

## Spatial Differences in Time Use Patterns in Romania

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*Time use survey examines how people allocate their time to different kind of activities.*

*The purpose of the paper is to determine whether significant differences exist between the eight statistical regions observed in Romania. In order to analyze this, we first present the time use patterns in respect with work time, leisure time and with gender.*

*We use the factorial analysis and data analysis to observe the differences existing in time use between eight Romanian regions and we also identify the factors that cause these differences. These aspects help us to better understand the role of each region in Romanian economy.*

*The data source is Time Use Survey, conducted in Romania in 2000 on a pilot basis. The survey covered residents of private dwellings in urban and rural areas across all counties of Romania. All households within selected dwellings were included in the survey and all persons aged 10 years and older living in this households were in scope, so that the results are comparable at international level.*

### Introduction

Romania was always characterized by important economic, but also social and cultural differences between its regions. The economic disparities already existing between the prosperous and the lagging regions of Romania have increased during the transition years, influenced by institutional renewal, restructuring, privatization, etc. Several regions display higher unemployment rates, lower activity rates, lower incomes per capita and higher out-migration rates compared with the average. Beside these economic aspects, important regional disparities appeared in time use patterns.

The purpose of the paper is to determine whether significant differences exist in time use patterns between the eight statistical regions observed in Romania.

In order to do this, the paper is structured as follows: we first present the Romanian regions and we compare their economic and social situation. We focus on human resources and labor aspects.

In the second part, time use patterns are presented, in respect with statistical regions, gender and time spent on personal care activities, economic activities and leisure.

Finally, we use the factor analysis and data analysis to observe the differences

existing in time use between eight Romanian regions and we also identify the factors that cause these differences. These aspects help us to better understand the role of each region in Romanian economy.

The study is based on data from National statistics and Time Use Survey (TUS).

Time Use Survey was first conducted in Romania in 2000, on a pilot basis. The survey covered residents of private dwellings in urban and rural areas across all counties of Romania. All households within selected dwellings were included in the survey and all persons aged 10 years and older living in these households were in scope.

The data results are comparable at international level as the survey was harmonised with similar surveys within similar European Union with respect to the concepts, definitions, classifications used, as well as of sampling plan and method of organization and data collection.

## Regional economic disparities in Romania

For a better understanding of the main features of a presentation of the general context of Romanian transition has been considered necessary: labour is a key factor for economic development strategies and is also influenced by economic situation in quantitative and qualitative terms.

The political turmoil in the last ten years made a real advance of reform

very difficult, Romania being severely criticised by the EU and international financial institutions for the drawbacks in restructuring and privatization, the incapacity to eliminate losses within the economy, the lack of real changes in public administration. All these phenomena are reflected by the evolution of the key performance indicators between 1990 and 2000.

Three sub-periods can be identified<sup>1</sup> within this decade, namely:

- 1990-1992 (the beginning of transition), when the GDP recorded a serious drop;
- 1993-1996, when a macrostabilisation programme was applied, with positive consequences upon economic growth, unemployment and inflation rate;
- 1997-2000, when the economic decline (until 1999) represented the first result of the massive restructuring and privatisation process (too much delayed in Romania) undertaken in this period, being followed by a slow recovery starting with 2000.

Within this general context the evolution of population and labour resources expresses a variety of demographic and social-economic conditions and causes, closely interrelated. The demographic changes mainly refer to: accelerated fertility decrease, high level of mortality, important increase in out-migration, high share of the

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<sup>1</sup> Constantin, D.I., *Interregional migration in Romania during the 1990s*, paper presented at the 43<sup>rd</sup> congress of the European Regional Science Association, Jyväskylä, august 27 – 30, 2003

aged population (60 years and over), high level of demographic dependency ratio, particularly in rural areas. [Roman, Roman, 2002]. The social-economic causes concentrate on the decrease in the standard of living and quality of medical services etc.

