a(\eta(X)\eta(Z)Y-$

$g(X,Z)Y+\eta(Y)g(X,Z)\xi)-(a-b)\eta(Z)g(X,Y)\xi]$

If in (13) we replace b=0, we obtain:

(14) $R(X,Y)Z = g(Y,Z)X - g(X,Z)Y$

therefore M is of constant curvature.

If a=b we have from (13):

(15) $R(X,Y)Z = \left(1 - \dfrac{a(m^2-m-S)}{a+1}\right)[g(Y,Z)X-g(X,Z)Y]-$

$a^2\dfrac{a(m^2-m-S)}{a+1}[\eta(X)\eta(Z)Y-\eta(Y)\eta(Z)X-\eta(X)g(Y,Z)\xi+\eta(Y)g(X,Z)\xi]$

If in (15) we have S=m(m-1) we obtain (14) therefore M is of constant curvature 1.

If S=m(m-1) in (13) we obtain also (14).

Let suppose now that M is of constant curvature. From (13) and (14) we have:

(16) $\dfrac{b(m^2-m-S)}{a+1}[(a-b)\eta(Z)(2\eta(X)\eta(Y)-g(X,Y))\xi+b(\eta(Y)\eta(Z)X-g(Y,Z)X+$

$\eta(X)g(Y,Z)\xi)-a(\eta(X)\eta(Z)Y-g(X,Z)Y+\eta(Y)g(X,Z)\xi)]=0$

Suppose now that b≠0, S≠m²-m. If in (16) we take X=Y such that $\eta(X)=0$ and Z=ξ, X≠0 we have:

(16) $-(a-b)g(X,X)\xi=0$

therefore a=b. But from the preceding discussion we must have S==m²-m. Contradiction. We can conclude:

Theorem 1 A Sasakian manifold with R(X,Y)A=0 $\forall X,Y \in X(M)$ is of constant curvature if and only if b=0 or b≠0 but S=m²-m where m=dim M. The constant curvature is 1.

Corollary 1 ([5]) A Sasakian manifold satisfying R(X,Y)R=0 $\forall$X,Y$\in$X(M) is of constant curvature.

Corollary 2 A Sasakian manifold with R(X,Y)P=0 where P is the Weyl projective curvature tensor is of constant curvature 1.

Corollary 3 A Sasakian manifold projectively flat is of constant curvature 1.

Corollary 4 A Sasakian manifold with R(X,Y)K=0 where K is the Yano concircular curvature tensor is of constant curvature 1.

Corollary 5 Sasakian manifold with R(X,Y)C=0 and S=m^2-m where C is the Weyl conformal curvature tensor is of constant curvature 1.

Corollary 6 ([4]) A Sasakian manifold conformally flat is of constant curvature (if it has S=m(m-1)).

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The Income of Meat Products in Galati County

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Abstract: The work has proposed to study the supply and the demand of the production from on sale Galati County, starting from the requirements of population consumptions, from the existing funds for the growth of animal production and from the requirements and the potential that can be expected. The sale of meat products is low enough, due to the reduced number of animals, small productions and the reduced production average on hectare. Weak economical and productivity performances are resistant by minimization of the self-consuming through the limit of surviving.

Keywords: meat, production, economic advantages, producers, consumers.

Jel Classification: M41, H42

1. Results and Research

Obtaining certain income, that would allow a competitive profitability, represents a fundamental objective of every agricultural farm organized on economical basis in an economical competitive market. Among the productivity activities income, a deeper analysis is required for business affairs of the stock production and the production subventions. The income in the last 3 years of the total agricultural societies with judicial personality is presented in the following table (Table 1).

On our market, some meat products are capitalized: bovine meat, pork, chicken in carcasses (grilled chicken, reform chicken), breast chicken and hen, breast chicken

and hen without bones, the calves of the chicken and hen, mutton and other meat products.

