Econometric Research Regarding the Expectations of the Romanian Emigrants. Part I

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Abstract:

Starting from the statistics and the realities of the labor market in Romania and to obtain a wider perspective regarding the social, economic, and demographic implications of the work force mobility we used the results from a previous research, carried out through a questionnaire which was distributed online. The previous research (Cojocaru 2020) underlying this article, was performed on a sample of 157 persons giving valid answers, from a total of 183 filled questionnaires, representing 85,8% compliance degree. The subjects are aged between 18 and 60 years and belong to the various socio-professional categories.

Therefore, starting from the answers of the interviewed people from this investigation carried out with the help of the online questionnaire, for a more detailed analysis of the expectations of the Romanian emigrant, we decided to use the binomial ordinal logistic regression model, with cumulated probabilities, based on the proportionality of chances (cumulated logit model). This research is structured and published in two parts, the first part including the introduction, the presentation of the research methodology. Results and discussions (the analysis of the variable change income and the analysis of the variable qualification), and the second part results and discussions (the analysis of the variable labor conditions, the analysis of the variable duration and the analysis of the variable satisfaction) and conclusions.

Keywords: mobility; expectations; geographical mobility; migrants; workforce; education.

JEL Classification: M51; M57.

Introduction

The investigation of the factors influencing the profile of the emigrants is a complex and highly analyzed and discussed aspect in the reference literature. We can identify a multitude of factors which can be considered defining to obtain a" robot portrait" of the Romanian emigrant, as well as estimations regarding the expectations.

Starting from the answers of the interviewed people during the investigation carried out with the online questionnaire, relevant information can be obtained both by applying some classic quantitative and qualitative methods, but also by building statistical-mathematic models to obtain additional information, which should confirm and complete the conclusions obtained through classical methods.

An efficient way of analysis and synthesis of the data obtained after a statistics research is to elaborate and use the ordinal regressions models, mainly aiming at the cumulative probabilities of event occurrences.

1. Literature Review

Beyond the current events, migration was a key subject in Europe for a long time. Migration is a complex phenomenon which requires political answers based on facts, numbers and scientific proof.

The international migration of the active people refers to the movement of works between countries. This is an example of international factors movement. The movement of workers relies on a difference of resources between countries (Bonin *et al.* 2008). According to the economists, the migration of the workforce should have an equalizing effect on the salaries, and the workers from the same industries should obtain the same salary (Ederveen, Nahuis, Parikh 2005). Most of the theoretical models assign the relocation desire based on the expected level of the salaries (Ederveen, Nahuis, Parikh 2005). Therefore, the perspective of employment in another region leads to movements to value new opportunities and resources which are not available in the initial community. The perceptions, the loops in the potential incomes, the availability of the exact information and the geographical distance represent a significant factor in the decision to migrate (Avram *et al.* 2007).

The surveys show that the potential migrants are also confronted with anxiety regarding the perspective to find an adequate workplace in the new location. This happens because migration capacity relies on the current income or to the access to credit to support relocation and it is always randomly (Cannizzaro, Corinto 2012). At the same time the social insurances unemployment programs contribute to increasing the individual liquidity and to the reduction of the search costs and the movement risk (Pîrvu *et al.* 2011). Research showed that, on the whole, the social insurance does not have a strong impact on the personal movement rate, because while it reduces the relative costs of movement, they also increase the opportunity costs of the movement (Tatsiramos 2009).

Therefore, looking for a job in another country implies financing, visa or even an impossibility in certain situations. At the same time, the governmental support is not guaranteed for the international geographic mobility, and the existing languages and the cultural barriers contribute to the reduction of the geographical mobility on a regional and national level (Bonin *et al.* 2008).

From the point of view of the importance, the individual preference factors among the economic logic can strongly influence the geographic mobility of an individual. The preoccupations as the climate, the regional housing market, the cultural comfort, the family and the local social capital playa decisive role in the decision to relocate (Ederveen, Nahuis, Parikh 2005).

From a demographic point of view, research show that the education level of the individual is related to a higher mobility, especially around the university graduates. The youngsters but also the lack of the family and children belong to the category with high mobility, with a peak of mobility on the level of the population in Europe (Bonin *et al.* 2008).

The geographical mobility of the workforce also allows the workforce offer to meet the regional disparities, limiting the economic inefficiency (Pirvu 2013). On the other hand, reducing the mobility of the workforce would rapidly lead to increasing the disparities between the static economic regions and the diversion of the work resources (Ederveen, Nahuis, Parikh 2005).

The geographical mobility might also contribute to the alleviation of the asymmetrical shocks among the regions with diversified economies, as it happens in the European Union. It is interesting to outline the fact that while a growth of the geographical mobility increases the global economic efficiency, the growth of the competition for jobs on a global level in the regions with a prosperous period might lead to a higher unemployment than before the migration (Badircea *et al.* 2016).

Therefore, the labor mobility leads to a more balanced and more efficient distribution from the point of view of the working places and resources. The individual employees can better adjust their aptitudes to the requirements of the working places on the open countries market. They can look for ideal hobs, instead of being artificially limited to their geographical areas (Bonin *et al.* 2008).

At the same time, the possibility to study abroad is an important way for the active youngsters to enter the workforce market in the occidental countries (Kim 2010). On the other hand, the mobility might also have negative consequences on a region confronting with wide-spread emigration. Decreasing the professional level and reducing the labor resources make the recovery difficult for the less developed regions after an economic crisis.

The persons migrating in a region, they also focus on the existing social infrastructure for services as medical assistance, welfare and unemployment. Increasing the geographical mobility and the movement on long distances exerts at the same time pressures on the household and the family. Losing the family connections might decrease productivity, especially among the teenagers (Gillespie 2013). The geographical isolation from the family might also lead to real disparities (Pirvu 2011).

Migration allows the people on the other hand to develop new abilities and to benefit from a new education abroad (Włodarczyk *et al.* 2018).

