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Farm income variability in Hungary:
A comparison with the EU based on FADN records

Szilárd PODRUZSIK[1] - Carmen HUBBARD[2] - Szilárd KESZTHELYI[3] - Lionel HUBBARD[2]

[1]Department of Food Economics, Corvinus University of Budapest, Hungary.
[2]Centre for Rural Economy, School of Agriculture, Food and Rural Development, Newcastle University, UK
[3]Agricultural Economics Research Institute, Budapest, Hungary.
Correspondence address: szilard.podruzsik@uni-corvinus.hu

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[1]Department of Food Economics, Corvinus University of Budapest, Hungary.
[2]Centre for Rural Economy, School of Agriculture, Food and Rural Development, Newcastle University, UK
[3]Agricultural Economics Research Institute, Budapest, Hungary.
Correspondence address: szilard.podruzsik@uni-corvinus.hu

Abstract
This paper intends to shed some light upon the changes in farm incomes in Hungary as a result of the country's accession to the EU in 2004. Subsidies for arable farms increased by 20 percent over three years. The highest degree of increase is observed in the case of arable farms. In terms of national farm subsidies the largest increase can also be identified in the case of large corporate arable and mixed farms. Nevertheless, it was found that the farm income level in Hungary is only half of that in the EU-25.

Introduction
Hungary is one of the ten countries that joined the EU in 2004 and has achieved considerable economic and social progress since transition to a market economy. For example, the restitution of land to private ownership and the creation of a land market have had a radical effect on Hungary's farm structure. Despite the economic indicators of performance showing that agriculture's contribution to the Hungarian economy has decreased since 1989, the sector still plays an important role, in terms of its contribution to Gross Domestic Product, the trade balance and total labour force. Between 2002 and 2005, Hungarian farmers faced a price squeeze, with input prices rising faster than output prices, but farm income rose significantly as a result of a near doubling in direct agricultural subsidies following EU accession. Nevertheless, for many farms, subsidy payments far outweigh net farm income. Although the Copenhagen summit ruled out the possibility of granting full direct payments for the New Member States and a gradual approach (i.e., 25 per cent of the EU level in the first year of accession, 30 per cent in the second year, etc.) was considered more appropriate, for these countries the adoption of the reformed Common Agricultural Policy (CAP) will have a significant impact on their farmers' incomes as well as on the agricultural sector as a whole.

This paper examines the variability of farm income in Hungary for a variety of farm types and compares the situation to that faced in the wider EU. Particular attention is paid to the role of the new form of agricultural subsidies under the CAP, i.e., the Single Farm Area Payment (SFAP), the Single Farm Payment (SFP) and the Complementary National Direct Payments (CNDP), and whether these can be expected to stabilise farmers' incomes.

The point of departure in the analysis is the Farm Accountancy Data Network (FADN) survey, in particular results for 16 farm types focusing on changes in net value added, gross farm income and the distribution of agricultural subsidies. The analysis covers the period between 2002 and 2005, two years prior to and one year after accession, which in spite of

being a relatively short time period is suitable for us to illustrate the substantial structural and distributional changes in Hungarian agriculture.

The dichotomous farm structure of Hungary comprises private farms and corporate farms, which include several different legal business forms such as limited liability companies, co-operatives, deposit companies and joint stock companies. As for private farms, there are a large number of small units, many of which can be classified as uncommercial. The FADN survey provides economic and financial information for eight farm types in both groups, namely small arable, medium arable, large arable, cattle and sheep, pigs and poultry, permanent crops, mixed, and horticulture.

The analysis focuses on net value added and gross farm income, two measures of the economic performance of farms. AKI (2006, p.27) notes that "incomes of private farms and [corporate farms] cannot be directly compared", and therefore applies a correction for labour costs of Hungarian private farms based on the labour costs recorded by corporate farms. This paper will follow suit and employ the same correction when describing farm income. Furthermore, the paper aims to describe the distribution of agricultural subsidies as included in the FADN survey. Over the three-year period these subsidies underwent major changes, as SFAP, SFP and CNDP replaced the former subsidies.

