



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Monica Tudor<sup>1</sup>, Borbala Balint<sup>2</sup>

<sup>1</sup> Institute of Agricultural Economics (IAE), Romanian Academy  
Calea 13 Septembrie 13, 050711, sector 5, Bucuresti, Romania  
monik\_sena@yahoo.com

<sup>2</sup> Center for Development Research (ZEF), University of Bonn  
babeszter@yahoo.com

## Regional disparities in off-farm employment and their impact on agricultural production and sales<sup>1</sup> – evidence from Romania

---

***Abstract:** During the transition towards a market economy in Romania most enterprises established at the time of industrialization and urbanization project of the communist period reduced or stopped their activity and many employees lost their jobs. A reverse migration from urban to rural areas took place, thus contributing to the increase in employment and underemployment in agriculture – the main occupation in the rural areas. The emerging farmers without necessary production factors, know-how and confronted with inadequate input and output markets decreased their agricultural sales and purchase of agricultural goods, while increasing self-consumption in the household. Given the interaction between unemployment, the increase of employment in agriculture and consequently in self-consumption in the households, the paper analyzes how the differences in the off-farm employment opportunities in the different regions impact agricultural commercialization.*

***Keywords:** off-farm employment, region, agricultural production*

---

### Agricultural production, sales and employment in Romania in transition

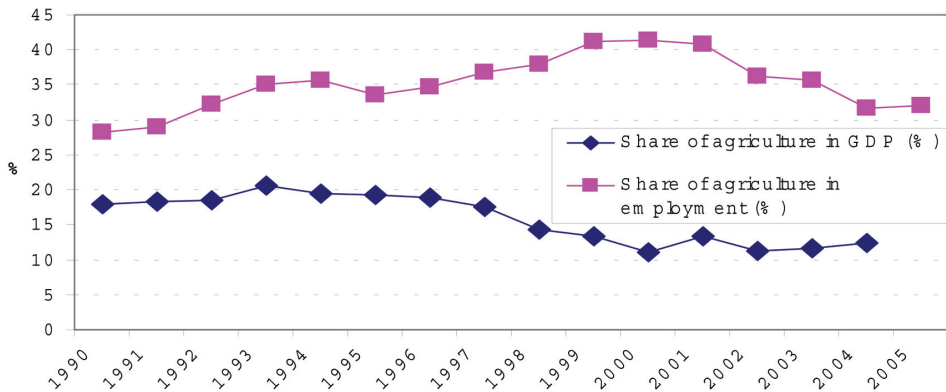
Since 1989, Romania has gone through a continuous transition process from the command to the market economy. The social costs of the changes were high. The inefficient economic sectors contracted leading to mass unemployment. In parallel, in agriculture the privatization of land and the downsizing of the agricultural production units occurred. The rural sector – with agriculture as the main driving force – was a significant factor that absorbed the economic and social shocks (Tesliuc, 2000a; OECD, 2000).

---

<sup>1</sup> The research was made possible by the Robert Bosch Foundation under the project “Policy Analysis for Sustainable Agricultural Development in Central and Eastern Europe and South Africa”. This is an revised version of the ‘post print’ of the article “Off-farm Employment and Agricultural Sales: Evidence from Romania” published in Post-Communist Economies, Vol. 18, No 2, June 2006, pp. 243–260, POST-COMMUNIST ECONOMIES is available online at: <http://journalsonline.tandf.co.uk>

The decline in industrial activities determined the urban population to return to the rural areas, most of them finding occupation in agriculture. As a result, the share of the population employed in agriculture increased from 28% in 1990 to 36% in 2002. At the same time the contribution of agriculture to GDP declined, thus suggesting a decrease in the labor productivity of agriculture<sup>2</sup> (Graph 1).

The lack of increase in agricultural production parallel to the increase in agricultural employment is mainly related to the fact that the farmers lacked the necessary factors of production. One of the factors of production was land, which was to be returned to the prior owners, their heirs and cooperative members who did not contribute land. As a result of the reforms several small individual farms emerged: 4.7 million individual farms cultivated 62% of Romania's arable land area in 2002, with an average size of 1.6 ha (NIS, 2004). By re-establishing the situation before collectivization, the land reform has contributed to the fragmentation of agricultural lands (Tesliuc, 2000a).



**Graph 1.** Share of agriculture in GDP and employed population. \* Methodology used: before 1998 – ESA 1979; after 1998 – ESA 1995. Source: NCS, 1991; NCS, 1998; NIS, 2000; NIS, 2003; NIS 2006

Another hindering factor, leading to low labor productivity was that land restitution was not accompanied by the provision of the necessary technical equipment to the households. Since, most farmer households were of subsistence or semi-subsistence type with very low cash incomes, the farmer households significantly decreased the agricultural input procurements (Tesliuc, 2000a).

Another important factor in increasing production, investments were practiced by a limited number of rural households. Survey evidence illustrates that in the reference period November 2001-October 2002 only about 22% of the rural households made investments, and out of the investor households 74% invested

<sup>2</sup> The low labor productivity in agriculture is underlined by high rate of underemployment in agriculture. Indeed, in 2002 underemployment affected only 3% of the employed population in the urban area while 20% in the rural area. Underemployment affected mainly the population employed in agriculture, out of which 29% were working on a part-time basis (NIS, 2003b).

in agriculture. The invested amounts represented only 5% of the gross income of the rural household (OSF, 2003).

The reasons for low investments are manifold. Low cash incomes of the households result in a low capacity to save money, therefore low potential for investment (Tudor, 2004; Tudor, 2003). Credits, another source of funding farm investments, have been insignificant as well, owing to constraints in the credit supply for the rural area and agriculture as well as to the limited credit demand of the households (Chaves *et al.*, 2001).

Land fragmentation resulted in farming low-size and dispersed parcels, which increased very much the costs of mechanical works per area unit. The poor technical endowment of agriculture and the impossibility of adapting the agricultural machinery to the new particularities of agricultural farms often resulted in delays in the execution of agricultural works; the high prices of the works obliged some individual farmers to use traditional means in farming their land (IAE and CURS, 1998; Tudor, 2003a).