Table 1 Production and income of the main provisions of meat in Galati commerce (2005)

The provider	Bovine meat		Sheep meat		Pork meat		Chicken meat	
	tons	LEI	tons	LEI	tons	LEI	tons	LEI
SC. PRISACA SRL MUNTENI	8,8	110	0	0	23	333,5		0
SC. AGRIMAT SRL	12,4	155	0	0		0		0
AVICOLA - MATCA		0	0	0		0	177	1327,5
CARNIPROD		0	0	0	9,82	142,4		0
FULGA		0	0	0	13,2	191,4	120	900
AGRICULTORUL MUNTENI	24,1	301,3	0	0	22,4	324,8		0
Total	45,3	566,3	0	0	68,42	992,1	297	2227,5

The main beneficiaries from Galati in meat and its derivate are the merchants from Galati. These beneficiaries contract almost 80-85% from the offer, the difference of 15-20% is valorised by different occasional beneficiaries. A small part from the meat and meat derivates is valorised through the proper shops net. Between, 2005-2007, the sales had a rising tendency in the main meat products and meat derivates.

Table 2 The evolution of total income realised on company with legal status

Provider	U.M	Bovine meat		Sheep meat		Pork meat		Chicken meat	
		2004	**2006**	**2004**	**2006**	**2005**	**2006**	**2005**	**2006**
AVICOLA - MATCA	LEI	0	0	0	0	0	0	955,8	1328
SC. AGRIMAT SRL	LEI	143	155	0	0	0	0	0	**0**
AGRICULTOR UL MUNTENI	LEI	277,1	301,3	0	0	257,6	324,8	0	**0**
CARNIPROD	LEI	0	0	0	0	112,9	142,4	0	**0**
FULGA	LEI	0	0	0	0	151,8	191,4	648	**900**
SC. PRISACA SRL MUNTENI	LEI	101,2	110	0	0	264,5	333,5	0	**0**
Total	LEI	520,9	566,2	0	0	786,8	992,0	1604	2227

The largest income were achieved by AVICOLA MATCA, of 1327,5 lei. The sale of chicken meat (Avicola Matca) on the external market was achieved by SC Prodexport SA Bucharest and since 2003 the unit has renounced in favour of the external market because of the low prices offered by foreign partners (through intermediary) which did not cover the production expenses.

Between 2005-2007 the medium sale prices on the external market was between 5,4 lei/kg, an insignificant rise compared to the inflation index achieved on the internal market. In the near future, SC AVICOLA SA Matca has to establish as target the permanent prospect of external political policy, both in chicken meat and eggs, to get on new markets and especially on traditional markets.

Thus, the direct export system adoption is required and also the existence of a proper distribution network adapted to specific marketing logistics conditions on the economical global market.

Table 3 The analysis of income situation from farms profiled in the

meat production from Tecuci town

Specification	M.U	2004	2005	2006	(+/- %) 2006 over 2004
Number of associations	number	6	6	6	0
The total meat productivity	tons	338,55	387,5	410,72	+21,32
Income of the total associations from the meat sale	lei	2911,58	3456,7	3785,8	+30,03
Income from an association	lei	485,26	576,12	630,97	+30,03
Income on kg of meat	lei	8,60	8,92	9,22	+7,18

Processing dates after statistical information from D.A.D.R Galati

Analysing the evolution of the income in the last years in Galati County a rise is noticeable for the agricultural farms with legal status; it is an important role to have the sale prices in meat, which in certain periods, due to inflation, has a significant rise. Obtaining larger profits using this method is not the result of a performing economic-financial activity of the economic agents.

It can be observed that for agricultural farms the income achieved by an association is between 485,26 lei and 630.97 lei; this fact indicates that for some associations the income value is quite low. In this case, without sufficient income the agricultural farm will live from one day to another, through shifts, being marked by a level of risk and permanent vulnerability at the external changes.

The business affair average represents the total sum of the income achieved by an economic agent in a certain period of time, as main and secondary activity. This index does not include the financial income. The target of each farm is to obtain a business affair sum as large as possible or a moderate sum, but with a very secure future. The calculation of the business affair sum at the level of farms is a complex action which requires more elements in their evolution such as the income from the production sale, the income from different services, the income from interest etc.