Between 1990 and 2000 total employment diminished by 2.2 million people (from 10.8 to 8.6 million people) whereas the employment rate dropped by 16%. As regards unemployment – very low and hidden before 1990 – it recorded significant levels starting with 1990. Despite some oscillatory variations it displays an upward trend in long run. Thus, in the first phase (1991-1994) it grew continuously, reaching the highest level in March 1994 (11.2%), as a result of the serious economic decline (mainly in industry). The short term recovery thereafter entailed a decrease in the unemployment rate between 1995 and 1996.

Since 1997, when the massive restructuring (especially in mining industry and manufacturing) began, at the same time with applying permissive laying off regulations, unemployment restarted to grow until the year 2000 (the beginning of a new economic growth phase).

These evolutions are specifically reflected by the activity rate (active population / total population): between 1990 and 1997 it rose from 47.2% to 52.2%, then diminished continuously until 2000 (51.6%).

Before present the regional economic and social disparities, it is necessary to mention that Romania's administra-

tive-territorial structure comprises one regional level – the counties, named “judete”, corresponding to NUTS3 level of the EUROSAT (there are 41 counties plus Bucharest municipality) and one local level (cities, towns, communes).

Also, according to the Regional Development Act 151/1998 eight development regions, corresponding to NUTS2 level have been established on a voluntary basis (without being administrative units) in order to ensure the regional development policy elaboration and implementation framework. Each region comprises between 4 and 7 counties (excepting Bucharest-Ilfov region).

Regional disparities have been only recently quantified [*Green Paper*, 1997 and Pascariu et al., 2002]. They are much deeper between counties, between rural and urban areas than between regions. This fact requires a multi-level analysis of territorial disparities so as to offer an adequate background for the economic and social cohesion policy.

In general terms the roots of regional imbalances in Romania come from the inter-war period, when the industrial activity was concentrated in a couple of zones, dependent upon the access to mineral and energy resources as well as to the main transportation routes: Bucharest, Constanța, Prahova Valley, Brașov, Hunedoara, Jiu Valley, Reșița, Brăila, Galați [Pascariu et al., 2002].

In the communist period the forced industrialization and urbanization resulted in a more rapid development of

the lagging zones, particularly in North-East and South-East, reducing regional disparities. After 1989 these zones have firstly suffered the consequences of economic restructuring, leading to a significant increase in the economic and social discrepancies. In terms of regional GDP (revealing the productive capacity of each region) Bucharest-Ilfov ranks first and North-East region the eighth. Between them, closer to North-East rather than Bucharest-Ilfov rank at present – in this order – Centre, West, South-East, North-East, South-West and South.

It has been demonstrated that transition deepens regional disparities since the factors that used to control the economy are replaced by market forces that are gradually freed up. [Constantin, 2003].

Though, the basic question is whether after a period of growing interregional disparities a process of spatial convergence will start in longer run. This means that the regional problem is not simply a static allocation problem but also one referring to a long-range qualitative conversion phenomenon. Within this context regional labour markets are expected to play an active role.

**Human resources** has an uneven territorial distribution in Romania. Thus, the North-East region (including Bacău, Botoşani, Iaşi, Neamţ, Suceava and Vaslui county) has the biggest population and the negative natural growth is a relatively recent phenomenon, whereas the West region (including Arad, Caraş-Severin, Hunedoara and Timiş county) is characterized by a

low number of population and a chronicle negative natural growth. Significant differences in labour aged population number and dynamics can be noticed not only between regions but also between counties.

In almost all regions labour resources are predominant in urban areas excepting for North-East and South region, which include some of the poorest counties. North-East, South-West and South also record the highest level of the dependency ratio (number of labour aged persons per 1000 persons out of labour age).

In the first ten years transition determined a generalized diminishing of the use of human capital (the relative decrease in employment was greater than the rate of GDP decrease), significantly differentiated by regional economic structure.

The rate of employment decrease was above the national average in both longstanding industrial traditional zones (e.g. Banat, Transilvania) and zones of industrial structures created in the centralized economy period (Oltenia, Moldova).

In other zones, such as Muntenia, Dobrogea and Lower Danube the rate of employment decrease was slower than the average owing to a compensating flow of employment increase in agriculture (more intense than in other zones) on the one hand and the investment attraction exerted by the two big urban areas that dominate these zones, namely Bucharest and Constanţa. They have complex, diversified economic structures, with relatively

well developed infrastructure and large business opportunities, enabling them to adjust with good results to changing economic circumstances.

