Key Skills Development at Firm Level in Regional Perspective

- Case Study for Romania -

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Abstract

In view to define the need for change in the knowledge economy perspective an important place is occupied by the key competences development. In the new global context, with the digital and knowledge economy emergence "company expects current and prospective employees to bring this set of skills to the workplace". (Learning for the 21st century)[1]. Some key competences are already recognized with transversal value by the employers – the ability to think creatively and logically in order to identify, formulate and solve problems, the ability to synthesize information, the ability to develop new skills, applying knowledge to the new situations, communicating, collaborating, making decisions and included into the "learning skills" literature etc. Based on the results of the Survey applied at national level, representatively at region NUTS 2 level, in Romania in 2008, we try to develop the firm perspective regarding the demand for the key skills development in regional perspective on medium term. The similarities but also the differences regarding the pattern of the potential aggregated demand of key skills at regional level emphasis that the region could be an important variable in the equation of the competences management at firm level. The regional perspective offers a lot of precious information in view to design better key competences not only at institutional side but also at firm level.

1. Introduction

Between firms and institutional entities located in a specific region are established several types of relationships. The local network asymmetry is generated by the interactions between different types of capital: national and international groups (the most important form of capital), regional groups (regional capital), small and medium size enterprises (local capital) as well as the labor / capital participation. The links between nodes are determined by the work-capital connections, influenced by local employment policies.

The economic landscape of a region is described by various levels of structures and qualifications. The region can be seen as a dynamic product of the interregional relationships, with the development history and also with its production system integrated. In this way we can talk about "industrial layers, like research and development regions, qualified labor force regions and less qualified labor force regions" [2]. The fundamental idea is to pass from the firm maximization profit way of thinking to the regional perspective which focuses more on the regional development. The space can be seen as a material form of organizing the capital which takes into account the historical and geographic aspects. The geographic location of a region gives an intrinsic advantage over the other regions, differentiating itself by transportation, transactions and information costs.

The analysis of resources allocation is conditionated by geographic structure of the region.

The geographic zone has to be correlated with the existence of possible specific transfers between enterprises, between enterprises and institutional entities, in an innovation background ecosystem. In this new

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perspective the region is directly involved in the shaping of the processes emergence (production, technology, acquiring knowledge etc).

In order to analysis the allocation of resources as competences and qualifications for Romania we had conducted a study at the NUTS 2 level, in 2008. Further, we developed a model to emphasis the connections between region, its characteristics and the way in which is concentrated at region level the demand for the key competences. Our model [3] include as components: premises, hypothesis, the mathematical relationship already presented as a paper. Based on this model, in this paper we present some new results, concentrated on Key skills development at firm level in regional perspective.

2. Premise
2.1 Skills and firm

Nonaka's model of "**organizational knowledge creation**, in which he proposed that tacit knowledge, could be converted to explicit knowledge" [4] Any organization can be considered as an open social system, adaptive, with varying degrees of permeability to environmental influences. Organization of XXI st Century is a dynamic system, whose evolution and "life expectancy" is based on ability to assimilate changes into the system, but also in its relations with the environment.

2.2 Paradigm changes in skills definitions induced by Knowledge Society

One consequence of the paradigm changes from Industrial world to Knowledge Society is made by the **Job centred** approach to learning to **human centric approach**. In Industrial Age, on the cognitive stability and slowly cognitive background changes are easy to define requested, easy to transmit and to learn skills. It is very important to emphasis that in the knowledge stability situation is essential the **transfer of** existing knowledge into the minds of learners.

The human-centric approach **"enables** the development and realisation of important and useful capabilities in a changing world where innovation, knowledge creation, and communication can lead to individual and social development" [5]. On a fast cognitive background changes with a high cognitive instability, volatility and variation the skills becomes very dynamic with a short life span. Therefore it becomes difficult to define the requested skills, to predict then, to transmit and also to teach them. The skill is no more located on the job but on the **Knowledge community** as a network, without geographic limitations in global world.

2.3 Key competences and skills typology from firm level perspective

The subject of skills is delicate. Competence should be distinguished from competency, although in general usage the terms are used interchangeably. "The concept of core competence is most closely associated with the work of Gary Hamel and C. K. Prahalad, notably in their book, *Competing for the Future* (1994). They describe core competences as bundles of skills and technologies resulting from organizational learning". [6] A competency [7] is more than just knowledge and skills, is more complex. Skills are usually acquired or learned, gained through training and experience following some definite reason, process or action.

