

CHANGE IN ECONOMIC STRUCTURE, EXPANSION OF UNIVERSITY TRAINING AND DEVELOPMENT OF NON-WAGE EMPLOYMENT¹

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A*bstract:* The present paper investigates the development of non-wage employment (NWE) in the context of sensible changes in economic structure, by increasing the relative importance of the services' sector and labour force supply due to an expansion of higher education. We identify factors which favour the expansion of NWE in the context of transition to knowledge-based economy in the countries with solid market economy. A comparative analysis is made about the relative importance of employment in European Union member countries and a series of correlations performed with other structural indicators of the labour force market. On this basis, the conclusion is that the NWE physiognomy is dependent to a significant extent on the development degree and sectoral structure of the economy in various countries.

The analysis of the NWE development is deepened in the case of Romania by paying special attention to the case of higher educated individuals. It is found that the increases in the number of self-employed persons with higher education is mainly a forced choice for avoiding entering unemployment and only at

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secondary level the expression of a new type of entrepreneurial spirit, as in the case of countries with consolidated market economy.

Key words: higher education, multicriterial analysis, employment model, entrepreneurship, labour market flexibility, economic sectors

JEL Classification: E24, I25, J16, J21, J24, L26

Introduction

In the context of the turbulences of the last years within the European economy for the foreseeable future a series of major changes can be anticipated within the employment model of labour force (Pavelescu, F.M, Platon, V., 2002) both at national level, and at international level. Among the facets of the labour force employment model where major changes can be anticipated also the one of the professional status¹ is counted. Under these conditions, of special importance is the study of the opportunities that the non-wage entrepreneurial employment (NWE) forms can provide for increasing the total number of employed persons and in rendering dynamic the labour force market functioning. Because in many theoretical approaches the hypothesis is that the development of the entrepreneurial spirit can constitute one of the forms of re-launching economic activity it is of particular importance to evaluate realistically the role of NWE forms of the active population in the current conditions and in the foreseeable future; also, it is important to evaluate the factors favouring the relative importance increase of the respective component of the professional status.

1. Modelling factors of the expansion of self-employment forms for labour force

NWE forms represent, in fact, a combination of tradition and modernity under the current economic conditions. They are both a reflex of perpetuating some traditional forms of using labour force, the origins of which date back to the period before the expansion, and of consolidating the market economy², and of some important

¹ From the viewpoint of the professional status within international statistics, the following employed population categories are considered: a) employed; b) employers; c) self-employed; d) members of production cooperatives; e) unpaid family workers; f) workers that cannot be classified by professional status.

² It is interesting to notice that, in some papers, the considerable expansion of NWE forms in Italy is seen as a reflection of maintaining some "proto-capitalism" forms in certain sectors of the economy. In the respective institutional framework, the existence of those labour

mutations of the productive apparatus in the context of extending the use of new technologies and, in particular, of the information-communication ones which bring along an increase in the decentralisation degree of the economic activity.

Under these conditions, several types of NWE can be identified depending on the specific features of the three large economic sectors:

- a) **NWE within the agricultural sector.** In this case, NWE has mostly a traditional character, being related both to perpetuating some development structures of the activity preceding the market economy or practicing subsistence farming. From the viewpoint of the distribution by occupation categories, within NWE in agriculture the trades and professions with a low qualification degree are predominant.
- b) **NWE within industry** is mainly an outcome of decentralising the economic activity as result of extending the use of new technologies, and of negating the Fordist production organisation manner. Within this activity, the qualification degree of NWE is sensibly higher than the one found within the agricultural sector.
- c) **NWE within constructions and services** is a consequence of the action of a complex of factors, that is: I) Perpetuating some traditional forms of developing the activity; II) Existence of an entrepreneurial tradition which influences positively the expansion of the respective employment form of labour force; III) Decentralising the economic activity and expanding the use of information-communication technologies; IV) transfer of some activities from the industrial sphere to the services sector.

From the perspective of the qualification level, within NWE the two activity fields mentioned above are noticeable for the high polarisation degree.

At international level, one may see that the share of employers and employees in total population is directly proportional to the relative importance of agriculture within the economic activity, and in reverse proportion to the economic development level¹.

force employment forms allow for greater flexibility of the economic activity, and implicitly a better adjustment to an economic environment with a higher turbulence degree.

¹ Thus, in 1999, the share of this employed population category in countries with consolidated market economy was 7.56% in USA, 11.67% in Japan, 13.64% in Australia and 16.95% in Canada. In turn, in emerging countries, the value of the indicator was considerably higher, i.e. 28.41% in Mexico or 38.26% in Thailand (Pavelescu, F.M.; Platon, V., 2002).

In the last decade, the attraction to NWE forms increased, not only as result of some changes in the institutional framework or in the productive apparatus but also as a consequence of some changes in the labour force supply structure. We refer mainly to an increasing relative importance of higher educated individuals. The increase in the professional knowledge level contributes to extending the demand for higher freedom in developing the professional activity and to creating conditions for the development of the entrepreneurial spirit. Within the surveys performed in various member countries of the European Union, the share of those wishing more for a NWE individual status is significantly higher than the share of the respective category in the total employed population. Thus, the share of persons wishing that their professional status be that of an NWE individual was 45% in 2010 (Rouvinen P., 2010), while the share in total employed population was about one sixth¹ in 2009.

The relative importance of the various NWE forms in European Union member countries is sensibly differentiated depending on the local entrepreneurial traditions and the economic development level and the variants of the adopted social model. For these reasons, a series of interesting conclusions can be detached from the analysis in time and space of the experience in this field in the European Union.

¹ Transposing into fact the wish of developing self-employed activities or an entrepreneurial type activities is conditioned by a high number of factors among which the following can be mentioned: a) the previous personal experience in practicing various forms of NWE; b) family tradition; c) quality of social capital and of the social networks in which the persons with propensity for entrepreneurial activities work; d) gender gaps referring to entering the framework of entrepreneurial activities; e) family situation; f) age of persons tempted join the respective form of employment; g) available welfare level of the persons from the target group and the remuneration level of the efforts made within NWE activities as compared to the wage forms for using labour force; h) the stage of the economic cycle at the time when the respective person must take the decision of initiating self-employment activities or entrepreneurial ones; i) the characteristics of the institutional framework regulating the business environment; j) characteristics of the labour legislation referring to employment and firing personnel and the labour tax system, as well as the level of contributions to social insurance; k) the existence and quality of programmes for supporting self-employment activities of entrepreneurial type, as well as of the small and medium-sized enterprises (Millan J. M.; Congregado E.; Roman, C., 2010).

2. Population's self-employment dynamics within European Union countries. Correlations with structural indicators of labour force functioning

In the year 1999, in all EU member countries (in the 2012 constitution) the share of NWE persons was 16.8% (Table 1). Within EU-15 countries, the share of NWE persons was lower, 14.6%.