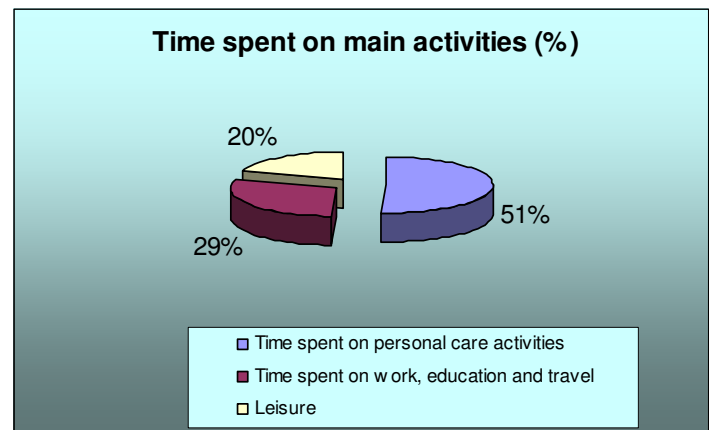
In 2000, the national average unemployment rate was 10.5. The lowest unemployment rates<sup>2</sup> are recorded by Bucharest (5.8%) and the highest was registered in North-East region-13.2%. The territorial distribution of unemployment reflects a tendency of concentration in monoindustrial, poor zones, with an important number of active population at the same time.

### **Regional differences in time use patterns**

The Romanian regions have adapted inadequately to the changing economic system, to the social and political conditions and, as a result of this fact, the disparities between them are still important. In the late 1990s and in 2000 these widespread regional disparities, in terms of labour supply as well as the main demographic indicators, are even deeper than at the beginning of the transition process. These disparities are noticed in time use patterns in Romanian regions.

Figure 1.

### **Time spent on main activities**



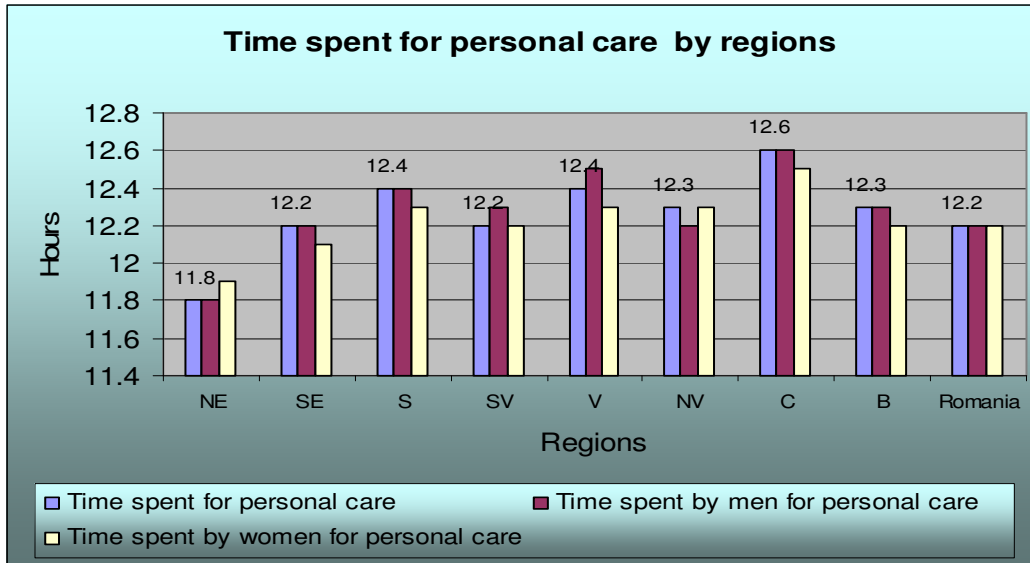
More than a half of a day (51%) is spent on personal care activities (12,2 hours), 29% of a day is used for work, education and travel (7 hours) and 20% (4.8 hours) is free time. Both men and women spend about the same amount of time on personal care activities (sleep, rest, meals and hygiene). There are deeper differences in time spent on economic activities and time spent on leisure. Thus, Romanian women dedicate more time than men to economic activities (32% of the total amount of time, respective 7.6 hours as against 6.5 hours, 27,8%). Men, instead, have more 1.1 hours free time than women.