There is an rich international literature regarding the key competences and skill. We mention some like the lists of Organisation of Economic and Cooperation Development (OECD), European perspective regarding the key competences and skill lists (European legislation), nnational perspective regarding the key competences and skill lists. (USA: basic skills and thinking skills and personal qualities, Romania: National Council for Adult Vocational Training (CNFPA)'s List of key skills[3], United Kingdom: "Key or **Generic skills** are general skills which are transferable across different occupations. They encompass basic communication, numeracy, information technology (IT) skills, the ability to work with others, problem solving, improving own learning and performance, reasoning skills for work planning and work process management skills. It also includes "softer skills" cited in the context of generic skills. These include team leadership, negotiation, facilitation and social skills" [8], Bussines – State Partnership National perspective regarding the learning skill lists (The Partnership for the 21st Century Skills)

2. Hypothesis of the model
2.1. Model background of Occupation Clasification in Romania (COR)

The model background of Occupation Classification in Romania (COR) is based on the identification system, hierarchy and codification of all occupations performed in the economy, regardless of their type and place. COR is applied in all areas of economic and social activities, when is need to fill in the official documents whenever required to specify occupation covered by activities. Using the COR's codes is mandatory for all central public administration bodies and local budgetary units, economic units, regardless of ownership, employer organizations, trade unions, professional and political, foundations, associations, individuals and companies, referring to them as users. Occupations listed in the COR are the result of continuous update work, because the

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[3] In the Romanian legislation there are not semantic difference between competences and skills

labour market in Romania and the European Union, is a dynamic market, constantly subject of changing. Lately this dynamic is more complex, including the change in content of economic activities, on one side and economic crisis effects on the other side. In terms of occupations there are some destroyed and other new emerged, a lot of them induced by the current technological processes, the production's expansion and technical progress. Thus, COR is, at least theoretically, the result of the market needs. Consequently, any of the professions listed in the COR has utility for economic agents and /or public institutions. Reviewing and updating the Classification Occupation of Romania (COR) was a necessary project, rely on the one hand, to this dynamic occupational, and on the other, the need for all users of this nomenclature having access to a single classification, and avoiding abuses of the labour rights. Finally, the classification review requirement was imposed by Romania in order to implement Standardized International Classification of Occupation - ISCO-08 and to adjust statistical surveys according this classification regulatory structure imposed by the European Commission. Occupation groups, the structure, in terms of professional skills, can be found at the ministry's work on the following link: http://www.mmuncii.ro/ro/cor-664-view.html.

To achieve the classification and description of occupations have had used the international standards classification of occupations works. [9] (Our reference in the model is related to occupation codification made at COR occupation codification at 5 and 6 digits level.)

But all these classifications were used to determine the quantitative side of the structure of occupations, without offering, however, sufficiently qualitative-structural information regarding homogeneous activity structure of the occupied persons.

The opportunity for a new occupation classification development, including also the skill perspective, suitable for all countries including also Romania[4], is sustained by:

a) the emergence of new occupations following the spectacular results in research and development, the introduction of new technologies, materials and diversification of the scope of services;

b) the changes in economic and social structures, especially in catching up countries, imposing new groups of occupations;

c) the process of aligning the whole system of classifications and nomenclatures to international standard systems, particularly those in the European Union Countries (the need to ensure accurate and comparable to the same criteria and principles for knowledge, evaluation, comparison and communication development indicators)

2.2 Key skills list used in model - according to Romanian legislation

In our paper the key skills are defined by National Council for Adult Vocational Training (CNFPA)'s Decision harmonized with international methodology and including 6 key skills and 9 other skills see Table 1:

Table 1

**Romania: National Council for Adult Vocational Training (CNFPA)'s
List of key skills, at 01.2008/ before 24.06.2008**

List of key competences, commune to some occupations was actualized through the CNFPA's decision no. 86/24.06.2008. Is important to point out that the List of key competence should represent:

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[4] the identification of the past and current status of the occupational structure of employment in Romania and the significant changes in content in the case of certain occupations on the market, main objective of the study „Evolution of occupations on Romanian Labour market in 2010 perspective (Bucharest, 2006) emphasized changes in their work content. The occupations „whose content has changed significantly" were those that recorded the highest levels of change(they disappeared), being followed by the „piercing" and „dominant" ones The development of new sectors explain the high levels of change recorded by the „piercing" occupations, new, poorly formalized occupations, out of which some are not included yet in the Romanian Occupations Classification (COR). We find the dominant occupations and also suppressed/ obsolete occupation mostly in the industrial sectors, strongly affected by economic reorganization and technological restructuring. The competences mainly associated with the changes in the work content are using the computer, problems solving, resource management and communication.

a)   a dynamic dimension regarding the perspective of key skills development –is not constant in time;

b)   list of key skills represents in Romania an institutional list, the selection of the key skills is an outcome of the vocational and life long learning policy. (Another institutional aspect is that there is no legal request to solicit occupational standards for vocational training program authorisation);

c)   in building this list is essential to cover the business inputs in a anticipative manner, especially in such a dynamic and changing environment.