Low input use, low investment, high costs of mechanical cultivation and land fragmentation all lead to the reduction of agricultural yields. The farmers decreased their reliance on the markets and increased self-consumption, which together with low agricultural yields meant that very low surplus production could be marketed (Tudor, 2003a; Tudor, 2004).

A chance to increase market orientation would be the general economic development creating off-farm employment beneficial on agricultural sales on both the demand and supply side. Some positive tendencies of economic development can be noticed in Graph 1. From 2001 the share of agriculture in employment started to decline. The reversal is related to the increase in the number of private companies mainly in urban, but also in rural areas. Indeed, the number of new and active economic units from industry, construction, trade and other services increased almost twofold in 2001 as compared to 2000 – an unprecedented increase in the transition period. The increase continued also in 2002, with around 50 thousand new companies established (NIS, 2003). As a result, an increase in the rural off-farm employment rate was registered; moreover the urban-rural migration flow stopped and even reversed.

## Hypothesis

Commercialization of agriculture occurs both on the demand and supply side (Pingali, 1997) and off-farm employment plays an important role in the commercialization of agriculture (Timmer, 1997; Timmer, 1988; Pingali, 1997) both on demand and supply side. On the demand side, off-farm employment leads to increased cash income, which is spent in large part on food, thus contributing to an increased demand of marketed agricultural products (von Braun *et al.*, 1994). On the supply side, income from off-farm employment increases access to

credit, investments in agriculture and agricultural labor productivity. Increased production allows a higher share left for sales after satisfying self-consumption.

## Methodology

The paper uses descriptive as well as correlation analysis. The descriptive analysis reveals the general trends and the regional differences in off-farm employment, agricultural production and sales as well as income, credits and investment. The descriptive part offers an insight into the relationships between off-farm employment, income, credits and investment and agricultural sales. Moreover the correlation analysis offers empirical proof of the influence of off-farm employment on the sales of agricultural products. The data sources for the analysis are secondary data from the National Institute for Statistics (NIS), previously National Commission of Statistics (NCS) and the Rural EuroBarometer Survey<sup>3</sup> of the Open Society Foundation (OSF) (OSF, 2003).

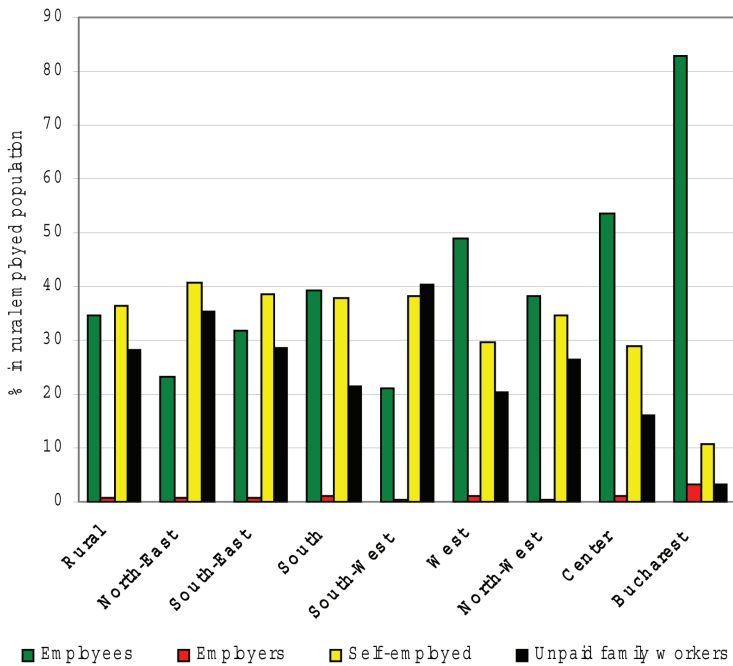
## Off-farm employment in the development regions

The differences in the off-farm employment patterns in the eight statistical regions of Romania provide a first step to the understanding of the interaction of off-farm employment and agricultural sales in a regional<sup>4</sup> context. Main disparities exist among the development regions of Romania in the structure of the employed population according to the different sectors of activity. The distribution of the rural employed population in the different sectors of the economy is concordant with the economic and social development level, just like the distribution of the overall population according to the different sectors of the economy. The highest share of employment in agriculture can be found in the regions with low socio-economic development, NE, SE, S, SW and NW. The more developed regions, Bucharest and the regions from the province of Transylvania – W and Center – have a lower share of agriculture in rural employment than the other regions. The rural area of the municipality of Bucharest has a different occupational structure than the rest of the regions, as the strong economic and social influence of the capital city leads to a balanced structure of the employed population between the three sectors of the economy. Moreover, the region Center provides an occupational contrast as well, with the second lowest share of agriculture in rural employment after Bucharest. (NIS, 2006). (Appendix 1)

The concentration of rural activities in the primary sector is associated with a specific socio-professional structure. While in the urban area more than 90%

<sup>3</sup> The Rural EuroBarometer survey was conducted in the period September 2002 – January 2003 on a representative sample of 1963 rural households. The data was collected for the period November 2001 – October 2002.

<sup>4</sup> The statistical regions are development regions consisting of neighbour counties that have similar economic and social profiles. These are the following: North-East (NE), South-East (SE), South (S), South-West (SW), West (W), North-West (NW), Center (C) and Bucharest (B).



**Graph 3.** Regional socio-professional structure of the rural population in 2005. Source: NIS, 2006a

of the active persons are employees, in the rural area self-employed and family workers prevail, mostly involved in farming activities.

Graph 3 presents the distribution of the rural employed population according to the professional status. In the regions with predominant agricultural sector – NE, SE, S and SW -, the self-employed and unpaid family workers account for about 70% or more of the employed population. The regions West and Center has an even higher share of employees, close to 50%, while the region Bucharest is the closest to the urban pattern with 83% of employees and 3% employers in the rural employed population.

The *distribution of members in farmer households* according to their professional status shows a similar structure as the distribution of rural employed population according to their professional status. The most developed regions from the economic point of view also have the greatest shares of members performing non-agricultural activities as employees, employers and self-employed in non-agricultural activities. Thus, in Bucharest and Center regions 13% of the household members work off-farm, in the S, W and NW regions up to 7% and in the NE, SE and SW regions the shares of off-farm employed members range up to 6%. At the same time the lowest share of members performing agricultural activities as farmers and unpaid family workers is found in the Center and Bucharest regions (NIS, 2006c).