Table 1. Structural indicators of labour market in UE countries, 1999

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
EU-27	16.8	15.9	11.8	65.2	27.3	7.5	206 710
EU-15	14.6	17.6	13.4	69.6	26.1	4.3	163 342	8.5
Austria	14.0	16.0	8.0	67.0	27.0	6.0	3 753	4
Belgium	17.5	18.4	9.9	74.8	23.0	2.3	4 028	8.5
Bulgaria	27.8	:	:	48.6	27.1	24.3	3 318	:
Czech Rep	17.1	5.6	7.6	55	39.8	5.2	4 949	8.6
Cyprus ^{xx)}	23.2	6.5	10.3	72.4	21.6	6.1	310.0	:
Denmark	7	21.6	9.6	73.2	23.2	3.6	2 746	5.2
Estonia	8.6	8.1	2.5	60	32	8	581	:
France	10	17	15	74	22	4	23 697	10
Finland	12	12	17	66	28	6	2 247	10
Germany	10	19	13	68	30	3	38 425	8
Greece ^{x)}	39	6	13	:	:	:	4 235	12
Ireland	19.2	16.4	5.1	63.0	28.3	8.7	1 623	5.6
Italy	26.4	7.9	9.5	65.1	29.9	4.9	22 494	10.9
Latvia	16.5	12.1	7.6	58.0	25.5	16.5	973.0	14.0
Lithuania ^{xx)}	20.1	:	:	53.5	27.2	19.3	1 457	13.7
Luxembourg	7.7	9.8	5.2	74.3	24.1	1.6	250.0	2.4
Malta ^{x)}	11.8	6.8	4.1	71	26.4	2.6	146	6.7
Netherlands	14.2	39.7	12.3	76.9	19.6	3.5	7 937	3.2
Portugal	17.0	11.0	18.7	55.5	32.3	12.1	4 927	4.5
United Kingdom	12.5	24.6	7.0	76.3	22.0	1.7	29 216	5.9
Romania	45.0	15.9	3.0	28.7	26.0	45.3	10 855	7.1
Slovak Rep.	8.0	2.1	3.9	58.0	35.7	6.3	2 065	16.4
Slovenia	19.0	6.1	10.5	49.9	37.8	12.3	893.0	7.3
Spain	16.3	8.0	32.9	63.8	29.6	6.6	15 617	12.5
Sweden	6.7	19.7	16.5	72.3	24.7	3.0	4 198	6.7
Hungary	17.4	3.8	6.2	54.5	32.0	13.5	4 208	6.9
Poland	27.0	10.5	4.6	45.4	27.7	26.9	14 750	13.4
Correlation Coefficient.	1.0	-0.13851	-0.19795	-0.70617	0.03186	0.81753	0.13071

Note: ^{x)} = year 2000, ^{xx)} = year 2001; (%) – share in total employment.

Source: Employment in Europe 2010, Brussels, European Commission.

Among the old Member States (EU-15), the highest shares of NWE (over 20%) were registered in Greece (39%) and Italy (26.2), and the lowest in Luxemburg (7.7%) and Sweden¹ (6.7%). Within the state which during the analysed period were preparing for European integration, the share ranged between 8% in Slovakia and 45% in Romania. The respective share mirrors mainly the significantly higher relative importance of the agricultural sector in using labour force. In support of this hypothesis we mention the positive and particularly high value in absolute size of the Pearson correlation coefficient between the share of the NWE population and the share of the agricultural sector in total employed population. On the other hand, it is interesting to notice that the previously mentioned indicator has a positive value but very low (0.03186) in relation to the share of the industrial sector and strongly negative (- 0.70617) in relation to the share of the tertiary sector. At the same time, NWE was negatively correlated with the share of part-time work and with the share of determined period contracts and positively with the unemployment rate. In conclusion, it can be ascertained that the relative importance of the self-employment phenomenon in European countries was more related to the share of the agricultural sector in

¹ As regards the share of NWE persons in total employed population there is also a series of issues related to defining and implicitly measuring accurately this category of employed population. The differentiation of the definitions used at national level or for statistical registration might contribute to underestimating the role held by the NWE population in using human capital or in developing economic activities at national level. An example therefore is provided by Sweden where there are notable differences between the number of NWE persons revealed by labour force surveys (LFS) and the one provided by administrative data (RAMS). Thus, the labour force survey (LFS) is, in fact, a survey with the purpose of describing the actual conditions of labour and of providing information regarding labour market functioning. The survey is performed on a monthly basis and comprises 20000 persons interviewed by phone on their current occupational situation. The records based on administrative data (RAMS) contain the entire population. They are completed starting from income statements of the employees and the taxation statements of NWE individuals. The purpose of RAMS is to provide an image of the labour force market evolution as regards both the whole population and to business environment. Yearly RAMS data are available starting from the year 1985 and reflect the situation in the month of November for each year. In order to be regarded as NWE a person must actively run his/her own business. This means that the process of running a business requires at least one third of the labour time of full-time occupied person. With respect to the persons receiving incomes both from self-employment activities and from paid activities, the principle applied is "the highest sum of the income types registered for the month of November". This means that active individuals are classified as "NWE" or "employed" depending on the highest income type (Bjuggren C. M., Johansson D., Stenkula M.,2010).

employed population in 1999. The respective way of using labour force appeared as an alternative to other forms of rendering flexible the labour force market, such as part-time work or contracts on determined periods. Additionally, the NWE expansion did not diminish the unemployment rate.

The NWE phenomenon showed in 1999 a significant gender differentiation (Annex 1). Thus, among men the share of NWE individuals was 19.2% as a whole for member or candidate countries for European Union integration of. As for the whole employed population, the relative importance of NWE males was lower within EU-15 than in the candidate countries. Values over 20% were registered in Greece (40.2%), Italy (29.4%) and Ireland (26.4%), while values under 10% were registered only in Luxemburg (8.2%) and Sweden (9.4%). In the candidate countries the share was over 20%, and exceptions were registered in Estonia (10.7%), Latvia (17.6%), Malta (14.4%) and Slovakia (10.8%). Among employed women, the share of NWE persons within EU-27 was 13.7% in 1999, while in EU-15 the indicator value was 10.8%. In EU-15 shares of 20% were encountered only in Greece (36.2%) and Italy (20.1%), while shares smaller than 10% were characteristic only of Denmark (4.3%), Finland (8.5%), Germany (7.2%), Ireland (8.7%), Luxemburg (6.7%), the United Kingdom (7.6%), Sweden (3.6%) and Slovakia (4.6%). Among candidate countries the share of NWE women was higher than 20% in Bulgaria (21.7%), Romania (47.5%) and Poland (24.5%). Shares smaller than 10% were recorded in Estonia (6.4%). The above data reveal the fact that in the year 1999 the gender difference with respect to non-wage employment status was a significant one in favour of men, especially in the countries where the share of services and industry in employed population was a very high one. The positive gender differences in favour of women were found in countries where the share of the agricultural sector in total employed population was higher.

During the period 1999-2009 the relative importance of the NWE population diminished to some extent from 16.8% to 15.5% (Table 2). In all EU-15 a slower diminution in this category's share of employed population is noticed, from 14.4% to 14.0%.

