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**A Note on the Need for Micro Economic Household Data
in Agriculture for International Policy Analysis**

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A note on the need for micro economic household data in agriculture for international policy analysis

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Introduction

This paper provides some information on the experiences in the Netherlands with micro economic data from the FADN on household incomes, and reflects how this could be useful at the European level and in a transatlantic cooperation. We take these experiences point by point, starting with the data itself.

1. Non-farm income becomes more important

Non farm income has become more important over the last 15 years (table 1) and it counts for a large part of the increase in total income, with rather stable incomes from farming on the average farm. The average farm is larger now, with a smaller profit margin, and there are fewer of them. Where 15 years ago the non-farm income was roughly equal (on average) with the paid taxes (making the family farm income roughly equal to the discretionary income), this is clearly not true anymore.

The growth in non-farm income comes from different sources:

- more outside farm labour (especially by spouses who have entered the labour market, a phenomenon also seen outside agriculture in the Netherlands in this period);
- more money invested outside farming (lacking good investment opportunities inside the farm for older farmers without a successor or due to non-availability of assets like land and quota);
- a bit higher level of allowances (disability, child benefits etc.).

Table 1 Income sources and spending in Dutch agriculture (€ 1.000 per holding per year, in nominal terms)*

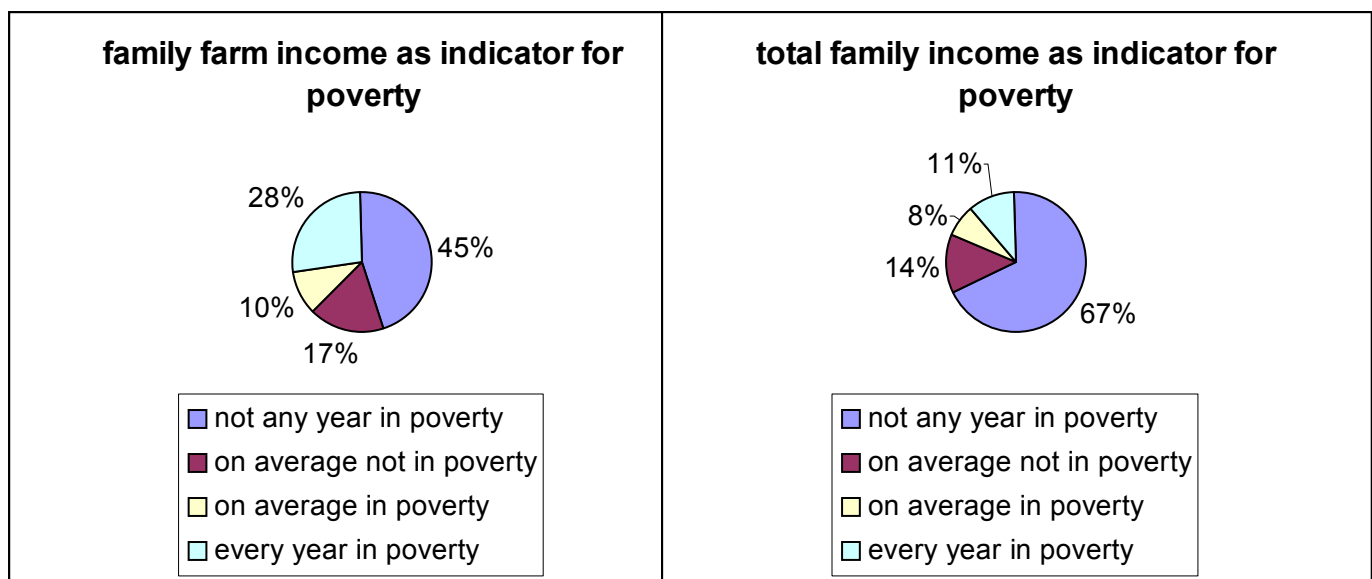
	period 1981-1985	1986-1990	1991-1995	1996-1999
Family Farm Income	31,9	39,3	33,1	34,6
Non Farm Income (farm couple)	6,5	7,8	10,9	13,1
Incl. Labour	1,1	1,7	3,4	5,0
Capital (interest)	2,2	2,9	3,8	3,9
Allowances	2,8	3,0	3,5	3,7
Other	0,4	0,2	0,2	0,4
Total Family Income	38,4	47,1	44,0	47,7
Taxes and social security paym.	7,6	7,5	8,4	7,4
Discretionary income	30,8	39,7	35,6	40,3
Household spending	23,2	26,1	29,5	32,7