The FADN Survey Results

The FADN consists of an annual survey carried out by all EU Member States. It collects physical and financial data from farms to evaluate incomes and business analysis of agricultural holdings. The survey aims to provide representative data on regions, the economic size and type of farming. It covers approximately 90% of the total EU Utilised Agricultural Area (UAA) and more than 90% of total agricultural production. However, the survey covers only those holdings which owing to their size can be considered market-oriented.

The basic FADN information for Hungary is shown in Table 1. The total sample in 2005 comprised 1,940 farms drawn from a population of almost 91,861 farms.[1] The average size of farm in 2005 was 49 hectares, but with a wide discrepancy between the private farms and corporate farms. Most of the sample (1,546) relates to the private farms, which are far more numerous. However, the much larger average size of corporate farms (394 hectares in 2005) means that each grouping accounts for approximately half of the total agricultural land area in Hungary. Between 2002 and 2005 the number of private farms fell, with an increase in the average size of farm, whilst the number of corporate farms *increased* by 30%, causing a correspondingly large fall in the average size of this category of farm. In the analysis, national level results are derived by use of raising factors based on the number of farms recorded in the population, i.e. N/n (Table 1).

[1] This is the number of farms above the FADN minimum threshold of 2 ESU (Economic Size Unit). The total number of farms in Hungary in 2005 was 715,000, down from almost 1,000,000 in 2002.

Table 1 Hungarian FADN Records – basic data, 2005 and 2002

	2005	2002	% change
All farms			
Number of farms in sample (n)	1,940	1,893	
Number of farms in population (N)	91,861	91,128	0.8
Average farm size (ha)	48.8	48.3	1.0
Private farms			
Number of farms in sample (n)	1,546	1,401	
Number of farms in population (N)	86,115	86,717	-0.7
Average farm size (ha)	25.7	23.6	8.9
Corporate farms			
Number of farms in sample (n)	394	492	
Number of farms in population (N)	5,746	4,411	30.3
Average farm size (ha)	395.4	526.8	-24.9

Source: AKI

The total output of the Hungarian 'national farm' in 2005 was 1,189 billion HUF, slightly more than in 2002.[2] Over this period, total intermediate consumption decreased slightly. Direct agricultural subsidies increasing from 108 billion HUF to 232 billion HUF. Thus the total national gross farm income rose to 319 billion HUF (see top half of Table 2). The contribution of subsidies to farm net value added rose from 50% in 2002 to 57% in 2005.

Table 2 Economic Performance of Farms, 2005 and 2002

	2005	2002	% change
All farms			
Total output (m HUF)	1,189,490	1,074,545	10.7
Total intermediate consumption (m HUF)	848,171	853,038	-0.6
Farm Net Value Added (m HUF)	404,574	216,093	87.2
Gross farm income (m HUF)	319,195	182,169	75.2
Agricultural Subsidies (m HUF)	232,384	107,791	215.6
			% point change
Private farms' share (%)			
Farm Net Value Added	35.7	38.5	-2.8
Agricultural Subsidies	41.2	33.0	8.2
Corporate farms' share (%)			
Farm Net Value Added	64.3	61.5	2.8
Agricultural Subsidies	58.8	67.0	-8.2

* Adjusted for labour cost on private farms.
Source: FADN and authors' calculations.

[2] All values and prices in the paper are reported in nominal terms; deflators have not been used.

Private farms contribute slightly more than one-third to the total net value added (lower half of Table 2).[3] The dominance of the corporate farms increased slightly between 2002 and 2005, but their share of agricultural subsidies decreased by 8 percentage points. Conversely, in 2005, private farms' share of agricultural subsidies had risen to above their corresponding share of the national net value added, whereas in 2002 the situation was the reverse. To obtain a clearer picture of the changes that underlie these broad aggregates, the paper next examines what has occurred at the level of main farm types within the private farm and corporate farms groupings.

Farm types

A breakdown of the total farm net value added by the 16 farm types for the two years is given in Table 3, in which the farm types are ordered by the percentage point change in shares. In 2005, the largest farm type, by net value added, was the corporate mixed farm (21% share), and the smallest was the private permanent crop farm (1.4% share). Looking at the changes over the three year period, it is clear that there was a marked shift from animal and mixed farms to large arable farms, which affected both private farms and corporate farms. Arable farms in total (six farm types – large, medium and small under both private and corporate farm ownership) increased their share of the national net value added by nine percentage points between 2002 and 2005 (Table 3). The share of pig and poultry farms fell by over seven percentage points, and of cattle and sheep farms by over 3 percentage points.