2.3 The key skill assumptions made in the model

In the knowledge economy the production induces changes also into the jobs, occupations, competences, training and education dimensions. In this new context, this article points the value of the skills development approach under the firm perspective. Our attempt is focused to define the required skills by the firm that matches with the description of Key Skills List (presented above 2.2.), with the perspective to estimate the potential aggregate demand of key skills (under this assumption) for short and medium term at firm level and at occupation.

Next to "specialized skills/hard skills" – skills included in competences, occupation or job description we evaluate the Romanian firm standpoint at one moment in time regarding the interest for soft skills/learning skills/transversal/general skills development as potential firm demand, without concerning the skills structure of occupation.

Considering the key skill as the unit of acquiring/using/producing (new) knowledge requested from the new needs of performing an occupation in a firm, in both its dimensions tacit and explicit then we make the following assumptions regarding the key skills development at firm level:

-    the aggregate potential demand is at wide economy scale level (the potential demand unit is estimated by the firm only, in institutional legal framework), for every type of key skill;

-    the potential of key skill addition into the occupation after a threshold overpass expressed in terms of probabilities;

-    the key skill dynamics is dependent with the technological progress. The disruptive changing into the technological progress induces also variations in the key skills "prestige".

-    when aggregate the skills potential demand, considering as input disjointed key skills (very difficult to estimate "As a result, any simple cataloguing of society-wide "skill-gaps" remains inadequate. As skills are contextual and socio-technically distributed, there is no universal arithmetic that could be used to aggregate skills."[5]) then, for every key skill is a potential demand at firm level (as a sum for all the occupations in the firm), with the possibility to be aggregate also at national level;

-    under the resources scarcity side becomes interesting the process of selecting the essential skill need. Even if in the normative perspective there are desirable as input at a large spectrum, could be relevant at firm level the order/priority/timing to acquire the skills appropriated with firm strategy;

-     another important issue in view to choose to invest in skills development is determined by the "place/base/fundament" to allocate it, to addition on but using into different combinations (intensity, frequency, etc). In our paper this place is represented by the occupation;

-    new resources developed as input for the economic growth. New skills input are valuable not only by the value that brings as a unit of knowledge but also as huge potential of combine them, again referring to Romer's statement that "economic growth occurs whenever people take resources and rearrange them in ways that are more valuable" [10].

3. **Model building**

3.1 *Model description*

Considering the key skill as the unit of acquiring/using/producing (new) knowledge then this is an external knowledge to the firm. The firm is rationale and identifies the specific key skills KSm list selected (a list with variable number of cases, with possible value 0 to 15) from the input CNFPA List (in our case with 15 cases, constant) (see Table 2).

We investigate the perspective of the most spread/normal/inertial occupations – the economic agents list the first 5 occupations, most important in regard the number of jobs (with the biggest number of employees) – for one occupation there are admitted more then 1 number of jobs /number of salaries;

Because the interaction between firm and new key skills request is analysed at occupation level then we developed the procedure to identify the specific key skills KSm list selected as requested skills, as a base for the estimation of the key skill demand at firm level/ sector/national level.

Then, for every occupation the firm makes the potential match, in short term and medium term perspective 1-3 years, following some steps:

Step 1: The firm "compare" the internal list of skills included into the Occupation description, in our specific case the internal skills list OD6 (Fig.1) with the input CNFPA List. The first key skills KSm0 selected list retains only the key skills that differ from the OD6List. In other words, here is visible the relativity of defining the new key skills. The main criteria in our model are that the key skills should be new for the firm;