¹ The author is head of the Department of Agriculture of the LEI. Trained as a business economist, his research activities are linked to farm information systems, farm accountancy and FADN. The author expresses his gratitude to Walter van Everdingen for the data handling and a review of an earlier draft.

2. An analysis of 'poverty' asks for data on total family income over a longer period

More interesting than the trend is the distribution in the data. In a research project² in 1999 we investigated the situation of farm households with a low income (below a 'poverty line' of € 19,137.- in 1998 prices) and the contribution of non-farm income to the poverty-issue.

Figure 1 A comparison between two indicators to determine the level of poverty (1993-1997)



In the calculations it is important to take a five year average of the income of individual households into account: due to cyclical markets and changes in weather conditions, incomes fluctuate from year to year. An analysis on a one-year basis would show much more low incomes than on a multi-year average.

Figure 1 clearly shows that indicators matter: measured on a 5-year average for family farm income, 38% of the households are below the poverty line. If we take however non-farm income into account and look for total household income, the percentage declines to 19%, less than one in five farms.

As might be expected, the fall in the number of low-income households moving from one indicator to another is especially strong in small farms: on farms in the size class 16-40 European Size Units (ESU) 63% of the households have a family farm income below the poverty line, but "only" 23% have a total family income below that level. For the largest holdings (110-800 ESU) the percentage drops from 17% to 10%.

² W.H. van Everdingen, G.S. Venema and K.H.M. van Bommel: Agrarische gezinnen en hun inkomens - is er sprake van armoede? [Farm households and their incomes - does poverty occur?], LEI, The Hague, October 1999; in Dutch.

Table 2 Statistics (in euro per household), for different groups of households (based on a 3-year average per household, 1995 t/m 1997)

	Households with total family income below the poverty line	Households with total family income above the poverty line		All
		due to non-farm income	already based on family farm income	
Share of households (%)	23	21	56	100
Share of farms (%)	23	22	55	100
Farms size (DSU *)	74	45	119	94
<i>Profit and loss account</i>				
Total output	115,250	86,055	240,315	178,800
Of which: EU direct payments	1,470	2,000	1,475	1,585
Family farm income	2,430	9,915	51,420	31,385
<i>Income Statement</i>				
Non-farm income	5,225	16,565	6,020	8,105
Total family income	7,655	26,480	57,440	39,490
Taxes paid	670	3,935	9,350	6,215
Household consumption	19,455	23,740	28,730	25,550
Savings **)	-10,590	-270	20,510	8,990
<i>Flow of funds statement</i>				
Savings	-10,590	-270	20,510	8,990
Depreciation	18,900	11,600	31,260	24,235
Others (heritages, gifts)	4,205	5,985	4,960	5,005
New loans	13,690	11,840	28,335	21,470
Total funds available	26,210	29,155	85,070	59,700
Repayments on loans	11,465	6,280	23,020	16,805
Investments	16,530	14,345	48,585	33,955
<i>Balance sheet per 30 April 1998</i>				
Net worth	357,700	465,500	658,300	546,700
Liabilities	194,100	112,500	266,200	216,800
Solvability	64,8	80,2	71,2	71,6
Change in net worth '95-'98 (%)	2,3	11,1	24,1	17,9

*) DSU: Dutch size units, roughly equivalent to European Size Units (ESU)

***) not shown but also deducted as household spending some corrections and payments on life insurance

Source: Dutch FADN

Table 2 provides interesting information on how the different groups manage their money:

- Households 'in poverty' have a higher farm turn over (output) than households that manage to stay above the poverty line with non-farm income sources. Their farms are also bigger.