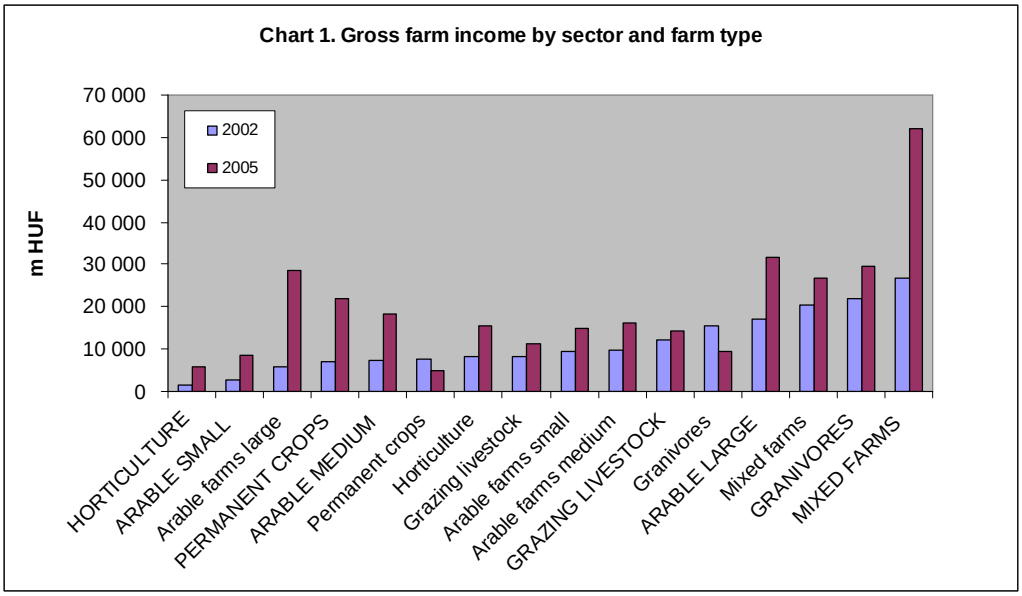
Table 3 Share of Farm Net Value Added by Farm Type, 2005 and 2002

Farm group	Farm type	2005 %	2002 %	Change % point
Private	Arable large	8.5	2.3	6.2
Corporate	Permanent Crop	6.7	4.4	2.3
Corporate	Arable large	11.8	10.3	1.4
Corporate	Arable small	3.4	2.2	1.2
Corporate	Mixed	20.6	19.6	1.0
Corporate	Arable medium	6.8	5.8	1.0
Corporate	Horticulture	1.7	0.8	0.9
Private	Horticulture	4.1	3.6	0.5
Private	Arable medium	4.8	4.5	0.3
Private	Arable small	4.1	5.0	-0.9
Private	Cattle & sheep	3.1	4.1	-1.0
Private	Mixed	7.3	8.9	-1.5
Private	Permanent Crop	1.4	2.9	-1.6
Corporate	Cattle & sheep	4.5	6.8	-2.3
Corporate	Pigs & poultry	8.8	11.6	-2.7
Private	Pigs & poultry	2.5	7.2	-4.7
Total		100.0	100.0	0.0

Source: authors' calculations based on FADN results

[3] The division of farm income between private farms and corporate farms was, respectively, -15,000 m HUF and 74,000 m HUF in 2005; and -39,000 m HUF and 51,000 m HUF in 2002.

Changes in gross farm income over the three years are shown in Chart 1, where farm types in the private sector are shown in lower case and those under the corporate grouping are shown in upper case. As with changes in farm net value added, changes in gross farm income reflect shifts in favour of arable farms, but also of mixed farms. The chart also shows that all bar two of the farm types, after correction for labour costs, had higher farm income in 2005 than 2002.



Source: FADN and authors' calculations.