Step 2: The firm "compare" the first key skills KSm0 selected list with the new needs of performing the occupation in analysis at firm level and formulates the skills requested as specific key skills KSm list selected for an occupation. Another very important criteria in our model is that the key skills should be useful for the firm;
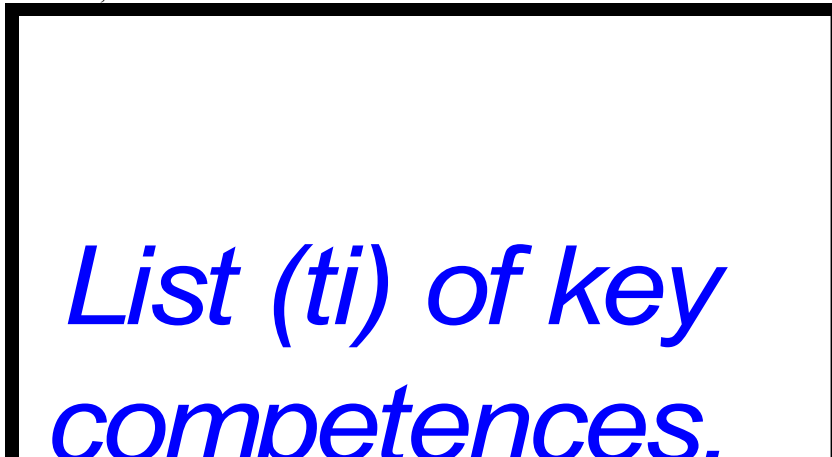
List (ti) of key competences.

Fig.1. Occupation description according to COR [11] (at moment t_i)

Step 3 The firm response in our model is represented by the dichotomy values, 0 or 1 for every input CNFPA List (in our case with 15 cases, constant), respective for every case of key skill; (see Table 2). In our model "1" represents that the skill (i) is requested by the occupation (j) in the firm (k) and also is new for the occupation in the firm.

Table 2

The firm response for every input CNFPA List (in our case with 15 cases, constant), respective for every case of key skill

PR7 proiect - Key sk
number of persons i

| Key skills | a. comunication |

Where: the selection for a key skill was made into the dummy variables (15 variables pr7 for every Occupation j) Generic codification:

pr7oiKSj   =   **1**   **Yes,** the skill is requested by the occupation j in the firm
                     0   **No,** the skill is not requested by the occupation j in the firm
                            ,   NA

KSj-key skill indice   *15 variables, codified From „a" to „o"*
 Occupation indice: j   *1 la 5, for the first 5 occupation most important;*
maxim prtoKSi = 5
min=0

In our model we describe the firm as a pattern build from occupation combination. One person is employed on a job and is entering into an occupation. The occupation is constant as long the person performs the same type of duties. In the moment when the person gets out of the occupation that person exits from the occupation group. At this point, there is another important assumption, in our model (as medium term perspective 1 to 3 years horizon) we consider there is no variation in terms of occupation firm structure and

dimension. That means there is no variation regarding the number of the occupation at firm level and the occupation turnover is different from the personnel turnover. In our model we describe the personnel turnover of the firm as a function of personnel turnover at occupation level. Then there is a surjectiv relation between the number of employees and number of occupations. (for every employee there is only one occupation but for one occupation could be more then 1 employees). As an algebric relation we express as:

a. Flux of people/employees across the occupations/jobs at firm level

$$\sum Ns = \sum_{i=1}^{5} Noc \qquad (1),$$

Another generic relation is that the variation of the number of employs during (t1-t0) period of time is:

$$N_{t0} - N_{out} t_1 + N_{in} t_1 = N t_1 \qquad (2)$$

Where, for r occupations, at the firm (i) the flux of personnel into the firm during (t1-t0) period of time is equal with the sum of all flux of personnel into every occupation position :

$$N_{t_1}^i = (N_{t_0}^i + N_{in_{t_1}}^i - N_{out_{t_1}}^i)_{occupati on1} + (N_{t_0}^i + N_{in_{t_1}}^i - N_{out_{t_1}}^i)_{occupation2}$$

$$(N_{t_0}^i + N_{in_{t_1}}^i - N_{out_{t_1}}^i)_{occupation3} + \ldots + (N_{t_0}^i + N_{in_{t_1}}^i - N_{out_{t_1}}^i)_{occupati\_tri} \qquad (3)$$

Step 4. In perspective to be developed: the **simulation of the firm decision procedure** regarding the way to respond to the key skill acquires (investing in vocational training programmes or fire/hire a new employee). In this stage is need to develop also an analyse cost/return;

Step 5. There is no variation of the internal skills (skills that respond to demand for occupation practicing, included into the occupation description, OD6 position in Figure 1), according to COR definition. Based on this hypothesis we consider the Occupation as a black box ignoring the possibility to lose some skill in the occupational practice. **The only possibility admitted into our model is represented by the situation** of the enrichment of an occupation in the case pi>p0 (4)

p probability at moment t2 to add the Key Skill(p/t1) [p=1 to n] on the every Occupation explored;

$$p_i = \frac{\sum_{J} D_{i_J}}{f_J} \qquad (4)$$

Where: J occupation indices in Index of COR,
i key skill indices,
f frequency

p0 the minim threshold of probability (proposed 60%) that confirm the transition of an external skill for an occupation as an internal (new) skill into the old occupation. If the old occupation is still with the same name the difference from the skills structure differ and in this context we could consider that the occupation is enriched. There is a new discussion regarding the "quantity of new" absorbed in terms of status of the new occupation. Is possible that the new occupation to change its name, to become a related occupation with the old one.

