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A Cross-Country Comparison of Non-Farm Rural Employment in Macedonia & Slovenia

Revised Version

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Discussion papers in this series are intended to stimulate discussion among researchers, practitioners and policy makers. The papers mostly reflect work in progress. **The authors are grateful to Dr. Frank Litzka, University of Hohenheim, Institute of Farm Management, for his valuable comments.**

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A Cross-Country Comparison of Non-Farm Rural Employment in Macedonia and Slovenia[1]

GERTRUD BUCHENRIEDER, JUDITH MÖLLERS AND FRANZ HEIDHUES

1 Introduction

Evidence from most continents over the last decade shows that the share of rural household income from non-farm sources is growing in the process of rural development. Recent empirical research found that non-farm sources account for 40-45% of average rural household income in sub-Saharan Africa and Latin America, 30-40% in South Asia, and 30-50% in Central and Eastern Europe. Most of this income originates from local rural sources rather than urban migration (Barrett *et al.* 2001, Knüpfer and Buchenrieder 2001, Kopeva, Doichinova and Madjarova 2001, Lanjouw and Shariff 2001, Reardon *et al.* 2001, Seddon and Subedi 2000, Davis and Gaburici 1999, Bryceson and Jamal 1997, Greif, 1997, Lanjouw and Lanjouw 1997, Reardon 1997). Thus, rural non-farm employment (NFRE) is gaining prominence in debates on rural development (Start 2001). The term NFRE is used to denominate any non-farm employment of a rural household, including urban jobs and remittances. Hence, it is related to employment, income and livelihoods not directly derived from crop and livestock production (Pfluger 2000).

The expansion of NFRE and diversification of income are desirable policy objectives because they give individuals and households more options to improve livelihood security and to raise their living standards. Empirical evidence suggests that there exists a positive correlation between higher income levels of rural households, higher productivity in agricultural activities and access to NFRE. Moreover, NFRE is found to be correlated with the level of education, the quality and access to infrastructure and the service sector and the access to financial services, and employment in the non-farm sector. However, the interdependence between cause and effect is complex (Pfluger 2000). Therefore, analysis is needed case by case to gain a better understanding of discerning patterns and clusters.

In 2001, the per-capita income at purchasing power parity (PPP)[2] prices in the

[1] This paper has been prepared in connection with the PHARE-ACE research project P98-1090-R. Financial support from the European Commission is gratefully acknowledged.

[2] PPP gives a conversion rate that reflects how many goods the local money buys within the country and compared to a reference region (the US or the EU-15) instead of how many dollars or euros the local currency will buy in the exchange market.

eight EU-accession countries of the first round reached 47% (excluding Bulgaria and Romania[3]) of the EU-15 average (as compared to 38% in 1995) (EC 2003 and own calculations based on World Bank 2003). Within the EU-accession countries there is a great disparity. While Slovenia (71% of EU-15 average per-capita income in PPP) almost reached the level of Greece (with 73% of EU-15 average per-capita income in PPP, representing the lowest level in the EU in 2001), Romania was at the bottom of the scale in terms of per-capita GDP (24% of EU-15 average per-capita income in PPP). In the context of EU enlargement, the socio-economic imbalances between individual regions in CEE have been recognised as one of the most intractable problems of transition (Haarbeck and Bogner 1997). Slovenia was selected for the analysis because it is both, an accession country to the European Union (EU) of the first round and, furthermore, it represents the accession country with the highest per-capita income. The inclusion of Macedonia allows to (1) compare NFRE of a non-accession with an accession country of about the same population size and a per-capita income (25% of EU-15 average per-capita income in PPP) reaching the lows of Bulgaria and Romania.

The factors affecting rural people's attitudes and access to non-farm rural employment are complex. A large share of the rural population is still employed in agriculture, many of them are so-called disguised unemployed. Social and cultural factors as well as economic and other constraints influence the predominantly agricultural population's preferences and constraints towards NFRE. Therefore, data have been collected on the availability and type of NFRE opportunities and activities from all sources, including those generated by rural households themselves, or those arising from social payments or migration activities.

This paper will focus on factors determining changes in the mix of employment activities within one household and determinants for shifting away from traditional rural employment such as agricultural activities. It will review attitudes of the rural population to avail themselves of non-farm opportunities. Also, the analysis will identify demand-pull or distress-push factors driving non-agricultural development and employment in Macedonia and Slovenia.

2 Methodology and data

2.1 Diversification in the rural non-farm economy

The distinction between *demand-pull* and *distress-push* factors is of particular

[3] The per-capita income in PPP prices in Bulgaria and Romania represented 28% and 24%,

interest to the study. It allows to highlight the different constraints, which the rural, predominately farm population experiences in obtaining NFRE. The term *demand-pull* is used to describe a situation in which agricultural workers become able to seize more remunerative employment opportunities in the non-farm sector (Davies 1996, Hart 1998). The response to *demand-pull* factors often results in an increasing specialisation and intensification within the non-farm sector (Möllers and Heidhues 2003). The term *distress-push* describes a situation in which inadequate incomes in agriculture pushes workers into poorly paid non-farm sector employment (Davies 1993). Contrary to *demand-pull* factors, the reaction to *distress-push* factors in agriculture implies a growing diversification of income creating activities (Möllers and Heidhues 2003).

Four issues need to be pointed at the beginning. First, Start (2001) states that diversification can refer to an increasing mix or multiplicity of activities, regardless of the sector, or it can refer to a shift away from traditional rural sectors, such as agriculture, to non-agricultural activities associated with the growth of NFRE. Therefore, in the analysis below we have distinguished part-time farmers who increased the number and mix of their activities and farmers who completely shifted away from farming, often specialising in a specific non-farm activity instead. Second, diversification can take place at different levels of the economy. Thus, diversification of a rural economy like the expansion of NFRE is to be distinguished from the diversification of a household or individual economy like the expansion of rural non-farm income shares. Clearly there are links between these levels. The focus of the analysis here is on employment diversification of a household. Third, 'non-farm' or 'non-agricultural' are sectoral definitions whereby the concepts of primary, secondary and tertiary enterprises are a useful benchmark to follow.[4] The survey on which the analysis is based covered employment in all rural economic sectors. Fourth, rural is a

spatial definition and includes small rural towns, growth centres and their industries.[5] Often this is where the largest share of RNFE is located (Barett *et al*. 2001,

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respectively of the EU-15 average (EC 2003).

[4] The primary sector refers to agriculture, mining, and other extractive activities. Agriculture is a subset of primary activities, including any activity in the production or gathering of unprocessed crops, livestock, forest, hunting or fishing. Non-agricultural then covers all other forms of activity and income including processing, transport or trading of unprocessed products (Start 2001).

[5] The population density per square kilometre usually determines the distinction between urban and rural, whereby the density ought to be less than 150 persons per square kilometer to classify as rural. The OECD (1996) defines rural as (1) mainly rural area – more than 50% of the population inhabit rural municipalities, (2) essentially rural areas – between 15-50% of the population live in rural municipalities, and (3) mainly urban areas – fewer than 15% of the population live in rural municipalities.

Start 2001). Therefore, the sample was drawn to include rural and peri-urban areas.

2.2 Study and survey design

The study is based on a research grant by the European Union (EU): EC-PHARE ACE Project No. P98-1090-R "Accession in the Balkans: Policy Options for Diversification in the Rural Economy" (from April 2000 to May 2002). The project consortium consisted of five country partners from the United Kingdom and Germany (western European partners), Bulgaria, Macedonia, and Slovenia (eastern European partners).[6] In the analysis at hand, however, the data from Bulgaria are excluded because of unresolved data inconsistencies and the agricultural income figures for Macedonia have been corrected such that they represent net figures now. Map 1 shows the countries involved in the analysis.

Table 1 gives an overview of the most important economic characteristics of the case countries. The income differences between the countries are substantial. The gross domestic product (GDP) per capita of Slovenia is five times as high as of Macedonia. Slovenia's share of agriculture in GDP is close to Western European levels with about 3.2% in 2000 and 2001 (Clement 2002). Macedonia is far more dependent on agriculture, contributing about 9.7% to GDP in 2000 (Gruber 2002). The two countries suffer from high open unemployment rates and, presumably, disguised unemployment in agriculture. Here, Macedonia displays a higher rate of open unemployment with 30.5% (2001) than Slovenia with only 5.9% (2001). Clearly, for Macedonia, the agricultural sector is still functioning as a sector to absorb disguised unemployment. Thus, structural transformation that would increase labour productivity in the agricultural sector may not be at the top of the agenda. Nevertheless, employment opportunities in the non-farm sector for these disguised unemployed are of great importance for future restructuring of the agricultural sector. Inflation has been and is, to various degrees, an issue in both countries. The case countries have made tremendous progress in increasing the private sector share in GDP.

[6] UK – Dr. Davis Junior (co-ordinator) of the Natural Resources Institute (NRI); Germany – Prof. Dr. Franz Heidhues, Judith Möllers (neé Knüpfer), and PD Dr. Gertrud Buchenrieder (University of Hohenheim); Bulgaria – Prof. Dr. Diana Kopeva (University of National and World Economy); FYR Macedonia – Prof. Dr. Kalina Trenevska-Blagoeva and Sasho Josimovski (The University of St. Cyril and Methodius); and Slovenia – Prof. Dr. Emil Erjavec, Luka Juvancic (University of Ljubljana).

Table 1 Indicators of economic development in the case-countries

	1991	1993	1995	1997	1999	2000	2001 Estimate
Macedonia							
Growth & output							
GDP per capita (USD)	2,134	1,141	2,267	1,867	1,837	1,792	1,738
Share of agriculture in GDP (%)	na	na	17.8	13.1	11.4	9.7	na
Agricultural gross output (%age change)	17.1	-20.4	2.3	1.1	0.5	-6.5	na
Employment							
Unemployment (% of labour force)	19.2	28.3	37.7	36.0	32.4	32.1	30.5
Prices							
Consumer prices (average p.a. % change)	na	338.4	16.4	0.8	-1.3	6.5	5.0
Producer prices (average p.a. % change)	112.0	258.3	3.9	4.2	-0.1	8.9	-1.2
Private sector							
Private sector share in GDP (%)	15.0	35.0	40.0	50.0	55.0	55.0	na
Slovenia							
Growth & output							
GDP per capita (USD)	6,333	6,370	9,418	9,103	10,050	9,073	9,416
Share of agriculture in GDP (%)	5.2	4.5	4.6	4.3	3.7	3.3	3.2
Agricultural gross output (%age change)	-2.5	-4.2	1.6	-3.0	-2.1	-1.0	-2.1
Employment							
Unemployment (% of labour force)	7.3	9.1	7.4	7.1	7.4	7.2	5.9
Prices							
Consumer prices (average p.a. % change)	117.7	32.9	13.5	8.4	6.1	8.9	8.4
Producer prices (average p.a. % change)	124.1	21.6	12.8	6.1	2.1	7.6	9.0
Private sector							
Private sector share in GDP (%)	30.0	40.0	50.0	60.0	60.0	65.0	na
Share of small farms privatised (%)	61.6	96.5	98.3	98.6	98.8	na	na

Source: EBRD (1999: 205, 221, 269); EBRD (2000: 149, 165, 213); EBRD (2001: 128, 148, 196) ; EBRD (2002 : 59, 83) ; Clement (2002 :54, for Slovenia) ; Gruber (2002 : 90, for Macedonia)