The share of the dependent members (unemployed, pensioners, pupils and other dependent people) in the household is another important indicator determining the division of agricultural production between household consumption and sale. The subsistence of dependent members is ensured mainly by the activity of the other household members working either inside or outside the household. In Bucharest, 66% of members of farmer households are dependent members. The smallest share of dependent members – under 40% – is found in the predominantly agricultural regions NE, S and SW with low off-farm employment. In general, high and constant off-farm incomes allow supporting more dependent members at household level, without obliging them (for example the pensioners) to work in agriculture.

An important indicator of the off-farm employment opportunities is represented by the evolution and current situation of the occupational change. Occupational change follows a descending trend<sup>5</sup> in time for most of the rural population. In the period 1992–2002, according to population census, the share of workers and machine-operators in all regions decreased, most of them being re-integrated as workers in agriculture – a descending occupational mobility. Except for the regions Center and Bucharest, the technicians had also a similar evolution, losing part of their jobs (Appendix 2).

The *descending occupational mobility* was more pregnant in the regions NE, S, SW and W where the share of farmers in the employed population increased by more than 10%. The *ascending mobility* has a higher incidence in the regions inside the Carpathians ring and Bucharest, where the highest increase in the shares of specialists with intellectual occupations, of technicians and of employees in services and trade occurred. Inside the Carpathian ring and in Bucharest, the intensity of descending social mobility phenomena generated by the loss of jobs at the level of workers, handicraftsmen and machine-operators had lower values compared to those outside the Carpathians ring.

The more positive occupational mobility in Bucharest and the inner Carpathian ring as compared to the outer Carpathian region can be explained by the higher economic development level, and therefore more new employment possibilities of the former as compared to the latter one. Moreover, in the inner Carpathian ring and Bucharest a higher share of population affected by economic restructuring participated in the re-qualification courses than the population in the outer Carpathian regions, contributing to the difference in the maintenance or increase of the occupational status at individual level (Abraham, 2000)<sup>6</sup>.

<sup>5</sup> A descending occupational change is social marginalization or exclusion, like becoming unemployed or acquiring jobs with lower status than what the person's professional qualifications would imply. An ascending occupational change is on the contrary acquiring the employer status or professional reconversion for example.

<sup>6</sup> The data from CURS survey in 1999 indicate the following situation in relation to the share of persons who attended re-qualification courses in the period 1990–1999, by regions: NE, SE, S and SW – 5%; W – 10%; NW – 7%; Center – 8%; Bucharest – 7% (CURS, 1999)

The opportunities for off-farm employment across the regions are indicated by the regional disparities in underemployment as well. Underemployment rates, approximated by the number of 8 hour working days per person in the farming sector in 2002, according to agricultural census, had the highest share in the regions with low economic development and high agricultural sector share in both total and rural employment. Thus, the regions NE and SW are characterized by the highest underemployment with the persons employed in agriculture working less than half a year. Other two agrarian regions, S and SE, had the second largest underemployment with 56% and 61% of the yearly working time used. They are followed by the Transylvanian regions and finally by the Bucharest region with 380 eight hour days per person worked (NIS, 2004).

The overview of the regional disparities show that the regions Bucharest, Center and West are the most developed, with lowest shares of total and rural agricultural employment, highest shares of off-farm employment and greatest share of employees and employers in the rural occupational structure. The higher degree of economic development of these regions also permits an ascending occupational mobility. As a sign of better off-farm employment opportunities in the Bucharest, Center and West regions, underemployment affects less the active population than in the rest of the regions.

## **Agricultural production and sales in the development regions**

Parallel with the regional disparities in off-farm employment, agricultural production patterns are examined through indicators like the utilized agricultural area per farm, the labor productivity of agriculture or the share of agriculture in GDP.

The average farm size and the labor productivity of agriculture feature significant disparities by regions. The W, SE and Center regions have a higher average farm size and higher labor productivity of agriculture than the rest of the regions. However, a clear relation between the average farm size and farm output value per person cannot be established, given that the ranking of the regions based on average farm size does not match the ranking of the regions based on the labor productivity of agriculture.

Even if the average farm size is not importantly higher in the economically developed Transylvanian and Bucharest regions than in the rest of the regions, the labor productivity of agriculture follows the development patterns of the regions. Indeed, the agricultural output value per one person employed in agriculture is the highest in the W, Center and Bucharest regions. This fact suggests that off-farm employment opportunities have an important influence on labor productivity besides the average farm-size in the Transylvanian region.



**Table 1.** Regional cultivated agricultural area, farm output value per person and share of agriculture in GDP

	Cultivated agricultural area ha/farm <sup>1</sup>	Farm output value Euro/pers. employed in agriculture <sup>2</sup>	Share of agriculture in GDP 2004 (%) <sup>2</sup>
National level	2.9	4370	12.4
North-East	2.3	2845	15.8
South-East	3.6	5056	17.6
South	2.5	4137	17.9
South-West	2.8	2765	13.9
West	4.7	8175	13.9
North-West	2.9	5631	13.0
Center	3.0	8330	11.9
Bucharest	2.5	14022	1.0

Source: <sup>1</sup> NIS, 2004; <sup>2</sup> NIS, 2006

In concordance with the work of Chenery and Syrquin 1989 the share of agriculture in GDP increases from the developed to the less developed regions. Indeed, agriculture has the lowest share of GDP in Bucharest and Transylvania.

Both farm output value and labor productivity are related to the degree of specialization of the farm. The households in the zone Transylvania are getting more specialized as regards farm production. The EuroBarometer survey illustrates that the share of households cultivating cereal crops is generally lower than that in the other regions and a higher share of households cultivate cash crops, like vegetables and potatoes. Moreover, the households from the Transylvanian regions have usually higher production per household in most crop products. The share of households that raise livestock is lower in the regions with higher shares of off-farm employment; however, both the number of animals and the quantities of animal products (meat, milk) obtained per household are higher on the national average, reflecting farming intensification on these households (OSF, 2003).