Table 2. Structural indicators of labour market in UE countries, 2009

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
EU-27	15.5	18.8	13.5	70.4	24.1	5.6	222 305	8.9
EU-15	14.0	21.6	13.7	74.4	22.3	3.4	177 696	9.0
Austria	14	25	9	72	23	5	4 080	5
Belgium	16.2	23.4	8.2	78.9	19.3	1.8	4 445	7.9
Bulgaria	26.9	2.3	4.7	53.0	27.1	19.9	3 723	6.8
Czech Rep.	18.7	5.5	8.5	59.3	37.1	3.5	5 226	6.7
Cyprus ^{xx)}	17.2	8.4	13.4	75.7	19.8	4.5	392.0	5.3
Denmark	6.2	26	8.9	77.8	19.4	2.8	2 864	6
Estonia	8.2	10.5	2.5	64.8	31.1	4.1	579	13.8
France	9	17	14	77	20	3	25 559	10
Finland	12	14	15	71	24	5	2 454	8
Germany	11	26	15	73	25	2	40 267	8
Greece ^{x)}	35	6	12	69	19	12	4 652	10
Ireland	17.8	21.2	8.5	72.6	22.1	5.3	1 927	11.9
Italy	23.4	14.3	12.5	68.3	27.7	3.9	24 839	7.8
Latvia	11.6	8.9	4.3	68.0	23.4	8.6	975.0	17.1
Lithuania ^{x)}	12.1	8.3	2.2	63.5	27.2	9.3	1 417	13.7
Luxembourg	5.9	18.2	7.2	77.1	21.3	1.5	352.0	5.2
Malta ^{x)}	12.3	11.3	4.8	77.8	19.9	2.3	163.0	6.9
Netherlands	13.4	48.3	18.2	80.5	16.7	2.8	8 631	3.4
Portugal	13.2	11.6	22.0	62.2	26.9	10.9	5 015	9.6
United Kingdom	13.7	26.1	5.7	81.6	16.8	1.6	30 942	7.6
Romania	28.8	9.8	1.0	40.9	31.3	27.8	9 175	6.9
Slovak Rep.	15.4	3.6	4.4	64.6	32.3	3.2	2 185	12.0
Slovenia	17.3	10.6	16.4	58.4	32.9	8.6	967.0	5.9
Spain	13.7	12.8	25.4	71.4	24.1	4.4	19 134	18.0
Sweden	5.4	27.0	15.3	76.1	21.8	2.1	4 482	8.3
Hungary	11.0	5.6	8.5	62.3	30.7	7.1	3 999	10.0
Poland	22.8	8.4	26.5	:	:	:	15 814	8.2
Correlation Coefficient	1.0	-0.39860	0.00273	-0.51811	0.17450	0.65271	-0.11061

Note: x)=year 2000, xx) = year 2001; (%) – share in total employment.

Source: Employment in Europe 2010, Brussels, European Commission.

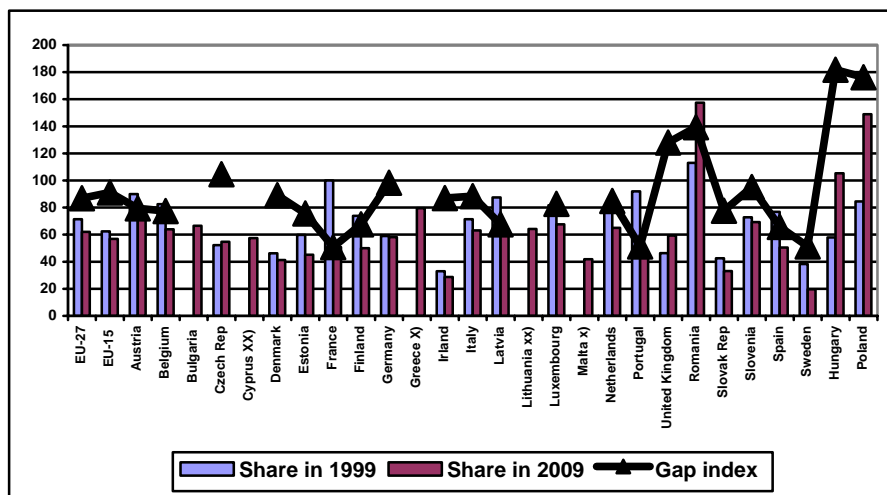
In most countries the relative importance of NWE population diminished. Exceptions to the rule were Austria, the Czech R., German, the United Kingdom and Slovakia. Under these conditions, the existing gaps with respect to the previously mentioned indicator diminished. The maximum level was registered in Greece (35%), and the minimum one in Sweden (5.4%). Values higher than 20% were recorded in Bulgaria (26.9%), Italy (23.4%), Romania (28.8%) and Poland (22.8%). Shares lower than 10% were registered in Denmark (6.2%), Estonia (8.2%), France (9.0%) and Luxembourg (5.9%).

Resizing the relative importance of the NWE population was accompanied by the change in the correlation of this indicator with other variables that define the functioning of the labour force market in the whole EU. Thus, a diminution is noticed in the intensity of the positive relation between the relative importance of the NWE population and the share of the agricultural sector, on one hand, and of the intensity of the negative correlation between the relative importance of the NWE population and the share of the tertiary sector in employed population, on the other hand. It is important to note the positive correlation of the relative importance of NWE population with the share of contracts on a determined period. On this basis, it may be concluded that these two forms of flexibilization of labour force market functioning were influencing positively one another and were no longer complementary, as it had happened one decade before. Another change in the Pearson correlation coefficient sign in relation to the one registered one decade before is that one recorded in the case of the correlation between the relative importance of the NWE population and the unemployment rate. The negative sign reveals that the development of some employment forms where entrepreneurial aptitudes have a defining role can be a factor of unemployment reduction.

The change in the relative importance of the NWE population took place with different intensities within the male and female segment respectively (Annex 2). Thus, in the case of men the size of the respective indicator was 18.5% in 2009 in the whole European Union. In the case of EU-15 the value of the respective indicator was 17.4%, in other words very close to the average in the whole EU-27. The maximum level of the NWE male population share continued to be recorded in Greece (39%), and the minimum one was recorded in Luxemburg (6.8%). Values over 20% were registered in other 7 states (Bulgaria, the Czech R., Cyprus, Italy, Ireland), and under 10% only in Sweden. With respect to the female segment, the relative importance of the NWE population was 11.6% in the whole EU-27 and 9.9% in EU-15. Values over 20% were registered in the countries where the share of the agricultural sector continued to be high in total employed population, respectively Greece (31%), Romania (28.5%), Bulgaria (21.2%) and Poland (20.1%). Values under 10% were registered in 14 states, the minimum being reached in Sweden (3.2%).

The evolutions in early 2000 have triggered in the whole EU-27 an increase in the gender gap related to the relative importance of NWE population, from 71.4% in the year 1999 to 62.0% in the year 2009 (Table 3), i.e. a gender gap index of 86.9%.

Graph 1. Gender gap index of relative importance of NWE in EU member states in the period 1999-2009 (%)



Source: Authors' calculation based on Employment in Europe 2010, Brussels, European Commission.

In EU-15 the increase in the gender gap was slower. The more marked gender gap to the detriment of the female segment was sensibly higher in Austria, Belgium, Estonia, France, Latvia, Portugal, Slovakia, Spain and Sweden, while in the United Kingdom the gender gap diminished significantly. As a whole, in the new member states an increase in the gender gap can be estimated, the exceptions being the Czech Republic, Romania, Poland, Slovakia and Hungary.

The integration of the economies of European Union member countries had a significant impact on number and age along with the qualification structure of the NWE individuals. Thus, the statistical data for the year 2010 reveal an increase in the NWE persons in the United Kingdom, the Czech Republic, Latvia and Greece. In the Netherlands, after an initial increase in number of NWE persons, a decrease in their numbers is noticed, which seems to reflect an employed population transfer to non-wage employment forms with the purpose of maintaining the companies' competitiveness, but not turning this process into viable job creation (European Employment Observatory Review, 2010).