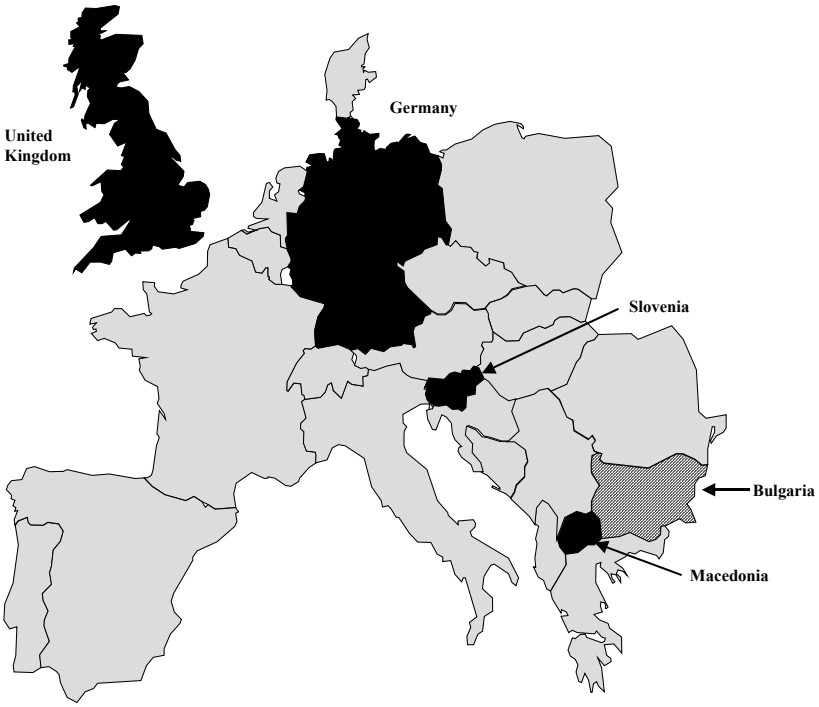
Important for the comparability of the country data within the research project was the definition of regional boundaries within which the survey on NFRE took place. It was agreed to choose two distinct regions in each country with different potential for NFRE. These two regions, a peri-urban and a rural sub-region, were selected according to the criteria outlined in Figure 1. One selection criteria for the peri-urban sub-regions was the NUTS 4 territorial level.[7]

[7] NUTS stands for Nomenclature of Territorial Units for Statistics. This is a five-level hierarchical classification with three regional and two local levels. NUTS 1 is the largest regional level. It is subdivided into a number of NUTS 2 regions and so on. Although the NUTS classification for regions has no official standing, it has been used in the European Community (EC) legislation since 1988. NUTS provides a single uniform breakdown of territorial units for the regional statistics and analysis of the EC. NUTS 5 is used for at the local level, that is for rural municipalities (local communities) with a population density of less than 100 inhabitants per square kilometre. For comparison, in Germany, NUTS 5 corresponds to municipalities (*Gemeinden*), NUTS 4 does not exist, NUTS 3 refers

Variability at this level is important statistically. The peri-urban and rural region in Macedonia are Kumanovo and Gevgelija. In Slovenia, Gorenjska was selected as peri-urban and Pomurska as rural region.

The second regional tier related to less favoured and more favoured areas, within which the household sample was selected. This conceptual procedure ensured that the data could be compared across the two Balkan countries. In each sub-region, 30 households were interviewed, thus the number of interviews in each country totalled 120.

Map 1 Country survey partners



Note: The data from Bulgaria are not part of the analysis here for the above mentioned reasons, although it was part of the research project.

As discussed earlier, there is no common understanding and agreement of what NFRE comprises. Here, the term NFRE is used to mean any non-farm employment by a household located in a rural area, including urban jobs and remittances. In this sense, the types of households that were interviewed in each sub-region comprised (1) full-time farm households, where all household members worked on the farm, (2) part-time farmers with off-farm wage-employment, where at least one household member worked in a wage job, (3) part-time farmers with self-employment activities, where at

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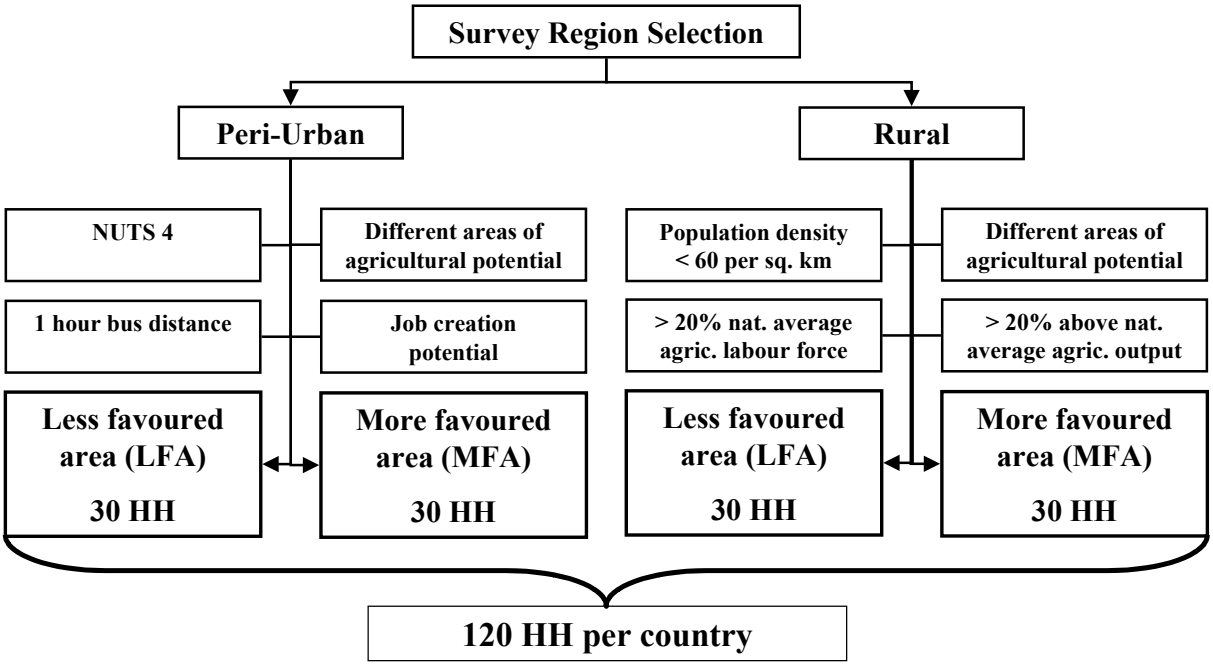
to the county or district level (*Kreise*), NUTS 2 refers to *Regierungsbezirke*, and NUTS 1 to the state level (*Bundesländer*).

least one household member had started an own business, and (4) rural households that had fully abandoned farming. The last type of household must have been engaged in farming before taking up full-time non-farm activities.

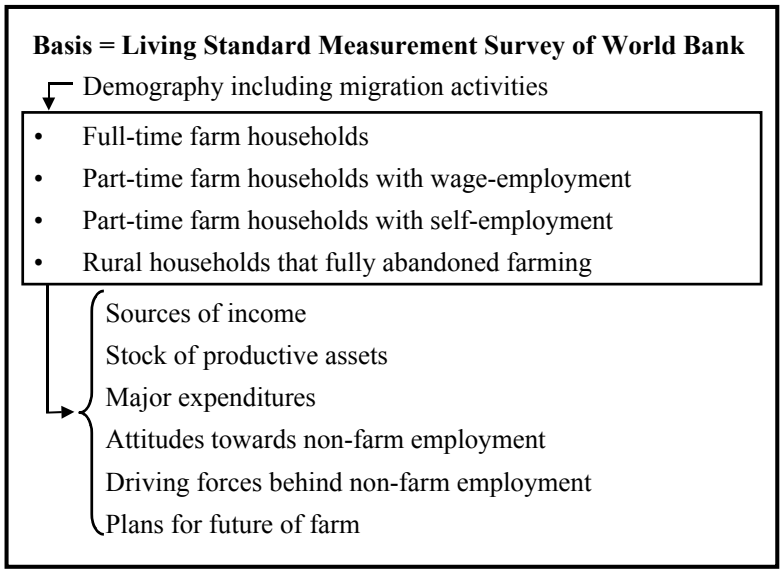
Figure 1 Selection of regions in the case country for survey work



Accordingly, the questionnaire was designed to match these four types of rural households and employment structures. The basis for the comprehensive questionnaire was the questionnaire used by the World Bank for its Living Standard Measurement Surveys (LSMS). While this questionnaire does not distinguish between different types of households but rather aims to collect all relevant income and expenditure data, one focus of this research was precisely to make a distinction between different income creating strategies to secure the rural livelihood. Therefore, the questionnaire contained several customised sections to capture the above described types of rural households (Figure 2). The major issues in each section were sources of income, driving forces for income diversification, attitudes towards NFRE and plans for the future of farming activities. The conceptional work for the questionnaire was done at the University of Hohenheim, but the questionnaire went through several stages of revision to ensure the incorporation of the feedback from all partners. The questionnaire was finalised in September 2001 during a workshop at the University of Ljubljana. Prior to the workshop, it had been tested in the field. Thereafter, the training of the enumerators in Slovenia started. In October 2001, a visit to Macedonia was undertaken to train the trainers for the enumerators in the application of the questionnaire.

While the Balkan partners were collecting the primary data, the data entry mask in ACCESS was designed and tested at the University of Hohenheim. The ACCESS data mask followed closely the questionnaire and restricted the possible entries to plausible entry options according to the questionnaire coding. Data entry started in January 2002 after the data entry mask had been tested by the Slovenian partners. Suggestions for correction and improvement were incorporated. Data entry took place in the countries in January and February 2002 as well as the first explorative data analyses.

Figure 2 Concept of questionnaire design



Since March 2002, the aggregation of the data, particularly the estimation of total income (consisting of farm, wage income, and income from self-employment) was the focus of the data aggregation. The types of explanatory variables to be used in the econometric analyses were jointly developed with all partners.

2.3 Econometric modeling of non-farm rural employment

First, important descriptive values of the explanatory model variables are presented for easier interpretation of the model results (see Appendix). Then, the models are estimated and interpreted. All the models presented here relate to households as basis of analysis, not to individual household members.

The multinomial logit regression model of discrete choice (Maddala 1987) is used to identify significant differences in underlying characteristics between households with and without non-farm opportunities; and between diversified and non-diversified enterprises and activities that have led to job creation opportunities and

those which have not (see Model 1). This approach will also consider the probability (or log-odds) of particular types of activity combinations of households and thus allow us to empirically identify and quantify the importance of the potential constraints for non-farm opportunities. Nevertheless, there exist exogenous variables which may push farmers out of agriculture but do not influence access to NFRE as such, i.e. lack of agricultural income pushes farmers to search for income elsewhere but has no effect on access to income elsewhere. Contrary to pull factors, the push factors influence the behaviour, but they do not affect access to NFRE.

Model 2 represents a binominal logit regression.[8] Here the dependent variable is binary in the sense that it has only two possible values. A value of one represents the occurrence of having abandoned farming for income creation and a value of zero represents the occurrence of having continued farming either full-time or part-time.

In the third model, a discriminant function analysis is carried out to determine which variables discriminate between the income quintiles in each case country.[9] The basic idea underlying discriminant function analysis is to determine whether groups (in this case income quintile groups) significantly differ from each other with regard to the mean of an explanatory variable, and then use that variable to predict group membership. Computationally, discriminant analysis is very similar to the one-way analysis of variance (ANOVA). Clearly, if the means for a variable significantly vary in different groups, then this variable discriminates between the groups. The final significance test is the *F*-test. In the backward stepwise discriminant analysis, all explanatory variables are included in the model and then, at each step, the variable that contributes the least to the prediction of the group membership (that is quintile membership) is eliminated. Thus, as the result of a successful discriminant function analysis, those variables that contribute the most to the discrimination between groups are kept.

In the following, the potentially possible explanatory variables for the various models and the hypotheses behind the choice of the explanatory variables are presented. The list is narrowed to the statistically significant variables during the modelling:

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[8] In the binary logit regression model, the predicted values for the dependent variable will never be less than (or equal to) zero, or greater than (or equal to) one, regardless of the values of the independent variables.

[9] The income quintiles are calculated for each country individually.