Table 4 The evolution of income situation from farms profiled

in the meat production from Galati county

Specification	U.M	2004	2005	2006	2007	(+/- %) 2007 over 2004
Total income	lei	3330,94	3620,29	3851,60	4441,05	33,33
Income from exploiting	lei	3330,94	3620,29	3851,60	4441,05	33,33
Business affair sum	lei	2911,58	3123,35	3456,7	3785,84	30,03
The stock production	lei	133,37	258,66	53,65	275,99	106,93
The exploiting subventions	lei	285,98	238,28	341,24	379,22	32,60
Income from the financial activity	lei	0	0	0	0	0,00
Income from the exceptional activity	lei	0	0	0	0	0,00

Thus a certain obtained quantity from the products was for sale for different beneficiaries in order to cover some productivity expenses, another part was for the association members on their contribution to achieve the agricultural farm, another part was for the animals food (where it was necessary) and another part was still in the stock so as to be sold later at a more convenient price.

From the above table it can be noticed that the total income from 2007 was raising compared to those in 2004, especially on the exploiting activity income, which corresponds to a better selling line both to more ascendant market and the necessities of a farm specialised in meat production and in a rising competition. The values of financial income are inexistent which means a low activity of the agricultural households on the exchange market.

Between, 2005-2007, the evolution of the income obtained from the meat products and meat derivates sale (en gross and en detail) was in a permanent rising even for the rising quantities or for the inflationist process which led to the fast rise of the prices.

Table 5 The evolution of income from meat products sale between,

2004-2007 to the level of researched region

Years	Total income from selling	From which:							
		En detail		En gross					
				Total		Out of which			
				thousands LEI	% of total	On the internal market		On the external market	
						thousands LEI	% of total	thousands LEI	% of total
2004	17790	733	4,12	17057	95,8	17351	97,5	427	2,4
2005	26316	1895	7,2	24421	92,8	26316	100	0,00	0
2006	26400	2677	10,1	23723	89,8	26400	100	0,00	0
2007	30026	3069	10,2	27195	90,5	30026	100	0,00	0
Media	25133	1991	7,92	23192	92,3	24978	99,4	151	0,6
% 2007 compare 2004	68,78	318,6	148	59,43	5,54	73,05	2,53	-100	-100

Processing dates after statistical information from D.A.D.R Galati

From this information we can observe that the sale from 2007 have risen with 68.78% from those in 2004, being different on the two systems of valorisation, the dominant is the en gross system (92.27%) while the en detail sale through proper shops represents 7.92% and in 2005 its majority rose from 4.12% (in 2004) to 10.22% (in 2006).

From the obtained economical results in an agricultural house-hold in Tecuci town with a total of 15 bovine (11 milk cows) 4 pigs, 14 sheep and 30 chickens, it can be observed that the largest achieved income is: at pigs – 464.8 lei representing 44.27% from the total income of meat production selling.

Table 6 The economic result getting in one agricultural household in Galati County

Specification	Total income of a year		Total expenses		The net income of a year	
	lei	%	lei	%	lei	%
Total from wich:	3976	100,00	2926	100,00	1050	100,00
Bovine meat	1282,4	32,25	1075,2	36,75	207,2	19,73
Pork meat	1570,8	39,51	1106	37,80	464,8	44,27
Sheep meat	602	15,14	431,2	14,74	170,8	16,27
Chicken meat	520,8	13,10	313,6	10,72	207,2	19,73

Processing dates after statistical information from D.A.D.R Galati

A financial – economic synthesis indicator represents the expenses on which very important aspects can be prognoses and solved especially aspects regarding the quality of the whole economic-financial activities from the profitable farms in processing the meat production.

The expenses of fixed production represent the agricultural farm expenses, and its size does not depend on the expenses or depends only unimportant by the production volume (for example, the wear, the maintenance expenses and those for buildings and the equipment, etc). The necessary information for this analysis can be synthesised in the table 7.