Our research is cover only the first 5, most important occupation from the firm, using the Key Skills list

Step 6. In view to develop the Step 4, we express the demand in Conventional Unities of Key Skills [CUKS] (next we shall allocate cost values based on the history of vocational training programmes), at a key

a .key skill demand by every type at the firm level

$$KS_{D_i}{}^f = \sum^{j} KS_{D_{iOcj}} * N_{e_{Ocj}} \qquad \text{[CUKS] (5)}$$

a1. key skill demand by every type at the firm level

$$KS_{D_i} = \sum^{f} KS_{D_i}{}^f = \sum^{f} \left(\sum^{j} KS_{D_{iOcj}} * N_{e_{Ocj}} \right) \qquad \text{[CUKS] (6)}$$

b. key skills demand at firm level

$$KS_D{}^f = \sum^{i} KS_{D_i}{}^f = \sum^{i} \left(\sum^{j} KS_{D_{iOcj}} * N_{e_{Ocj}} \right) \qquad \text{[CUKS] (7)}$$

c. key skills demand at national level

$$KS_D = \sum^{f} KS_D{}^{f} = \sum^{f} \left(\sum^{i} KS_{D_i}{}^{f} \right) = \sum^{f} \left[\sum^{i} \left(\sum^{j} KS_{D_{i_{Ocj}}} * N_{e_{Ocj}} \right) \right] \text{ [CUKS] (8)}$$

Where: f firm indices,
j occupation indices in firm,
i key skill indices,
Ne number of employees (from the Ocj))

4. Data and methods

We use data obtained by a national survey in Romania (2008) at firm level. The main result are: the potential demand estimation for key skills development at medium term (3 years) at firm, sector, national level aggregation and the probability to an occupation to absorb an key skill. These results are useful especially for the firm in view to identify the priority to invest in key skills development into the training programmes projection and also to estimate in terms of CUKS the key skill demand as presented in (5) to (8) issues.

4.1 Building the Sample Survey:
- Multistadial and multilayered, following the next procedure:
  Firm sample dimension (number of units): 506 firms
- Stratified sample for 8 economic regions, 3 types of size classes of firms (small, medium and large) and **CANE Rev.1 (activity of national economy –7 sections covered)**;
- Selection of companies was made randomly for each layer, the online database www.listafirme.ro; companies in Romania (about 740,000 - database made by Borg Design SRL).
- 125 municipalities (urban and rural), of which 6 represent sectors of Bucharest, widespread in all 42 counties (județe);
- Average number of interviews conducted in each locality: 4
  The maximum sampling error: ±4.36%

4.2 Correspondently to the firm sample there are the occupation samples:
- COR represents the main nomenclature, we list of occupation sum 3078 occupations presented into the INDEX COR [12] (January 2010, MMSSF).
- There are investigating the potential demand for key competences (defined by the list presented into the table 1) only the first / the most important 5 occupations into the firm.
  Main Objective of research/survey:
- Identifying the needs for training in companies in Romania applying a questionnaire towards the selected companies, the respondents were human resource managers;
- Period for implementing the interviews: June 1 to July 7, 2008.
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5. Results regarding Key skills development at firm level in regional perspective:

Based on the previous stage of the research where we determined the mean values for the key skills potential demand aggregated by different characteristics (including also CANE Rev1, enterprise dimension according to the employees number) and using the enterprise number (TEMPO data base developed by National Institute of Statistic INS Romania) for the year 2008 by the same characteristics CANE Rev.1 and enterprise dimension according to the employees number we weighted the units number with the category CUSK mean and we estimate the potential aggregate demand at NUTS 2 level. The potential demand for the key skills formulated by the firm is expressed in out paper as a CUSK measured aggregate total and also in the key skills spectrum typology (15 key skills categories). Based on this convention is possible also to aggregate the key skills at regional level – NUTS 2 (8 development regions) as total key skills potential demand (see Table 7] but also as a specific key skill from the list potential demand. Finally the regional distribution of the potential demand for the key skills is presented in braking down by CANE Rev.1 at sectors level and by the size classes according to employee's number. The methodological limits of our survey allow us to emphasis some relevant results for selection of CANE Rev.1, 7 sectors and only for SMM with more then 10 employees.