VARIABLES FROM HOUSEHOLD SURVEY

Demographic variables	
Age-HHH	Age of household head - It is assumed that the age of the main decision maker in the household influences the type of activities, household members are engaged in. On the one hand, older household heads may be less flexible, on the other hand, they may have accumulated more equity, which they can make available to other household members as risk capital in new activities.
Squared age of HHH	Squared age of household head - Flexibility may decline with increasing age but not at a constant rate, the squared age of the household head indicates whether flexibility changes at a declining rate.
Highest level of education in HH	Better education is assumed to expand the choice within NFRE opportunities (Gordon 2000). It is hypothesised that the household member with the highest educational level can have a particular influence on joint household decisions, regardless of gender. The variable is defined as the logarithm of the discrete schooling variable, whereby 1 = primary school level or lower; 2 = vocational training level; 3 = secondary school level, and 4 = university level
Number of active HH members	Number of family members older than 15 and younger than 65. This indicator may be necessary to evaluate labour productivity in the different income creating sectors. It is likely that the direct labour productivity indicators below are not applicable because, e.g. households that have abandoned agriculture do not show a value for agricultural labour productivity. We have a true missing value there. This implies that in the regression analysis, the whole observation (household) would be neglected.
Gender ratio	Women in the age group of 16 and 64 years as share of total active household members - Depending on whether these active women are employed or not, it can push or pull the households in either direction.
Farm characteristics	
Farm size	Total cultivated area in ha - The farm size influences the decision to remain or to leave agriculture because of its decisive influence on income. Farmers with the possibility to cultivate larger land holdings may also have the possibility to diversify into higher paid NFRE sectors (Gordon 2000). For households, which abandoned farming in full, this indicator was given the value zero, if no other figure was reported.
Share of agricultural income	Income from agriculture (crop & and animal production) over total income (includes non-earned income such as pensions or child benefits etc.). Similarly to the farm size, the share of agricultural income in total income influences the employment decisions. Households that abandoned farming display a zero for this variable.

Non-farm characteristics

Share of non-farm income • from wage employment • from self-employment	Income from non-farm activities (self-employment or wage-employment) over total income. The share of non-farm income in total income influences the employment decisions. Households that do not engage in any off-farm activity display a zero for these variables.
Number of non-farm activities per household/per active household members	The number of non-farm activities per household/per active household member may give an indication of productivity.

Variables influencing the risk-bearing capability of the household

Gender & wage employment	If there is one or more women with wage employment then the variable=1, else=0. Empirical research in Armenia showed that a husband who has a wife with a wage-employment is more likely to start self-employment activities (Bezemer and Davis 2002). The hypothesis here is that households with active women who have access to wage-employment are more likely to start self-employment activities.
Share of unearned income in total income per household	The share of income from social transfers (remittances, child benefits, pensions etc.) is divided by total income in Euro. The share of unearned income in total income influences the employment decisions. Households that do not receive any unearned income display a zero for this variable.
Proxy for income level	Logarithm of income quintile, whereby quintile 5 has the highest income level. For each country, the income has been categorised in quintiles. This variable can go in both directions, meaning that a household in a low income quintile may be pushed to get engaged in NFRE and a household in a higher income quintile may be pulled into NFRE.
Mobility dummy	If any job-seeking active household member is willing to move in case this allows him/her to gain access to employment or a job-holder has a job in a distance of more than 20 km or the household has one or more migrants, this dummy = 1, else 0. Households with more mobile active members are assumed to be more likely to have access to NFRE.
Equity capital tertile	Equity capital tertile (corresponds to enterprise assets). For each country, the value of enterprise assets has been categorised in tertiles. Enterprises, farm or non-farm, that are located in a higher equity tertile are assumed to be better established in the market than otherwise. Nevertheless, in the area of orchards and vineyards, labour intensive and capital extensive profitable enterprises may be possible too.

Attitudes towards farm & non-farm employment

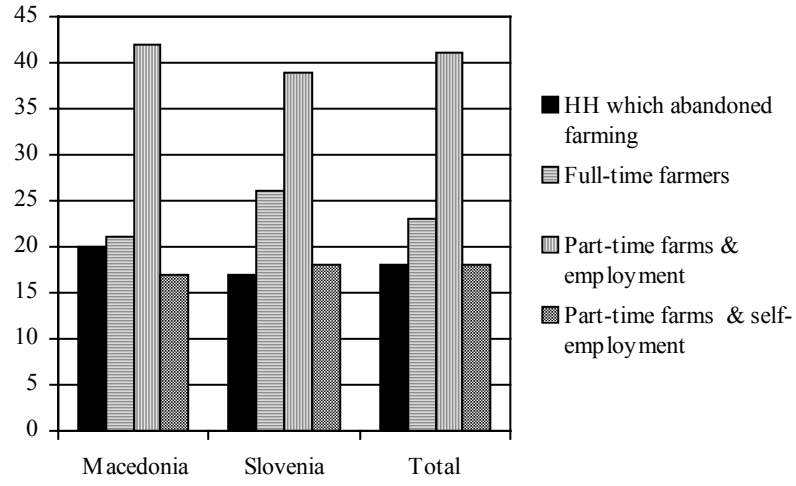
Prestige dummy	The dummy = 1 if the household associates increased prestige with NFRE, else 0. It is assumed that household members who associate higher prestige with NFRE will more actively try to work off-farm than otherwise.

Positive attitude of the operator towards • agriculture • wage-employment • self-employment • migration	The attitudes of the household head are hypothesised to be decisive for his/her own decision of employment and the household members decisions. A dummy variable indicates, whether a household head has a positive attitude towards a type of employment (dummy = 1) or not (dummy = 0). Three different types of employment were assessed in regard to the attitude towards them: wage-employment, self-employment, agricultural work and migration activities..
Future of the farm dummy	The dummy = 1, if answer to the question whether farm will be maintained in the future was positive, else 0. If the household head anticipates to continue farming in the future, either full-or part-time, then the trend towards NFRE is less than otherwise.
INFRASTRUCTURE VARIABLE	
Remoteness	This variable gives the average distance in kilometres for rural households to the most important hard infrastructure units: retail shop, post office, primary and secondary school, hospital and bank. The more developed the overall hard infrastructure the better the conditions for the rural economy, not only for agriculture but also for non-farm activities.

3 Household characteristics

The sample of 240 rural households (Figure 3) is dominated by part-time farm household in which at least one household member follows some type of dependent employment (41%). Second are full-time farm households (23%). The rural households, which abandoned farming as an income creating activity totally and rural households with some form of self-employment activity are both contributing 18% to the households.

Figure 3 Type of households in the sample, in percent



Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: In each country 120 households were part of the survey in the fall of 2001.

Although, the Slovenian sample has slightly more households that rely fully on agriculture as income source than Macedonia, the sample structure is quite homogenous. Particular characteristics of the sample are that in Slovenia the full-time farms were selected on the basis of their future viability while in Macedonia the full-time farms were randomly selected.

3.1 Demographic characteristics

The contents of Table 2 and Figure 4 refer to the highest level of education, which a member in a given household had achieved. In this sense, the figure in the sixth column of the first line for Macedonia can be interpreted such that in 18.3% of the sample, the elementary school degree was the highest level of education achieved.

In both countries, the educational standard is very high. In Macedonia and Slovenia, 65% and 61% of the households, respectively, had at least one household member with a secondary school or even university degree. Vocational training is most pronounced in Slovenia. There, almost 27% of the households had one or several members with vocational training. Part-time farm households with self-employment activities displayed the largest share of vocational training.

Table 3 looks at the highest educational level among female household members in the case countries. It is obvious that their educational background is not as strong as the one of the male household members. Between twice and three times more women than men stop their formal education at primary school level. Similar results, although not as striking, emerge for the other educational levels. Obviously, formal education for girls and women still lacks behind that of men in rural areas.

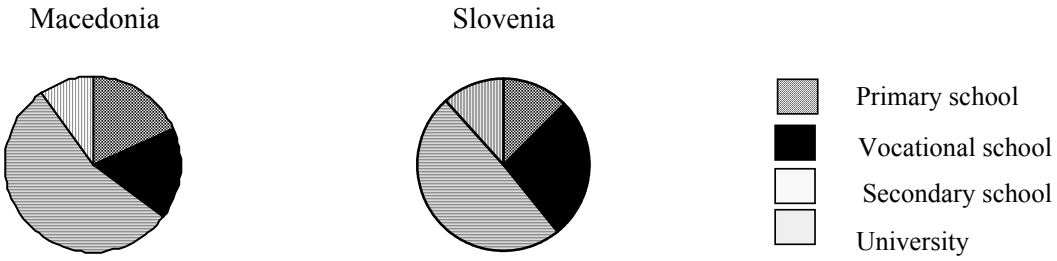
The average family size across the two countries is 4.5 (StD = 1.7). Slovenia's average is slightly above and Macedonia's slightly below the average. The dependency ratio in Slovenia is higher, too (Table 4). In Slovenia, one active household member (16-65 years of age) has to support 0.69 dependent household members (< 16 years & > 65 years), in Macedonia the ratio is 0.55. It is also interesting to note that the part-time farms with wage or self-employment activities, that is diversified farm households, have to support on average larger families then full-time farms or rural households, which abandoned farming. Not only are the families larger, the dependency ratio is larger too, implying that these households do not have more active households members capable of working but more dependent members to support financially. This is true in both countries. It could already be an indication that the reason for diversifying is rather a distress-push than a demand-pull reason.

Table 2 Highest level of education, all household members, in percent of households

	Abandoned farming	Full-time farming	Part-time farming & wage-income	Part-time farming & self-employment	Total
Macedonia (N=120)	(N=24)	(N=25)	(N=51)	(N=20)	
Elementary school and lower	25.0	20.0	17.6	10.0	18.3
Vocational and professional studies	20.8	24.0	15.7	5.0	16.7
Secondary education	45.8	40.0	56.9	80.0	55.0
University studies	8.3	16.0	9.8	5.0	10.0
Slovenia (N=120)	(N=20)	(N=31)	(N=47)	(N=22)	
Elementary school and lower	5.0	29.0	10.6	0.0	12.5
Vocational and professional studies	15.0	29.0	25.5	36.4	26.7
Secondary education	55.0	32.3	51.1	63.6	49.2
University studies	25.0	9.7	12.8	0.0	11.7

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Figure 4 Highest level of education, in percent of households



Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.
Note: The figures reflect the right-hand column of Table 2.

Table 3 Highest level of education, only female household members, in percent of households

	Abandoned farming	Full-time farming	Part-time farming & wage-income	Part-time farming & self-employment	Total
Macedonia (N=110)	(N=21)	(N=22)	(N=49)	(N=18)	
Elementary school and lower	52.4	36.4	24.5	16.7	42.0
Vocational and professional studies	9.5	9.1	30.6	27.8	8.9
Secondary education	28.6	50.0	24.7	44.4	47.3
University studies	9.5	4.5	10.2	11.1	1.8
Slovenia (N=112)	(N=18)	(N=26)	(N=46)	(N=22)	
Elementary school and lower	38.9	61.5	34.7	36.3	35.0
Vocational and professional studies	11.1	3.8	10.9	9.1	19.7
Secondary education	50.0	30.8	52.2	54.5	36.8
University studies	0.0	3.8	2.2	0.0	8.5

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The data base for this analysis counts 222 households.

Table 4 Household structure

	Abandoned farming	Full-time farming	Part-time farming & wage-income	Part-time farming & self-employment	Total
Macedonia (N = 120)	(N=24)	(N=25)	(N=51)	(N=20)	
Average family size	4.2	4.0	4.5	4.8	4.4
Number of children < 16 years	1.8	2.0	1.8	1.8	1.8
Number of elderly > 64 years	1.3	1.4	1.5	1.5	1.4
Dependency ratio	0.51	0.47	0.58	0.63	0.55
Slovenia (N = 120)	(N=20)	(N=31)	(N=47)	(N=22)	
Average family size	3.9	4.0	5.0	5.7	4.7
Number of children < 16 years	2.0	1.8	2.0	2.1	2.0
Number of elderly > 64 years	1.1	1.5	1.2	1.6	1.3
Dependency ratio	0.65	0.60	0.73	0.76	0.69

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

3.2 Farm characteristics

This section gives an overview of the major farm assets. The average farm size varies substantially across the two case countries. It is significantly larger in Slovenia with 13.2 ha (Table 5). This figure may be larger than the national average because in Slovenia, financially viable farms were purposely selected into the sample. Another interesting aspect of the farms in Slovenia is their access to forest, on average a rural household owns more than 8 ha in addition to its farm land.

