GENERAL ASPECTS REGARDING THE EVOLUTION OF ROMANIAN SPECIALIZED FARMS BASED ON FADN DATA

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Abstract

The aim of this paper is to analyze and compare the evolution of specialized COP, horticulture, dairy and mixed Romanian farms. The research of this evolution is a very important step in understanding the elements that can affect the modernization process of our agriculture. For accomplishing the research we utilized the data for 2007-2009 periods from Farm Accountancy Data Network (FADN) which collect information from different types of specialized farms. The main results revealed the following: the net farm income had increased during 2007-2009 only in mixed crop and mixed livestock farms; work productivity was higher in COP farms but increased the most in livestock farms; the productivity ratio was higher in COP farms; the solvability had dropped during 2007-2009 period; even with higher liquidity, mixed crop farms present a reduction of this ratio. In conclusion, the specialized farms present, along with the increase of their rate of specialization a better financial stability and an improvement in work productivity, but only the mixed farms show an improvement in net income.

Key words: income, liquidity ratio, productivity ratio, solvability ratio, specialized farm

INTRODUCTION

In Romania, during the period 2007-2009, the value of production in real terms increased to 11.8%, mainly due to increase in value of crop production, while animal production value had declined mainly due to reduction of livestock [2]. Also, other important aspects of Romanian agriculture are: farmers obtaining low productivities per hectare; over 94% of farms have less than 4 ESU [7]; the crop production sector presents a great variability in terms of cultivated area, production and average production [4]; over 60% of farms (big and specialized farms with COP, crops and granivores) have a direct economic dependence of subsidies [8].

In this context, the specialization of Romanian farms becomes an important step to insure a proper use of natural and economic resources and to reach a higher performance, especially since many specialists consider that to achieve economic efficiency there is a fundamental need to specialize agricultural production [5] and others demonstrated that a specialized farm is more technically efficient [3].

MATERIALS AND METHODS

In order to characterize the evolution of specialized farms in our country we utilized the FADN indicators and methodology. The FADN main criteria used to define specialized farms is a share of main production sector higher than 50% of the total output and coupled subsidies [9].

The FADN data are representative for over 860 thousand specialized farms (Table 1).

Table 1. FADN specialized farms structure

Specification	UM	2007	2008	2009
TOTAL	No	864960	866860	866870
COP	%	9.8	15.5	14.3
UAA	ha/farm	47.75	37.2	40.09
Economic dimension	UDE	7.4	5.7	6.0
dairy	%	14.7	14.1	11.6
UAA	ha/farm	6.05	8.51	7.99
Economic dimension	UDE	2.6	3.7	3.7
Mixed crop	%	21.0	11.6	12.0
UAA	ha/farm	5.32	6.75	7.9
Economic dimension	UDE	1.9	2.4	2.6
Mixed livestock	%	12.1	17.1	17.2
UAA	ha/farm	4.66	4.33	5.13
Economic dimension	UDE	2.0	2.2	2.3

Source: FADN

The available data at this time are only for the period 2007-2009, but FADN is a viable

instrument which offers through its TF14 classification, detailed information regarding the main economic indicators of specialized farms.

Starting from the FADN data, due to our research objectives, all the indicators were analyzed and compared based on their evolution per hectare/LSU or AWU. Also we compared the farms' main results based on the following indicators: FNVA/AWU; the multi-factor productivity ratio (total output-to-total input); Solvency (liabilities-to-assets ratio, indicating the proportion of liabilities (total loans to be repaid) used to finance assets); Liquidity (current assets-to-short-term liabilities ratio) [10].