Time allocated to personal care activities differs from a region to another. In central region the time spent on this activities is 0.8 hours more than in North –East Region. In the most part of the country men spend more time on personal care activities than women.

<sup>2</sup> The unemployment rate reflects the share of registered unemployed persons on total labor force.

Figure 2.

## Time spent for personal care by regions

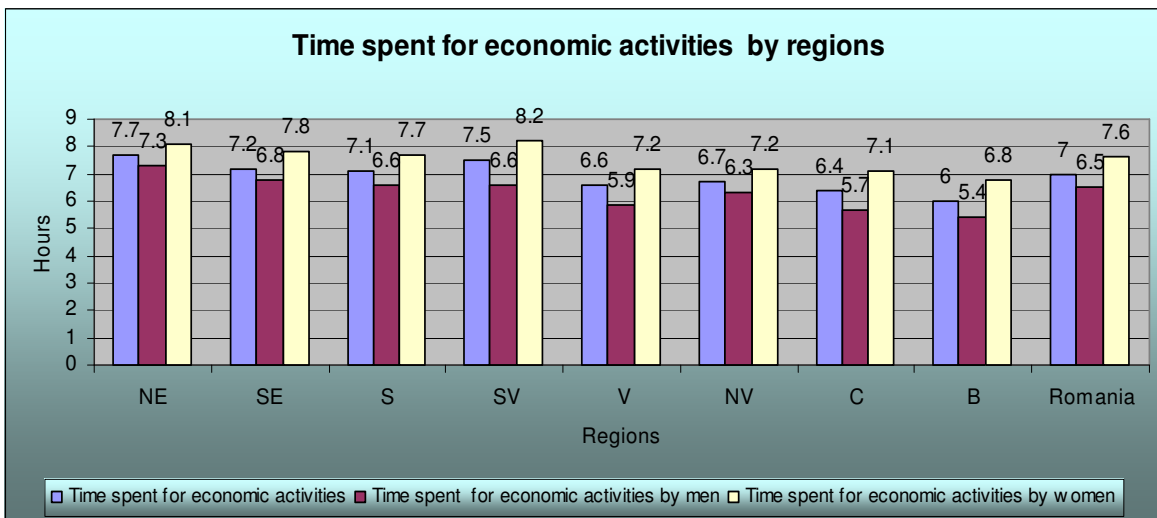


The exceptions are the two regions from the North part of Romania, in which women spend more time on personal care activities. Time spent on

personal care varies more in men's case (0.8 hours) than in the women's case. (0.6 hours).

Figure 3.

## Time spent for economic activities by regions



Considering the time spent on economic activities, is important to notice that in all Romania's regions women