In conclusion the differences in the agricultural production patterns in the regions parallel the employment characteristics of the regions. In the regions with many possibilities for off-farm employment and low share of agriculture in employment – Bucharest and Transylvania – the share of agriculture in GDP is low. Moreover the regions Center and West have the highest agricultural output value per one person employed in agriculture, not so much the Bucharest region.

The production volume of the household has a direct influence on its commercial behaviour. However, given the small average yields and the high dependency on agriculture of most rural farms, very little surplus products remain after covering the household's consumption needs, and therefore the share of sales in production is quite low. In these conditions sales is mostly determined by the

**Table 2.** Structure of households according to the incidence of agricultural sales

Share of households in percentage, who sold ...	Regions								Total
	NE	SE	S	SW	W	NW	Center	Bucharest	
Non-significant or no amounts	84.2	85.6	83.7	88.9	80.3	73.3	74.7	97.4	82.6
Less than one quarter	8.3	7.2	7.5	6.2	11.4	11.5	14.9	–	8.8
Between one quarter and half	4.6	3.2	6.1	2.9	3.8	9.9	5.2	2.6	5.1
Between half and three quarters	2.2	2.8	2.4	1.6	3.8	5.3	3.4	–	2.8
Almost all	0.7	1.2	0.3	0.4	0.8		1.7	–	0.6

Source: OSF, 2003

household members' stringent needs for cash (IAE and CURS, 1998; Tudor, 2003a).

Indeed, Table 2 shows that most rural households sold only non-significant amounts of agricultural products or did not sell at all. More important agricultural sales occurred only in about 17% of the surveyed rural households. There is a variation in the sales pattern of the different regions, with the regions outside the Carpathians ring (NE, SE, S, SW, Bucharest) having the highest share of households with non-significant or no sales. The region Bucharest reached an absolute record in this respect, with more than 97% of households selling non-significant amounts of agricultural products in the year 2002. The regions W, NW and Center have a relatively better situation, over 20% of the households selling products. The W, NW and Center regions have also the highest share of market-oriented households –about 5%- who sell more than half of their production.

The share of households producing almost exclusively for the market is less than 1% at the national level. The region Center has the highest percentage of households producing for the market, followed by one of the regions outside the Carpathian ring, SE. An explanation for the high share of households producing to the market in the SE region is land concentration – the average area per individual farm is larger than in the other regions outside the Carpathians ring and it is above the national average (NIS, 2004).

The low market participation in the Bucharest region is paradoxical, given the proximity to the large agrifood market of the capital city. A reason for low market participation may be exactly the proximity of the big urban center with important off-farm occupational opportunities, and thus providing significant cash incomes to the households. A second explanation resides in the average individual farm land size which is below the national average in the Bucharest region (NIS, 2004).

The differences in the labor productivity of agriculture and off-farm employment are translated into differences in market participation and market orientation. In the regions with both high off-farm employment and high labor produc-

tivity of agriculture, like the Transylvanian regions, the market participation of the households with at least a quarter of own production is higher than in the rest of the regions. Moreover, the highest share of households marketing more than 50% of the production is observed in the Transylvanian region.

The households from the regions W, NW and Center obtain higher average quantities of agricultural products in most crop products and they also raise more animals than the households from the rest of the regions. All these are equivalent with a specialization and intensification tendency in the production structure of households from these regions.

### **Incomes, investments and their impact on market participation and sales**

Poverty rate is an indicator for the share of households with low income in the region. The 0.94 correlation between the regional poverty rate (as reported by the World Bank<sup>7</sup> for the year 2002) and the share of the population employed in agriculture, suggests that a large share of population employed in agriculture is synonymous with a chronic and generalized poverty phenomenon.

Indeed, the Rural EuroBarometer data reveals that around 60% of the rural households from the regions outside the Carpathians ring have the social security incomes as main cash income source (Table 3). In the Center and Bucharest region, where off-farm employment is higher and the share of agriculture in employment is lower, a lower share of households have social security incomes as main incomes and a higher share of households have their main income from salaries and from profit from business. In the regions outside the Carpathian ring, the high dependency upon agriculture of the rural households is correlated with a lower share of households with main incomes coming from the sale of agricultural products. At the same time, in the Transylvanian region a higher share of households had agricultural sales as a main income source than the other regions.

The above regional interactions between non-farm cash incomes and sales suggest that the more important non-farm cash incomes the households obtain, the more they will be tempted to sell or hire out their land to other households interested in farm business. Furthermore, their additional incomes can generate additional demand on the agrifood market. The farmers who increase their land area will obtain higher production and therefore a larger marketed surplus, which they can sell more easily due to the increased demand for agricultural products. In consequence, the number of households with agriculture as main income source will also increase.

The value of the agricultural products sold by the households has great variations from one region to another. The cash flows generated by the trade with

<sup>7</sup> Poverty rate based upon consumption per adult equivalent in 2002: NE – 43%; SE – 32%; S – 33%; SW – 33%; W – 22%; NW – 23%; Center – 23%; Bucharest – 11% (World Bank, 2003)

**Table 3.** Distribution of rural households according to the main income source in 2002 (%)

	NE	SE	S	SW	W	NW	Center	Bucharest
Salary or civil convention	21.4	26.0	26.5	22.2	26.2	24.0	33.2	59.0
Social security incomes*	60.9	56.5	60.3	61.9	51.8	50.0	50.0	35.9
Self-employment in non-agricultural activities	1.2	1.6	0.8	0.4	0.0	2.0	0.5	0.0
Profit from business	1.2	0.4	0.5	1.6	0.7	1.2	1.6	2.6
Agricultural incomes:	11.1	10.2	9.9	11.5	15.6	17.9	12.1	2.6
From which cash incomes from own agricultural production	6.4	6.5	4.2	7.5	9.2	10.6	5.3	0.0

\*pension, unemployment benefit, child allowances, other social security incomes

Source: OSF, 2003

agricultural products is inversely correlated to the share of households that sell their products. Seller households from the regions Bucharest, Center and SW obtain the highest, over 500 Euro/year from agricultural sales while the share of seller households is below the national average. In the poor regions, with a low rural occupational diversification, such as NE, the sale of agricultural products has rather the role to cover the minimum cash needs of household and it reflects to a lesser extent the tendency to develop a commercial farm. The proof is that households obtained the lowest incomes from agricultural sales in the NE region as compared to other regions while the share of seller households was with 27% among the highest (OSF, 2003).