RESULTS AND DISCUSSIONS

Regarding the farms' economical results obtained during the 2007-2009 period first of all we want to draw attention on the variation between data. The main factor of change in the observed population is the specialization rate, i.e. the share of main production output and subsidies in total output and coupled subsidies. This rate is sensitive to the relative price of main products of the farm in the way that when agricultural prices are stable, so is the specializations rate. But in the last few years, the volatility of prices meant that a farm which was considered specialized in a given year could not belong to the 'population' of observed farms the next year, and vice versa [5]. In the 2007-2009 period the rate of specialization increased in almost all specialized farms, with exception of dairy and mixed livestock farms (Table 2). This situation is due exactly like we mentioned above to the volatility of prices (especially that of milk).

In this context, we may appreciate that, in general, the specialization rate increased in Romanian agriculture. The main issue remains in this situation to analyze if along with this increase or decrease of specialization, which was the evolution of main income of these farms.

The COP specialized Farms

COP specialized farms have almost 70% cultivated area with cereals, while the average UAA was over 40 hectares.

Table 2. Rate of specialization - share of main production output and subsidies in total output and coupled subsidies

Spcification	2007	2008	2009	2009/2007 %
COP	76.2	75.9	87.1	114.3
Dairy	67.3	56.4	50.2	74.6
Mixed crop	80.4	81.6	81.7	101.6
Mixed livestock	59.2	56.5	54.2	91.6
Mixed crop and livestock	81.1	76.8	86.1	106.2

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

We observe an increase of forage crop surfaces and livestock units which show us that the tendency of these farms is to complete their main activity (COP production) within a mixed system. But the cereal production remains the main source of income, these representing 96.6% of total output.

The economic size decreased in 2007-2009 period with 18.9% to a level of 6 ESU while total output decreased by 22%.

Table 3. The main incomes of COP specialized farms – expressed in euro/AWU and euros/ha

Spcification	2007	2009	2009/2007 %
Total labour input (SE010)	2.18	1.51	69.3
Total Utilised Agricultural Area	47.75	40.09	84.0
Euros/AWU			
Total output	9519.3	10723.2	112.6
(-) Total intermediate consumption	6994.0	7519.9	107.5
(+)c\Current balance subsidies & taxes	3281.7	2992.1	91.2
Decoupled payments	1067.0	1864.9	174.8
(-) Devaluation	1231.2	1533.8	124.6
(=) Farm Net Value Added (FNVA)	4575.7	4661.6	101.9
(-) Total external factors	2515.1	2275.5	90.5
Wages paid	1286.7	1035.1	80.4
Rent paid	1078.9	1096.0	101.6
Interest paid	149.5	145.0	97.0
(+)Subsidies balance & taxes on investments	132.6	86.8	65.4
(=) Farm Net Income (FNI)	2193.1	2472.8	112.8
Euros/UAA			
Total output	434.6	403.9	92.9
(-) Total intermediate consumption	319.3	283.2	88.7
(+)Current balance subsidies & taxes	149.8	112.7	75.2
Decoupled payments	48.7	70.2	144.2
(-) Devaluation	56.2	57.8	102.8
(=) Farm Net Value Added (FNVA)	208.9	175.6	84.0
(-) Total external factors	114.8	85.7	74.6
Wages paid	58.7	39.0	66.4
Rent paid	49.3	41.3	83.8
Interest paid	6.8	5.5	80.0
(+)Subsidies balance & taxes on investments	6.1	3.3	54.0
(=) Farm Net Income (FNI)	100.1	93.1	93.0

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

Because of the input/output rate of 1.06 (input 17107 euro/farm and output 16192 euro/farm), the gross farm income reached a level of 9356 euro/farm (with 26.1% lower than in 2007) and farm net value added a value of 7039 euros/farm (with 29.4% lower than in 2007).

Regarding the evolution of income in COP specialized farms (Table 3), we may observe an increase in work productivity (due not only to the increase of incomes but also to a lower AWU), and a decrease of income per hectare.

The lower values per hectare are due especially to the prices from 2009 that affected the receipts. We may also observe an increase of share of direct payments in FNVA from 23.3% to 40.0%, and a share of total subsidies of 64.4% in 2009. This is a very important fact because it shows that COP farms depend very much on subsidies.