2. Description of the Variables Used in the Econometric Research

For a more detailed analysis of the expectation of the Romanian emigrant, as well as to be able to obtain a quantitative characterization of its characteristics, we decided to use the logistic regression binomial order model, with cumulative probabilities, based on the proportionality of the chances (cumulative logistic model). Therefore, we built more models starting from the five depending variables and the five explanatory variables, with their characteristics presented in Table 1:

Table 1. Variables used in modelling

Variables	Type of Variable	Symbol of the variable	Measuring scale
The estimated income growth after transfer	Dependent	CHANGE_INCOME	Ordinal variable, with 6 answer variants: less than in the country; more than in the country; 50% higher; higher than 100%; higher with 150%; higher with 200%; higher with more than 200%.
Changing the qualification level after transfer	Dependent	QUALIFICATION	Ordinal variable with 3 answer variants: inferior; equal; superior.
Changing the work conditions after transfer	Dependent	WORK_CONDITIONS	Ordinal variable, with three answer variants: lighter; the same; more difficult.
Duration of the transfer abroad	Dependent	DURATION	Ordinal variable with 5 values: seasonal (under 1 year); 1-2 years; 2-5 years; 5-10 years; definite
Satisfaction degree after the transfer abroad	Dependent	SATISFACTION	Ordinal variant with 5 answer variants: totally unsatisfied; unsatisfied; a little satisfied; satisfied; very satisfied.
Age	Explanatory	AGE	Categorical variable with 5 values: 18-25 years; 26-35 years; 36-45 years; 46-55 years; above 55 years.
Gender	Explanatory	GENDER	Recodifies binary variable with the values: masculine; female.
Level of studies	Explanatory	STUDIES	Categorical variable with 4 values: 10 classes/ professional school; average studies (high school); university studies (BA); university studies (MA / PhD).
Level of income before transfer	Explanatory	INCOME	Categorical variable with 4 values: less than 2000 lei; 2001 lei – 2500 lei; 2501 lei – 3500 lei; more than 3501 lei.
Seniority in work	Explanatory	SENIORITY	Categorical variable, with continuous numerical values, recodifies with the values: 0-5 years, 5-10 years, 10-20 years, above 20 years.

Source: own calculations, using SPSS

Through the modelling process we aim at creating a new variable *logit*, corresponding to the dependent variable Y_j of ordinal type, with r answer variants. Therefore, the general relation of the proposed model can be defined under the form:

$$ln(odd_j) = \alpha_j + \sum_{k=1}^{p} \beta_k \times X_k; j = \overline{1, r-1} \quad (1)$$

where:

$$odd_j = \frac{prob(Y \leq j)}{prob(Y > j)} = \frac{prob(Y \leq i)}{1 - prob(Y \leq i)} \quad (2)$$

Therefore, the model is transformed in:

$$ln\left(\frac{prob(Y \leq i)}{1 - prob(Y \leq i)}\right) = \alpha_j + \sum_{k=1}^{p} \beta_k \times X_k; j = \overline{1, r-1} \quad (3)$$

or:

$$ln(odd_j) = \alpha_j + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k; j = \overline{1, r-1} \quad (4)$$

In the end, the chances ratio (*odd ratio*) is calculated based on the formula:

$$OR_j = \frac{odd_j}{odd_r} \quad (5)$$

For the relations (1-5) we considered the following observations:

- Y – ordinal dependent variable, where the answer variants are written with *j*, $j = \overline{1, r-1}$;
- r – total number of answers on a ordinal scale of the dependent variable;
- X_k – independent variables, $k = \overline{1, p}$;
- p – number of independent variables;
- α_j – interception parameters (threshold values), that are different for each *logit* function, specific for the first r-1 values on the scale of the dependent variables, $j = \overline{1, r-1}$;
- β_k – regression coefficients (being the same for all the *logit* functions) which express the contribution of the factor X_k to explain the probability of the event defined according to the values of the dependent variable, $k = \overline{1, p}$;
- prob(Y≤j) – probability that the values of the Y dependent variable to be lower or at least equal with the *j* score;
- odd_j – chance coefficient, $j = \overline{1, r-1}$;
- OR_j – chances report (*odd ratio*).

Along with transforming the logit value in probabilities, the model will become:

$$prob(Y \leq j) = \frac{e^{\alpha_j+\beta_1 X_1+\beta_2 X_2+\cdots+\beta_k X_k}}{1+e^{\alpha_j+\beta_1 X_1+\beta_2 X_2+\cdots+\beta_k X_k}} \quad (6)$$

The modelling process was carried out with the help of the special programme IBM SPSS Statistics, therefore we have to mention the fact that the equation (3) has the following implementation form:

$$ln\left(\frac{prob(y\leq i)}{1-prob(Y\leq i)}\right) = \alpha_j - \sum_{k=1}^{p} \beta_k X_k; j = \overline{1, r-1}; \quad (7)$$

In order to apply the cumulative *logit* model with proportional odds (*Cumulative odds ordinal logistic regression with proportional odds*) we checked the following premises:

(a) explained variables are measured on an ordinal scale;
(b) explanatory variables are continuous numerical variables, ordinal or categorical;
(c) the existence of proportional odds.

As we can notice from the description in Table 1, we can notice the fact that the two premises taken into consideration for the definition of the general framework of modelling are validated, and the third priority is to be checked during the analysis which will be carried out for each model.

The hypothesis considered for the analysis of the influence of the explicative variables are the following:

(a) as for *the existence of the proportional chances* and testing the opportunity of applying the model based on these chances, we used the *Test of parallel lines* with the hypothesis:

H_{0_1}: The model with proportional chances is suitable to point out the influences of the explicative variables on the dependent variables;

H_{1_1}: The model with proportional chances is not adequate to perform this analysis;

(b) as for the *plus of information which can be obtained by introducing in the models the explanatory variables* compared to the results obtained based on the marginal probabilities (results obtained from the marginal probabilities (results obtained through the direct analysis of the dependent value of the variable):

H_{0_2}: The model does not offer a significant plus of information compared to the results obtained from the direct analysis of the values of the explicative value;

H_{1_2}: The model offers a significant plus of information compared to the results obtained from the direct analysis of the values of the explicative variable;

(c) As for the *statistical signification* of the values of the parameters of the models obtained (α_j and β_k), *the Wald test* was used, the hypothesis being:

H_{0_3}: The value of the tested parameter is not different from 0 (respectively its value is not significant from a statistical point of view);

H_{1_3}: The value of the tested parameter is significantly different from 0 (respectively its value is significant from a statistical point of view) and it points out the influence of the factor on the dependent variable.