When off-farm employment has a high share, the agricultural income per person also tends to be high. In the regions with low shares of population employed off-farm (NE, SE, SW), peasant farms mostly produce for self-consumption, and very little surplus is left for sales. Indeed, the households diversify their production, distributing their limited (land) resources into a production structure that

**Table 4.** Share of persons with off-farm employment and the agricultural incomes of farmer households – 2005

Regions	Persons employed off-farm, % of household members <sup>1</sup>	Agricultural incomes Euro/month/person <sup>2</sup>
North-East	6.0	5.6
South-East	4.6	7.3
South	8.6	6.2
South-West	3.0	8.3
West	6.9	7.6
North-West	8.2	6.3
Center	12.5	10.1
Bucharest	16.0	12.5

Source: <sup>1</sup>NIS, 2006b, <sup>2</sup>NIS, 2006.

permits them to cover their own consumption needs. Thus, different products but only in small quantities are generally produced on the farms. The surplus that remains after self-consumption is sometimes difficult to sell. The effort of selling the surplus products on the urban markets may be greater than the profit, while the exchange of products on the local markets is quite difficult, as there is no solvent demand as long as the great majority of the population is involved in the same activity, in similar conditions (IAE and CURS, 1998; OSF, 2003).

As the share of persons employed off-farm increases, the agricultural incomes also increase, in principle the households selling a larger amount of their production. The diminution in the number of the population employed in agriculture and its transfer to other economic sectors reduces the pressure exercised by the subsistence needs of household members upon the farm resources. In these conditions, the surplus production after satisfying consumption is larger. The incomes from the sale of this surplus justify the effort of travelling to urban markets. Through higher incomes, the households with members employed off-farm afford buying agricultural inputs, paying for mechanized services and paying labor for agricultural works and thus farm yields increase. This increase can be even higher if households restrict their production structure out of lack of time for farming activities, and thus, farm specialization is higher. Because they are less dependent on farming activities, the people employed off-farm, who spend money for farm production, also expect a profit out of farming. Hence, on their farms, both the production and the commercial flows are more intense (IAE and CURS, 1998).

The cash flows of the off-farm employed population generate a solvent demand of agricultural products even at local level as the farms of off-farm employed population either specialize or give up farming. In these conditions, the *farmer households* will respond to the additional demand on the market, through their own production intensification and specialization. The farm incomes from the farmer households will also increase.

A series of disparities are found across the regions as regards the share of households that invested in agriculture, the investment type and the average amounts invested per household (Table 5). The highest share of households with such initiatives is concentrated in the region NW, with 27% of total households, and the lowest share is found in the region SE, with 16% (OSF, 2003). In general, a greater propensity for agricultural investments is found in the regions inside the Carpathian ring (Center and NW) and Bucharest, while an overwhelming share of households invest in buying livestock. Thus, a relative orientation towards rural farm intensification can be noticed.

Only 3% of the surveyed households invested in agricultural equipment, given the high price of agricultural equipment as compared to household incomes and the difficulties of obtaining a credit. 2% of the households purchased land, with the highest share of households investing in land in the NW region.

**Table 5.** The share of investor households by types of investments and average value of investments in 2002

Regions	Households that invested % of total households by regions					Average values of investments* Euro/household
	Total, out of which:	Agricultural equipment	Animals	Land	Planting fruit-trees	
NE	17.0	2.9	14.6	1.7	5.5	44.6
SE	15.8	2.7	15.4	2.3	3.1	55.3
S	17.2	3.6	14.9	2.6	1.3	64.2
SW	16.2	1.9	13.5	2.3	1.5	27.5
W	16.0	3.5	16.0	1.4	4.2	21.2
NW	26.6	2.7	22.8	3.9	4.6	81.0
Center	18.5	2.6	18.5	2.1	4.1	81.9
Bucharest	20.5	–	20.5	–	5.1	16.2
Total	18.0	2.8	16.3	2.3	3.5	53.9

\* Ratio of total investments at regional level to the total number of households in the region

Source: OSF, 2003

The highest amount was invested in the Center and NW regions where the households spent more than 81 Euro in 2002 for investments in agriculture, followed by the regions S and SE. The lowest amount was invested in the Bucharest region, followed by the regions W and SW.

In general, in the regions with a higher share of off-farm employment, the invested amounts in agriculture are higher. The invested amount is not significantly correlated with higher off-farm incomes at farm level, it is rather correlated with a higher value of incomes obtained from agricultural sales at household level<sup>8</sup>. Thus, these investments are primarily supported by households that develop commercial farms.

For the regions with the highest share of population with off-farm employment, i.e. those from Transylvania, agriculture and mainly the sale of agricultural products generate higher incomes. In these areas, higher shares of households have agriculture as a main cash income than households from other regions.

### Relation between off-farm employment and agricultural sales

The paper analyzed the regional disparities in off-farm employment, agricultural sales, incomes, credits and investments at the regional level and the relationships between them. In order to illustrate the arguments, it is interesting to analyze some correlation coefficients.

<sup>8</sup> At household level the Pearson correlation index between the value of incomes obtained by selling agricultural products and the value of investments = 0.23 and it is significant at the 1% level.

Table 6 illustrates the relation between farm output value, farm output value per 1 person employed in agriculture, market participation and income from sales on the one hand and different measures of off-farm employment on the other hand. The measures of off-farm employment consist of the share of agriculture in total employment, share of agriculture in rural population employment, amount of work days in agriculture, share of households with salary or civil convention as main income source, share of households with profit from business as main income source and the income from off-farm employment at the household level.

The farm output value and all measures suggesting low off-farm employment and high employment in agriculture exhibit positive relationship. This result is intuitive, since the more labor input goes into agriculture the higher will be the output. Moreover, the share of households with main income source salary or civil convention, profit from business and the value of income from off-farm employment all have a negative relationship with farm output value, reinforcing the argument before. Low labor share in agriculture indicated by off-farm employment as main income source or high income share from off-farm employment will lead to low farm output value.