The Dairy specialized Farms

In Romania, the non-specialized farms produce 28% of the milk production, while the specialized farms the remaining 72% [1]. Dairy specialized farms have 69.5% cultivated area with forage crops, while the average UAA was around 8 hectares. From this UAA, only 70% is cultivated with forage crops, the lowest forage area among EU-27 Member states [6].

We observe an increase in LSU per farm, with 48.9%, from which over 63% were dairy cows and almost 28% were other cattle. From total output, 54.2% come from cows' milk and milk products and 32% from crop production.

In the 2007-2009 period, the economic size increased with 42.3% (to 3.7 ESU) and total output with 18.3%. Because of the input/output rate of 0.67 (input of 9085 euros/farm and output of 13582 euro/farm), the gross farm income reached a level of 7935 euros/farm (with 7.1% higher than in 2007) and farm net value added a value of 6913 euros/farm (with 2.5% higher than in 2007).

Regarding the evolution of income in Dairy specialized farms (Table 4), we may also observe an increase in work productivity and a decrease of income per LSU (due to lower prices than in 2007).

The share of total subsidies in FNVA of 21.1% in 2009, lower than in 2007,

considering the increase of the share of decoupled payments, reflects that farms received smaller subsidies for livestock.

Table 4. The main incomes of Dairy specialized farms – expressed in euros/AWU and Euro/ha

Spcification	2007	2009	2009/2007 %
Total labour input (SE010)	1.99	1.82	91.5
Total livestock units	8	11.91	148.9
Euros/AWU			
Total output	5770.9	7462.6	129.3
(-) Total intermediate consumption	2938.2	3904.4	132.9
(+)Current balance subsidies & taxes	892.0	801.1	89.8
Decoupled payments	145.7	311.5	213.8
(-) Devaluation	334.7	561.5	167.8
(=) Farm Net Value Added (FNVA)	3389.9	3797.8	112.0
(-) Total external factors	403.5	525.8	130.3
Wages paid	228.6	398.9	174.5
Rent paid	92.0	85.2	92.6
Interest paid	82.9	41.8	50.4
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	2986.4	3272.0	109.6
Euros/LSU			
Total output	1435.5	1140.4	79.4
(-) Total intermediate consumption	730.9	596.6	81.6
(+)Current balance subsidies & taxes	221.9	122.4	55.2
Decoupled payments	36.3	47.6	131.3
(-) Devaluation	83.3	85.8	103.1
(=) Farm Net Value Added (FNVA)	843.3	580.4	68.8
(-) Total external factors	100.4	80.4	80.1
Wages paid	56.9	61.0	107.2
Rent paid	22.9	13.0	56.9
Interest paid	20.6	6.4	30.9
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	742.9	500.0	67.3

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

The Mixed crop specialized Farms

Mixed crop specialized farms have almost 65% of the area cultivated with cereals, 18% with forage crops and 5% with permanent crops, while the UAA was between 5 and 8 hectares. For these farms we observe also an increase of forage crop surfaces of 36.5% and livestock units of 56.9% which also show us the tendency to complete their main activity with livestock production.

But the crop production remains the main source of income, these representing 80.1% of total output (from which 24.2% cereals, 22.3% vegetables and flowers, 10.6% fruits and 9.9% forage crops).

In the 2007-2009 period, the economic size increased with 36.8% to a level of 1.47 ESU and total output with 28.2%. Because of the input/output rate of 0.6 (input of 5742 euros/farm and output of 9519 euros/farm), the gross farm income reached a level of 5904

euros/farm (with 27.0% higher than in 2007) and farm net value added a value of 4877 euros/farm (with 31.5% higher than in 2007). Regarding the evolution of income we observe the same situation like in COP farms (Table 5), respectively an increase of work productivity. The data calculated for a hectare reveal a decrease of FNVA, but due to the low level of wages, farm net income increased with 69%.