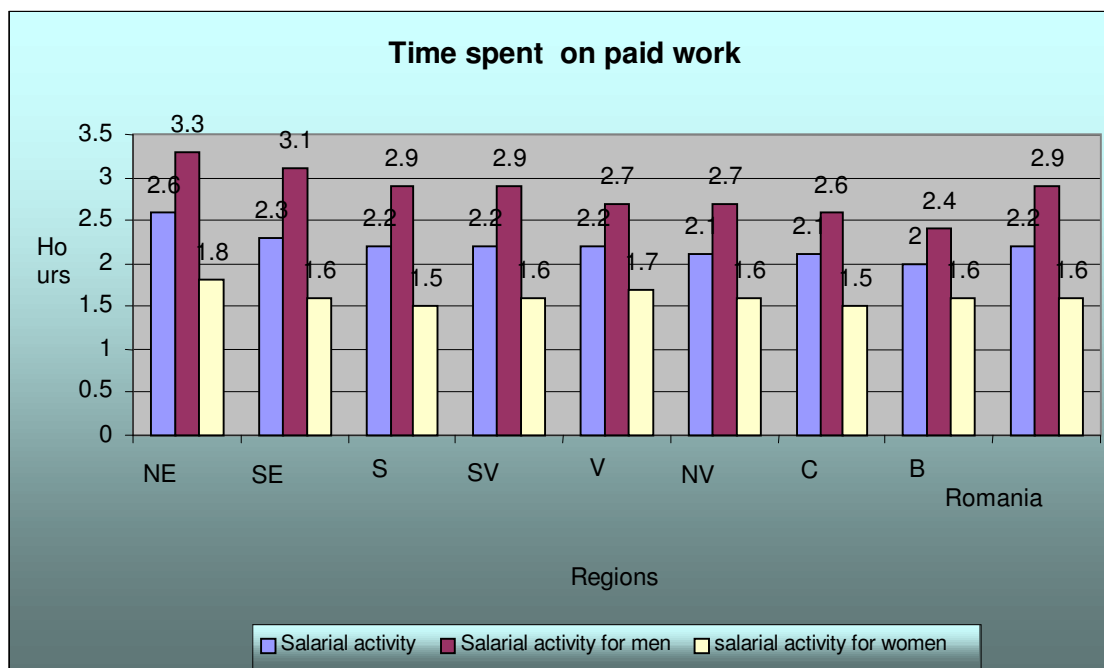
work more than men. On average a woman works with 1.1 hours more than men, but there are regions where this difference is more important. In

south West women spent on economic activities 1.6 hours than men, while in Bucharest and Central Region the difference is 1.6 hours. This difference is generated mostly by the time women spent on children's care and house work.

As a consequence of more time spent on economic activities, women from all regions have less time for leisure than men. There are important differences between free time spent by the men from different regions. Men from Central region spend 6.3 hours on leisure, while men from North East spend 4.9 hours.

Figure 4.

#### Time spent on paid work



The detailed structure of the day shows us few interesting aspects, such as:

It might seem surprising that in the most poor region of Romania it is spent the most time for work, while in the developed regions the time spent on economic activities is less than national average. This aspect is explained by the unbalanced structure of Romanian economy: the North East region is mostly depending on agriculture, with poor technical resources and low productivity. The amount of time spent on economic activity will be greater than the similar one from other regions.

- The most part of the time spent on personal care activities is for sleep and female sleep more than male.

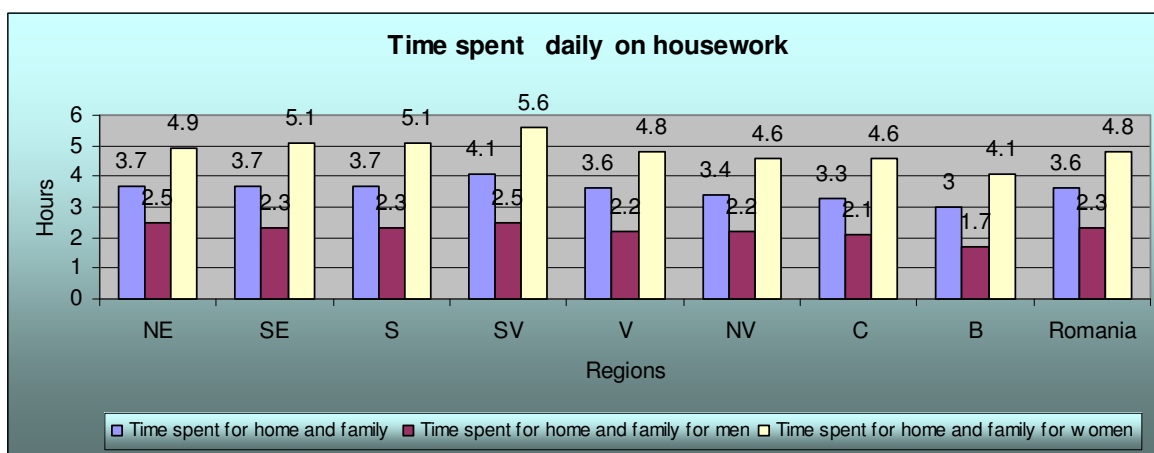
- Meals duration is about the same in all regions, and also the time for rest.
- Time spent on paid work differs from a region to another and reflects the degree of economic development of the region: in agricultural regions the time spent on paid work is more than other regions.
- Although women work more than men, men spent more time on paid work. In South and South East regions this differences are more important (94%), explain mostly by the

cultural traditions. The smallest difference is in Bucharest where men spend on paid work more with 50% than women.