Contrary to the correlation results for the farm output, the farm output value per 1 person employed in agriculture negatively correlates with most measures of

**Table 6.** Correlation between farm output value, labor productivity, market participation and commercial orientation as well as measures of off-farm employment

Measures of off-farm employment	Farm output value <sup>1</sup>	Farmoutput value/1 employed persons <sup>1</sup>	Share of sellers in total farm hhs. <sup>4</sup>	Avg. monthly per capita agric. incomes in farm hhs. <sup>1</sup>
Share of population employed in agriculture from total employed population 2005 <sup>1</sup>	0.77***	-0.98***	0.69*	-0.78**
Share of rural population employed in agriculture from rural employed population <sup>2</sup>	0.78**	-0.97***	0.71**	-0.79**
Work days in agriculture in 2002 (thou of days) <sup>3</sup>	0.96***	-0.93	0.65*	-0.89**
Share of households with main income source salary or civil convention <sup>4</sup>	-0.86***	-0.92	-0.80**	0.88
Share of household with main income source profit from business <sup>4</sup>	-0.77**	0.62	-0.58	0.79
Value of income from off-farm employment in household <sup>4</sup>	-0.88***	-0.32	-0.74**	0.65*
Observations	8	8	8	8

<sup>1</sup>NIS, 2006; <sup>2</sup> NIS, 2006b; <sup>3</sup>NIS, 2004; <sup>4</sup>OSF, 2003;

\*\*\* Significant at the 1% level, \*\* significant at the 5% level; \* significant at the 10% level

off-farm employment suggesting the predominance of agriculture in employment. These correlations underline the problem of Romanian agriculture described in the previous chapters, of important surplus labor in agriculture. More off-farm employment opportunities in the total and the rural population in the current technical conditions of agricultural production would decrease output, while labor productivity would increase.

The share of sellers positively correlates with all measures indicating low level of off-farm employment and negatively correlates with the share of households with main income salaries or civil convention and the value of income from off-farm employment. The higher the share of total and rural employment in agriculture, the higher the number of persons employed in agriculture the more households will participate in the markets. This phenomenon can be explained by the fact that agriculture is the one of the few sources and sometimes even the only source to generate some cash income. Therefore the more population and the higher share of household members work in agriculture less other options they have to obtain some income, therefore more people will sell some surplus production after satisfying consumption needs.

Commercial orientation exhibits opposite patterns to market participation. In the regions with high off-farm employment fewer sellers are present but they obtain a higher income from agriculture than the sellers in the regions with low off-farm employment. This is explained by the positive impact of off-farm employment on commercial orientation. Part of the population exits farming in the conditions of attractive off-farm employment opportunities, thus giving the chance to the remaining farmers to increase their land size and become more specialized. The additional incomes in the households from off-farm employment contribute to farm investments and/or to the demand for agricultural products thus boosting sales.

The opposite relation between commercial orientation and market participation is illustrated by the regional negative correlation of  $-0.71$ , significant at 5% level, between the share of households selling no or insignificant amounts of products and the share of households with main income source cash income from agricultural sales.

Table 7 reinforces the results from Table 6 and illustrates that in rural regions with a high share of employees and employers the share of seller households is lower, however the commercial orientation of the households is higher. The high rural share of self-employed and unpaid family workers increases market participation, decreasing the monthly per capita agricultural incomes in the farm households.

Similarly, the high share of members performing non-agricultural farm activities is positively correlated with the average monthly agricultural incomes. The more members work on farm the higher will be the share of sellers. At the same time dependent members will decrease the share of sellers, while positively



**Table 7.** Regional correlation between rural socio-professional status, farm household member occupational status as well as market participation and commercial orientation

	Share of sellers in total farm households <sup>3</sup>	Monthly per capita agric. incomes in farm households <sup>4</sup>
<b>Structure of rural employed population by professional status<sup>1</sup>:</b>		
Employees	-0.72**	0.79**
Employers	-0.77**	0.50
Self-employed	0.65*	-0.82**
Unpaid family workers	0.68*	-0.68*
Members of agricultural association or co-operative	0.23	-0.48
<b>Occupational status of farm household members<sup>2</sup>:</b>		
Members performing non-agricultural activities	-0.47	0.84***
Members performing on household agricultural activities	0.73**	-0.59
Dependent members	-0.78**	0.38
Observations	8	8

<sup>1</sup> NIS, 2003a; <sup>2</sup> NIS, 2003b; <sup>3</sup>OSF, 2003; <sup>4</sup>NIS, 2003; agric. agricultural.

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level

although not significantly correlated with commercial orientation. The regional share of dependent members in the household is positively related to the members of the household employed off-farm, since persons with low working abilities like pensioners prefer not to work when there is sufficient cash income in the household. Therefore a negative relation of the share of dependent members to share sellers in total farm households is in concordance with the negative relation of the share of members employed off-farm to the share of sellers in total farm households.

## Conclusion

The paper aimed at analyzing the relation between off-farm employment and agricultural sales. For this purpose the regional disparities in the evolution and current situation of off-farm employment, agricultural production, agricultural sales, incomes, investments and credits were analyzed at the regional level. The direct interactions identified between off-farm employment and sales as well as the indirect interaction through the impact of off-farm employment on agricultural labor productivity, incomes, investments and access to credit were examined with the help of correlation analysis.

Both the descriptive part and the correlations prove the existence of a relation between off-farm employment and agricultural sales. The regions with high

development level, the Bucharest, Center and West regions have a relatively low share of agriculture in total and rural employment. These regions also exhibit a larger share of employees and employers in the rural occupational structure and the largest off-farm employment of the farm households. In these regions a low share of underemployment in agriculture suggests better off-farm employment opportunities than in the outer Carpathian regions with low development levels.