The family farms in Macedonia are much smaller than in Slovenia with about 2.9 ha (Table 5). In Slovenia, the mountainous structure of the landscape calls for livestock breeding, thus pastures (5.8 ha on average) dominate the farm structure. Particularly the full-time farms and part-time farms with wage employment display a land use structure with a high proportion of pasture in Slovenia.

Table 5 Farm characteristics, average cultivated area

	Full-time farming	Part-time farming & wage-income	Part-time farming & self-employment	Total
Macedonia (N=120)	(N=25)	(N=51)	(N=20)	
Farm size	2.91	2.76	3.13	2.88
- Arable land (ha)	2.34	2.29	2.70	2.39
- Pasture (ha)	0.29	0.20	0.23	0.23
- Orchards (ha)	0.28	0.27	0.20	0.26
Forest (ha)	…	…	…	…
Slovenia (N=120)	(N=31)	(N=47)	(N=22)	
Farm size	17.75	9.78	14.27	13.24
- Arable land (ha)	10.99	4.00	8.35	7.12
- Pasture (ha)	6.41	5.73	4.98	5.78
- Orchards (ha)	0.34	0.05	0.94	0.34
Forest (ha)	8.94	8.96	7.85	8.71

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: Although some of the rural households, categorised as abandoned farm households had still some arable land, this type of household is not presented here as the figures were negligible.

3.3 Sectors of employment and income structure

Annual per capita income in 2001 was 1,738 USD (1,941 Euro) and 9,416 USD (10,518 Euro) in Macedonia and Slovenia respectively (EBRD 2002). Assuming that there was no significant upward trend in the per capita income, one could divide the

average household income from Table 6 by the average household size to compare this value with the one reported by the EBRD (2002).

All income figures refer to net income.[10] The per capita income value of the Macedonian and Slovenian sample of rural households for 2001 are 1,408 Euro and 4,020 Euro, respectively. The empirically observed per capita income in Macedonia and Slovenia is 30% and 60% lower, respectively, than the average per capita income reported by EBRD (2002) for the year 2001. To some extent, this result can be explained by the fact that one of the regions selected in Slovenia (Pomurska region) is the least developed region in Slovenia. In addition, the World Bank (2000) estimated that the risk to become poor in a transition country is 50% larger in rural areas as compared to urban areas. Thus this result may not surprise too much.

Table 6 Households' income quintile boundaries in Euro, 2001

	Macedonia		Slovenia	
	Lower	Upper	Lower	Upper
Quintile 1	-1,853	1,846	968	9,135
Quintile 2	1,896	3,572	9,293	13,166
Quintile 3	3,578	5,228	13,255	17,001
Quintile 4	5,248	8,396	17,020	23,481
Quintile 5	8,640	23,956	23,659	75,295
Average	5,628		17,608	

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The lower and upper margin of each quintile is given in Euro.
The average family size in Macedonia = 4.4 and in Slovenia = 4.7.
Note that three households in Macedonia had a negative total income in 2001.

It should be pointed out that the first four quintiles for Macedonia (80% of the sample) have the same spread as the lowest income quintile for Slovenia (20% of the sample). Macedonia's fifth quintile is covering the same income spread as Slovenia's second to fourth quintile (60% of the sample). One can conclude from this observation that the 20% best-off rural households in Macedonia are comparable to the middle income households in Slovenia. Table 7 compares the income quintiles based on PPP-Euros. This comparison reveals that the incomes in Macedonia deviate less from the Slovenian incomes than previously assumed. In this estimation, the first 80% of the sample from Macedonia compare in income to the first 60% of Slovenia. The

[10] Agricultural income was estimated based on key production figures. All other income figures from wage- or self-employment, and unearned income refers to net income as stated by the interviewees. Thus, the income figures here represent a conservative approximation.

difference in the higher income quintiles too, is not so pronounced anymore. On average, the rural incomes in Macedonia reaches about two thirds of that in Slovenia.

Table 7 Households' income quintile boundaries in PPP-$, 2001

	Macedonia		Slovenia	
	Lower	Upper	Lower	Upper
Quintile 1	…	5,912	1,618	15,267
Quintile 2	6,070	11,438	15,531	22,003
Quintile 3	11,456	16,741	22,152	28,413
Quintile 4	16,806	26,887	28,444	39,242
Quintile 5	27,666	76,710	39,540	125,837
Average	18,022		29,428	

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The lower and upper margin of each quintile is given in purchasing power parity (PPP-$).
The average family size in Macedonia = 4.4 and in Slovenia = 4.7.
The PPP-conversion factors from local currency to international $ used for the calculation are 18.7 for Macedonia and 133.8 for Slovenia (World Bank 2003).

Table 8 reveals that there exists a statistical correlation (at the 5% level) between a household with at least one woman in wage employment and its income quintile (Pearson Chi-Square = 10.249, df = 4). Interestingly, in the higher three income quintiles, there were several cases where more than one women worked in a wage job.[11] The value of the ordinal symmetric measures was positive but very low, indicating that the relationship between the two variables is positive (the higher the income quintile the more likely a women with wage employment) but very weak. This is further supported by the fact that the measures were not significant. The statistical association between the occurrence of wage employment in general and the household's income quintile presented in Table 9 is also significant at the 1% level (Pearson Chi-Square = 13.108, df = 4). As for the case of households with women in wage employment, the value of the ordinal symmetric measures was positive but very low, indicating that the relationship between the two variables is positive (the higher the income quintile the more likely a women with wage employment) but very weak. This is further supported by the fact that the ordinal symmetric measures were not

[11] The Chi-square measures test the hypothesis that the row and column variables in a cross-tabulation are independent. While the Chi-square measures may indicate that there is a relationship between two variables, they do not indicate the strength or direction of the relationship. The so called ordinal symmetric measures, such as Kendall's tau-b, Kendall's tau-c and Gamma indicate the significance, strength and direction of the relationship between row and column variables in a cross-tabulation. Negative values of the ordinal symmetric measures indicate a negative and positive values a positive

significant. So far, it can be concluded that there exists a weak statistical relationship between higher income levels and the incidence of wage employment in rural households.

Table 8 Correlation between the household's income quintile and the existence of active women in the household with wage-employment

Categorical variable B (explanatory) ↓:	Categorical variable A (dependent) →: Income quintiles					
Active women with or without wage-employment	1	2	3	4	5	Total
HH with women in wage-employment	11	14	16	24	12	77
HH without women in wage-employment	37	34	32	24	36	162
Total	48	48	48	48	48	240

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The quintiles are calculated for each country separately on the basis of its real income distribution.

Table 9 Correlation between the household's income quintile and the occurrence of wage-employment in the household

Categorical variable B (explanatory) ↓:	Categorical variable A (dependent) →: Income quintiles					
Households with or without wage-employment	1	2	3	4	5	Total
Households with wage-employment	22	33	31	38	27	151
Households without wage-employment	26	15	17	10	21	89
Total	48	48	48	48	48	240

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The quintiles are calculated for each country separately on the basis of its real income distribution.

Based on the frequency results, presented in Table 10, the Chi-square analysis was calculated to determine whether there exists a correlation between a household with at least one active women employed in a wage job and the household's self-employment activities. At a level of significance of 0.01 for the Chi-square test for association, we can conclude that the wage-employment of active women and the self-employment of households are statistically associated in the sense that households with self-employment activities are less likely to have women in wage employment (Pearson Chi-Square = 7.991, df=1). This finding is supported by the highly significant ordinal symmetric measures. Nevertheless, the negative values, indicating the above described direction, of these measures are low, pointing to the fact that the relationship between the two variables is rather weak. Apparently, wage employment of women and self-

relationship. The lower the value of the test statistics the weaker the relationship between the two variables.

employment do not complement but substitute each other. This finding is contrary to the results from Armenia of Bezemer and Davis (2002).

The correlation between the incidence of wage employment in a rural household and its taking up of self-employment activities is also significant (Pearson Chi-square 10.859, df = 1, see Table 11). Overall, a household tends to refrain from the risky self-employment activity if the security of income from wage employment is given. The ordinal symmetric measures are significant, their values are negative and, as before, fairly low. Thus, the described relationship is significant but lacks strength.

Table 10 Correlation between a household with self-employment activities and the existence of active women in the household with wage-employment

Categorical variable B (explanatory) ↓:	Categorical variable A (dependent) →: Households with or without self-employment		
Active women with or without wage-employment	with self-employment	without self-employment	Total
Household with women in wage-employment	8	69	77
Household without women in wage-employment	43	120	163
Total	51	189	240

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Table 11 Correlation between a household with self-employment activities and the occurrences of wage-employment in the household

Categorical variable B (explanatory) ↓:	Categorical variable A (dependent) →: Households with or without self-employment		
Households with or without wage-employment	with self-employment	without self-employment	Total
Households with wage-employment	22	129	151
Households without wage-employment	29	60	89
Total	51	189	240

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

One objective of the study was to analyse whether diversification of employment contributes to income. This relationship is presented in Table 12. Figure 5 shows more clearly than Table 12 that the number of income creating activities among the household members between 16 and 65 years of age increases, on the one hand, with increasing income quintile, and on the other hand, from the poorer country Macedonia to the richer country Slovenia. This is a clear indication that income diversification into NFRE contributes to improved livelihood situations. Compared to the average number of income creating activities per active household member, the lowest quintile in Macedonia lies about 23% below and the highest quintile 28% above the average. The picture is similar in Slovenia, although not as pronounced. The second quintile in

Slovenia displays the lowest number of activities with 9% less than the average and the highest quintile 15% more activities than the country average. As will be seen below, the possible income creating activities in rural Slovenia are much more diversified than in Macedonia.

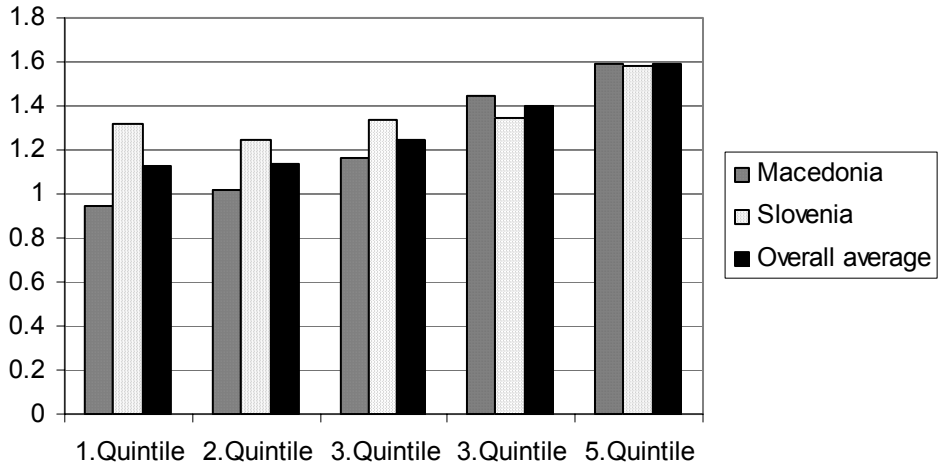
Table 12 Income levels in relation to average number of income creating activities per active household member

	Macedonia	Slovenia	Overall average
Quintile 1	0.95	1.32	1.13
Quintile 2	1.02	1.25	1.14
Quintile 3	1.16	1.34	1.25
Quintile 4	1.45	1.35	1.40
Quintile 5	1.59	1.58	1.59
Average	1.24	1.37	

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The quintiles are calculated for each country separately on the basis of its real income distribution.