The educational infrastructure is a regional variable which accounts for the distribution of the educational units over the all 8 development regions. It has a minimum of 21 ISCED 4-7 units and maximum 108 units, arranged in 5 clusters (Map 1, 2).

The greatest value of the total aggregate potential demand of conventional units [CUSK] is reached in Bucharest-Ilfov Region, representing one third of the total potential demand. This result was predictable because there a metropolis with high concentration and high diversity of enterprises in this region, where the educational units have also relative high values, being between 36 and 42 ISCED 4-7 units.

The smallest aggregated potential demand is observed in North-East region, where is the biggest number of educational units ISCED 4-7. If we correlate the results about the aggregated potential demand with the size of firms from that region we'll notice that the most significant demand comes from the small and medium enterprises

On the other side if we analyze these (before presented) the two most different environment characteristics emphasis that this variety induces also different inputs in the firm process of competences management. The reaction to the environment is according to the firm dimension. The new skills competencies demanded by the human resources managers from the analyzed zone, indicates the fact that big and medium organizations are in the process of modernization, acquisition of new technology, reorganization of work processes, so they are dealing with the processes dimensioning of the necessary of human resources and there are identified continuous (with a good periodicity) processes re-evaluation of competencies in the same time with the quantitative and qualitative organization of competencies.

Next to the Bucharest-Ilfov region is the Centre region with 22% of the total aggregate potential demand at national economy (Table 3). The cumulated demands at the level of these two regions (Bucharest-Ilfov and Center) represent 53% of the total potential aggregate demand. This important level of potential aggregate key skills demand indicates that these two regions can be considered the most *dynamic regions* if we have in mind the aspects regarding competencies organizing, dimensioning and re-evaluation of human resources.

Table 3

The regional distribution at NUTS 2 level of the potential aggregate demand for the key skills reported to the national total [CUSK]

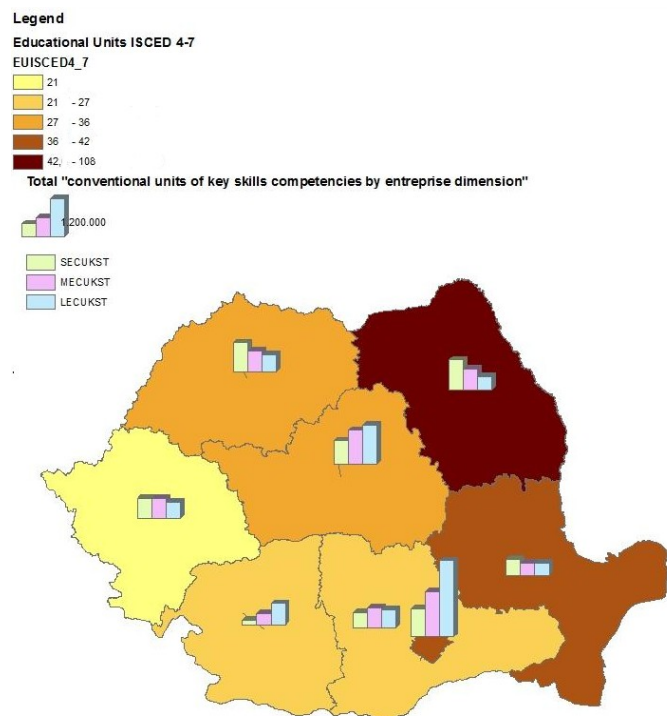| North-East Region	South-East Region	West Region	South Region	South-West Region	North-West Region	Center Region	Bucharest-Ilfov Region	Total
5.6%	5.9%	8.6%	9.4%	10.2%	11.5%	21.8%	31.2%	100%
First category		*Second category*				*Third category*		

Analyzing Map 1, it can be observed that from the small enterprises perspective the North-East region has the largest potential aggregate demand at the level of all 8 NUTS 2. The creation and development of small enterprises raises the problem of human resources management from in terms of key or transversal competencies because these units are more opened to the extern environment, more flexible and adaptable. So they need a personal with multiple abilities that covers all the key competencies presented in this model.

The smallest percents of the distribution of total aggregated potential demand over economic sectors in all regions of development is observed in the case of North-East (5.6%) and South-East (5.9). Both regions have a relatively close distribution of educational units ISCED 4-7, which is a high one. One explanation of this different would be that the high density of educational units, as a regional factor permits a better allocation of human recourses, a better of key competencies.