The recession triggered a loss of jobs in particular for NWE persons with low qualifications, but also for those with medium qualifications. Also, a diminution is noticed in the number of individuals aged less than 40 years (Baldasarinni A.2010). In conclusion, it may be stated that the economic recession at the end

of the first decade of the 21st century had strongly required redefining the role that NWE forms play within the labour force market. The experience acquired during the last years has revealed that the respective form of employment and of using labour force is important to be analysed in particular from the perspective of the qualification level of the involved persons. In the context of expanding new technologies and, implicitly, of changing the organization manner of production and labour, it is very useful to widen the analysis field of the factors stimulating entrepreneurship, innovation and flexible forms of using human capital. In order to value the opportunities provided by self-employment activities and entrepreneurial ones within the post-industrial period, it is necessary to start from the existence of the multidimensional human capital (Ferante, F.; Sabatini, F., 2007), which is determined to a great extent by the expansion of the various forms of higher education.

3. NWE impact of increasing the share of higher educated individuals in the total number of graduates on the NWE expansion

The increase in the number of higher education and post-university graduates led and still leads to particularly vast changes in the professional and occupational structure. We are witnessing thus the emergence of a “class of creative professions”. Persons that enter the respective category of professions tend to be creative not only in the technological or artistic fields, but also economically as they have a higher propensity to develop self-employed activities, or entrepreneurial ones (Florida R., 2004). Under these conditions, professions can be divided into several categories, such as:

- a) Creative core professions**, which include painters, actors, writers, scientists, IT experts, university staff, engineers and designers, psychologists;
- b) Creative professions**, which include medium-level managers, lawyers (barristers), technicians, professionals from finances and insurances;
- c) Non-creative professions**, such as nurses, tourism agents, firemen, social assistants.

The merit of the previously mentioned classification consists in revealing that professions and occupations have various degrees of creativity in the fields in which they act (technological, artistic, economic or social) but also potential differentiations regarding the propensity for the employment form (wage or non-wage).

The potential propensity of the persons pertaining to professions of the creative core or to the creative professions to develop self-employment or entrepreneurial activities is rendered concrete only if several conditions are cumulatively met, as previously mentioned. Therefore, a particular importance gains the systematic study based on multicriterial analysis of the NWE persons from the field of core creative professions and of the creative professions. For the multicriterial analysis aforementioned, the following elements can be taken into account (Frisch M., Rusakova A., 2010):

- **Economic environment** (unemployment rate, number of small- and medium-sized enterprises, population density, sectoral structure of economic activity and labour force employment);
- **Human capital** (number of schooling years, level of the last graduated school, participation in the lifelong learning process, experience in the labour market and, in particular, participation in full-time employment activities);
- **Social capital** (family tradition in self-employed entrepreneurial activities, marital status);
- **Socio-demographic characteristics** (gender, age);
- **Personality characteristics** (openness towards new experiences, conscientiousness, temperament).

In fact, the use of the multicriterial analysis means to prove the hypothesis whether the propensity towards entrepreneurial-type activities of the professions is actually translated at the level of the interviewed group of persons. On this basis, estimates can be subsequently made regarding the impact that entrepreneurship support programmes may have on easing the labour force market and on efficient allocation of human capital.

Besides studying the modelling factors of NWE it is important to adopt a series of coherent measures for supporting this form of employment and of using labour force, among which the most important are:

- A better definition of the concept of “NWE person”;
- Providing fiscal incentives for creating jobs for NWE persons.
- Regulating social protection of the NWE persons
- Ensuring better conditions for free “entry” and not a forced one into the area of the self-employment and entrepreneurial activities.
- Improving the business climate and diminishing bureaucracy.

- Ensuring access to financing business start-up and setting up new small enterprises.
- Improving lifelong learning forms.
- Stimulating the formation of social networks of small entrepreneurs and extending the dissemination of good practices to the entrepreneurial field.

4. Changes in the number and professional structure of NWE persons in Romania in the 2000-2010 period

As it results from previously presented data, in Romania the share of NWE persons diminished from 45% in the year 1999 to 28.8% in the year 2009, as a consequence of the diminution in the demand for labour force in the respective employment form was significantly more intense than the reduction in the labour force demand at the level of the whole Romanian economy. During the 2000-2010 period, a diminution is found in the number of self-employed individuals by 653298 persons, and by 24.61% respectively. A significant diminution is found for the following occupations (professions):

- a) Enterprise managers and leaders in the administrative field by 21.46% due to the restructuring of administrative services;
- b) Managers in the sales, marketing, and development field by 56.75% due to diminishing size of production and commercial units and in some cases to the reorganisation of the activity by privatisation;
- c) Managers of units in the commercial field by 55.61%, by tearing commercial units apart and developing micro-enterprises with a sole associate, which according to law can have the status of employed;
- d) Experts in life sciences by 7.72%, in particular due to external mobility and employment in other markets in the EU area or in developed countries of the world with interests in the field, by brain drain or head hunting; it should be mentioned that a significant decrease by 79% is registered in the group of technicians in life sciences and other assimilated experts, in our opinion not only due to reducing specific activities, but also because of labour migration;
- e) Teachers in the vocational education who vanished almost entirely;
- f) Other experts in education, by 51.45%, by developing an employment system for limited periods (part time, or limited duration);

- g) Experts in the social and religious field, by 4.93%, due to developing social economy units that allow for wage-based employment;
- h) Creative artists and actors, by 30.30%, for multiple reasons, but the most important being the mobility abroad, and only to a small extent their entry into the wage system by employment in private cultural and art units developed in the last decade;
- i) Controllers-supervisors in the extractive industry, processing industry and constructions and technicians-controllers of industrial processes – their diminishment being almost full, operators for ores exploitation and processing installations by over 62%, in particular due to reorganizing and closing of several exploitations;
- j) Veterinary technicians and assistants by 65.06% as result of the development of private practices and their transition to the employed status;
- k) Sales and supply agents and brokers, by 36.1%;
- l) Administrative and specialised secretaries by 48.1%, governmental experts with regulation tasks and assimilated ones, clerks (public officers) with general attributions, secretaries by 100%. Typewriting/computation machines operators by 6% due to increased exigency with respect to the qualification level of the personnel employed with the State. By completing studies and requiring the compulsory university studies for some positions previously requiring only upper secondary education, the shift is made to another group;
- m) Other experts in the legal and social field, by 35.93%;
- n) Workers in the field of sports and physical training by 12.83%;
- o) Clerks for economic and administrative management by 73.68%, by increasing the qualification level due to the new generations of graduates;
- p) Waiters and bartenders, by 83.68%, by developing and concentrating integrated units in the field of hospitality, as they enter the wage employment system and/or by migration and employment in labour markets in other countries (Greece, Spain, Italy, Germany, the USA, etc.);
- q) Shop assistants by 42.32% and other workers in the sales field by 42.72% due to shifting to wage-employment;
- r) Workers in civil protection services, by 79.42%;

-
- s) Gardeners and farmers by 81.34%, livestock breeding by 71.84%, qualified workers in vegetal cultures and animal breeders by 38.60% due to migration mainly to Spain;
 - t) Forestry works and assimilated ones – 3.38%, fishermen and hunters by 72.86%;
 - u) Smelters, tinkers - coppersmiths, welders, rollers and assimilated ones by 1.28%, moulders, diemakers and assimilated by 85,04%, skilled workers in the field of manufactured products by 55.64% due to reduced demand for specific products and services;
 - v) Electronic and telecommunication equipment fitters by 72.54% due to the development of wireless ITC services or of other services requiring skilled personnel with higher education;
 - w) Food industry skilled workers by 78.65%, due to the development of wage employment in super- and hypermarkets;
 - x) Skilled workers in wood treatment and assimilated ones by 23.57%, workers in textile and clothing industry by 62.61%;
 - y) Machinery and installation operators for manufacturing chemical and photographic products by 100%, machine and tool operators for manufacturing products from rubber, plastic and paper by about 2/3, machine and tool operators for manufacturing textile products and articles, furs by about 1/3, machine operators for manufacturing food products and other similar products by 41%, finishers by about 85%, due to increased demands for preparation and the imposing of quality standards for small producers (for instance, in case of milk and dairy products) or their shift to the employee status with small companies developed with EU and WB financing for local development;
 - z) Truck and bus drivers by 4.65%, mobile installations and tools operators by 3.58%, unskilled workers in merchandise transport and warehousing by 56.18% and other similar categories.