- Time spent on housework present a completely different pattern: women spent more than twice time on housework than men between 196% in NE region and 241% in Bucharest). In Bucharest women spent on housework 4.1 hours daily and in SV- 5.6 hours daily.

Figure 5.

**Time spent daily on housework**

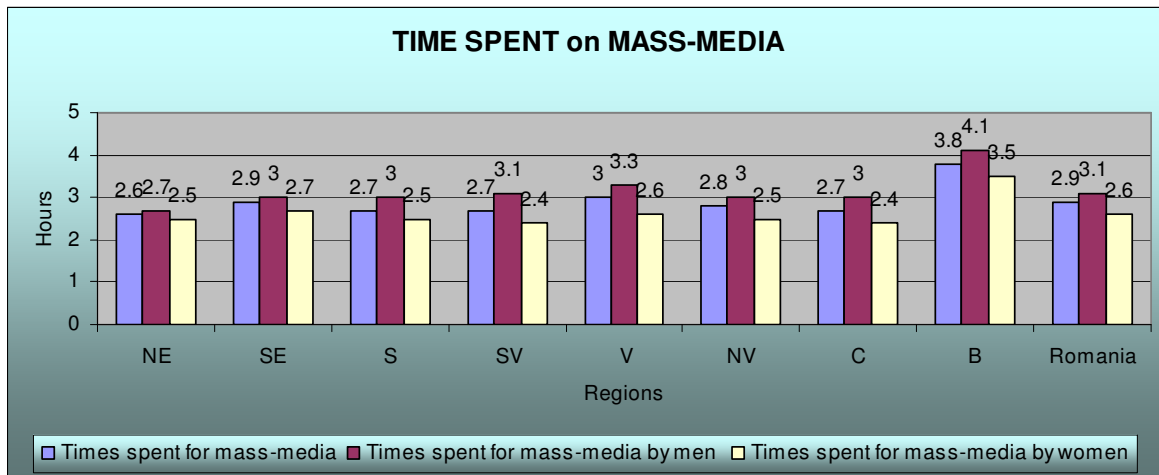


The most important category of free time is dedicated to mass media 65%: watching TV, reading and listening to radio. Also in this case there are significant differences. The persons who

live in Bucharest spend the most time on mass media activities, 3.8 hours, while in the NE region the time spent on these activities is 2.6 hours, which is less with 51%.



Figure 6.

**Time spent on mass-media****Factor analysis of regions in respect with time use**

There are important disparities between Romanian regions, concerning the economic development level, social conditions, living standards, but also concerning the way people use their time. A question seems to arise: Is there a connection between these types of inequalities, or, in other words, are the different time use patterns determined by the economic and social factors? In order to answer this question, we use factor analysis or principal components analysis to be precise.

The main applications of factor analytic techniques are:

- (1) To reduce the number of variables
- (2) To detect structure in the relationships between variables, that is to classify variables.

Therefore, factor analysis is applied as a data reduction or structure detection method (the term factor analysis was first introduced by Thurstone, 1931). The principal components analysis is based on the principle of expressing two or more variables by a single factor.

We do not want to go into the details about the computational aspects of principal components analysis here, which can be found elsewhere (references are provided at the end of the paper). However, basically, the extraction of principal components amounts to a *variance maximizing rotation* of the original variable space. For example, in a scatterplot we can think of the regression line as the original  $X$  axis, rotated so that it approximates the regression line. This type of rotation is called *variance maximizing* because the criterion for (goal of) the rotation is to maximize the variance (variability) of the "new" variable (factor), while

minimizing the variance around the new variable.

We also used factor analysis as a classification method, in order to obtain classes of regions where people have similar attitudes in time use.