As in the case of Bucharest-Ilfov, the most semnificative potential demand comes from the small and medium enterprises, which makes the total aggregate potential demand to be larger comparing it with other regions, as it can be seen in Map 1.

It is observed a correlation between the potential demand of key competencies and the allocation of educational units in territorial profile:
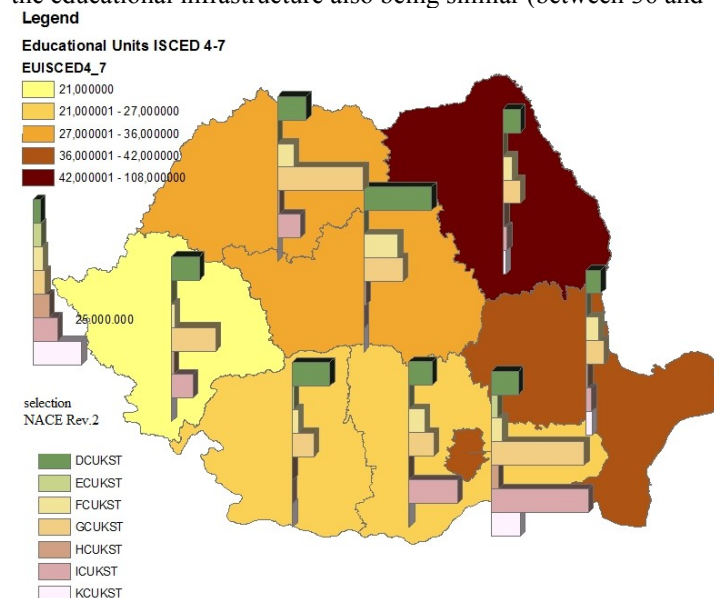
Legend
Educational Units ISCED 4-7
EUISCED4_7
21
21 - 27
27 - 36
36 - 42
42 - 108
Total "conventional units of key skills competencies by entreprise dimension"

1.200.000

SECUKST
MECUKST
LECUKST

	Number of CUKST Selection by calculated with the CUKST by entreprises average weighted with the number in 2008 [*number of CUKST –Conventional Units of Key Skills Competencies by Enterprise Dimension*]
SECUSKT	number of small enterprises (firms with 10-49 employees)
MECUSKT	number of medium enterprises (firms with 50-249 employees)
LECUSKT	number of large enterprises (firms with more then 250 employees)

Map 1: The distribution of potential demand of key skills competencies by enterprise dimension

The relative small demand (8.6% of the total aggregate demand) on the background of a poor educational infrastructure, in the case of West region; the relative small demand is the result of the needs of key competencies for small and medium enterprises;

• A cumulated potential demand of 20% of the total demand is concentrated in two neighbor regions, South-West and South, on the background of educational infrastructures similar distributed (between 21 and 27 units);

• Over a third of the potential aggregate demand at the national level is concentrated in two neighbor zones with the same territorial repartition of educational units (between 27 and 36 units);

• About 37% of the total potential demand is concentrated in the Bucharest-Ilfov and South-East regions, the educational infrastructure also being similar (between 36 and 40 units)

Legend

Educational Units ISCED 4-7
EUISCED4_7
21,000000
21,000001 - 27,000000
27,000001 - 36,000000
36,000001 - 42,000000
42,000001 - 108,000000

25,000.000

selection
NACE Rev.2

DCUKST
ECUKST
FCUKST
GCUKST
HCUKST
ICUKST
KCUKST

	Number of CUKST Selection by NACE Rev.1 calculated with the CUKST by NACE sector average weighted with the number in 2008, [number of **CUKST** –Conventional Units of Key Skills Competencies by Enterprise Dimension]
D	Manufacturing
E	Electric and thermal energy, gas and water
F	Construction
G	Trade
H	Hotels and restaurants
I	Transports, storage and telecommunications
K	Real estate transaction and other services

Map 2: The distribution of aggregated potential demand in conventional units of key skills competencies by NACE Rev.1 sector 's selection

Taking into account at the results presents in Map 2 we can draw the following conclusions:
- The biggest demands of potential aggregate key competencies are in the following sectors: manufacturing, construction, transports, storage and telecommunications, trade. The results are relevant

from the view of manufacturing, because the telecommunications represents the sector of new technologies
- The smallest demands are in the following sectors: electric and thermal energy, gas and water, real estate transaction and other services. An explanation could be the fact these sectors don't need key competencies (one reason could be the acquiring form the filling their need from the labour market);
- The manufacturing sector has a relative uniform distribution over the 8 regions of development. The biggest demand is in Center, and then comes South-West with a potential demand representing about half of the ones in Center and North-West together. If we correlate these results with potential aggregate demand by the enterprise size, it can be seen that the most important potential aggregate demand of key competencies is observed at the small and medium enterprises from the manufacturing sector, from the Center region, where the educational units ISCED 4-7 are between 27 and 36.