There have been carried out tests and validations of the statistical hypothesis, taking into consideration a trust coefficient of minimum 90% (*Confidence level 90%*), corresponding to a signification threshold of α=0,10. After the analysis carried out regarding the influence of the explicative variables X on the Y dependent variables, by using the binominal order logistic regression model with cumulated probabilities based on the proportionality of chances (cumulative *logit* model), resulted from the fact that there were identified significant influences of the analyzed factors on some resultative variables bringing extra information for analysis.

The first stage of elaborating and testing the binominal logistic regression models with proportional chances aimed at checking the hypothesis H_{0_1} regarding the existence of the proportional chances, as well as testing the opportunity of applying the model based on these chances. The results obtained were centralized in Table 2 and Table 3:

Table 2. Results of applying the Test of parallel lines for the variables AGE, SEX, STUDIES

VARIABLES	AGE			SEX			STUDIES		
	χ^2	df	Sig.	χ^2	df	Sig.	χ^2	df	Sig.
CHANGE_INCOME	3,931	3	0,269	6,516	3	0,089	8,373	3	0,039
QUALIFICATION	2,342	1	0,126	0,867	1	0,352	0,030	1	0,862
LABOR_CONDITIONS	0,008	1	0,927	0,003	1	0,954	4,850	1	0,028
DURATION	0,177	3	0,981	2,182	3	0,536	2,438	3	0,487
SATISFACTION	1,265	2	0,531	0,574	2	0,751	1,861	2	0,394

Note: Link function: Logit
Source: own calculation, using SPSS

Table 3. Results of applying the Test of parallel lines for the variables INCOME, SENIORITY

VARIABLES	INCOME			SENIORITY		
	χ^2	Df	Sig.	χ^2	Df	Sig.
CHANGE_INCOME	1,411	3	0,703	1,97	3	0,579
QUALIFICATION	0,007	1	0,996	3,821	1	0,051
LABOR_CONDITIONS	0,093	1	0,761	0,187	1	0,665
DURATION	10,821	3	0,013	7,015	3	0,071
SATISFACTION	1,175	2	0,556	2,185	2	0,335

Note: Link function: Logit
Source: own calculations, using SPSS

The results obtained after applying the *Test of parallel lines* point out the fact that for most of the models which can be built, the values of the signification level (Sig.) are higher that the signification threshold used, α=0,10 (level of trust of 90%). As a consequence, for these variables, we can use the model with proportional odds (cumulative *logit* model) for the analysis of the explanatory values.

For the selected variables there are three exceptions for which we cannot use the proportional chances model: the dependence between the dependent variable CHANGE_INCOME and the explanatory variable STUDIES, the dependence between the dependent variable CONDITIONS_LABOR and the explanatory variable STUDY, and the dependence between the dependent variable DURATION and the explanatory variable INCOME. For the analysis of these variables, the model with proportional chances is not adequate and in consequence, the analysis of the dependence between these variables will be carried out based on the marginal probabilities.

For the second stage of the analysis we tested the hypothesis regarding a surplus of information by introducing in the models the explanatory variables, as compared to the variant of the model using the information obtained by analyzing the marginal probabilities) table 4 and table 5).

Table 4. The Chi-Square (χ^2) values and of the signification level (Sig.) regarding the extra information obtained by introducing in the model the variables AGE, GENDER, STUDIES

VARIABLES	AGE			GENDER			STUDIES		
	χ^2	Df	Sig.	χ^2	df	Sig.	χ^2	df	Sig.
CHANGE_INCOME	24,224	16	0,085	7,685	4	0,104	31,815	12	0,001
QUALIFICATION	6,133	8	0,632	1,034	2	0,596	4,243	6	0,644
LABOR_CONDITIONS	5,677	8	0,683	1,998	2	0,368	11,040	6	0,087
DURATION	11,657	16	0,767	2,539	4	0,638	12,052	12	0,441
SATISFACTION	16,563	12	0,167	1,474	3	0,688	17,244	9	0,045

Note: Link function: Logit; *Source*: own calculation, using SPSS

Table 5. The Chi-Square (χ^2) value and of the signification level (Sig.) regarding the extra information obtained by introducing in the model the variables INCOME, SENIORITY

VARIABLES	INCOME			SENIORITY		
	χ^2	Df	Sig.	χ^2	df	Sig.
CHANGE_INCOME	17,393	12	0,135	96,047	88	0,261
QUALIFICATION	7,06	6	0,315	38,057	44	0,723
LABOR_CONDITIONS	3,557	6	0,736	53,587	44	0,152
DURATION	25,379	12	0,013	84,99	88	0,571
SATISFACTION	7,049	9	0,632	53,282	66	0,870

Note: Link function: Logit; *Source*: own calculation, using SPSS

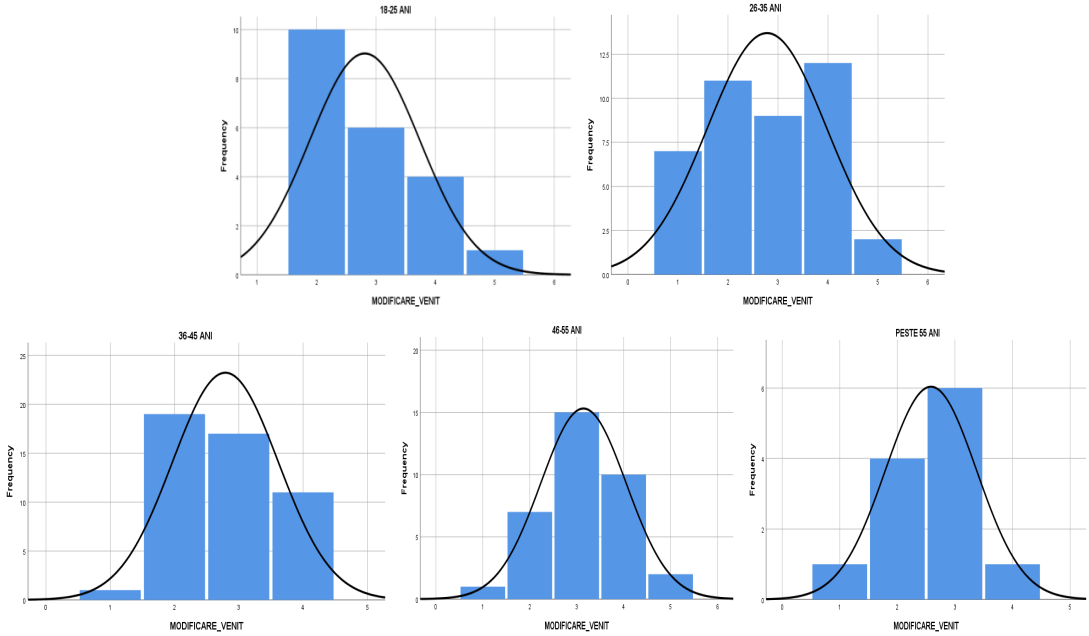
Taking into consideration the chosen signification threshold (α=0,05 or α=0,10), for the analysis of the relations CHANGE_INCOME = f(AGE), CHANGE_INCOME = f(STUDIES), LABOR_CONDITIONS = f(STUDIES), DURATION = f(INCOME) and SATISFACTION = f(STUDIES) the cumulative *logit* model with proportional odds (4) was used, and in the other cases the marginal analysis will be used.