An indication of the extent to which the compositional changes in terms of farm type may have been due to changes in output and input prices is given by the data in Table 4. Output prices over the three year period generally fell, with only sugar beet and maize recording an increase. Coupled with large falls in the prices for eggs and milk, this suggests perhaps relative price movements favouring arable farming. However, the price of sunflowers and rye also showed large falls over the period. Prices of all variable inputs rose over the three years, the highest rise recorded by energy and the lowest by fertilisers. The movement in output and input prices clearly shows a price squeeze, but it is difficult to observe any particular farm type being favoured over others as a result of these relative changes. Farmers' decisions are likely to have been influenced also by policy changes, in particular in anticipation of EU accession, and by expected changes, relative and absolute, in levels of support.

Table 4 Agricultural Output and Input Prices in Hungary, 2005 and 2002

	Unit	2005	2002	% change
Output				
Sugar beet	HUF/kg	9.61	8.68	10.7
Grain maize	HUF/kg	21.20	21.14	0.3
Pigs (liveweight)	HUF/kg	272.3	273.33	-0.4
Potato	HUF/kg	29.54	31	-4.7
Winter barley	HUF/kg	21.09	21.72	-3.0
Wheat	HUF/kg	21.68	23.18	-6.5
Milk	HUF/litre	66.71	72.88	-8.5
Rye	HUF/kg	17.90	20.05	-10.7
Eggs	HUF/egg	10.78	12.81	-15.9

Sunflower	HUF/kg	49.78	63.61	-21.7
Input (2000=100)				
Energy & Lubricants		128.5	100.2	28.2
Seeds		151.6	133.3	13.7
Chemicals		124.0	114	8.8
Fertilisers		128.5	120.9	6.3
Feedstuffs		121.9	110.6	10.2

Source: authors' calculations

Agricultural subsidies

The distribution of agricultural subsidies, as recorded in the FADN survey, across the different farm types is shown in Table 5, with the farm types ordered by the percentage point change in share. Corporate mixed farms received the largest share (20%) in 2005, with the corporate and private horticultural farms and private pig and poultry farms in receipt of the smallest shares (<1%). The changes to the distribution over the three years show a clear shift in favour of arable farms which is even more pronounced than that reflected by changes in shares of farm net value added. Arable farms, which increased their share of net value added by nine percentage points between 2002 and 2005, increased their share of total subsidies by 19 percentage points, at the expense of most animal and mixed farms. However, all farms received more direct subsidies in 2005 than in 2002 because of the near doubling in the total amount of direct subsidies paid.

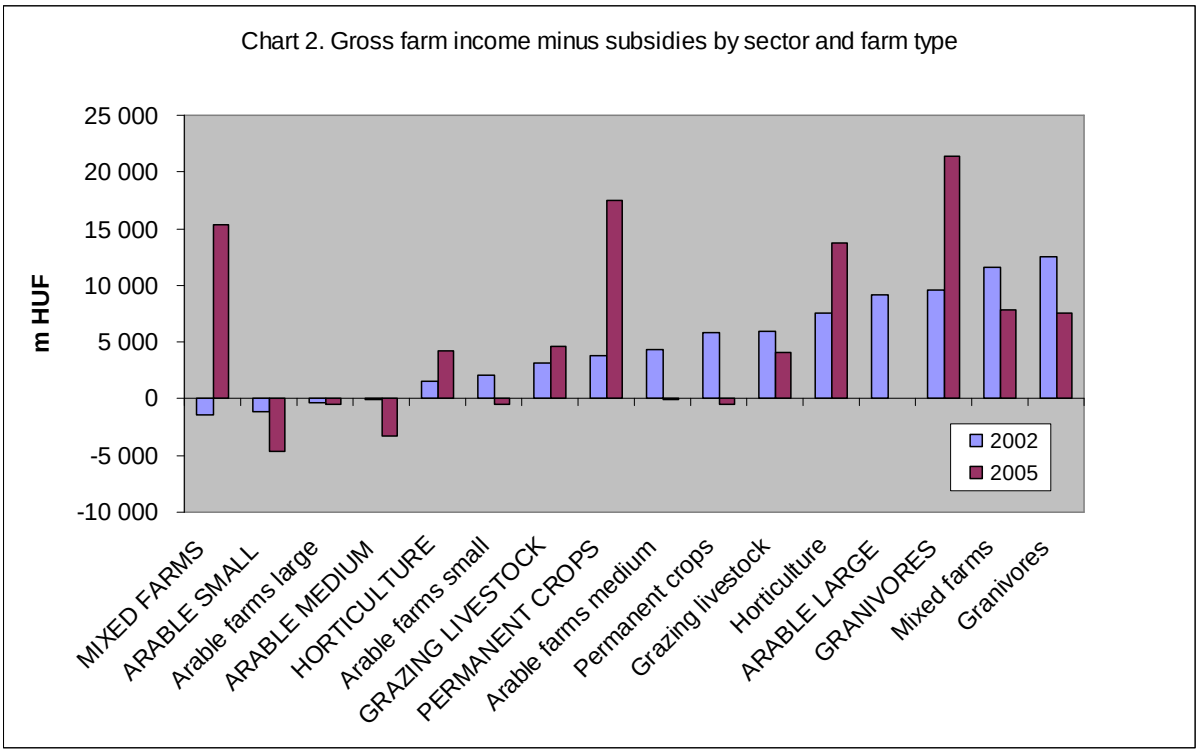
Table 5 Share of Agricultural Subsidies by Farm Type, 2005 and 2002