The smallest demand of conventional units of key competences for manufacturing sector is in South-East and North-East regions, even thou their distributions of educational units are different, between 36 and 42 for North-East and between 42 and 108 for North-East. Furthermore, the potential demand for key competencies on manufacturing sector for the South-East region is the smallest for all, even thou the number of educational units ISCED 4-7 is relatively high (Map 2). In the case of North-East region, the most significant demand comes from the manufacturing and construction sectors, this region having the biggest allocation of educational units ISCED 4-7 in the country. But this demand is the smallest from all.

The smallest variation by sectors is noticed also in North-East region, the zone with the biggest allocation of educational units, as we've mentioned above. A similar situation is present in South-East.

The biggest variations by sectors are noticed in the Bucharest-Ilfov region, where the degree of diversity and complexity of the activities performed is greater than in other regions.

From the results presented in Map 2 we can summarize the main factors that influence the variations of the aggregate potential demand by sector at the level region:
- The existence of educational units ISCDE 4-7
- The development demands of the sectors
- The size of the enterprise
- The educational level of workers for the occupations that have the ..
- Workers mobility on labour market
- Jobs that have the biggest number of workers by region

The variations of key competencies by region are presented din Table 4.

Table 4

The variation of the key competences spectrum according to the NUTS 2 level distribution [CUSK]
- **Differences and similarities -**

Key skills				
	The highest potential demand for the key skill (SK) *[region] (%)*	Educational Units ISCED 4-7	The lowest potential demand for the key skill (SK) *[region](%)*	Educational Units ISCED 4-7
a. communication	South East (15.,3)	36 -42	West (5,6)	21
b. problem solving	South (15,2)	21 - 27	South-West (3,8)	21-27
c. team work ability	South-East (19,0)	36 -42	North-East (11,0)	42 -108
d. ITC competences	South-West (4,7)	21 -27	South-East (1,3)	36 -42
e. numbers work ability	South –West (11,1)	21 -27	South-East (1,8)	36 -42
f. personnel performances self emprouvment	South-East (17,3)	36 -42	South-West (6,7)	21 -27
Others skills				
g. foreign languages	București-Ilfov (3,5)	36 -42	South (0,5)	21 -27
h. making decisions	Center (4,9)	27 -36	North-West (1,6)	42 -108
I. initiative	Bucuresti - Ilfov(20,7)	36 -42	South-West (5,2)	21 -27
j. creativity	West (6,7)	21	South-West (1,6)	21 -27
k. capacity to work under stress pressure	West (14,1)	21	Bucuresti - Ilfov (5,3)	36 -42
l. capacity to work independently	West (10,8)	21	South (3,8)	21 -27
m. activities planning	South-West (8,5)	21 -27	South (2,8)	21 -27
n. management competences	Bucuresti-Ilfov (2,0)	36 -42	South –East (0,3)	36 -42
o. driving license	South-West (4,7)	21 -27	North-East (1,3)	42 -108

6. Discussion

          The **similarities but also the differences** regarding the pattern of the potential aggregated demand of key skills at regional level offer the prove that the region could be an important variable in the equation of the competences management at firm level.   The medium term of the key skills anticipation demand could be a component of the common strategy for continual and vocational training of human capital. Another aspect related to the similarities and differences is shaped by the economic activities and firm dimension characteristics. The real challenge emerging from this analysis is the need to create and organize networks dedicated to formulate in a dynamic approach the key skills potential demand not only on medium and short term but also on long run. The specific case of the key skills development is strongly related to the region perspective because of the universal interest for these (regardless the economic sector and the firm dimension) and local specificity.

          In view to define the need for change in the knowledge economy perspective an important place is occupied by the key competences development. In the new global context, with the digital and knowledge economy emergence *company expects current and prospective employees to bring this set of skills to the workplace.* This paper try to make the photo of the firm perspective regarding the demand for the key skills development in regional perspective in Romania but also suggest new challenges**. The regional perspective offers a lot of precious information in view to design better key competences not only at institutional side but also at firm level.**

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