Table 5. The main incomes of Mixed crop specialized farms – expressed in Euro/AWU and euro/ha

Spcification	2007	2009	2009/2007 %
Total labour input (SE010)	1.99	1.47	73.9
Total Utilised Agricultural Area	5.32	7.9	148.5
Euros/AWU			
Total output	3731.7	6475.5	173.5
(-) Total intermediate consumption	1549.2	2925.9	188.9
(+)Current balance subsidies & taxes	153.3	467.3	304.9
Decoupled payments	126.6	371.4	293.3
(-) Devaluation	471.4	698.6	148.2
(=) Farm Net Value Added (FNVA)	1864.3	3318.4	178.0
(-) Total external factors	970.4	281.6	29.0
Wages paid	924.1	217.7	23.6
Rent paid	24.1	61.2	253.8
Interest paid	22.1	2.7	12.3
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	894.0	3036.7	339.7
Euros/UAA			
Total output	1395.9	1204.9	86.3
(-) Total intermediate consumption	579.5	544.4	93.9
(+)Current balance subsidies & taxes	57.3	87.0	151.7
Decoupled payments	47.4	69.1	145.9
(-)Devaluation	176.3	130.0	73.7
(=) Farm Net Value Added (FNVA)	697.4	617.5	88.5
(-) Total external factors	363.0	52.4	14.4
Wages paid	345.7	40.5	11.7
Rent paid	9.0	11.4	126.3
Interest paid	8.3	0.5	6.1
(+)Subsidies balance & taxes on investments	0.0	0.0	0.0
(=) Farm Net Income (FNI)	334.4	565.1	169.0

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

We observe a share of total subsidies in FNVA of 15.4% in 2009 and an increase of share of direct payments in FNVA from 6.8% to 11.2%, but the contribution of this subsidies to income formation remain low due to the small UAA per farm.

The Mixed livestock specialized Farms
Mixed livestock specialized farms have 48.15% cultivated area with cereals and 45.42% with forage crops, while the average UAA was around 5 hectares. We observe an increase in LSU per farm, with 17.4%, and from total LSU, 47% were dairy cows and cattle, 18.3% sheep and goats, 21.76% pigs

and 9.51% poultry. From total output, 58.6% come from livestock production sales and 41.1% from crop production.

In the 2007-2009 period, the economic size increased with 15.0% (to 2.3 ESU) and total output with only 1.9%. In condition of an input/output rate of 0.7 (input of 5146 euros/farm and output of 7357 euros/farm), the gross farm income reached a level of 3871 euros/farm (with 28.6% higher than in 2007) and farm net value added a value of 3026 euros/farm (with 37.7% higher than in 2007). Regarding the evolution of income in mixed specialized farms (Table 6), we observe an increase in work productivity and an increase of incomes per LSU due to the fact that the dynamics of outputs was higher that the dynamics of inputs.

Table 6. The main incomes of Mixed livestock specialized farms – expressed in euros/AWU and Euro/ha

Spcification	2007	2009	2009/2007 %
Total labour input (SE010)	2.03	1.49	73.4
Total livestock units	5.91	6.94	117.4
Euros/AWU			
Total output	3557.1	4937.6	138.8
(-) Total intermediate consumption	2385.2	2710.1	113.6
(+)Current balance subsidies & taxes	310.8	370.5	119.2
Decoupled payments	114.3	238.3	208.5
(-) Devaluation	400.5	566.4	141.4
(=) Farm Net Value Added (FNVA)	1082.3	2031.5	187.7
(-) Total external factors	140.9	177.2	125.8
Wages paid	89.7	140.3	156.5
Rent paid	18.2	32.9	180.4
Interest paid	33.0	3.4	10.2
(+)Subsidies balance & taxes on investments	0.0	10.7	-
(=) Farm Net Income (FNI)	941.4	1865.1	198.1
Euros/LSU			
Total output	1221.8	1060.1	86.8
(-) Total intermediate consumption	819.3	581.8	71.0
(+)Current balance subsidies & taxes	106.8	79.5	74.5
Decoupled payments	39.3	51.2	130.3
(-)Devaluation	137.6	121.6	88.4
(=) Farm Net Value Added (FNVA)	371.7	436.2	117.3
(-) Total external factors	48.4	38.0	78.6
Wages paid	30.8	30.1	97.8
Rent paid	6.3	7.1	112.8
Interest paid	11.3	0.7	6.4
(+)Subsidies balance & taxes on investments	0.0	2.3	-
(=) Farm Net Income (FNI)	323.4	400.4	123.8