Figure 5 Income levels in relation to average number of income creating activities per active household member



Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Table 13 shows a similar trend for the non-farm activities in the various income quintiles as Table 12 for the income creating activities in general. This relationship is further illustrated in Figure 6. The number of non-farm employment activities per active household member increases from the lowest to the highest income quintile. However, while Slovenian households on average have a greater number of overall income creating activities than Macedonia (see Table 12 and Figure 6 above),

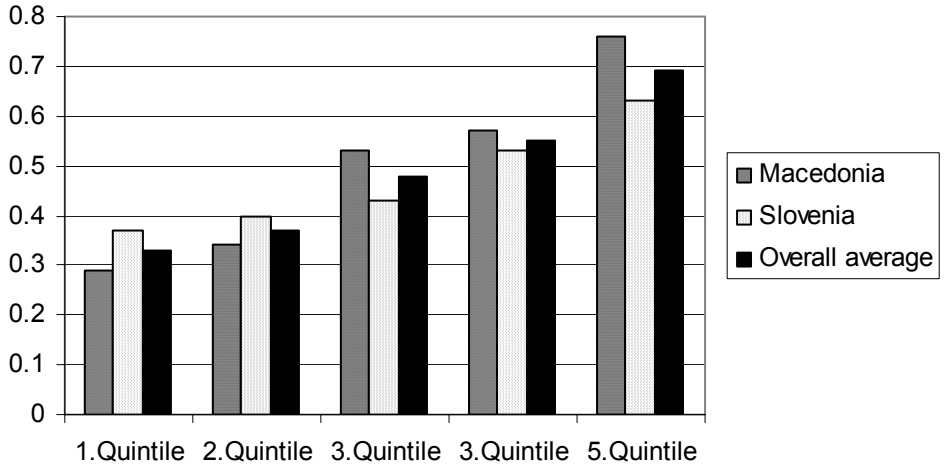
Macedonia leads the field as it concerns non-farm activities. Agriculture seems not to produce sufficient income for the needs of the Macedonian households and pushes more and more household members into non-farm activities. On average, Macedonia displays 0.50 non-farm activities per active household member and Slovenia 0.47.

Table 13 Income levels in relation to the average number of income creating *non-farm* activities per active household member

	Macedonia	Slovenia	Overall average
Quintile 1	0.29	0.37	0.33
Quintile 2	0.34	0.40	0.37
Quintile 3	0.53	0.43	0.48
Quintile 4	0.57	0.53	0.55
Quintile 5	0.76	0.63	0.69
Average	0.50	0.47	

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.
Note: The quintiles are calculated for each country separately on the basis of its real income distribution.

Figure 6 Income levels in relation to average number of income creating *non-farm* activities per active household member



Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.
Note: N=117 households.
The quintiles are calculated for each country separately on the basis of its real income distribution.

3.4 Income and wealth characteristics

Table 14 shows the major non-farm income creating activities in the case-countries. Three outcomes are striking. First, the trade sector is among the two most important sectors for non-farm employment. Second, the three most important activities in Macedonia account for 17.5% of all non-farm activities of the household members and in Slovenia for 12.3%. That is a large share of the activities in each country. Third, the array of activities appears to be more diverse in Slovenia than in Macedonia. It is also interesting to note that Slovenia is ahead as far as it concerns the total number of non-farm activities. Nevertheless, as has already been shown above (see Table 13 and Figure 6), an active household member in Macedonia undertakes, on average, more non-farm activities than a household member in Slovenia.

Table 14 Major non-farm income creating activities of active household members

	Macedonia		Slovenia	
Total number and percentage share of major activities	#	%	#	%
• Food industry/food processing	7	2.27	12	3.68
• Trade sector	**20**	**6.47**	**14**	**4.29**
• Restaurant, waiter, and alike	11	3.56	4	1.23
• Tailoring, embroidery, knitting	7	2.27	12	3.68
• Car repair	**12**	**3.88**	2	0.06
• Transport sector	**22**	**7.12**	7	2.15
• Tourism sector	1	0.03	**13**	**3.99**
• Construction sector, carpentry	8	2.59	**13**	**3.99**

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Notes: The total number of active household members (16-64) in the sample of Macedonia = 368 and Slovenia = 352.
Some active household members may be engaged in more than one non-farm activity
The most favoured activities may vary across the countries.

Table 15 gives an overview of the sources, share and amount of net income in the case countries. Among those households that have abandoned agriculture in Macedonia, wage dominates as income source (58% of total net income). In Slovenia too, wage income dominates but far more with almost 83% of the net income. Households which have abandoned farming also display a large dependency on unearned income, primarily old-age pensions. Not only in relative but also in absolute terms, unearned income is far more pronounced in Slovenia. This depicts the better institutional environment with a functioning pension system and the generally higher transfers to the elder population as compared to Macedonia. Farming seems to be an activity in

Slovenian households that officially abandoned farming to be cross-subsidised by income from other activities. This fact is represented in the negative signs of the contribution from agriculture to this type of household, that is the net expenses surmount the net revenues from this sector.

Table 15 Sources and amount of net income per household

	Abandoned farming		Full-time farming		Part-time farming & wage-income		Part-time farming & self-employment	
	Share (%)	Euro (∅)	Share (%)	Euro (∅)	Share (%)	Euro (∅)	Share (%)	Euro (∅)
Macedonia (N=120)	(N=24)		(N=25)		(N=51)		(N=20)	
Total	100.0	3,878	100.0	3,751	100.0	6,047	100.0	9,007
Farming	0.1	4	88.0	3,300	46.6	2,820	24.9	2,244
Wage-employment	49.4	1,916	2.5	93	44.6	2,697	10.1	914
Self-employment	38.0	1,474	0.0	0	0.0	0	52.4	4,727
Unearned income	12.5	484	9.5	358	8.7	529	12.5	1,123
Slovenia (N=120)	(N=20)		(N=31)		(N=47)		(N=22)	
Total	100.0	14,915	100.0	17,053	100.0	15,580	100.0	25,173
Farming	-4.5	-675	60.1	10,253	19.8	3,092	28.7	7,213
Wage-employment	72.7	10,837	4.6	779	50.0	7,783	12.0	3,013
Self-employment	2.0	295	2.9	493	4.1	633	43.3	10,890
Unearned income	29.9	4,459	32.4	5,527	26.1	4,072	16.1	4,058

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.
Non-earned income = Pensions, social security payments, child benefits etc.

Full-time farms earn the lion's share of their net income from farming (in Slovenia 60%, in Macedonia 88%). The remainder is largely unearned income (Table 15). It can be said that in all household types a relatively large share of the income is derived from transfer payments, mainly old-age pensions (in Macedonia 9-13%; in Slovenia 16-32%). Part-time farms with wage employment derive between 45% and 50% of their net income from wage jobs. While in Macedonia agriculture plays an important role to complement the income portfolio of part-time farms, unearned income takes over this role in Slovenia. The income from self-employment in households categorised as part-time farms with self-employment contributes with 52% in Macedonia and 43% in Slovenia to the total net income. Farm and wage income as

well as unearned income do play a crucial role in Slovenia for part-time farms with self-employment though. While the analysis of income shares in total household income is already giving valuable information as to the income structure and importance of individual sources, it is necessary to assess the contribution of the various income sources in different household types on a per capita income basis. This is done below.

Table 16 indicates the per capita incomes of different household types and income sources. Interestingly, in Slovenia, the full-time farms have the highest per capita income (4,511 Euro) as compared to the other household types in the country. This is different for Macedonia. There part-time farms with self-employment produce the highest per capita income (2,044 Euro) as compared to the other household types. Households that have abandoned farming together with part-time farmers who are engaged in self-employment in Slovenia can be considered as runner-ups to the per capita income of full-time farms (4,297 Euro and 4,417 Euro respectively). Part-time farms with wage employment with a per capita income of 3,393 Euro lack around 25% behind the leader of the group. In Macedonia, a clear picture arises. Households that have abandoned farming do worst with a per capita income of 1028 Euro. This figure is followed by full-time farms with an per capita income of 1,144 Euro (+11%) and part-time farms with wage employment (+43%). The per capita income of household members in part-time farms with self-employment is almost double than that of households that have abandoned farming. Households that have abandoned farming seem to be quite diversified in Macedonia, thus it is puzzling that their per capita incomes are so low. The relative contribution of wage and self-employment income is substantial, but apparently the jobs are at the low end of remuneration as the family size of this household type is smaller than of part-time farms. This corresponds to the fact that this group of households is influenced by a relatively high occurrence of pensioners. The high per capita income of full-time farms in Slovenia seems also to be related somewhat to family size, as it is relatively small in this type of household. Moreover, the subsidisation of agriculture is relatively pronounced in Slovenia (and negligible in Macedonia). Subsidies contribute between 21% and 33% to farm income per household (see Table 17). Somewhat surprisingly, the subsidisation level is highest for part-time farms with more than 30%.

Table 16 Sources and amount of net income per capita

	Abandoned farming		Full-time farming		Part-time farming & wage-income		Part-time farming & self-employment	
	Share (%)	Euro (∅)	Share (%)	Euro (∅)	Share (%)	Euro (∅)	Share (%)	Euro (∅)
Macedonia (N=120)	(N=24)		(N=25)		(N=51)		(N=20)	
Farming	0.2	2	87.0	995	45.9	674	26.3	537
Wage-employment	48.5	498	2.7	31	45.8	672	9.1	185
Self-employment	36.7	378	0.0	0	0.0	0	52.6	1,076
Non-earned income	14.6	150	10.3	118	8.3	122	12.0	246
Per capita income		1028		1,144		1,468		2,044
Slovenia (N=120)	(N=20)		(N=31)		(N=47)		(N=22)	
Farming	-4.1	-176	63.2	2,849	19.5	663	26.3	1,163
Wage-employment	67.1	2,881	4.1	183	51.7	1,754	13.9	614
Self-employment	1.7	74	5.5	247	3.6	122	44.2	1,951
Non-earned income	35.3	1,518	27.3	1,232	25.2	854	15.6	689
Per capita income		4,297		4,511		3,393		4,417

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Notes: Total number of persons in the survey per country: Macedonia=529 and Slovenia=561.
Non-earned income = Pensions, social security payments, child benefits etc.

Table 17 Farm income per household and shares of agricultural subsidization

	Abandoned farming	Full-time farming	Part-time farming & wage-income	Part-time farming & self-employment
Macedonia (N=120)	(N=24)	(N=25)	(N=51)	(N=20)
Farm income in Euro	-4	3,300	2,820	2,244
Share of agricultural subsidies in percent	0.0	0.0045	0.0063	0.0022
Slovenia (N=120)	(N=20)	(N=31)	(N=47)	(N=22)
Farm income in Euro	-675	10,253	3,092	7,213
Share of agricultural subsidies in percent	…	21.0	33.4	32.3

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

3.5 Poverty analysis of household types

According to an estimate of the World Bank (2000), around 20% of the transition countries' total population live in absolute poverty, i.e. they have to survive on less than 2.15 USD (in 1996 purchasing power parity) per capita per day. However, the share of the population living in absolute poverty varies in the individual countries. Based on the above indicator, the incidence of poverty in Macedonia is 6.7%, and in Slovenia zero. Poverty levels are highest in Central Asia and the Caucasus, the incidence of poverty in Russia approaches 20%. Nevertheless, this international poverty line tells little about the level of resources that individuals in a particular country need to live in dignity. For this reason, countries establish their own national poverty lines.

The relative poverty risk index[12] is generally higher in rural areas than in urban areas. With few exceptions, the risk that a rural household in Central Europe and the Baltic in particular becomes poor is 50% higher for a rural household than for the population as a whole. The relative poverty risk of the rural population in Macedonia is 1.3 (World Bank 2000). This implies that the rural population has a 25-30% higher poverty risk than the population as a whole. Alongside the sometimes drastic slump in output during the first years of transition, the increasingly unequal distribution of a shrunken national income has caused a rapid widespread increase in poverty. While in Central Europe the Gini index[13] has increased relatively little, the situation in South Eastern Europe has been grave as Table 18 also indicates for the case countries.

Table 18 Income inequality during transition, by case country, selected years

	Gini coefficient for income per capita		
	1987-90	1993-94	1996-99
Macedonia	na	na	0.37
Slovenia	0.22	0.29	0.25

Source: World Bank (2000: 140)

Table 19 gives an overview of poverty related explanatory variables. The share of agricultural income increases from the lowest to the highest quintile in Macedonia and Slovenia. Nevertheless, the relative share of agricultural income in total income, particularly in higher income quintiles, is lower for Slovenia as compared to Macedonia.