3. Results and Discussions of the Econometric Research

3.1. Analysis of the Variable CHANGE_INCOME

As a result of putting the results of the Chi-Square (χ2) test into practice (Table 4 and Table 5) to use the model of binomial logistic regression model with cumulative probabilities, points out the fact that, from the five explanatory variables, only two variables (respectively AGE and STUDIES) might bring a plus of information regarding the relations among these and the variable CHANGE_INCOME for a trust coefficient of 90% (*Confidence level 90%*), corresponding to a signification threshold α=0,10.

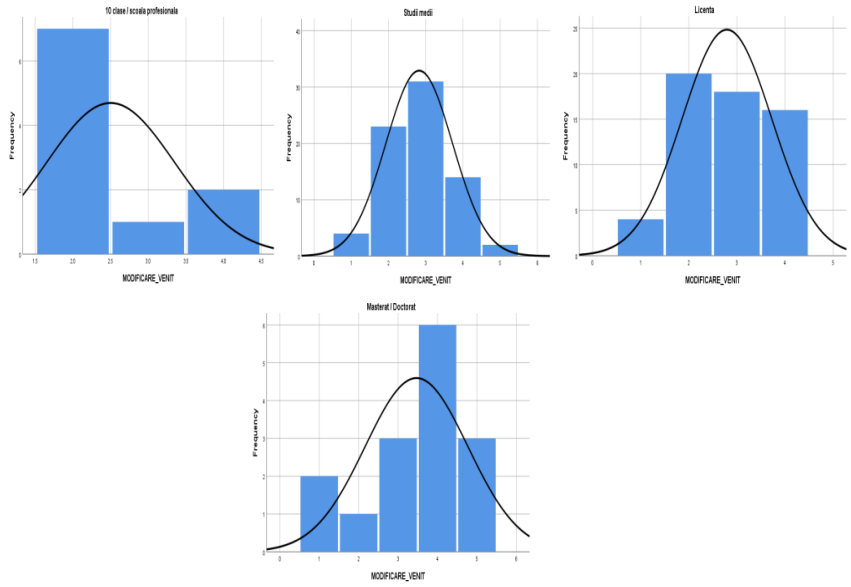
Figure 1 Distribution of the answers regarding the influence AGE on CHANGE_INCOME



Source: own calculation, using SPSS

As we can notice from Figure 1, the frequency of the answers obtained after the investigation based on the variable AGE offers extra information regarding the changes of the variables CHANGE_INCOME. Therefore, the persons aged between 18-25 years old expect a moderate increase of the income after the transfer abroad (between 50% and 100%), while along with the age increase, the respondents expect a more consistent growth of the incomes after the transfer (predominantly between 100% and 200%).

Figure 2. Distribution of the answers regarding the influence STUDIES on CHANGE_INCOME



Source: own calculations, using SPSS

As it results from Figure 2, we can notice an increase in the expectations of the study participants regarding the level of the assessed income (CHANGE_INCOME) which took place after the transfer abroad along with a higher level of graduated studies (STUDIES). Therefore, if the respondents graduating 10 grades or a vocational school except a growth with 50% of the income after the transfer abroad, the average studies graduates expect an average growth with 100% of the income, the university graduates assess a growth of the income between 100% and 200%, while the BA, MA and PhD graduates expect an increase in the income after the transfer abroad with 200% or even more. The parameters of the relation CHANGE_INCOME = f(AGE) are presented in Table 6:

Table 6. The assessed values of the parameters of the model CHANGE_INCOME= f(AGE)

VARIAVLES		Estimate ln(odd)	Wald	Sig,	ODD	AGE=26-35 years		
						ODD	Cummulated Prob.	Prob.
Threshold	[CHANGE_INCOME = less than in country]	-2,295	14,932	0,000*	0,10	0,074	0,069	0,069
	[CHANGE_INCOME = 50% higher]	-0,033	0,004	0,951	0,97	0,513	0,339	0,270
	[CHANGE_INCOME =100% higher]	1,426	6,866	0,009*	4,16	3,058	0,750	0,411
	[CHANGE_INCOME =150% higher]	3,885	31,672	0,000*	48,66	35,766	0,970	0,220
Location	[AGE= 18-25 years]	0,268	0,165	0,685	1,31			
	[AGE= 26-35 years]	0,308	0,264	0,007*	1,36			
	[AGE= 36-45 years]	0,317	0,290	0,590	1,37			
	[AGE= 46-55 years]	0,960	2,444	0,118	2,61			
	[AGE=above 55 years]	0[a]						

Note: Confidence level: *=99%; [a] This parameter is set to zero because it is redundant
Source: own calculations, using SPSS

Analyzing the results obtained from testing the hypothesis regarding the statistical signification of the values of the model parameter, for the dependent variable excepting [CHANGE_INCOME = 50% higher], for the other parameters, the null hypothesis H_{0_3} is rejecting and the alternative hypothesis H_{1_3} is accepted. In consequence, the parameters are significant from a statistical point of view (offer relevant information).