The share of those with higher education in the total number of self-employed persons is low, but on the increase from 2.16% in 2000 to 4.4% in 2010 (Table 3).

**Table 3. NWE evolution in Romania
in 2000-2010**

		2000	2010	2010 against 2000
NWE with university education	Short term studies (persons)	10710	10772	62
	% in university level	18.69	12.23	-6.46
	Long term studies (persons)	46586	77293	30707
	% in university level	81.31	87.77	6.46
	Total university level (persons)	57296	88065	30769
Total NWE persons		2654346	2001048	-653298
Share of the short term university graduates in total NWE (%)		0.40	0.54	0.14
Share of the long term university graduates in total NWE (%)		1.76	3.86	2.10
Share of university graduates in total NEW (%)		2.16	4.40	2.24

The evolution of NWE persons with university education underwent a **positive dynamics** especially for long-term higher education graduates (including master and post-university studies) a fact explained by the implementation of higher education in Bologna system only at the end of the period and by the small number of graduates of this system in total population with higher education. Their share will substantially increase in the future, representing, in fact one of the main sources of labour force.

By field of training, an important increase is found for the NWE persons with long-term higher education in fields such as social, economic, financial and legal sciences (almost half of the total period increase as regards those with university education) and for those in specific fields of industrial activity (extractive, processing, electricity, thermal energy, gas and water), constructions (about 31% of the total increase, i.e. 9500 persons). Privatisation and free consulting offices in the field of health and nursing triggered an increase of about 5200 individuals in the number of self-employed with long-term higher education (yet another 17% of the total increase). With respect to short-time education an important increase is found in some specific fields of industrial activities (extractive, processing, electricity and thermal energy, gas and water), constructions, that is by 1741 persons (Table 4).

Table 4. NWE with university education, by education domains and length of university studies

Education domains according to Occupations Classification in Romania- COR (3d)	2010	2010	2000	2000	2010 against 2000	2010 against 2000
	Long term (including master studies, post-university courses)	Short term	Long term (including master studies, post-university courses)	Short term	Long term (including master studies, post-university courses)	Short term
Total	77293	10772	46586	10710	30707	62
Pedagogy, training programs for teachers and instructors	278	724	890	1360	-612	-636
Human studies and Arts	2060	0	453	157	1607	-157
Foreign languages	1224	0	189	0	1035	0
Social, economic, financial and juridical sciences	26945	1880	12225	2656	14720	-776
Life sciences (biology and biochemistry, environment sciences)	343	94	1276	84	-933	10
Physics sciences (physics, chemistry, geography, geology, meteorology, oceanography, seismology)	1377	151	2594	233	-1217	-82
Mathematics and statistics	1089	131	397	265	692	-134
Computer sciences (programming/languages, system design and analysis, networks administration)	1615	435	460	287	1155	148
Use of computer (operation, editing, Internet use, learning computation applications, developing public use of computer)	0	110	0	223	0	-113
Specific fields of industrial activities (extractive, processing, electricity and thermal	24739	4611	15280	2870	9459	1741

Education domains according to Occupations Classification in Romania- COR (3d)	2010	2010	2000	2000	2010 against 2000	2010 against 2000
	Long term (including master studies, post-university courses)	Short term	Long term (including master studies, post-university courses)	Short term	Long term (including master studies, post-university courses)	Short term
energy, gas and water constructions						
Agriculture and veterinary medicine	4366	892	5557	474	-1191	418
Health and social assistance	10691	1195	5458	327	5233	868
Personal services, transport, mail and telecommunication services, environmental protection services, guard and protection services	2565	548	1468	747	1097	-199
Cannot be specified			337	1027	-337	-1027

Source: Calculations based on NIS data.

On the other hand, the analysis of statistical data reveal the absence of some occupations that are specific to non-wage employment with higher education in general, for which the national market is still underdeveloped. According to the data on the years 2000 and 2010, and from the labour force survey, the occupations missing from the statistics of self-employed persons can be included in three sub-categories (Annex 3):

- a) Occupations requiring higher education, which are not found in the NWE population, for any of the analysed years;
- b) Occupations which were not present in the year 2000 and are absent 10 years later, which can be explained by increased concern for education in some fields and/or the wish to find temporary “haven” of those with higher education who still haven’t found a suitable job or do not wish to work in the field they were trained for in university, the most frequent being, for various reasons, the financial ones or arguments about mismatch with the personal aptitudes and profile due to adequate professional counselling;

- c) Occupations entering into the NWE category with higher education in the year 2010, being absent in the year 2000.

NWE for higher education graduates is predominant and on the increase in training fields specific to industrial activities (extractive, processing, electricity and thermal energy, gas and water), constructions, social, economic, financial and legal sciences; health and social assistance), the respective specialisations accounting for about 68% in 2000 and 80% in 2010. Even though in a low share, the increase is important: 1.5 times in personal services of transport, mail and telecommunications, environmental protection, guard and protection; over 2 times in mathematics and statistics, about 2.7 times in computer sciences (languages/programming, system design and analysis, networks administration); over 3 times in human sciences and arts, about 6.5 times in human sciences and arts and foreign languages

Table 5. NWE by education domains for university level

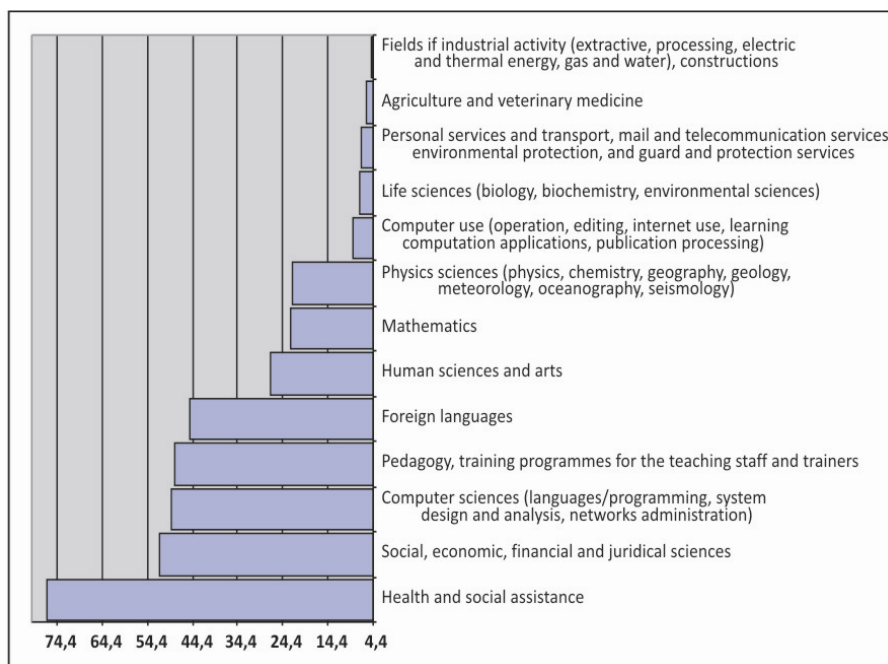
Education domains according to Occupations Classification in Romania- COR (3d)	2000	2010	Structure 2000	Structure 2010	Persons' number change in 2010 against 2000	Structure change 2010 against 2000 (pp)
Total	57296	88065	100.00	100.00	30769	0.00
Pedagogy, training programs for teachers and instructors	2250	1002	3.93	1.14	-1248	-2.79
Human studies and Arts	610	2060	1.06	2.34	1450	1.27
Foreign languages	189	1224	0.33	1.39	1035	1.06
Social, economic, financial and juridical sciences	14881	28825	25.97	32.73	13944	6.76
Life sciences (biology and biochemistry, environment scientists)	1360	437	2.37	0.50	-923	-1.88
Physics sciences (physics, chemistry, geography, geology, meteorology, oceanography, seismology)	2827	1528	4.93	1.74	-1299	-3.20
Mathematics and statistics	662	1220	1.16	1.39	558	0.23
Computer sciences (programming/languages, system design and analysis, networks administration)	747	2050	1.30	2.33	1303	1.02