The share of unearned income is largest in the lowest income quintile (in both countries) and decreases towards the highest income quintile. As old-age pensions are a major component in unearned income, it appears that the lower income quintiles are particularly affected by 'old age poverty'. This would also explain the surpassing level of education which is not used adequately (any more) for the income generation.

It strikes that more household heads in Slovenia have a positive attitude towards agriculture than in Macedonia. Especially the higher income quintiles esteemed

[12] Relative poverty lines define poverty relative to national living standards and are usually set as a fixed percentage of median or mean equivalent household income, A relative poverty index of rural areas greater one implies that the incidence of poverty among rural households is greater than among urban (World Bank 2000).

[13] The Gini index of income is a measure of the degree to which income among a population is unequally distributed. The Gini coefficient ranges from 0 to 100. If the income is perfectly even distributed, the Gini coefficient is 0.

agriculture a lot in Slovenia, which is shown by the large share of positive answers on attitude towards farming (50% to 63% of the respondents were positive towards agriculture). The attitude towards agriculture is on average less positive and not as clearly structured in Macedonia. While the second, third and the fifth income quintile are comparable positive towards agriculture as the same quintiles in Slovenia, the other two quintiles have a higher share of negative attitudes. The reasoning behind this finding are not yet clear.

Table 19 Summary statistics of poverty related explanatory variables

	Income quintiles					
	1	2	3	4	5	Average
Macedonia						
Average income per household in Euro	946	2,571	4,378	6,708	13,563	5,628
Household income in % of total						
- Agriculture	-6.2	14.9	30.5	48.2	47.4	40.2
- Wage	59.8	62.0	51.2	28.8	16.1	30.2
- Self-employment	15.8	4.2	7.6	17.7	26.8	19.2
- Non-earned	30.6	18.9	10.8	5.3	9.7	10.4
Dependency ratio	0.76	0.55	0.56	0.49	0.41	0.55
Education level of household head (%):						
- Grammar school or lower	66.8	62.2	54.2	33.3	50.0	53.5
- Vocational school	12.5	4.2	25.0	20.8	25.0	17.5
- Secondary school or higher	20.8	33.3	20.8	45.8	25	29.2
Positive attitude of HH heads towards agriculture (% of respondents)	16.7	29.2	45.8	20.8	50.2	32.5
Slovenia						
Average income per household in Euro	6,089	11,353	14,951	19,630	36,019	17,608
Household income in % of total						
- Agriculture	-0.8	12.4	24.4	27.6	41.4	28.8
- Wage	44.4	43.4	37.1	47.6	15.3	31.8
- Self-employment	13.0	5.5	6.2	8.4	22.5	13.7
- Non-earned	43.4	38.7	32.3	16.4	20.8	25.6
Dependency ratio	0.50	0.39	0.92	0.80	0.85	0.69
Education level of household head (%):						
- Grammar school or lower	54.2	50.0	50.0	37.5	33.3	45.0
- Vocational school	29.2	45.8	33.3	25.0	37.5	34.2
- Secondary school or higher	16.7	4.2	16.7	37.5	29.7	20.8
Positive attitude of HH heads towards agriculture (% of respondents)	54.2	20.8	54.2	50.0	62.5	48.3

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Notes: Income quintile 1 = quintile with lowest income etc., HH = household.

4 Econometric modeling of non-farm rural employment

Section 4 presents the econometric part of the analysis of employment diversification. The descriptive values of the explanatory model variables are presented for easier interpretation of the model results in the Appendix. The models described in Section 2.2 are estimated and interpreted below.

4.1 Multinomial logit analysis

It is not uncommon that a dependent variable has more than two possible categorical values. In this case the multinomial logit analysis allows to estimate a model that describes the relationship between the independent variables to the categorical dependent variable. The multinomial logit analysis is thus a logit analysis in nature but more general because it permits that the dependent variable has more than two categories. Here the dependent variable is the household category from 1 to 4 observed in the sample:

Multinomial logit analysis { **1 -** HH, which abandoned farming; **2 -** Full-time farm HH; **3 -** HH with wage-employment; **4 -** HH with self-employment } = **f (explanatory variables)**

The multinomial logit analysis uses a Maximum-Likelihood-Algorithm to estimate the parameters of the predictor variables. The coefficients for the independent variables are presented in Table 21. A negative logit coefficient can be interpreted such that when the independent variable increases by one unit, the odds that the dependent variable refers to the reference category (here group 4 'part-time farmers with self-employment) increases by the odds ratio (that is the exponential function, $e^{\text{logit coefficient}}$). The classification table (Table 20) relates the observed to the predicted group membership, in this case employment category of household.

The fit of the model is good. Chi-square is significant at the 1% level, and more importantly, the Nagelkerke-pseudo-R^2 indicates that 62% of the variance among the groups with the ten variables included can be explained by the model (Table 20). Correlation and covariance matrixes were estimated in the process of selecting the explanatory variables in the model. The model predicted 63% of the observations correctly (Table 20). However, the classification of two out of the four categories is not overly satisfactory, these are the full-time farm households and the rural households with self-employment activities. For these two groups the model predicts only between 38% and 55% of the observations correctly. Of the 240 observations, 236 were included in the multinomial logit regression.

The demographic variables reveal two interesting details. First, the share of women in the active household members in part-time farm households with self-employment activities seems to be relatively low. Second, they display a rather large number of (predominantly male) active households members. Both coefficients are significant. An additional active household member reduces the odds to belong to the household group one instead of four by about 45%, for household group two the odds are reduced by 50% and household group three by 15%. This is a strong indication for the fact that a greater number of active household members strengthens the trend to go into self-employment activities. One reason could be that labour demand can be satisfied more easily with well known household members before employing non-family labour and getting involved with formal employment regulations.

The farm size has nearly no predictive power on the choice of farm activity types. Nevertheless, the farm land coefficient is highly significant for the response category 'households that have abandoned farming'. Rural households that have abandoned farming tend to have less farm land. Since the sale and lease markets for land are not yet fully developed, neither in Slovenia nor in Macedonia, this result seems to indicate that *distress-push* reasons were causal for this type of household to abandon farming.

Table 20 Classification of correctly predicted employment categories

	Predicted				Percent correct
Observed	1	2	3	4	
1 = household which abandoned farming	34	0	10	0	77.3
2 = full-time farm household	3	32	17	4	57.1
3 = household with wage-employment	7	14	71	6	72.4
4 = household with self-employment	4	6	16	16	38.1
Overall percent correct predicted	20.0	21.7	47.5	10.8	**63.8**

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The categories of the dependent variable are: 1 = household which abandoned farming; 2 = full-time farm household; 3 = household with wage-employment; and 4 = household with self-employment.

The variables indicating the risk bearing capacity looked at equity and income. A low equity stock points rather to households which have abandoned agriculture. Households with part-time farming belong rather to the better-off income groups. Part-time farming appears to be the most effective strategy to create an income that maintains the livelihood on an acceptable level. However, this seems not true for full-time farm households in Slovenia as mentioned earlier.

Table 21 Multinominal logit estimation of employment categories, both countries

	Reference category = Part-time farm HH with self-employment						Reference category = Part-time farm HH with wage employment	
	Abandoned farming		Full-time farm households		Part-time farm HH with wage employment		Part-time farm HH with self-employment	
	Logit coefficient	Odds-ratio	Logit coefficient	Odds-ratio	Logit coefficient	Odds-ratio	Logit coefficient	Odds-ratio
Demographic variables								
Gender Ratio	0.46***	1.047	0.029***	1.029	0.019(*)	1.019	-0.019(*)	0.981
Number of active household members	-0.603***	0.547	-0.696****	0.498	-0.164	0.848	0.164	1.179
Farm characteristics								
Farm size in ha	-0.954****	0.385	0.045*	1.046	-0.045(*)	0.956	0.045(*)	1.046
Risk bearing capacity								
Logarithm of equity capital tertile								
• Lowest tertile	1.995***	7.351	-1.163*	0.313	-0.148	0.862	0.148	1.160
• Medium tertile	0.082	1.085	-0.449	0.639	0.340	1.405	-0.340	0.712
Logarithm of income quintile								
• Lowest quintile	-0.397(*)	0.672	2.566****	13.008	0.142	1.153	-0.142	0.867
• Second quintile	1.155	3.174	1.985***	7.280	1.608***	4.992	-1.608***	0.200
• Third quintile	0.897	2.451	1.639***	5.148	1.209**	3.351	-1.209*	0.298
• Forth quintile	0.083	1.086	0.534	1.705	0.696	2.005	-0.696	0.499
Attitudes towards NFRE								
Operator's attitude towards agriculture	-1.558*	0.211	0.518	1.679	-0.006	1.006	0.006	0.994
Operator's attitude towards wage employment	0.841	2.319	-0.094	0.910	1.056***	2.874	-1.056***	0.348
Operator's attitude towards self employment	-0.994(*)	0.370	-0.693(*)	0.500	-0.996***	0.369	0.996***	2.706
Intercept	0.864		-0.073		0.044		-0.044	
-2 Log-Likelihood	427.963							
Chi-Square	206.278****							
Nagelkerke pseudo R^2	0.621							
Observations in model	236							

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.
Significance at the (*) 15, * 10, ** 5 and *** 1% level

Surprisingly, the attitude towards agriculture was only relevant and significant among those rural households, which had abandoned agriculture already. If the attitude towards farming is positive the odds are reduced by 79% that the household falls into the first category, which has abandoned farming altogether. The variable 'attitude towards wage-employment' was significant and displayed a high odds-ratio for the gropus of part-time farmers. If the attitude towards wage employment is positive, the odds to be part of the third group of household types (instead of being part of the reference group, which is the group representing part-time farming with self-employment) increases by 2.9. As expected, the positive attitude towards self-employment was significant for the group 'part-time farm households with self-employment'. If the attitude is positive the odds to belong to this group of households increases by 2.7 according to the odds-ratio.

A preliminary conclusion of these results could be that non-farm employment can contribute to increase rural income levels, particularly among the part-time farm households. Furthermore, the family structure is crucial for realising the opportunity of working outside agriculture. Also, the attitudes towards farming and non-farm employment play a significant role for the decision to remain in agriculture, abandon agriculture, or expand the array of income creating activities.

4.2 Binominal logit analysis

In the binominal logit analysis the dependent (response) variable is binary in nature. The logit model describes the relationship between the explanatory variables to the binary dependent variable:

Binominal logit analysis { **1** = Rural households that abandoned agriculture; **0** = Otherwise } **= f (explanatory variables)**

The rural households coded with zero regarding the dependent variable include not only full-time but also part-time farms. Positive regression coefficients indicate that the probability of belonging to the group of rural households that have abandoned farming increases with increasing observed parameter. This is important to keep in mind when interpreting the model results.

In the list of explanatory variables, variables related to farming were excluded since they are not relevant to rural households which abandoned farming. Furthermore, variables relating to non-farm income were not included in the model. The chosen binominal model used the Wald-backward selection process, keeping only "important" variables in the model. Due to the important country differences, this procedure was

applied for the sample of both countries as well as for each case country individually. The "important" variables in these modes are presented in Table 22. Table 23 depicts the correctly estimated observations for the three models. Depending on the model, the prediction accuracy varies between 86% and 92%. The binominal model for both countries had the lowest accuracy in predicting the observations correctly and the model for Slovenia was best. The Nagelkerke-pseudo R^2 amounts to 47% for the two-country model and a very good 63% for the Slovenian model (Table 22). The model for Macedonia performs the least, indicating that unobserved parameters are crucial for Macedonia. The Nagelkerke-pseudo R^2 can be interpreted such that the variables in the model explain what percentage of the model fit is explained by them.

The case-country model results show that Macedonia is in some aspects different from Slovenia, as was expected. Interestingly, the parameter that is derived from the person in the household with the highest formal education is significant only in Slovenia. In Slovenia, households that have abandoned farming are frequently in better paid wage-employment, therefore, education is a pull-force for this group of households which encourages households to give up agricultural activities.