Farm group	Farm type	2005 %	2002 %	Change % point
Private	Arable large	12.6	5.7	6.9
Corporate	Arable large	13.6	7.2	6.4
Corporate	Arable medium	9.3	6.9	2.4
Private	Arable medium	7.0	5.0	2.0
Corporate	Arable small	5.6	3.8	1.8
Private	Cattle & sheep	3.1	2.1	1.0
Private	Permanent Crop	2.3	1.6	0.7
Corporate	Horticulture	0.6	0.1	0.5
Private	Horticulture	0.8	0.5	0.3
Private	Mixed	8.1	8.3	-0.2
Private	Arable small	6.6	7.0	-0.4
Corporate	Permanent Crop	1.9	2.8	-1.0
Private	Pigs & poultry	0.8	2.8	-2.0
Corporate	Cattle & sheep	4.1	8.5	-4.4
Corporate	Mixed	20.1	26.3	-6.2
Corporate	Pigs & poultry	3.5	11.3	-7.8
Total		100.0	100.0	0.0

Source: authors' calculations based on FADN results

The absolute level of subsidies shows the magnitude of the changes over the three years and the dominant position of arable and mixed corporate farms in 2005. Total subsidy payments to arable farms in 2005 were nearly three times (+194%) those in 2002 This was due mainly to a more than doubling in the subsidy per hectare (+130%), but also from an increase in the total arable area (+28%), arising mainly from an increase in the number of arable farms. The corporate mixed farms in most cases have been converted from state cooperatives. A common feature is that they are large (sometimes above 5000 ha), and therefore their total subsidy exceeds that of large corporate arable farms. Interestingly, farm numbers increased in all arable farm types.

Without subsidies, all six arable farm types in 2005 are loss-making (Chart 2). Furthermore, the income situation in that year worsened for 10 of the 16 farm types. These 'without-subsidy' income positions should not be interpreted as measures of likely income levels in the long run, if subsidies were to be removed. In this case, asset prices, particularly those for land, would be expected to adjust, with positive repercussions for income. Nevertheless, they show the vital importance of subsidies as a component of farm income.



Source: FADN and authors' calculations.

EU context

The harmonisation of the Hungarian FADN with EU requirements allows for the comparison of farms in Hungary, the EU-15 and EU-25 in a single system, by means of similar indices. Table 6 includes indices of Hungary and some other EU Member States (MS) which are comparable to Hungary in terms of the weight of agriculture in the national economy or farm structure.