Education domains according to Occupations Classification in Romania- COR (3d)	2000	2010	Structure 2000	Structure 2010	Persons' number change in 2010 against 2000	Structure change 2010 against 2000 (pp)
Use of computer (operation, editing, Internet use, learning computation applications, developing public use of computer)	223	110	0.39	0.12	-113	-0.26
Specific fields of industrial activities (extractive, processing, electricity and thermal energy, gas and water) constructions	18150	29350	31.68	33.33	11200	1.65
Agriculture and veterinary medicine	6031	5258	10.53	5.97	-773	-4.56
Health and social assistance	5785	11886	10.10	13.50	6101	3.40
Personal services, transport, mail and telecommunication services, environmental protection services, guard and protection services	2215	3113	3.87	3.53	898	-0.33
Total	1364	0	2.38	0.00	-1364	-2.38

Source: Calculations based on NIS data.

Important decreases are recorded for pedagogy, training programmes of the teaching staff and trainers, physics sciences; life sciences; agriculture and veterinary medicine. In the year 2010 the structure of self-employment in higher education highlights a diminution below 1% of NWE in training fields for life sciences and computer use. The share of persons with higher education in total NWE persons by training fields is the most important in health and social assistance, and lower in fields specific to industrial activities where wage employment is predominant (Graph 2).

**Graph 2. Share of university graduates in total NWE, in 2010
(national average level= 4.4% of total NWE)**



Source: Authors' calculation based on LFS database, NIS.

The numbers of NWE persons with higher education registered a significant increase in the period 2000 -2010 due to building and household supervisors and experts in the legal field and the highest diminution occurred among managers of commercial entities, and thereafter among farmers and cultivators (Annex 4).

Conclusions

Based on the performed analysis, the conclusion might be that in Romania, in the context of the sensible quantitative increase in the higher education supply, an increase is found in the number and relative importance of individuals with higher education among NWE persons. The respective development was an outcome not only of the changes in the labour force supply, but also of the fluctuations of the economic activity. Thus, even if throughout the first decade of the 21st century the gross product increased significantly, the demand for labour force diminished considerably. Also, it should be noticed that for the analysed

period the economic structure underwent deep changes implying a permanent increase in the share of activities grouped in the services' sector and a decrease in the relative importance of the secondary sector (industry and constructions).

The changes within the sectoral structure of the abovementioned economy favoured to a certain extent the expansion of some non-wage employment forms for labour force. The fact that during a decade the total number of NWE persons diminished reveals a still limited capacity of creating new jobs by means of the respective form of using labour force, which is highly based on entrepreneurial forms. Similarly, it should be mentioned that the increase in the number of higher-educated NWE persons occurred in the context of an increasing share of those involved trades and professions requiring only secondary education, which is in fact only a transitory alternative of higher education graduates who do not find quality and adequate jobs to match the training gained during schooling. In fact, the expansion of NWE among those with higher education is not - as it happens in countries with developed market economy and where a transition to the knowledge economy takes place based on the new technologies - the expression of a new type of entrepreneurial spirit, but a forced solution for avoiding entering into unemployment. These negative evolutions were caused both by the slow rate of modernisation the economy's structure, and the inertia manifest in the university environment, as well as a series of deficiencies in the communication between the university environment and the business one, with respect to the actual perspectives of developing the economic activity in general, and of the level and structure of labour force demand in particular.

Annex 1
Structural indicators of labour market in 1999 in EU countries,
by gender

MEN

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
EU-27	19.2	6.4	11.3	55.6	36.4	8.0	117 814	:
EU-15	17.3	6.1	12.6	59.4	35.5	5.0	94 271	7.5
Austria	14.8	4.2	7.9	55.7	38.3	6.0	2 117	3.3
Belgium	18.9	5.1	7.3	64.7	32.6	2.7	2 333	7.1
Bulgaria	33.9	:	:	:	:	:	:	:
Czech Rep.	21.6	2.4	6.2	44.4	49.3	6.3	2 777	7.3
Cyprus ^{xx)}	28.5	3.4	8.2	:	:	:	:	:
Denmark	9.3	10.4	8.6	62.3	32.4	5.3	1 479	4.6
Estonia	10.7	5.9	3.5	49.0	40.6	10.4	294.0	:
France	11.5	5.5	13.7	63.7	31.0	5.2	13 055	8.9
Finland	11.5	5.5	13.7	63.7	31.0	5.2	13 055	8.9
Germany	12.2	4.9	12.8	56.5	40.7	2.9	21 679	8.1
Greece ^{x)}	40.7	3.4	11.4	:	:	:	2 676	7.9
Ireland	26.4	7.2	4.1	50.0	37.1	12.9	966.0	5.7
Italy	29.4	3.5	8.2	58.5	36.1	5.4	14 305	8.4
Latvia	17.6	11.0	10.0	48.7	32.9	18.5	506.0	14.4
Lithuania ^{xx)}	22.7	9.2	5.9	44.2	33.4	22.	688	18.6
Luxembourg	8.2	1.5	5.2	64.3	34.0	1.7	158.0	1.8
Malta ^{x)}	14.4	3	3.4	66.5	30.1	3.4	102	6.4
Netherlands	15.8	18.0	9.7	68.0	27.8	4.3	4 543	2.3
Portugal	17.6	6.4	17.2	47.8	41.3	10.9	2 718	3.9
United Kingdom	16.4	8.8	6.3	66	31.6	2.4	16 147	6.5
Romania	42.4	13.8	3	26	31.2	42.8	5 782	7.7
Slovak Rep.	10.8	1.2	4.1	46.2	45.5	8.3	1 127	16.3
Slovenia	21.7	5.2	9.9	40.9	47	12.1	483	7.2
Spain	17.7	2.9	31.6	52.9	39.3	7.8	10 029	9
Sweden	9.4	8	14.2	58.6	36.9	4.5	2 204	6.6
Hungary	21.4	2.4	6.5	43.6	38.1	18.3	2 312	7.5
Poland	29	8	5.2	36.7	35.9	27.5	8 117	11.8

Women

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
EU-27	13.7	28.5	12.5	77.8	15.3	6.9	88 896	:
EU-15	10.8	33.2	14.3	83.1	13.6	3.3	69 071	9.9
Austria	13.3	32.2	8.0	81.1	12.0	6.8	1 636	4.7