Preliminary binominal regressions showed that the absolute number of non-farm employments had a negative sign for the reference group of rural households, which had abandoned agriculture (not presented here). Nevertheless, the relative figure, that is the number of non-farm activities per active household member carries a positive sign and is significant for all three models. This result can be interpreted such that rural households without agriculture have fewer members than other households but show a high degree of diversification per active household member. This finding supports the argument of Möllers and Heidhues (2003), namely that rural households with low incomes from agriculture are pushed into non-farm activities and, on average, have a stronger tendency to diversify than other households.

Two coefficients related to the risk bearing capacity came out as being significant. First, in Macedonia it is typical for rural households that have abandoned farming to have access to credits and to be indebted.

The variable 'low equity capital tertile' is significant for all three models, that is for the combined and the individual country models. The trend is consistent, namely that the probability to belong to the group of rural households that have abandoned farming increases for those households which fall into the low equity tertiles. Rural households with a greater productive capital stock are less prone to abandon farming. This is an intuitive result since the capital endowment influences productivity.

Table 22 Binominal logit estimation for households, which abandoned farming, Wald-backward selection process

	Parameter		
	Both countries	Macedonia	Slovenia
Demographic variables			
Logarithm of highest level of education in household	…	…	2.773**
Non-farm characteristics			
Number of non-farm activities per active household member	1.516**	2.165***	2.548**
Risk bearing capacity			
Lowest equity capital tertile	2.363***	2.186***	4.801***
Credit	…	2.357**	
Attitudes towards NFRE			
Operator's attitude towards agriculture (1 = positive)	-2.335***	-3.077***	…
Operator's attitude towards migration (1 = positive)	0.847*	…	…
Operator's attitude towards self-employment (1 = positive)	…	…	-1.434*
Infrastructure			
Remoteness	…	0.254**	
Intercept	-3.309***	-4.705**	-9.354***
-2 Log-Likelihood	156.573	80.206	52.028
Chi-Square	81.698***	39.890***	55.740***
Nagelkerke-pseudo R^2	0.471	0.447	0.628
Iterations	15	14	15
Total observations	239	120	119

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The categories of the dependent variable are: 1 = rural household abandoned agriculture; 0 otherwise (includes rural households with full-time and part-time farming).
Significance at the *10, **5 and ***1% level.
The variables included in the base model of the bi-nominal regression that turned out not to be significant were: (1) regional dummy variable, (2) age-HHH, (3) squared age of HHH, (4) gender ratio, (5) mobility dummy, (6) Dummy of women with wage employment, (7) attitude towards wage-employment, (8) public employment dummy, (9) prestige dummy, and (10) share of unearned income in total income

The attitude of the head of household towards farming is also significantly influencing the decision whether or not to abandon farming. If the attitude is positive, the probability to abandon decreases. This correlation is significant for the two-country model as well as the Macedonian model. Heads of rural households who had abandoned agriculture had a significantly positive attitude towards migration in the two-country model. In Slovenia, a positive attitude towards self-employment influences the decision to abandon agriculture negatively. This may be explained by the fact that self-employment is an ideal complement to farming activities for part-time farmers. The distance to markets and other important institutions depicted by the variable remoteness has a significant influence on Macedonian households.

Remoteness is positively correlated with the decision to abandon farming in Macedonia. This hints rather at distress-push factors and less favorable farming conditions (Table 22).

Table 23 Classification of correctly predicted abandoning of farming

Observed	Predicted 1	Predicted 0	Percent correct
		Both countries	
1 = rural household abandoned farming	25	19	56.8
0 = otherwise	14	181	92.8
Overall percent correct predicted			86.2
		Macedonia	
1 = rural household abandoned farming	12	12	50.0
0 = otherwise	4	92	95.8
Overall percent correct predicted			86.7
		Slovenia	
1 = rural household abandoned farming	15	5	75.0
0 = otherwise	5	94	94.9
Overall percent correct predicted			91.6

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: The categories of the dependent variable are: 1 = rural household abandoned agriculture; 0 otherwise (includes rural households with full-time and part-time farming).

4.3 Discriminant correlation analysis

Discriminant function analysis is used to determine which variables discriminate between two or more naturally occurring groups, here groups of household heads with different attitudes towards farm, wage, and self-employment:

Discriminant function analysis { **Attitudes towards …**; **1 -** positive attitude; **0 -** negative attitude } **= f (explanatory variables)**

Note: … = farming, wage-employment, and self-employment

Computationally, discriminant function analysis is very similar to analysis of variance (ANOVA), nevertheless, the basic idea underlying discriminant function analysis is to determine whether groups differ with regard to the mean of an explanatory variable, and then to use that variable to predict group membership. If the means for a variable are significantly different in different groups as indicated by multivariate F-tests, then we can say that this variable discriminates between groups. The standardised canonical discriminant function coefficients are used to compare the relative importance, or in

other words, the partial contribution of each independent variable to the discriminant function. Table 24 presents the standardised canonical coefficients for the discriminant analysis, their level of significance (based on the F-test) as well as the mean of the explanatory variable. Clearly, different explanatory variables explain the group differences for attitudes towards farming, wage, and self-employment. They are presented side by side in Table 24. For the explanation of the discriminatory effect of the coefficients, the sign (plus, minus) does not play a role, just the absolute value. Table 25 summarises the hit-ratios for the discriminant functions. The correctly predicted cases vary between 64% and 69%, which is a fairly good result.

The explanatory variables included in the discriminant function assessing the attitude towards farming determine a significantly high percentage of variance in the dependent variable as indicated by the Chi-square ratio. The same is true for the other two discriminant functions assessing mean differences in the group looking at attitudes towards wage and self-employment.

An obvious and important finding of the discriminant analysis of attitudes towards farming is that a positive attitude is related to larger farm sizes, a secure perspective for the farm in the future, and a lower level of equity. These three explanatory variables are among the four variables with the highest relative importance in classifying the dependent variable (attitude towards farming, 1= positive, 0 = otherwise). In line with the above findings, non-farm activities are more frequent in the group with a negative attitude towards farming (mean of total non-farm activities in household = 1.6) as compared to the group with a positive attitude (mean of total non-farm activities in household = 1.2). The fourth variable with a high relative importance in explaining farming attitude is the age of the head of the household as well as the squared age. On average, the group with a positive attitude towards farming is older than the group with a negative attitude. This positive attitude becomes more pronounced with increasing age in this group, which is indicated by the squared age variable.[14]

[14] Interestingly, the stepwise discriminant function, which removes explanatory variables if the F-value is smaller than 2.71, keeps three highly significant variables (squared age, farm size and future of the farm), results in a Chi-square of 49.218, and explains already 69.9% of the model.

Table 24 Discriminant function analysis for groups of household heads with different attitudes towards farm, wage, and self-employment

	Standardised canonical coefficients						Mean
	Farming	F-test	Wage	F-test	Self-empl.	F-test	
Demographic variables							
Age of household head in years	-0.178	***	…	…	-0.785	**	50.8
Squared age	0.609	***	…	…	1.262	**	2746.9
Gender ratio	-0.217	**	-0.203	**	…	…	45.3
Farm characteristics							
Farm size in ha	0.608	***	-0.330	*	-0.288	**	6.8
Share of farm income in total	-0.054	**	0.582	***	…	…	24.6
Non-farm characteristics							
Total non-farm activities in HH	-0.217	**	…	…	…	…	1.4
Share of wage income in total	-0.155	***	0.021	*	0.124	…	35.8
Share of self-employment income	…	…	0.455	**	…		12.6
Risk bearing capacity							
Share of unearned income in total	…	…	-0.257	***	…	…	24.3
Women with wage employment	0.071	*	-0.038	(*)	0.423	**	0.3
Equity dummy	-0.235	***	…	…	0.257	***	0.3
Mobility dummy	…	…	…	…	0.348	*	0.4
Attitudes towards employment							
Future of the farm dummy	0.245	***	…	…	…	…	0.7
Self-employment prestige dummy	…	…	0.305	***	-0.345	(*)	0.3
Infrastructure							
Remoteness	0.174	*	-0.291	***	…	…	6.4
Chi-square	57.101***		48.513***		21.126***		

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

Note: Significance at the (*) 15, *10, **5 and ***1% level. Observations in the model = 240.

The four most important variables for classifying the household heads' attitudes towards wage employment (based on the absolute value of the standardised coefficient) are the income share of farm and self-employment, and the perceived prestige from self-employment (in this order of importance). Moreover, households with a negative attitude towards wage employment can rely, on average, on higher incomes from self-employment than the other group. In line with this, their perception of the prestige associated with self-employment is higher, too. The farm size of the households with a negative attitude towards farming is, on average, larger than in the group with a positive attitude. However, the former show a significantly lower agricultural productivity (as indicated by the share of farm income in total income) than the latter. This could be one explanation for the negative attitude despite larger

land resources. This result can be explained as follows: a larger share of farm operators may be already in the retirement age but is still continuing farming. Another group may concentrate on non-farm self-employment despite a relatively large farm size, working the farm only for subsistence purposes.[15]

Table 25 Classification of correctly predicted attitudes

Observed	Predicted 1	Predicted 0	Percent correct
	Attitude towards farming		
1 = positive	67.7	32.3	67.7
0 = negative	30.6	69.4	69.4
Overall percent correct predicted			68.8
	Attitude towards wage employment		
1 = positive	69.5	30.5	69.5
0 = negative	32.1	67.9	67.9
Overall percent correct predicted			68.8
	Attitude towards self-employment		
1 = positive	64.1	35.90	64.1
0 = negative	35.8	64.2	64.2
Overall percent correct predicted			64.2

Source: Own calculation. Data from EC-PHARE ACE Project No. P98-1090-R.

The attitude towards self-employment activities is influenced by three risk bearing variables. This relatively large number proposes that the risk bearing capacity plays a superior role in the perception of self-employment activities. The four most important variables for classifying the household heads' attitudes towards self-employment (based on the absolute value of the standardised coefficient) are the age of the household head, the number of women with wage employment, the mobility dummy, and the prestige that is associated to self-employment. Age becomes more important with respect to the attitude towards self-employment the younger the household head is. This finding may also be related to the acceptable level of risk bearing. The original hypothesis was that households that have one or several women with wage employment are more inclined to take the risk of self-employment because potential expenses and temporary losses can be cross-subsidised with the wage income of the

[15] In the stepwise discriminant function analysis, four variables are retained (share of unearned income, prestige of self-employment, share of wage income, and size of farm). The Chi-square is 41.363 and these four variables result in 67.1% correctly predicted cases. It should be pointed out that the share of unearned income in the group with a positive attitude towards wage income is about three times as large as in the other group.

woman. The result of the discriminate function analysis suggests that the attitude towards self-employment is not related to the presence of women with wage employment. Just the contrary, households which display a positive attitude towards self-employment count on average fewer women with wage employment than the others. This could point to the fact that they have fewer income alternatives, particularly in the wage sector, and therefore, need to concentrate more on non-farm self-employment for income generation. The group that expresses a positive attitude towards self-employment appears to be less mobile and associate a significantly higher level of prestige with being self-employed. As the lack of mobility is concerned, self-employment may be the seen as the alternative to wage employment, as wage employment is often linked to daily travel or temporary migration.[16]

5 Conclusion

In the context of the EU enlargement, the socio-economic imbalances between individual regions in CEE have been recognised as one of the most intractable problems of transition. The development of a more diversified rural economy has been stated repeatedly as one way to reduce these imbalances and thus improve the socio-economic livelihood of the rural population. The potential characteristics and determining factors of NFRE for the development of the rural economy were analysed in two case countries: Macedonia and Slovenia.

The analysis is based on survey data comprising rural households employed full-time in agriculture and households which had diversified their employment or shifted away from the traditional agricultural sector as income source. NFRE was differentiated into wage- and self-employment. The sample was categorised in four groups: (1) full-time farm households, (2) part-time farm households with wage-employment or (3) self-employment and (4) rural households which had abandoned farming. The composition of this sample allowed to determine factors responsible for the group membership.