Concomitantly, in the regions with many off-farm employment possibilities, Bucharest and Transylvania, the share of GDP in agriculture is low compared to the rest of the regions. The Center and West regions exhibit the highest labor productivity of agriculture, not so much the Bucharest region. The differences between the regions follow similar pattern with respect to market participation and market orientation as well. Market participation with more than a quarter of production is the highest in the Transylvanian regions, just like the share of completely market oriented households selling most of their production. The average agricultural cash incomes of the farm households in the regions is in turn inversely correlated to the share of sellers, suggesting that the large share of market participation is not a sign of commercial farming but the proof of urgent cash needs determining farmers to sell some products.

Investments in agriculture occur mostly in the regions with high off-farm employment, however they are not correlated with the off-farm income but with the agricultural cash incomes. This suggests that investments are primarily effectuated by households who develop commercial farms.

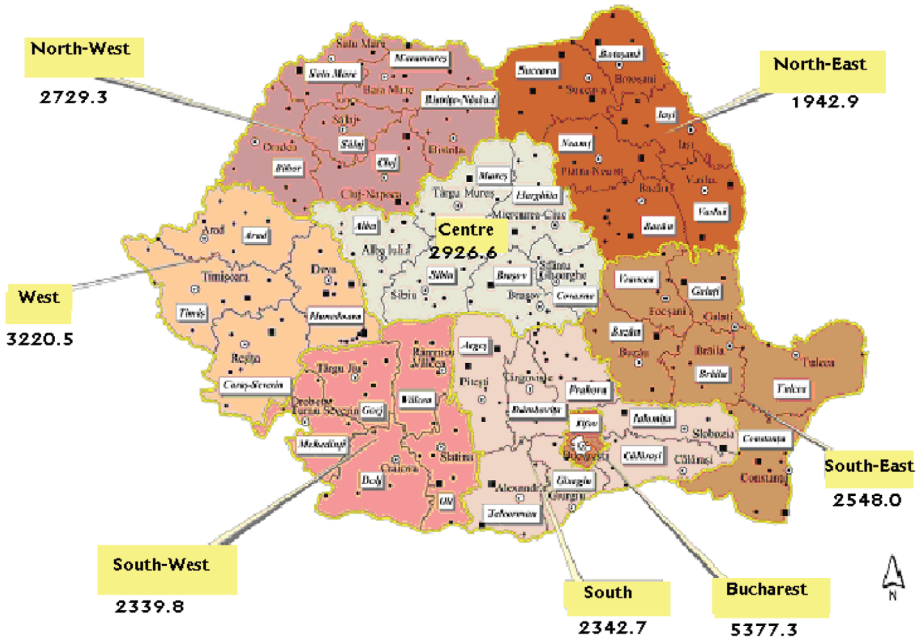
The correlation analysis proves the insights obtained at the regional level. High agricultural employment, low development is synonymous with high agricultural output but low labor productivity. Low off-farm employment measures bring about high market participation, given the lack of alternative cash income sources of the household, but they also mean low average incomes from sales.

The better off-farm employment opportunities lead to two evolutions, some households, especially those without significant agricultural activities exit farming, while the remaining households with higher agricultural incomes effectuate agricultural investments, become more specialized, increase their production and commercialize a large share of their production.

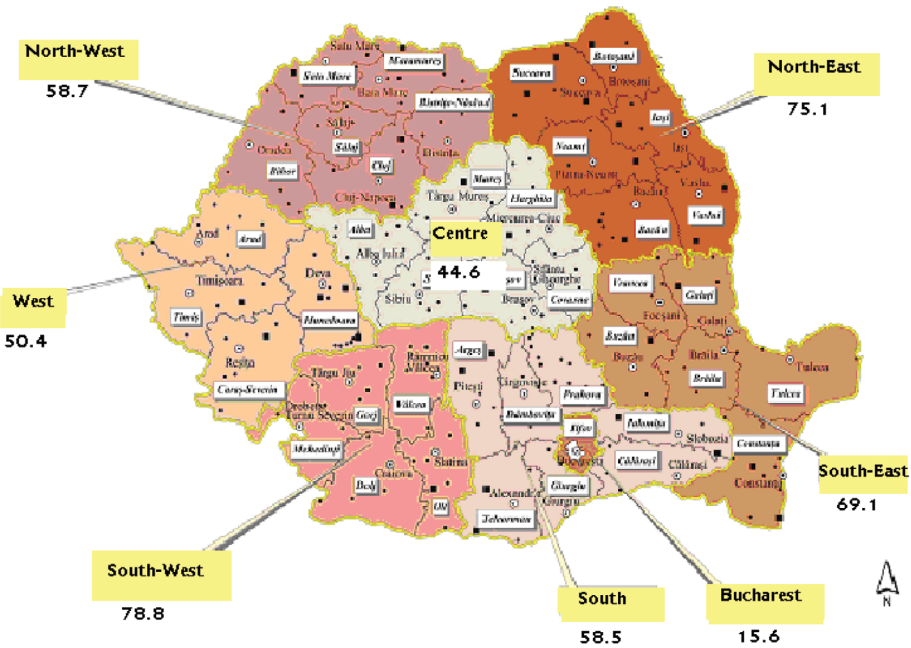
The important impact of off-farm employment on the commercialization of agriculture in a regional context underlines that economic development and the creation of non-agricultural jobs will all increase the commercialization of agriculture. At the same time the increase in off-farm employment will ease the burden of poverty the population is facing mainly in the rural areas by offering the chance to exit subsistence farming and pick up non-agricultural activities or become a commercial farmer.