For the explanatory variable, just for the variable AGE = 26-35 years the value of the corresponding coefficient is significant from a statistical point of view. In this case, the general form of the model will be:

$\ln(odds_i) = \alpha_i + \beta_{[CHANGE\_INCOME = 50\%\ Higher]}$; i=1,3,4

$$odd_i = e^{\alpha_i + \beta_{[CHANGE\_INCOME = 50\%\ higher]}} \quad (8)$$

Based on the equation (8), the models and the chance values corresponding to the migrants with the age between 26-35 years is calculated:

$$odd_{[\text{CHANGE\_INCOME = less than in the country}]} = e^{-2.295-0.308} = 0{,}074$$

$$odd_{[\text{CHANGE\_INCOME = 100\% higher}]} = e^{1.426-0.308} = 3{,}058$$

$$odd_{[\text{CHANGE\_INCOME = 150\% higher}]} = e^{3.885-0.308} = 35{,}766$$

The result is that for the respondents aged between 26-35 years the chance to have a lower income than in the country after the transfer abroad is of only 0,074 (corresponding to a probability of 6,9%), the chance of having a higher income with 100% as opposed to the income from the country is of 3,058 (corresponding to a probability of 41,1%), and the chance to have a higher income with 150% after the transfer abroad is of 35,766 (corresponding to a probability of 22,0%). The marginal probabilities corresponding to the dependent variable CHANGE_INCOME for the factorial variable AGE=26-35 years are presented in Table 7.

Table 7. The assessed probabilities and the marginal probabilities of the variable CHANGE_INCOME for the factorial variable [AGE=26-35 years]

AGE		CHANGE_INCOME				
		1	2	3	4	5
26-35 years	PE	0,170	0,270	0,220	0,290	0,050
	PM	0,171	0,268	0,220	0,293	0,049
	N	41	41	41	41	41

Note: PE – estimated probabilities, PM – marginal probabilities, N – number of respondents aged between 26-35 years
Source: own calculations, using SPSS

As it results from the data presented in Table 6 and Table 7, after the analysis carried out using the binomial ordinal logistic regression, with cumulated probabilities, based on the proportionality of chances in the case of the Romanian migrants aged between 26-35 years there were obtained additional information pointing out a growth of the chance to obtain a favorable change of the income after the transfer abroad. Therefore, if we consider only the marginal probabilities, the probability that the income changes after the transfer abroad to be 100% higher is of 65,9%, corresponding to a chance of 1,933 while the information obtained based on the proposed model estimate a probability of 66,0%, corresponding to a chance of 1,941.

As for the explanatory variable STUDIES, the parameters of the relation CHANGE_INCOME = f(STUDIES) are presented in Table 8:

Table 8. The assessed values of the parameters of the model CHANGE_INCOME = f(STUDIES)

VARIBLES		Estimate ln(odd)	Wald	Sig,	ODD
Threshold	[CHANGE_INCOME = less than in the country]	-4,245	49,984	0,000*	0,01
	[CHANGE_INCOME = 50% higher]	-1,971	14,539	0,000*	0,14
	[CHANGE_INCOME = 100% higher]	-0,472	0,907	0,341	0,62
	[CHANGE_INCOME = 150% higher]	2,091	12,220	0,000*	8,10
Location	[STUDIES = 10 grades/ vocational school]	-2,272	8,578	0,113	0,10
	[STUDIES = Average studies (high school)]	-1,538	8,051	0,005*	0,21
	[STUDIES = University studies (BA)]	-1,577	8,103	0,004*	0,21
	[STUDIES = University studies (MA/ PhD)]	0[a]			

Note: Confidence level: *=99%; [a] This parameter is set to zero because it is redundant.
Source: own calculations, using SPSS

Table 9. Estimated explanatory values for the model CHANGE_INCOME = f(STUDIES)

VARIABLES		[STUDIES = average studies (high school)]			[STUDIES = university studies (PhD)]		
		ODD	Cum. Prob.	Prob.	ODD	Cum. Prob.	Prob.
Threshold	[CHANGE_INCOME = less than in country]	0,003	0,003	0,003	0,003	0,003	0,003
	[CHANGE_INCOME = 50% higher]	0,134	0,118	0,115	0,129	0,114	0,111
	[CHANGE_INCOME = 100% higher]	0,724	0,420	0,302	0,310	0,237	0,123
	[CHANGE_INCOME = 150% higher]	1,738	0,635	0,215	1,672	0,626	0,389

Note: Confidence level: *=99%; [a] This parameter is set to zero because it is redundant.
Source: own calculations, using SPSS

As a result of testing the hypothesis regarding the statistical signification of the values of the model parameter, in the case of the depending variable, excepting [CHANGE_INCOME = 100% higher], for the other parameters we reject the null hypothesis H_{0_3} and we accept the alternative hypothesis H_{1_3}. In this case, the parameters are significant from a statistical point of view (offer relevant information).

As for the explanatory variable STUDIES, in two from the three the value of the corresponding coefficients is significant from a statistical point of view, for [STUDIES = Average studies (high school)] and respectively, [STUDIES = university studies (BA)].

In the first case, the general pattern of the model, will be:

$$\ln(odds_i) = \alpha_i + \beta_{[CHANGE\_INCOME\ =higher\ than\ 100\%]};\ i=1,2,4$$

$$odd_i = e^{\alpha_i + \beta_{[CHANGE\_INCOME\ =higher\ than\ 100\%]}} \quad (9)$$

By applying the parameters of the equation (9), the models and the chance values corresponding to the migrants with average studies (high school), are calculated as follows:

$$odd_{[\text{CHANGE\_INCOME = less than in the country}]} = e^{-4.245-1.538} = 0{,}003$$

$$odd_{[\text{CHANGE\_INCOME = 50\% higher}]} = e^{-0.472-1.538} = 0{,}134$$

$$odd_{[\text{CHANGE\_INCOME = 150\% higher}]} = e^{2.091-1.538} = 1{,}738$$

After interpreting the coefficients, it results that for the respondents with at least average studies (high school) the chance of having a lower income than in the country after the transfer abroad is 0,003 (corresponding to an odd of 0,3%), the chance of having a higher income of 50% as for the income in the country is 0,134 (corresponding to an odd of 11,8%), and the chance of having a higher income with 150% after the transfer abroad is 1,738 (corresponding to an odd of 63,5%). The marginal odds corresponding to the dependent variable CHANGE_INCOME for the factorial variable [STUDIES=average studies (high school)] are presented in Table 10.