In both countries, Macedonia and Slovenia, a tendency of diversification into wage-employment is observable. Generally, families with a greater number of active household members and especially active men are more likely to start an own business. The three dominating non-farm activities in Macedonia are trade, car repair

[16] The stepwise classification function analysis keeps three variables (equity dummy, squared age of household head, and women with wage employment). These three variables produce a highly significant Chi-square of 14.913 and predict 62.5% of the cases correctly.

and transport (17% of mentioned activities). In Slovenia, the composition of non-farm activities was more diverse. Trade was among the top three activities followed by the tourism and construction sector (12 % of mentioned activities).

The decision to abandon farming activities is not only influenced by economic determinants, but also the attitude towards farming. Household heads who display a clear positive attitude are not likely to give up their farm completely. The results also showed that better education is less important for rural households who are facing *distress-push* situations. In *demand-pull* situations, higher education provides the opportunity to take up better paid wage employment in Slovenia.

The highest per capita incomes are reached by full-time farms in Slovenia and by part-time farms with self-employment in Macedonia. While the farm income is rather a function of the farm structure and size as well as of the labour productivity, the total income is clearly related to the number of non-farm activities in the household. The more non-farm activities per person are carried out, the higher the income level will be. This is a clear indication of the positive effect of NFRE on rural incomes in general. Yet, there is also evidence that diversification is often driven by *distress-push* reasons and that people turn to NFRE to complement insufficient farm income.

By way of summary, employment choices are characterised by personal, demographic and income related variables. In both countries dissatisfactory incomes from agriculture seem to force households to complement their livelihood by NFRE. The final choice and composition of activities is also influenced by the attitudes towards different types of activities.

Clearly, restructuring the agricultural sector in the Balkans will continue and thus more and more people will need to find employment in the non-farm sector. The non-farm sector has been shown to work as a safety net as it concerns income generation. Nevertheless, national and ideally European development strategies for the non-farm sector are needed to cope with the existing regional imbalances as it concerns income levels and the increasing employment pressure on this sector in the future.

References

Barrett, C., Reardon, T., and P. Webb. 2001. Non-farm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics and policy implications. *Food Policy* 26 (4): 315-332.

Bezemer, D., and J.R. Davis. 2002. The rural non-agricultural economy in transition countries: Findings from Armenia. Workshop on „Rural non-farm employment and development in transition economies“, March 6 - 7, 2002, Greenwich, UK: Natural Resources Institute.

Bryceson, D., and V. Jamal. 1997. *Farewell to farms: De-agrarianisation and employment in Africa*. Aldershot: Ashgate.

Clement, H. 2002. Slowenien. In *Osteuropa im Integrationsprozeß. Transformation und Wirtschaftslage in Ostmitteleuropa und der GUS 2001/02*. Bundesagentur für Außenwirtschaft (Hrsg.): 47-56. München, D: Osteuropa-Institut München.

Davis, J.R., and A. Gaburici (1999): The economic activity of private farms in Romania during transition. *Europe-Asia Studies* 51 (5): 843-869.

Davies, S. 1993. Are coping strategies a cop out? *IDS Bulletin* 24 (4): 60-72.

Davies, S. 1996. *Adaptable livelihoods: Coping with food insecurity in the Malian Sahel*. Basingstoke: Macmillan.

EBRD. 1999. *Transition report 1999. Ten years of transition*. London, UK: European Bank for Reconstruction and Development (EBRD).

EBRD. 2000. *Transition report 2000. Employment, skills, and transition*. London, UK: European Bank for Reconstruction and Development (EBRD).

EBRD. 2001. *Transition report 2001. Energy in transition.* London, UK: European Bank for Reconstruction and Development (EBRD).

EBRD. 2002. *Transition report update. Economic transition in Central and Eastern Europe, the Baltic states and the CIS*. London, UK: European Bank for Reconstruction and Development (EBRD).

European Commission (EC). 2003. Mitteilung der Kommission. Zweiter Zwischenbericht über die wirtschaftlichen und sozialen Zusammenhalt. Brüssel: Kommission der Europäischen Gemeinschaften (http://www.inforegio.org, accessed May 2003).

Gordon, A. 2000. Diversify in rural incomes: Issues affecting access at household levels. Paper presented at the workshop on "Non-farm rural development", May 15-17, 2000. Washington, DC, USA: World Bank, www.worldbank.org/research/ rural/workshop.htm, accessed April 10, 2002.

Greif, F. 1997. *Off-farm income sources and uses in transition economies*. Rome, I: Food and Agriculture Organisation (FAO).

Gruber, W. 2002. Mazedonien. In *Osteuropa im Integrationsprozess. Transformation und Wirtschaftslage in Ostmitteleuropa und der GUS 2001/02*. Bundesagentur für Außenwirtschaft (Hrsg.): 83-91. München, D: Osteuropa-Institut München.

Haarbeck, P. and S. Bogner 1997. Europäische Politik für die Entwicklung ländlicher Räume. Bonn, D: Agrarsektoranalyse (ASA).

Hart, G. 1998. Regional linkages in the era of liberalisation: A critique of the new agrarian optimism. *Development and Change* 29: 27-54.

Knüpfer, J., and G. Buchenrieder. 2001. Rural poverty alleviation trough non-farm income in transition economies. Research in Development Economics and Policy DP 3/2001, University of Hohenheim, Department of Agricultural Development Theory and Policy. Stuttgart, D: Grauer Publisher.

Kopeva, D., Doichinova, J., and S. Madjarova (2001): Rural development in Bulgaria – A brief outline. Sofia, BU: University of National and World Economy, Department of Agribusiness (Phare-Ace P98-1090-R).

Lanjouw, J.O., and P. Lanjouw. 1997. The rural non-farm sector: An update. Paper presented at the XXIII International Conference of Agricultural Economists (IAAE) on Food Security, Diversification and resource management: Refocusing the role of agriculture. August 10-16, 1997, Sacramento, USA.

Lanjouw P., and A. Shariff. 2001. Rural non-farm employment in India: Access, incomes and poverty impact. Paper presented at a workshop on "Rural transformation in India: The role of the non-farm sector". New Delhi: Institute of Human Development.

Maddala, G.S. 1987. *Limited dependence and qualitative variables in econometrics*. Econometric Society Monograph 3, CUP.

Möllers (neé Knüpfer), J. and F. Heidhues. 2003. *Diversification Decisions in the Rural Non-Farm Sector of Transition Economies: The Case of Slovenia and Macedonia.* Paper presented at the at the 25th International Conference of Agricultural Economists (IAAE) within the Mini-

Symposium „Poverty Impacts and Policy Options of Non-Farm Rural Employment“. August 2003, Durban, South Africa.
Pfluger, W. 2000. The rural non-farm Sector: Characteristics, importance, policies. Paper presented at the workshop on “Non-farm rural development”, May 15-17, 2000. Washington, DC, USA: World Bank, www.worldbank.org/research/ rural/workshop.htm, accessed April 10, 2002.
Reardon, T. 1997. Using evidence of household income diversification to inform study of the rural non-farm labour market in Africa. *World Developme*nt 25 (5): 735-748.
Reardon, T., Berdegue, J., and G. Escobar. 2001. Rural non-farm employment and incomes in Latin America: Overview and policy implications. *World Development* 29 (3): 395-409.
Schmitt, G. 1992. Unvollkommene Arbeitsmärkte, Opportunitätskosten der Familienarbeit und Betriebsgrößen. *Berichte über Landwirtschaft* 75 (1): 35-65.
Seddon, D., and B.P. Subedi. 2000. Labour markets and the poor. DFID Report. Norwich: Overseas Development Group & University of East Anglia.
Start, D. 2001. The rise and fall of the rural non-farm economy: Poverty impacts and policy options. *Development Policy Review* 19 (4): 491-505.
World Bank. 2000. *Making transition work for everyone: Poverty and inequality in Europe and Central Asia*. Washington, DC, USA: World Bank.
World Bank. 2003. World Development Indicators. Washington, DC, USA: World Bank (http://www.worldbank.org/data/wdi2003/index.htm (accessed May 2003).

Appendix

Table 26 Description of the explanatory model variables, Macedonia

	Mean	Min	Max	StDev
Demographic variables				
Age of household head	50.4	25.0	82.0	12.6
Squared age of household head	2694.0	625.0	6724.0	1323.8
Gender ratio	44.6	0.0	100.0	17.6
Education of active women	8.8	0.0	11.0	2.6
Education of active men	9.7	0.0	11.0	2.0
Highest level of education in household	2.6	0.0	4.0	0.9
Dependency ratio	0.6	0.0	4.0	0.7
Number of active household members	3.1	0.0	8.0	1.2
Farm characteristics				
Farm size	2.3	0.0	10.0	2.2
Share of agricultural income in total	29.6	-225.2	208.2	52.4
Non-farm characteristics				
Share of non-farm income in total	53.4	-108.2	170.7	44.1
Number of non-farm activities per household	1.5	0.0	7.0	1.2
Variables influencing the risk-bearing capacity				
Gender & wage employment	0.3	0.0	2.0	0.5
Share of unearned income in total	20.9	0.0	325.2	44.4
Household's income quintile	3.0	1.0	5.0	1.4
Mobility dummy	0.5	0.0	1.0	0.5
Equity capital tertile	2.0	1.0	3.0	0.8
Attitudes towards NFRE				
Operator's attitude towards agriculture	0.3	0.0	1.0	0.5
Operator's attitude towards wage-employment	0.4	0.0	1.0	0.5
Operator's attitude towards self-employment	0.4	0.0	1.0	0.5
Prestige dummy	0.4	0.0	1.0	0.5
Future of farm dummy	0.6	0.0	1.0	0.5
Community variables				
Remoteness	5.3	1.3	12.8	2.4

Source: EC-PHARE ACE Project No. P98-1090-R - EU Accession in the Balkans: Policy Options for Diversification in the Rural Economy.

Note: The farm size is depicted here for all households in the sample, including households which have abandoned farming and display a zero for this value.
In total, 3 Macedonian household had a negative total household income. The farm income of 33 households was negative. For these reasons, negative values appear in the minimum column of this table and figures greater than 100% in the maximum column.

Table 27 Description of the explanatory model variables, Slovenia

	Mean	Min	Max	StDev
Demographic variables				
Age of household head	51.2	23.0	84.0	13.6
Squared age of household head	2799.9	529.0	7056.0	1487.0
Gender ratio	46.0	0.0	100.0	20.0
Education of active women	10.11	0.0	17.0	2.6
Education of active men	10.2	0.0	17.0	2.4
Highest level of education in household	1.6	0.0	3.0	0.9
Dependency ratio	0.7	0.0	2.5	0.7
Number of active household members	4.3	1.0	14	2.1
Farm characteristics				
Farm size	11.3	0.0	67.1	10.5
Share of agricultural income in total	19.9	-132.5	100.0	43.4
Non-farm characteristics				
Share of non-farm income in total	48.7	0.0	210.2	39.0
Number of non-farm activities per household	1.4	0.0	10.0	1.4
Variables influencing the risk-bearing capacity				
Gender & wage employment	0.4	0.0	1.0	0.5
Share of unearned income in total	31.8	0.0	232.5	31.0
Household's income quintile	3.0	1.0	5.0	1.4
Mobility dummy	0.01	0.0	1.0	0.1
Equity capital tertile	2.0	1.0	3.0	0.8
Attitudes towards NFRE				
Operator's attitude towards agriculture	0.5	0.0	1.0	0.5
Operator's attitude towards wage-employment	0.5	0.0	1.0	0.5
Operator's attitude towards self-employment	0.7	0.0	1.0	0.4
Prestige dummy	0.1	0.0	1.0	0.3
Future of farm dummy	0.8	0.0	1.0	0.4
Community variables				
Remoteness	7.5	1.6	18.1	3.9

Source: EC-PHARE ACE Project No. P98-1090-R - EU Accession in the Balkans: Policy Options for Diversification in the Rural Economy.

Note: The farm size is depicted here for all households in the sample, including households which have abandoned farming and display a zero for this value.
The farm income of 38 households in Slovenia was negative, nevertheless, all household displayed a positive household figure. For these reasons, negative values appear in the minimum column of this table and figures greater than 100% in the maximum column.

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