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

Because of the small amount of UAA per farm, the share of direct payments in Farm Net Value Added remained at 10-11%, but we observe a decrease in received subsidies per LSU of 25.5%. Actually, the share of total

subsidies in FNVA decreased from 33.0% in 2007 to an amount of 19.9% in 2009.

The Mixed crop and livestock specialized Farms

Mixed crop and livestock specialized farms have 57.14% cultivated area with cereals and 32.11% with forage crops, while the average UAA was around 7 hectares. We observe an increase in LSU per farm, with 44.4%, and from total LSU 51.05% were dairy cows and cattle, 17.15% sheep and goats, 20.08% pigs and 9.21% poultry. From the total output, 43.5% come from livestock production sales and 55.8% from crop production.

Table 7. The main incomes of Mixed crop and livestock specialized farms – expressed in euros/AWU and Euro/ha

Spcification	2007	2009	2009/2007 %
Total labour input (SE010)	1.89	1.47	77.8
Total Utilised Agricultural Area	5.36	7.07	131.9
Total livestock units	3.31	4.78	144.4
Euros/AWU			
Total output	3302.1	5200.0	157.5
(-) Total intermediate consumption	1739.7	2838.8	163.2
(+)Current balance subsidies & taxes	269.8	610.2	226.1
Decoupled payments	137.6	368.0	267.5
(-) Devaluation	388.4	722.4	186.0
(=) Farm Net Value Added (FNVA)	1443.9	2249.0	155.8
(-) Total external factors	248.7	280.3	112.7
Wages paid	212.7	215.0	101.1
Rent paid	24.3	56.5	232.0
Interest paid	12.2	8.8	72.7
(+)Subsidies balance & taxes on investments	0.0	0.7	
(=) Farm Net Income (FNI)	1195.2	1969.4	164.8
Euros/UAA			
Total output	1164.4	1081.2	92.9
(-) Total intermediate consumption	613.4	590.2	96.2
(+)Current balance subsidies & taxes	95.1	126.9	133.3
Decoupled payments	48.5	76.5	157.7
(-) Devaluation	136.9	150.2	109.7
(=) Farm Net Value Added (FNVA)	509.1	467.6	91.8
(-) Total external factors	87.7	58.3	66.5
Wages paid	75.0	44.7	59.6
Rent paid	8.6	11.7	136.8
Interest paid	4.3	1.8	42.9
(+)Subsidies balance & taxes on investments	0.0	0.1	
(=) Farm Net Income (FNI)	421.5	409.5	97.2
Euros/LSU			
Total output	1885.5	1599.2	84.8
(-) Total intermediate consumption	993.4	873.0	87.9
(+)Current balance subsidies & taxes	154.1	187.7	121.8
Decoupled payments	78.5	113.2	144.1
(-) Devaluation	221.8	222.2	100.2
(=) Farm Net Value Added	824.5	691.6	83.9
(-) Total external factors	142.0	86.2	60.7
Wages paid	121.5	66.1	54.4
Rent paid	13.9	17.4	124.9
Interest paid	6.9	2.7	39.1
(+)Subsidies balance & taxes on investments	0.0	0.2	
(=) Farm Net Income	682.5	605.6	88.7

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

In the 2007-2009 period, the economic size increased with 36.8% (to 2.6 ESU) and total output with 22.5%. In conditions of an input/output rate of 0.74 (input of 5647 euros/farm and output of 7644 euros/farm), the gross farm income reached a level of 4368 euros/farm (with 26.2% higher than in 2007) and farm net value added a value of 3306 Euro/farm (with 21.2% higher than in 2007).