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
Belgium	15.6	36.9	13.2	88.3	10.1	1.6	1 694	10.3
Bulgaria	21.7	:	:	:	:	:	:	:
Czech Rep.	11.3	9.9	9.1	68.6	27.6	3.8	2 173	10.3
Cyprus ^{xx)}	15.8	11.1	12.9	:	:	:	:	:
Denmark	4.3	34.7	10.7	85.7	12.7	1.6	1 267	5.8
Estonia	6.4	10.4	1.6	71.3	23.1	5.6	286.0	:
France	11.5	5.5	13.7	63.7	31.0	5.2	13 055	8.9
Finland	8.5	16.9	19.8	81.6	14.2	4.1	1 067	10.7
Germany	7.2	37.2	13.4	82.2	15.8	2.0	16 746	8.4
Greece ^{x)}	36.2	10.0	14.4	:	:	:	1 559	18.1
Ireland	8.7	30.1	6.4	82.1	15.5	2.4	656.0	5.5
Italy	21.0	15.6	11.5	76.4	19.4	4.2	8 189	14.8
Latvia	15.4	13.2	5.1	68.1	17.5	14.4	467.0	13.6
Lithuania ^{xx)}	16.0	11.1	3.1	64.8	20.2	15	711	14.1
Luxembourg	6.7	24.0	5.2	91.7	6.9	1.4	92.0	3.3
Malta ^{x)}	5.9	15.5	5.6	80.9	18.2	0.9	44	7.4
Netherlands	12.1	68.9	15.6	89.2	8.3	2.5	3 394	4.4
Portugal	16.2	16.7	20.5	65.1	21.3	13.6	2 209	5.1
United Kingdom	7.6	44	7.8	88.8	10.3	0.9	13 069	5.2
Romania	47.9	18.2	3.1	31.7	20.2	48.1	5 073	6.3
Slovak Rep.	4.6	3.2	3.6	71.6	24.5	3.9	938	16.4
Slovenia	15.8	7.2	11.2	60.6	26.8	12.6	410	7.6
Spain	13.6	17.1	35	82.6	12.9	4.5	5 588	18
Sweden	3.6	33.3	18.7	87	11.7	1.3	1 994	6.8
Hungary	12.4	5.5	5.8	68.4	24.2	7.3	1 896	6.3
Poland	24.5	13.6	3.9	56.3	17.5	26.2	6 633	15.3

Note: ^{x)} = Year 2000, ^{xx)} = Year 2001.

Source: Employment in Europe 2010, Brussels, European Commission.

Annex 2

Structural indicators of labour market in 2009 in EU countries, by gender

MEN

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
EU-27	18.7	8.3	12.7	60.9	33.0	6.1	121 628	9.0
EU-15	17.4	8.9	12.7	64.9	31.1	4.0	97 232	9.1
Austria	16.4	8.7	9.2	61.6	33.2	5.2	2 187	5.0

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
Belgium	19	9	7	70	28	2	2 442	8
Bulgaria	31.9	2.0	5.2	44.7	31.5	23.8	1 982	7.0
Czech Rep.	23.2	2.8	7.0	49.5	46.3	4.2	2 991	5.9
Cyprus ^{xx)}	21.2	5.2	7.5	67.0	27.8	5.2	216.0	5.2
Denmark	8.5	15.3	8.3	68.9	27.0	4.1	1 505	6.5
Estonia	11.5	7	3	51.6	42.8	5.6	280	16.9
France	11.8	6	12.1	67.3	28.7	4	13 412	9.2
Finland	16	9	11	57	36	7	1 253	9
Germany	14	10	14	63	35	3	21 649	8
Greece ^{x)}	39	3	11	63	26	12	2 804	7
Ireland	27	11	7	60	32	9	1 043	15
Italy	27.4	5.1	10.8	59.9	35.6	4.5	14 876	6.8
Latvia	14.7	7.5	5.8	56.9	31.9	11.2	474.0	20.3
Lithuania ^{xx)}	14.8	7.0	2.9	51.7	36.8	11.6	680.0	17.1
Luxembourg	6.8	5.6	6.3	69.6	28.7	1.7	201.0	4.6
Malta ^{x)}	15.3	5.1	3.7	70.9	25.9	3.2	108.0	6.6
Netherlands	16.0	24.9	16.4	72.6	23.9	3.5	4 667	3.4
Portugal	25.0	5.8	26.3	:	:	:	8 692	7.8
United Kingdom	14.5	7.5	20.9	54.4	35.4	10.2	2 667	9.0
Romania	18.1	11.8	5.3	73.1	24.7	2.2	16 527	8.6
Slovak Rep.	29.0	9.1	1.1	35.8	37.8	26.4	5 063	7.7
Slovenia	19.9	2.7	4.6	52.8	42.9	4.3	1 224	11.4
Spain	20.4	8.4	15.1	49.2	42.3	8.5	523.0	5.9
Sweden	16.3	4.9	23.8	60.8	33.7	5.6	10 785	17.7
Hungary	7.5	14.2	13.0	65.0	32.1	3.0	2 350	8.6
Poland	13.5	3.9	9.0	50.9	39.6	9.5	2 162	10.3

WOMEN

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
EU-27	11.6	31.5	14.4	82.5	12.6	4.9	100 678	8.8
EU-15	9.9	37.0	14.7	86.8	10.7	2.5	80 464	9.0
Austria	12	43	9	84	11	5	1 893	5
Belgium	12.4	41.5	10.2	90.3	8.4	1.3	2 002	8.1
Bulgaria	21.2	2.7	4.2	62.8	21.9	15.3	1 741	6.6
Czech Rep.	12.7	9.2	10.2	73.2	24.2	2.6	2 235	7.7
Cyprus ^{xx)}	12.2	12.5	19.8	87.0	9.4	3.7	176.0	5.5
Denmark	3.5	37.9	9.6	88.7	10	1.3	1 359	5.4
Estonia	5.2	13.8	2	77.3	20	2.7	299	10.6
France	6	30	15	89	9	2	12 147	10
Finland	8	19	18	86	11	3	1 201	8
Germany	8	45	15	85	13	2	18 618	7
Greece ^{x)}	31	10	14	80	8	12	1 848	13

	NWE persons (%)	Share of part-time employment (%)	Share of limited period contracts (%)	Employment in the third sector (%)	Employment in the second sector (%)	Employment in the first sector (%)	Total employment (pers.)	Unemployment rate (%)
Ireland	7.6	33.8	9.6	88.8	10.0	1.2	884.0	8.0
Italy	17.3	27.9	14.6	82.0	15.0	3.0	9 963	9.3
Latvia	8.7	10.2	2.9	79.0	15.0	6.1	501.0	13.9
Lithuania ^{xx)}	9.5	9.5	1.6	74.8	18.1	7.1	736.0	10.4
Luxembourg	4.6	35.1	8.4	91.1	7.8	1.2	151.0	6.0
Malta ^{x)}	6.4	23.6	6.7	90.8	8.5	0.7	55.0	7.6
Netherlands	10.4	75.8	20.3	91.0	7.1	1.9	3 964	3.5
Portugal	11.8	16.4	23.2	71.9	16.3	11.8	2 348	10.3
United Kingdom	8.6	42.5	6.1	92.2	7.0	0.8	14 415	6.4
Romania	28.5	10.6	1.0	47.3	23.1	29.5	4 112	5.8
Slovak Rep.	9.6	4.7	4.1	79.3	19.0	1.8	960.0	12.8
Slovenia	13.8	13.2	17.8	70.1	21.0	8.9	444.0	5.8
Spain	10.3	23.0	27.3	86.7	10.5	2.8	8 349	18.4
Sweden	3.2	41.2	17.6	89.9	9.1	1.0	2 132	8.0
Hungary	7.9	7.5	7.8	76.2	19.6	4.1	1 837	9.7
Poland	20.1	11.6	26.6	:	:	:	7 122	8.7

Note: ^{x)}= Year 2000, ^{xx)}= Year 2001.