The variables list contains 20 variables, divided into three important groups. First, we selected three variables for quantifying the economic level of each region, namely: GDP<sup>1</sup> per capita, earnings per capita and expenditures per capita.

The social conditions are reflected by two variables: *life expectancy at birth* and *unemployment rate*. *Life expectancy at birth* is considered a relevant indicator for standard living conditions [Mihăescu, 2001] and is also included in aggregate indicator Human Development Index.

We focus our analysis on time use so we included 15 variables for characterizing the way people spent their time in Romanian regions.

Three of these variables concerned personal care activities: sleep, meals and rest.

We selected six variables to reflect time people spend on economic activities: Paid work, Housework, Time spent on cooking and food preparation, Time spent on child care, Time spent on domestic related travel and Time spent in education.

There are five variables for describing the activities people are doing in their

free time: Time spent watching television, Time reading books, papers, or magazines, Time spent in active sports, Time spent on religious activities and Time spent on social activities (visiting friends, spectator at an event etc.)

The computations were done using French program SPAD.

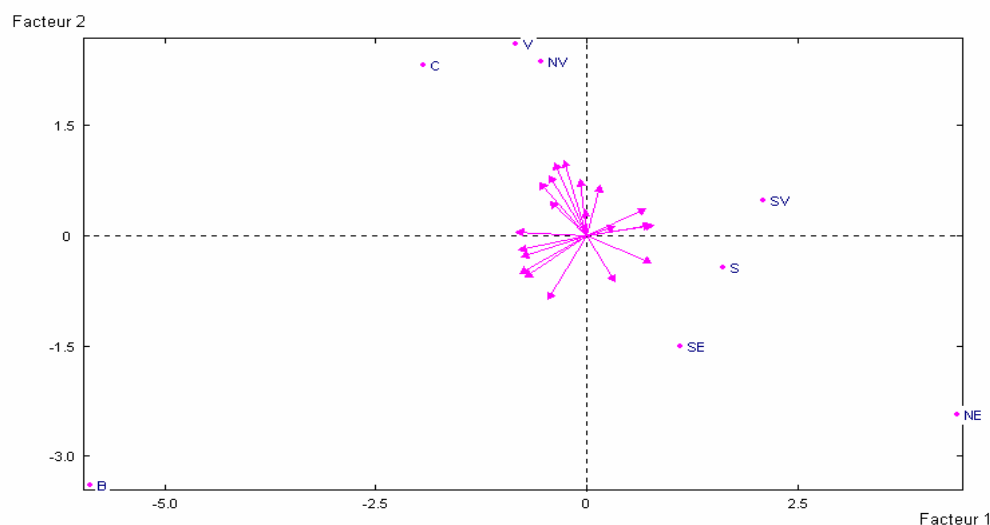
The Matrix variance-covariance reflects some interesting aspects concerning the variables we observed:

- Time spent on economic activities is negative correlated with all other types of activities, but is positive correlated with housework and travel.
- Time dedicated to watching TV is positive correlated with time spent on reading and sports and negative correlated with all other categories of free time.
- GDP is positive correlated with sports and reading (mass media) and negative correlated with unemployment rate, time spent on housework. The people spending more time on leisure, such as sports and mass media are a better economic situation than others, as a consequence of living in a developed region, characterized by a higher GDP.

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<sup>1</sup> GDP is expressed in USD

Figure 7.



The factors identified using PCA, as well as their weight, are described in the tables from the end of the paper. We briefly present now the most important conclusions of our analysis.

The projection of statistical region in principal axes space emphasizes the disparities existing between regions. Thus, there are five distinct zones that can be represented and defined in principal axes space.

The first zone groups three regions: Center, West and North-West, regions with similar features in respect with economic development and time use patterns.

The second group associates two zones, the South and South-east, in fact the entire southern part of Romania. South West region is situated between the two groups already mentioned, while Bucharest and North East region are situated on the opposite parts of first factor axes.