Table 10. Assessed odds and marginal odds of the variable CHANGE_INCOME for the factorial variable [STUDIES = average studies (high school)]

STUDIES		CHANGE_INCOME				
		1	2	3	4	5
[STUDIES=Average studies (high school)]	PE	0,050	0,310	0,420	0,190	0,030
	PM	0,054	0,311	0,419	0,189	0,027
	N	74	74	74	74	74

Note: PE – assessed odds PM – marginal odds, N – number of respondents graduating average studies (high school).
Source: own calculations, using SPSS

In the case of the second explanatory variable, [STUDIES=university studies (BA)], general form of the model will be:

$$\ln(odds_i) = \alpha_i + \beta_{[CHANGE\_INCOME\ =100\%\ higher]};\ i=1,2,4$$

$$odd_i = e^{\alpha_i + \beta_{[CHANGE\_INCOME\ =100\%\ higher]}} \quad (10)$$

According to the equations (10), the models and the corresponding chance values of the migrants graduating university studies (BA) are calculated as follows:

$$odd_{[\text{CHANGE\_INCOME = less than in the country}]} = e^{-4.245-1.577} = 0{,}003$$

$$odd_{[\text{CHANGE\_INCOME = 50\% higher}]} = e^{-0.472-1.577} = 0{,}129$$

$$odd_{[\text{CHANGE\_INCOME = 150\% higher}]} = e^{2.091-1.577} = 1{,}672$$

Analyzing the obtained results, we notice that for the graduates respondents with at least university studies (BA), the chance to have a lower income than in the country after the transfer abroad is of 0,003 (corresponding to an odd of 0,3%), the chance of having a higher income with 50% as opposed to the income from the country is 0,129 (corresponding to an odd of 11,4%) and the chance of having a higher income with 150% after the transfer abroad is 1,672 (corresponding to a probability of 62,6%). The corresponding marginal probabilities of the dependent variable CHANCE_INCOME for the factorial variable [STUDIES=university studies (BA)] are presented in Table 11.

Table 11. Assessed odds and marginal odds of the variable CHANGE_INCOME for the factorial variable [STUDIES = university studies (BA)]

STUDIES		CHANGE_INCOME				
		1	2	3	4	5
[STUDIES=university studies (BA)]	PE	0,007	0,340	0,310	0,280	0,001
	PM	0,069	0,345	0,310	0,276	0,001
	N	58	58	58	58	58

Note: PE – assessed odds, PM – marginal odds, N – number of respondents graduating higher studies (BA)
Source: own calculations, using SPSS

Regarding the influence of the explanatory variable GENDER, the cumulated odds and the chance coefficients point out the fact that, both for the female respondents, and also for the male respondents, the chances to get a higher income with 100% are higher than 1, meaning that more than half of the respondents (67,0% for [GENDER=male] and 85,0% for [GENDER=female]) assess that they will have an increasing income with 100% as opposed to the income that they have in the country (Table 12).

Table 12. GENDER * CHANGE_INCOME Cross tabulation

Parameters			CHANGE_INCOME				
			1	2	3	4	5
GENDER	Male	Odd	0,070	0,320	0,280	0,300	0,030
		Cum. odd	0,070	0,390	0,670	0,970	1,000
		ODD	0,060	0,240	0,220	0,230	0,040
	Female	Prob.	0,060	0,340	0,450	0,130	0,020
		Cum. odd	0,060	0,400	0,850	0,980	1,000
		ODD	0,050	0,250	0,310	0,120	0,020
ODD Ratio (Reference: female)			1,200	0,960	0,710	1,917	1,000

Source: own calculations, using SPSS

In the case of the explanatory variant INCOME, the cumulated odd and the chance coefficients (Table 13) also point out the fact that in the case of the respondents who had an income of less than 2000 lei before the transfer abroad, have a chance of 0,313 (corresponding to an odd of 45,7%) to obtain 50% higher income in the new destination. Similarly, for the respondents with an income between 2001-2500 lei, the chance to obtain an income 100% higher is of 0,277 (representing an odd of 38,3%), or the people having an income of 2501-3500 lei au have a chance of 0,231 (corresponding to an odd of 30%) to obtain an income 50% higher or 100% higher (cumulated with a probability of 67,5%).

Table 13. INCOME * CHANGE_INCOME Cross-tabulation

Parameters			CHANGE_INCOME				
			1	2	3	4	5
INCOME	Less than 2000 lei	Odd	0,065	0,457	0,304	0,022	0,152
		Cumm. Odd	0,065	0,522	0,826	0,848	1,000
		ODD	0,061	0,313	0,233	0,021	
		Odd	0,067	0,283	0,383	0,017	0,250

Parameters			CHANGE_INCOME				
			1	2	3	4	5
	2001-2500 lei	Prob. Cumulate	0,067	0,350	0,733	0,750	1,000
		ODD	0,063	0,221	0,277	0,016	
	2501-3500 lei	Odd	0,075	0,300	0,300	0,025	0,300
		Cum. odd	0,075	0,375	0,675	0,700	1,000
		ODD	0,070	0,231	0,231	0,024	
	More than 3501 lei	Odd	0,000	0,091	0,364	0,182	0,363
		Cum. odd	0,000	0,091	0,455	0,637	1,000
		ODD	0,000	0,083	0,267	0,154	
ODD Ratio (Reference: More than 3501 lei)	Less than 2000 lei		61,000	3,771	0,873	0,136	
	2001-2500 lei		67,000	2,663	1,037	0,104	
	2501-3500 lei		70,000	2,783	0,865	0,156	

Source: own calculations, using SPSS

The influence explanatory variables SENIORITY on the dependent variable CHANGE_INCOME can determine the data presented in Table 14:

Table 14. SENIORITY * CHANGE_INCOME Cross-tabulation

Parameters			CHANGE_INCOME				
			1	2	3	4	5
SENIORITY	0-5 years	Odd	0,074	0,358	0,309	0,222	0,037
		Cum. odd	0,074	0,432	0,741	0,963	1,000
		ODD	0,069	0,264	0,236	0,182	
	5-10 years	Prob.	0,050	0,350	0,375	0,200	0,065
		Cum. odd	0,050	0,400	0,735	0,935	1,000
		ODD	0,048	0,259	0,273	0,167	
	10-20 years	Odd	0,032	0,226	0,355	0,355	0,032
		Cum. odd	0,032	0,258	0,613	0,968	1,000
		ODD	0,031	0,184	0,262	0,262	
	More than 20 years old	Odd	0,190	0,200	0,400	0,200	0,010
		Cum. odd	0,190	0,390	0,790	0,990	1,000
		ODD	0,167	0,167	0,286	0,167	
ODD Ratio (Reference: over 20 years old)	0-5 years		0,413	1,581	0,825	1,198	
	5-10 years		0,287	1,551	0,955	1,000	
	10-20 years		0,186	1,102	0,916	1,569	

Source: own calculations using SPSS

Analyzing the influence of the variable SENIORITY, based on the chance coefficients and on the cumulated probabilities, we notice the fact that for the respondents who have a seniority of 0-5 years in work before the transfer abroad, the chance to obtain a 50% higher income is of 0, 264 (corresponding to the odd of 35,8%), and the chance to obtain an income of 100% higher is of 0,236 (corresponding to an odd of 30,9%). For the respondents with a seniority in work of 5-10 years we notice a chance of 0,273 (with a corresponding odd of 37,5%) to obtain a higher income 100%, while for the respondents who have 10-20 years of seniority the chance is equal (0,262, with a probability of 35,5%) to obtain a higher income of 100% or 150%.

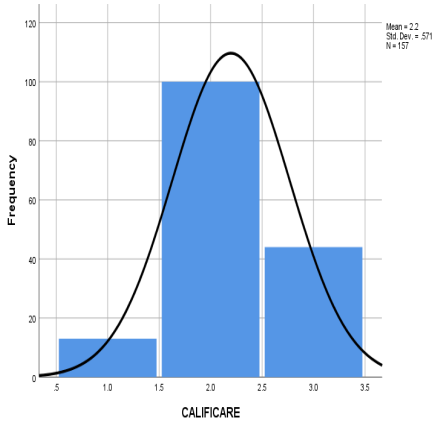
For the emigrants with a seniority in work of more than 20 years, there is a chance of 0,286, respectively an odd of 40% to obtain a higher income with 100% after the transfer abroad.

3.2. The Analysis of the Variable QUALIFICATION

For the explanatory variable QUALIFICATION, the results obtained after the test $\chi 2$ (Table 4 and Table 5) regarding the opportunity of using the binomial ordinal logistic regression model 4) do not lead to obtaining significantly different information as opposed to the ones which can be obtained with the marginal analysis.

We also notice that, on the whole, the attitude of the respondents towards the level of qualification they consider they will have after the transfer abroad is an optimist one, fact which is pointed out through the value Mean=2,2 corresponding to an expectation at least equal with the qualification level before the transfer or to a better level (Figure 3).

Figure 3 Distribution of the answers regarding the variable QUALIFICATION



Source: own calculations using SPSS

The marginal analysis of the factors determining the variable QUALIFICATION starts from the analysis of the influence of the explanatory variable AGE. The cumulated odds and the chance coefficients (Table 15) point out the fact that in the case of the respondents younger than 25 years, the chance to keep their qualification level after the transfer abroad is of 0,382 (corresponding to an odd of 61,9%), for the respondents aged between 26 and 35 years the chance is of 0,423 (respectively and odd of 73,2%), for the respondents aged between 36 and 45 years the chance is of 0,400 (respectively and odd of 66,7%), for the migrants aged between 45 and 55 years the chance is of 0,340 (respectively and odd of 51,4%), and for the respondents aged above 55 years the same chance to keep the qualification level is of 0,368 (corresponding to a probability of 58,3%).

From the analysis of the information obtained after the analysis of the results of the administered questionnaire, we can underline the fact that from all age groups included in the questionnaire, the emigrants aged above 55 years have the highest odd (16,7%) to have a lower qualification level after the transfer abroad, the emigrants aged between 26 and 35 years have the highest odd (75,6%) of keeping their current qualification level, and the emigrants aged between 45 and 55 years have the highest odd (37,1%) of improving their qualification level after the transfer abroad.

Table 15. AGE * QUALIFICATION Cross-tabulation

Parameters			CALIFICARE		
			1	2	3
AGE	Younger than 25 years	Odd	0,095	0,619	0,286
		Cum. Odd	0,095	0,714	1,000
		ODD	0,087	0,382	0,222
	26-35 years	Odd	0,024	0,732	0,244
		Cum. Odd	0,024	0,756	1,000
		ODD	0,024	0,423	0,196
	36-45 years	Odd	0,083	0,667	0,250
		Cum. Odd	0,083	0,750	1,000
		ODD	0,077	0,400	0,200
	45-55 years	Prob.	0,114	0,514	0,371
		Cum. Odd	0,114	0,628	1,000
		ODD	0,103	0,340	0,271
	Older than 55 years	Odd	0,167	0,583	0,250
		Cum. Odd	0,167	0,750	1,000
		ODD	0,143	0,368	0,200
ODD Ratio (Reference: older than 55 years)	Younger than 25 years		0,608	1,038	1,220
	26-35 years		0,168	1,149	0,980
	36-45 years		0,538	1,087	1,000
	46-55 years		1,168	1,584	1,355

Source: own calculations using SPSS

Regarding the influence of the explanatory variable GENDER, the cumulated odds and the chances point out the fact that, for the female respondents, and for the male respondents, the chances to keep the qualification level after the transfer abroad are relatively equal, respectively 0,400(corresponding to an odd of ,0%) for the male

emigrants and 0,380 (representing and odd of 60,0%) for the female emigrants. We must point out the fact that based on the analyzed data, we can notice a higher probability for the female emigrants to reach a lower qualification level as opposed to the male emigrants, that is 12,0% as opposed to 7,0%. (Table 16).