Source: Employment in Europe 2010, Brussels, European Commission.

Annex 3

Changes in professions practiced by self-employed with higher-education in the period 2000-2010

A. Occupations which are not found in self-employed population in any of the analysed years	
Legislators, members of the executive and high officials of public administration	Fishing and hunting workers
Experts in physics and earth sciences	Farmers whose production is for self-consumption
Mathematicians, actuaries and statisticians	Husbandry farmers producing for self-consumption
General nursing assistants and midwives	Workers in mixed farms producing for self-consumption
Complementary/alternative medicine practitioners	Fishermen and hunters whose production is for self-consumption
Paramedics	Painters, varnish workers, facade cleaners and assimilated ones
University professors and assimilated ones	Smelters, tinkers – coppersmiths, welders, rollers and assimilated ones
Vocational education teachers	Foundry workers, casters and assimilated ones
Primary and pre-school teachers	Polygraphic workers
Other educational experts	Electronic and telecommunication equipment mounters
Experts in data banks and networks	Skilled workers in the food industry
Librarians, archivists and curators	Textile and clothing industry workers

Controllers-supervisors in the extractive and processing industry and constructions	Other skilled workers
Controller technicians of industrial processes	Operators of ore exploitation and processing installations
Life sciences technicians and other assimilated experts	Operators for metal processing and finishing operators
Medical and pharmaceutical field technicians	Operators of chemical and photographic products machinery and tools
Nurses, including infant care nurses and assimilated	Operators of rubber, plastic and paper machinery and tools manufacturing
Governmental experts with regulation functions and assimilated	Operators of textile, fur articles and products machinery and tools manufacturing
Technicians in the field of telecommunications, radio and television broadcasting	Operators of wood processing and paper manufacturing installations
Clerks with general attributions	Other operators for machinery and tools
Secretaries	Locomotive mechanics and assimilated
Writing/computation machine operators	Mobile installations and tools operators
Cashiers, office operators and assimilated	Sailors, navigators and assimilated
Information centre clerks	Vehicle, glass and windows cleaning personnel
Economic and administrative management clerks	Unskilled workers in transports and warehousing
Other workers in administrative support services	Cook assistants
Flight stewards, drivers, and guides	"On call" service suppliers for population and assimilated
Tellers and ticket sellers	Street vendors (excluding food products)
Infant care personnel, including support services for pre-school, primary and secondary education	Armed forces officers
Civil protection workers	Under-officer
Forestry workers and assimilated	Armed forces staff, other ranks

B. Occupations present in the year 2000 and absent 10 years later	
Experts in the administrative field	
Software field programming analysts	Nursing personnel in the health field
Administrative and expert secretaries	Building workers for finishing works and assimilated
Workers in the sports and physical training field	Electrical equipment fitters
Other experts in the artistic, cultural and cooking field	Machinery operators for manufacturing food stuff and other similar products
Technicians for operations in the information and communication technology field	Household and services personnel at hotels and offices
Cooks	Sanitation workers
Waiters and bartenders	Other unskilled workers
Other workers in the personal services field	

C. Occupations included in the self-employment category in 2010, but absent in the first year of the analysis 2000	
Controllers and operators for naval and air traffic	Machinery and tools mechanics
Veterinary technicians and assistants	Fitters
Other experts in the legal and social field	Unskilled workers in the processing industry

Source: Processing based on NIS data.

Annex 4 NWE with university education, by main professional profiles, in 2000 and 2010

Professions	2010	2000	2010 against 2000
Total	88065	57296	30769
Building and household caretakers	10908	781	10127
Experts in the legal field	6546	1832	4714
General directors, executive directors and assimilated	4891	502	4389
Physicians	4976	2196	2780
Engineers (excluding electro-technology)	4357	2142	2215
Financial experts, mathematicians and assimilated	2341	466	1875
Unit managers in the processing and extractive industry, constructions and in the delivery field	8395	6526	1869
Other experts in the health field	4248	2818	1430
Experts in the finance field	1324	181	1143
Electro-technology engineers	1325	210	1115
Programming analysts in the software field	1114	0	1114
Skilled workers for vegetal cultures and husbandry farmers	8157	7319	838
Managers for other types of service unit	988	203	785
Household and service personnel for hotels and offices	700	0	700
Other experts in the health field, assimilated	545	0	545
Experts in the administrative field	514	0	514
Hotel and restaurant managers	1054	551	503
Nursing personnel in the health field	485	0	485
Other experts in the artistic, cultural and cooking field	448	0	448
Unidentified	437	0	437
Enterprise managers and administrative field managers	1986	1603	383
Managers of industry, agriculture, forestry and fishing entities	579	256	323
Veterinarians	1246	944	302
Unskilled workers in agriculture, forestry and fishing	881	581	300
Cooks	292	0	292
Construction workers and assimilated	364	76	288
Technicians in engineering sciences	388	152	236
Construction workers for finishing works and assimilated	222	0	222

Professions	2010	2000	2010 against 2000
Teachers in secondary education	220	0	220
Architects, designers, topographic technicians and art designers	969	752	217
Operators for food processing machinery and for other similar products	209	0	209
Technicians for operations in the information and communication technology and assimilated	182	0	182
Workers in the sports and physical training field	156	0	156
Administrative and specialised experts	150	0	150
Shop assistants	434	293	141
Waiters and bartenders	140	0	140
Sales and delivery agents and brokers	601	465	136
Other unskilled workers	135	0	135
Writers, journalists and linguists	424	293	131
Sanitation workers	125	0	125
Electrical equipment fitters	118	0	118
Truck and bus drivers	249	135	114
Commercial services agents	301	209	92
Service delivery managers	515	425	90
Experts in sales, marketing and public relations	230	148	82
Creative artists and actors	716	643	73
Other workers in the field of personal services	23	0	23
Husbandry farmers	728	726	2
Experts in life sciences	686	690	-4
Skilled workers in the field of manufacturing products	88	131	-43
Unskilled workers in the extractive industry and constructions	79	151	-72
Experts in the social and religious field	1697	1784	-87
Vehicle drivers	529	629	-100
Vocational education teachers	0	100	-100
Information and communication technology services managers	195	299	-104
Machinery and tools mechanics	0	116	-116
Other experts in the legal and social field	0	124	-124
Unskilled workers in the manufacturing industry	0	131	-131
Clerks for materials and transport management	169	323	-154
Hairdressers, cosmeticians, and assimilated	109	350	-241
Veterinary technicians and assistants	0	242	-242
Street and market vendors	637	907	-270
Naval and air traffic controllers and operators	0	302	-302
Skilled workers in wood treatment and assimilated	149	470	-321
Finishers	0	376	-376
Managers in the sales, marketing and development field	969	1619	-650
Other worker in the sales field	318	1024	-706
Gardeners and cultivators	415	1598	-1183
Unit managers in the field of commerce	5692	12502	-6810

Source: Processing based on NIS data.

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