Table 7 The expenses evolution from farms profiled in the meat production from Galati

No crt.	Specification	2005		2006		(+/- %) 2006/2005
		lei	% din total	lei	% din total	%
	Total expenses	**2875,68**	**100**	**4132,54**	**100**	**43,71**
A	Variable expenses	1958,91	68,12	2665,48	64,50	36,07
	Weighting index from the total	68,12	0,01	64,50	0,01	-5,31
1	Raw materials and materials	657,09	22,85	913,29	22,10	38,99
2	Supplying expenses and transport	104,96	3,65	159,10	3,85	51,58
3	Agricultural works	1015,40	35,31	1388,95	33,61	36,79
4	Labour	119,63	4,16	164,47	3,98	37,49
5	Other expenses	61,83	2,15	39,67	0,96	-35,84
	The brut approximation	**1272,19**	**44,24**	**1875,77**	**45,39**	**47,44**
B	Fixed expenses	916,77	31,88	1446,39	35,00	57,77
	Weighting index from the total %	31,88	0,00	35,00	0,00	9,79
1	The paid rent	169,09	5,88	267,37	6,47	58,13
2	Gasoline, electric power	243,57	8,47	456,64	11,05	87,48
3	Paid bank interest	372,40	12,95	607,48	14,70	63,13
4	Different expenses	85,70	2,98	48,76	1,18	-43,10
5	The payment of fixed equipment	46,01	1,60	66,12	1,60	43,70
	The brut approximation	355,42	12,36	429,37	10,39	20,81

Processing dates after statistical information from D.A.D.R - Galati

Analysing the total expenses structure it can be observed that the expenses majority is different in the total exploiting expenses. The decreasing order regarding the majority of the expenses is the following: the expenses with the agricultural works and the services done by intermediaries, with materials, banks interest, energy and water.

Different stages of rising the types of activities, there were recorded towards the total of expenses in the variable expenses especially for the agricultural works (35,31% in 2002 → 58,13% in 2005).

Because the fixed expenses do not influence directly the volume of the production, the main objective should reduce a part of these such as: the buildings and equipment payment, general interests and expenses of agricultural exploitation. If their value is high compared to the size of the forms and the value of productivity, these must be reduced until they will have a low effect over the production level. The rise of the fixed expenses can be appreciated as "being positive" depending only on the elements of expenses which caused this rise and in the same time the objectives.

The brut profit is an economic indicator to determine the performance and the contribution of every sector of production in the total profit of the farm specified on the meat production. The brut profit can be used to compare the performances of the same sector of the farm specified on meat production over the same years. Using the brut profit information of a farm specified in meat production a comparison can be made with similar sectors of other exploitations.

To simplify the profit obtained, the following situation regarding the brut interest was drawn. In the table it is presented the total profit level on an agricultural farm as well as on meat kg.

Analysing the situation of the brut profit and the brut profit instalment on total farms specified in meat production, it can be noticed that in 2007 and in 2005 was in a bad situation with the profit instalment around 15, 83% in 2005 and 7.47% in 2007 which represent a decreasing of the way in which the resources from the agricultural farms for the sold meat production brought profit.

The increasing of the brut profit in 2007 compared to 2005 (with 33.33%) was obtained almost exclusively on the quantity factors, fact which sustains the direction and the proportion of the efforts of brut profitability increasing the meat production.

Table 8 Profit evolution on farms profiled in the meat production from Galati

Specification	U.M			(+/- %) 2006/2005
		2005	2006	%
Number of associations	Nr.	6	6	0,00
The total meat production	tone	338,55	410,72	21,32
The total income from the meat sale	lei	3330,94	4441,05	33,33
The total expenses from the meat sale	lei	2875,68	4132,54	43,71
The brut profit on a total of associations	lei	455,26	308,51	-32,23
The brut profit instalment	%	15,83	7,47	-52,84
The brut profit on an association	lei	75,88	51,42	-32,23
The brut profit on a kilo of meat	lei	1,34	0,75	-44,14
% in comparison to 2002	%	100	55,86	-44,14

2. Conclusion

The sale of meat products is low enough due to the reduced animal number, small productions and surfaces and reduced average production on hectare. Weak economical and productivity performances are resistant by minimization of the self-consuming through the limit of surviving. The main source of the food self-consuming formation of the individual exploitation it is constituted by self production, which is reflecting the accentuation of self-consuming and subsistence state. The lack of the production specialization and activity profile diversifying of small exploitation determine the obtaining of small quantity of different products and of different quantities which are making selling difficult. The most part of the households incomes are coming from some quantity of animal products on market selling.

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