Table 16. GENDER * QUALIFICATION Cross-tabulation

Parameters			CALIFICARE		
			1	2	3
GENDER	Male	Odd	0,070	0,650	0,280
		Cum. Odd	0,070	0,720	1,000
		ODD	0,060	0,400	0,220
	Female	Odd	0,120	0,600	0,280
		Cum. Odd	0,120	0,720	1,000
		ODD	0,100	0,380	0,220
ODD Ratio (Reference: female)			0,600	1,053	1,000

Source: own calculations, using SSPS

In the case of the explanatory variable STUDIES, the cumulated odds and the chance coefficients (table 17) point out the fact that the respondents graduating 10 grades, or a vocational school have a chance of 0,412 (that is an odd of 70,0%) to keep their qualification level after the transfer abroad. For the emigrants with average studies (high school) the chance to keep the qualification level after the transfer is of 0,393 (that is an odd of 64,9%), for the emigrants with university studies (BA) the chance to keep their qualification level is 0,389 (corresponding to an odd of 63,8%), and for the emigrates with higher studies (MA/PhD) the chance of keeping their qualification level after the transfer is of 0,348 (that is an odd of 53,3%).

We can also notice that the highest odd for the Romanian emigrants to improve their qualification level after the transfer abroad belonged to the higher university studies MA or PhD (33,3%), the odd of improving the qualification level being reduced along with lowering the level of the graduated studies.

Table 17. STUDIES * QUALIFICATION Cross-tabulation

Parameters			QUALIFICATION		
			1	2	3
STUDIES	10 grades/vocational school	Prob.	0,100	0,700	0,200
		Prob. Cumulate	0,100	0,800	1,000
		ODD	0,091	0,412	0,167
	Average studies (high school)	Prob.	0,108	0,649	0,243
		Prob. Cumulate	0,108	0,757	1,000
		ODD	0,098	0,393	0,196
	University studies (BA)	Prob.	0,034	0,638	0,328
		Prob. Cumulate	0,098	0,672	1,000
		ODD	0,033	0,389	0,247
	University studies (MA, PhD)	Prob.	0,134	0,533	0,333
		Prob. Cumulate	0,134	0,667	0,333
		ODD	0,118	0,348	0,250
ODD Ratio (Reference: University studies (MA, PhD)	10 grades/vocational school		0,771	1,184	0,668
	Average studies (high school)		0,831	1,129	0,784
	Higher studies (BA)		0,280	1,118	0,988

Source: own calculations using SPSS

Regarding the influence of the explanatory variable INCOME on the depending variable QUALIFICATION, the cumulated odds, and the chance coefficients (Table 18) point out, as in the case of the respondents with an income before the transfer abroad of lower than 2000 lei, have a chance of 0,395 (corresponding to an odd of 65,3%) to keep their qualification level before the transfer. Similarly, for the respondents with an income between 2001-2500 lei, the chance of keeping the qualification level after the transfer abroad is of 0,400 (representing an odd of 66,7%), for the emigrants having an income between 2501-3500 lei the chance is of 0,375 (corresponding to a probability of 60%), and for the emigrants with a higher level of 3501 lei, the chance of keeping the qualification level is of 0,353 (that is an odd of 54,6%).

Table 18. INCOME * QUALIFICATION Cross-tabulation

Parameters			CALIFICARE		
			1	2	3
INCOME	Less than 2000 lei	Odd	0,130	0,653	0,217
		Cum. odd	0,130	0,783	1,000
		ODD	0,115	0,395	0,179
	2001-2500 lei	Odd	0,033	0,667	0,300
		Cum. odd	0,033	0,700	1,000
		ODD	0,032	0,400	0,231
	2501-3500 lei	Odd	0,125	0,600	0,275
		Cum. odd	0,125	0,725	1,000
		ODD	0,111	0,375	0,216
	More than 3501 lei	Prob.	0,001	0,546	0,455
		Cum. odd	0,001	0,546	1,000
		ODD	0,001	0,353	0,313
ODD Ratio (Reference: More than 3501 lei)	Less than 2000 lei		115,000	1,119	0,572
	2001-2500 lei		32,000	1,133	0,738
	2501-3500 lei		111,000	1,062	0,690

Source: own calculations using SPSS

We should also point out the fact that the highest chances (0,313) to improve the qualification level after the transfer is for the emigrants registering a higher level than 3501 lei, corresponding to a probability of 45,5%.

Analyzing the influence of the explanatory variable SENIORITY (Table 19), based on the chance coefficients and on the cumulated odds, we notice the fact that for the respondents with a seniority in work of 0-5 years before the transfer abroad, the chance to maintain their qualification level is of 0,347 (corresponding to an odd of 55,6%), and for the emigrants with 5-10 years seniority in work the chance to keep their qualification level is of 0,403 (corresponding to an odd of 67,5%). For the respondents with a seniority of 10-20 years we notice a chance of 0,436 (corresponding to an odd of 77,4%) to keep the same qualification level while for the respondents with more than 20 years of seniority the chance is equal with 0,801, being associated with an odd of 80,1%.

The highest chances to improve the qualification level after the transfer abroad belong to the emigrants with a seniority in work of 0-5 years (chance 0,250, with an odd of 33,3%), followed by the emigrants with 5-10 years seniority in work (chance 0,200 with an odd of 25,0%).

Table 19. SENIORITY * QUALIFICATION Cross-tabulation

Parameters			QUALIFICATION		
			1	2	3
SENIORITY	0-5 years	odd	0,111	0,556	0,333
		Cum. odd	0,111	0,667	1,000
		ODD	0,100	0,357	0,250
	5-10 years	Odd	0,075	0,675	0,250
		Cum. odd	0,075	0,750	1,000
		ODD	0,070	0,403	0,200
	10-20 years	Odd	0,032	0,774	0,194
		Cum. odd	0,032	0,806	0,194
		ODD	0,031	0,436	0,162
	More than 20 years	Odd	0,001	0,800	0,199
		Cum. odd	0,001	0,801	0,199
		ODD	0,001	0,444	0,167
ODD Ratio (Reference: more than 20 years)	0-5 years		100,000	0,804	1,497
	5-10 years		70,000	0,908	1,198
	10-20 years		31,000	0,982	0,970

Source: own calculations using SPSS

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