Table 6 Farms in Hungary and in some other EU Member States

Countries / Indices	France	Italy	Austria	Poland	EU-15	EU-25	Hungary
	EUR/ha						
Total output	1665.7	3300.4	2113.7	1210.4	1974.7	1804.1	1104.8
– Intermediate consumption	1017.7	1445.4	1229.0	714.2	1121.7	1038.5	767.4
– Depreciation	305.0	387.9	525.6	178.5	271.9	248.4	139.2
+ Balance of current subsidies and taxes	325.0	364.4	772.6	118.1	339.8	300.9	209.9
= Net value added	667.9	1831.4	1131.7	435.8	920.8	818.1	408.1
– Costs of foreign sources	309.1	377.5	174.0	53.1	330.3	291.7	240.0
of which: wages	125.0	281.0	45.6	32.6	171.1	155.6	156.8
+ Balance of investment subsidies and taxes	15.5	12.1	-58.0	-9.1	-0.3	0.7	5.7
= Farm income	374.3	1466.0	899.7	373.5	590.2	527.1	173.7
Gross farm income	499.2	1746.9	945.3	406.1	761.3	682.8	330.5
Gross farm income/ESU	19061.1	21203.6	15838.0	3648.0	17958.3	14120.4	8385.0
Gross farm income/ESU corrected by PPP	11173.6	13143.8	9789.2	3893.2	11017.3	8980.7	8385.0

Source: FADN and authors' calculations.

In Hungary the total output per hectare is 60 percent of the EU-25 average. At the same time, the value of intermediate consumption per hectare is almost 70 percent of the EU-15 average and 7 percent higher than in Poland. While in the EU-25 productive consumption of 71 cents is necessary to generate 1 Euro of production value, this ratio is 82 cents in Hungary. This results both from high input prices and the weaker efficiency of input utilisation.

Net value added in Hungary is half of the EU-25 average per hectare after deduction of intermediate consumption, depreciation (Hungarian average per hectare is only 56 percent of the EU average), the balance of current subsidies and taxes from the gross production value. One of the reasons for the difference is the different levels of subsidies after taxes. In Hungary it is only 70 percent of the EU-25 average.

Due to the discrepancies in property and labour law, the farm income indicator cannot be used as a basis for the comparison of Hungary and EU MS. (Hungarian wages per hectare are at the same level as the EU average, which is mostly due to the fact that in Hungary corporate farms employ foreign labour and their wages increase the value of the indicator. In other EU MS, however, family labour plays a dominant role, which does not generate labour costs.) More realistic is the indicator of gross farm income, which is two times higher in the EU. As for labour productivity, the EU-25 average is one-and-a-half times higher than that for Hungary, and that of the EU-15 is more than twice as high.

Taking price levels into account incomes can be evaluated more objectively. Therefore we have adjusted gross farm income per ESU by purchasing power parity. If the Hungarian figure is 100, the EU-25 figure is higher by 7 and the EU-15 higher by 31.

Summary and Conclusions

The relatively short period examined between 2002 and 2005 highlighted some significant changes in the structure of Hungarian national farms. Total output of production changed little over these three years. However, with the introduction of the SAPS and CNDP, direct agricultural subsidies nearly doubled and their ratio to total output rose from 10 percent to 20 percent. The number of corporate farms increased by 30 percent, but their share of agricultural subsidy payments decreased by 8 percent, with private farms gaining a considerably larger share.

Changes to the distribution of agricultural subsidies over the three years show a shift in favour of specialist field crops and large mixed farms which is even more pronounced than that reflected by the changes in net value added. Arable farms increased their share of total subsidies by 19 percentage points between 2002 and 2005 (from 36% to 55%), at the expense of most animal and mixed farms. Overall, it seems clear that arable and large mixed farms are the winners from EU accession.

Following analysis of the FADN data, there are two questions that are difficult to respond to. First, the direction of causality between changes in the structure of the national farm and the distribution of subsidy payments remains unclear. Second, there is no explanation of other factors reflecting structural changes under the SAPS and CNDP, such as market prices or competitive effects of the Single Market.

Based on the FADN data, Hungary's total output is 40 percent lower than the EU-25 average. Similarly, net value added in Hungary is half of the EU-25 average, but gross farm income per hectare is only 7 percentage points higher in the EU-25.

The caveats associated with a preliminary and descriptive analysis are self-evident. The short-term analysis focuses on two years' data, which may be atypical in terms of output and input prices and farmers' decisions on production. The FADN excludes the very large number of small private farms, i.e. the majority of Hungarian farms. The comparative analysis among MS is difficult owing to the lack of common data collection in previous years.

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