- Abraham, D. 2000: *Atlasul sociologic al schimbarii sociale din Romania post-comunista (Sociologic atlas of social change in post-communist Romania)*. Magazine Sociologie Romaneasca, no.1: 5–41
- Chaves, R., Sanchez, S., Schor, S. and Tesliuc, E. 2001: *Financial markets, obstacles to credit and investments in Romania's rural area*. World Bank working paper, no. 499
- Chirca, C. and Tesliuc, E. 1999: *From Rural Poverty to Rural Development*. World Bank and National Commission for Statistics. Bucharest: Romania
- FAO 2003: Rural finance in Romania. Project TCP/ROM/0167: *Strategy for Agriculture and Rural Development. Summary*
- Pingali, P. L. 1997: *From Subsistence to Commercial Production Systems: The Transformation of Asian Agriculture*. American Journal of Agricultural Economics 79:628–634.
- Tesliuc, ED. 2000a: *Agriculture Policy: Achievements and Challenges*. paper presented at the World Bank conference “Romania 2000. 10 Years of Transition – Past, Present and Future”, held in Bucharest, Romania, 21.–22.10.99.
- Timmer, CP. 1988: *The Agricultural Transformation*. in Chenery, HB. and Srinivasan, TN. (eds). Handbook of Development Economics. Amsterdam: North Holland.
- Timmer, CP. 1997: *Farmers and Markets: The Political Economy of New Paradigms*. American Journal of Agricultural Economics 79: 621–627.
- Tudor, M. 2003: *Reforms before December 1989 – a current reality*, in the tome of the National Session of Scientific Communications “Sustainable Development Economy”, Ecological University of Bucharest: 271–276
- Tudor, M. 2003a: *Institutional models favouring or constraining the agrifood system development. Case study – Romania*, within CERES grant “Implications of the accession to the EU upon the agricultural and rural policies in Romania, report no.5/2003
- Tudor, M. 2004: *Economic behaviour in the subsistence farmer* in Alexandri, C, Davidovici, I., Gavrilesu, D. (coord.). Treatise of Agricultural Economics. Expert. Bucharest: Romania
- Von Braun, J., Bouis, H. and Kennedy, E. 1994: *Conceptual Framework*, in Von Braun, J. and Kennedy, E. (eds.). Agricultural Commercialization, Economic Development and Nutrition. International Food and Policy Research Institute: Washington D.C.
- National Commission for Statistics (NCS) 1991: Romania's Statistical Yearbook. National Commission for Statistics. Bucharest: Romania
- National Commission for Statistics (NCS) 1992: Census of Population and Dwellings. National Commission for Statistics. Bucharest: Romania
- National Commission for Statistics (NCS) 1998: Romania's Statistical Yearbook 1997. National Commission for Statistics. Bucharest: Romania

- Center for Urban and Regional Sociology (CURS) 1999: survey Atlasul sociologic al Romaniei
- OECD 2000: Review of Agricultural Policies – Romania. Profitul agricol. Bucharest: Romania
- National Institute for Statistics (NIS) 2002: Romania's Statistical Yearbook 2001. National Institute for Statistics. Bucharest: Romania
- UNDP 2002: Human development report. Expert. Bucharest: Romania
- National Institute for Statistics (NIS) 2003: Romania's Statistical Yearbook 2002. National Institute for Statistics. Bucharest: Romania
- National Institute for Statistics (NIS) 2003a: Census of Population and Dwellings, 2002. National Institute for Statistics. Bucharest: Romania
- National Institute for Statistics (NIS) 2003b: Household Labour Force Survey (AMIGO), 2002. National Institute for Statistics. Bucharest: Romania
- Open Society Foundation (OSF) 2003: Rural EuroBarometer, Open Society Foundation. Bucharest: Romania
- World Bank 2003: Romania: Poverty Assessment, World Bank report no. 26169-RO
- National Institute for Statistics (NIS) 2004: General Agricultural Census 2002. National Institute for Statistics. Bucharest: Romania
- Institute of Agricultural Economics (IAE) and Center for Urban and Regional Sociology (CURS) 1998: Farm restructuring in Romania: causes, efficiency and political implications, PHARE ACE project, P96-6090-R
- Institute of Agricultural Economics (IAE) 2004: priority 4: Agriculture, rural development and fishing – analysis of current situation within the National Development Plan 2007–2013, material for debates
- Institute for Statistics (NIS) 2006: Romania's Statistical Yearbook 2005. National Institute for Statistics. Bucharest: Romania
- Institute for Statistics (NIS) 2006a: Labour force in Romania. Employment and unemployment in the year 2005. National Institute for Statistics. Bucharest: Romania
- Institute for Statistics (NIS) 2006b: Coordinates of living standard in Romania. Population's incomes and consumption in the year 2005. National Institute for Statistics. Bucharest: Romania



Regional GDP/capita in Euro (2004)



Share of rural population employed in agriculture from rural employed population

Source: National Institute for Statistics (2006), *Romania's Statistical Yearbook*.

**Appendix 2** Modifications in the rural population's occupational structure (% of total rural employed population)

Region/year	Specialists with intellectual occupations*	Technicians and assimilated workers**	Operators in services and trade	Farmers and qualified staff in agriculture	Workers and hand-craftsmen	Machine operators	Unskilled workers
NE 1992	1.0	4.1	2.2	55.1	17.7	11.5	4.9
NE 2002	1.5	3.5	3.8	68.4	9.6	4.9	5.3
SE 1992	1.1	4.8	2.4	49.2	17.1	15.3	5.9
SE 2002	1.9	4.3	4.8	55.4	12.6	7.7	8.9
S 1992	1.5	5.9	3.2	30.7	27.1	18.7	7.9
S 2002	2.4	5.2	5.9	45.7	18.5	8.9	8.7
SW 1992	1.6	4.6	2.4	49.6	18.9	14.1	5.2
SW 2002	2.3	4.2	3.9	61.5	12.7	5.9	5.6
W 1992	1.9	5.7	3.9	37.5	20.0	16.8	8.8
W 2002	2.4	5.1	6.0	48.5	15.8	8.6	8.4
NW 1992	1.6	5.2	3.1	43.3	21.4	13.7	6.9
NW 2002	2.5	5.0	5.3	50.5	15.0	8.4	8.6
Center 1992	1.7	6.5	4.0	27.4	28.7	16.5	9.6
Center 2002	2.9	7.0	8.3	30.5	23.3	10.4	11.0
Bucharest 1992	1.7	6.8	5.7	11.0	36.6	19.5	12.3
Bucharest 2002	3.6	8.7	12.5	8.0	26.1	14.1	16.1

\* includes persons who declared occupations related to execution functions that usually require higher education and implying intellectual and scientific activities of strict specialty

\*\* includes occupations requiring necessary skills (qualifications) for assuming technical, administrative, financial, commercial responsibilities or for carrying out auxiliary operations in research-design activities, informatics, education, health, social security, etc.; most of occupations in this group require post-high specialty training, foremen and high-school specialization.

Source: NCS, 1992; NIS, 2003a