The evolution of the main indicators (Table 7) reveal an increase in work productivity (also because of the rise in output and decrease of AWU) and a decrease of incomes per LSU and UAA due to the fact that the dynamics of outputs was lower that the dynamics of inputs and especially due to the lower prices from 2009.

Because of the small amount of UAA per farm, the share of direct payments in Farm Net Value Added remain at 10-11%, but we observe a decrease in received subsidies per LSU of 25.5%. Actually the share of total subsidies in FNVA decreased from 33.0% in 2007 to an amount of 19.9% in 2009.

Farm economics overview

The FNVA/AWU obtained in the 2007-2009 period are higher in COP specialized farms and lower in mixed livestock farms (Table 8). The income in mixed farms increased more than in other farms, with even 87.7% in mixed livestock farms.

Table 8. The main incomes of Mixed crop and livestock specialized farms – expressed in Euro/AWU and Euro/ha

Spcification	2007	2009	2009/2007 %
FNVA/AWU			
COP	4575.7	4661.6	101.9
Dairy	3389.9	3797.8	112.0
Mixed crop	1864.3	3318.4	178.0
Mixed livestock	1082.3	2031.5	187.7
Mixed crop and livestock	1443.9	2249.0	155.8
Productivity ratio (input-to-output)			
COP	1.13	1.06	93.6
Dairy	0.64	0.67	105.0
Mixed crop	0.80	0.60	75.3
Mixed livestock	0.82	0.70	85.0
Mixed crop and livestock	0.72	0.74	102.6
Solvency			
COP	0.041	0.070	169.8
Dairy	0.013	0.070	550.7
Mixed crop	0.000	0.019	-
Mixed livestock	0.001	0.034	3305.3
Mixed crop and livestock	0.002	0.006	279.8
Liquidity			
COP	10.5	13.6	129.6
Dairy	3.5	61.0	1760.6

Spcification	2007	2009	2009/2007 %
Mixed crop	5558.0	3965.0	71.3
Mixed livestock	24.7	1405.0	5690.5
Mixed crop and livestock	68.6	169.2	246.6

Source: own calculation on the basis of data from FADN http://ec.europa.eu/agriculture/rica/

The productivity ratio shows that in COP farm for one euro spent, 1.06 was earned, and that in the other farms the amount was only 0.6-0.7 euros per euro spent. This ratio evolves with a decreasing trend in COP, mixed crop and mixed livestock farms due to the public support which increase the incomes.

Solvency ratio (the ability to pay the debts), with an evident increasing tendency in all types of farms, demonstrate that the financial situation was deteriorating during the 2007-2009 period, especially in mixed livestock farms. The increasing values of this ratio show that the farms didn't meet their payment obligations, but the level is low.

Liquidity ratio (which measures the relation between current assets8 and current liabilities) demonstrate that the COP and dairy farms seem to be the least liquid, but the situation was improving in 2009.

CONCLUSIONS

The main conclusion regarding the evolution of specialized Romanian farms during 2007-2009 periods can be summarized as follows: all the farms present a better work productivity due to the decrease of AWU and the increase of total output per farm; all the farms present a decrease in incomes obtained per hectare/LSU but in crop farms this situation is due to the reduction of income values and for the other farms is due to the increase of UAA and LSU; the crop farms depend in a higher measure on subsidies and have the higher work productivity and productivity ratio due especially to the public support but also to the UAA dimension; the dairy farms present a decrease of almost 32% in net income, a low solvency and an improvement of liquidity; the mixed crop farms present the higher growth of net income and the higher liquidity; the mixed livestock farms present also an increase of net income

and the highest growth of work productivity and liquidity; the mixed crop and livestock farms present a decrease in net income, a low solvency and liquidity compared to the other mixed farms.

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