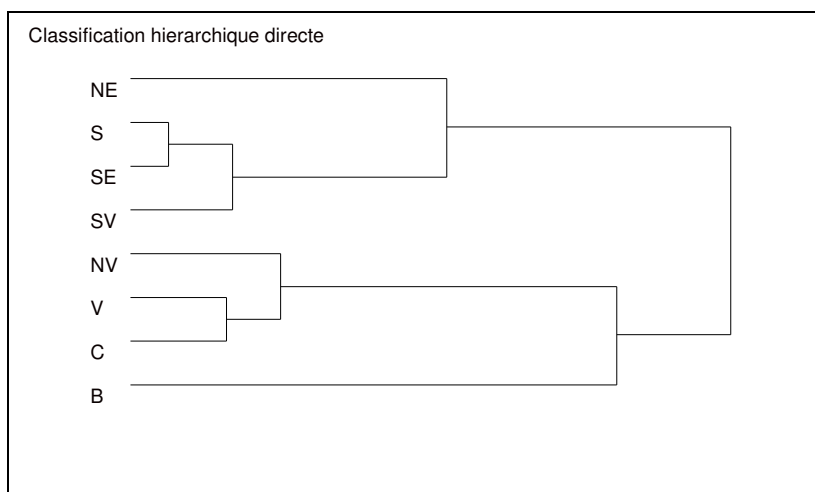
It is worth to mention the characteristics of the identified groups:

- The regions included in the same group have similar development level;
- Bucharest is the most economic developed region, characterized by large expenditures and incomes, low unemployment rate, high life expectancy at birth (71.5 years), the largest amount of time dedicated to personal care activities and sports, mass media and social activities, while the time spent on economic activities is the lowest. The time dedicated to children's care and housework is also low.
- Center, West and North-West are regions characterized by the high level of economic development, low rate of unemployment, high levels of leisure, average amount of time dedicated to economic activities and housework. The people living in these regions dedicate less time than national average to watching TV.

▪ North-East is the region situated at the opposite side in respect with Bucharest: low expenditures and incomes, high unemployment rate, low amount of time dedicated to personal care activities and sports, mass media and social activities, while the time spent on economic activities is high. Also is the time spent on travel to work.

▪ South, Southwest, South-East are differed from other regions in time spent on personal care activities, paid work and housework, which are higher than national average. As a consequence, free time is lower, both for aggregate case and for its components: religions, sports, mass media and social activities.

Figure 8.



Classification of the eight statistical regions observed for Romania's care realized considering the 20 variables mentioned before is made in respect with the distances between the regions in principal axes plan. This classification emphasizes a hierarchy which reflects surprisingly the historical regions of the country.

Thus, the first level groups South and South East in a group and Center and West into another group, while the other regions are independent. At the extreme are situated, just as we seen before, Bucharest and North East.

The second level adds to the first group South West, so that the entire

south region is grouped into the same class. By adding North West to the second group, we obtain the Transylvania historical region. North West region is added to the first group, being less economically developed, while Bucharest is added to the second group, with regions with a better economic and social standard.

**Conclusions**

Important disparities exist between Romanian regions, and they are also reflected by the way people use their time. Traditions and economic situation, which is difficult during transi-

tion, lead to different ways of spending time.

Time allocated to personal care activities differs from a region to another. In central region the time spend on this activities is 0.8 hours more than in North-East Region. In the most part of the country men spend more time on personal care activities than women.

Time spent on paid work differs from a region to another and reflects the degree of economic development of the region: in agricultural regions the time spent on paid work is more than other regions.

The most important category of free time is dedicated to mass media 65%: watching TV, reading and listening to radio. The persons living in Bucharest spend the most time on mass media activities, 3.8 hours, while in the NE region the time spent on these activities is 2.6 hours. Beside poor economic conditions, there are also social factors involved, linked to the access at TV channel or in some villages, to the access at electricity.

Using PCA there were identified several regions of regions with similar patterns in time use. The first zone groups three regions: Center, West and North-West, regions with similar features in respect with economic development and time use patterns. The second group associate two zones, the South and South-East, in fact the entire southern part of Romania. South West region is situated between the two groups already mentioned, while Bucharest and North East region are

situated on the opposite parts of first factor axes.

This regions classification argues once again that the disparities existing between regions in respect with time use are closely connected to the economic level, cultural and traditional patterns, as well as historical relations.

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