- Households 'in poverty' have farms that are much smaller than the farms of households with a more reasonable income. Farm structure is still adapting to technical progress that requires larger farms and more economies of scale.
- Households that manage to stay above the poverty line with non-farm income sources have on average much higher non-farm income and seem to have chosen diversification of income sources as an important strategy for the household.
- Taxes, with a highly progressive income tax in the Netherlands, correct some of the income differences.
- Households adjust their private consumption to their income level. Households 'in poverty' consume yearly an amount that is equivalent to the poverty level (€ 20,000.-).
- The cash flow available for spending is, due to depreciation that is a cost but not a cash flow, higher than the income.
- Also in households with income problems, investments are carried out, nearly at the same level as the depreciation. On average these households reject to consume a part of their production capacity. The two groups above the poverty line show on average a net-investment.
- The net-uptake of credit was positive in all three groups.
- Although households with a negative net worth exist, also households 'in poverty' manage assets of € 550,000, of which 65% is financed with net worth. Over this three year period the change in net worth was positive, but much smaller than for the other two groups.
- If the households 'in poverty' would sell their assets, pay their debts and invest their net worth at 6% per annum (a conservative percentage), they would replace their family farm income by an investment income of € 20,000.-, roughly equivalent to the 'poverty line income'. Economic and sociologic theory can provide a number of explanations why farmers don't do this. For instance in a time of booming asset prices and capital gains, real option theory provides an explanation why it is interesting to stay in business.

3. The role of European Policies in re-balancing low incomes is small

The Common Agricultural Policy (CAP) was first of all a reaction to the second world war, and an effort to become self sufficient in food by increasing productivity. In the seventies the CAP succeeded in replacing the bad memories of food shortages by those of butter mountains and milk lakes. The famous article 39 of the Treaty on the EEC also called to ensure a fair standard of living for the agricultural community by increasing individual earnings.

Table 2 shows that at least for the Netherlands the direct payments are still quite strong coupled to production; they increase individual earnings but this redistribution of income doesn't influence the income distribution as much as the national tax policy does.

The Common Agricultural Policy started at a time when farmers dominated rural economies, but were often not integrated in tax and social security systems as they were not able to keep books that would be good enough to be audited properly. An agricultural price policy and the improvement of agricultural productivity were efficient transmission mechanisms to improve incomes in imperfect labour markets. Nowadays farming counts

less in the regional economies and the (fiscal) accounts at farms in many EU countries (be it for VAT, tax or income support reasons) are not only superior in a historical perspective but also compared to many other small enterprises. This raises serious doubts on the efficiency of the CAP as a transmission mechanism to raise incomes of poor rural families. As fiscal and social policies are more the domain of the national member state than the European level, it also raises doubts where the objectives of the CAP end, and those of the national social policy starts.

4. Definitions matter

The analysis provided in the previous sections with Dutch data is based on data from the Dutch FADN. In interpreting the data a number of methodological issues should be taken into account:

- The number of households is larger than the number of farms, as some farms support more than one household. The father-son partnership (where the son is married and has his own household) is a typical example.
- The number of entrepreneurs (farmers) is higher than the number of households, as in many farms there are father-son partnerships (with the son living unmarried in the family household) or man-spouse partnerships (especially attractive under Dutch income tax).
- The definition of a farm is not so clear. This is especially the case in holdings with different locations, or with a strong separation of the work between partners (e.g. the son takes care for the pig operation), or where several juridical entities are used.
- The definition of a household and partnership are sometimes also clearer on paper than in practice. We once had an FADN farm where we had to modify accounts every year: it started as a father/son partnership, next year the son took over, then he lived together in one household with his girl friend, married the year after, and got divorced before his 6 year term in the FADN ended. If you would know it in advance, there would be a strong bias not to select such a farm.
- In the Dutch FADN we do not gather data on the distribution of the family farm income to the different entrepreneurs or households (if there is more than one household). Even worse: the FADN calculates a family farm income, where the entrepreneurs divide (and take decisions on) a fiscal income, that could be quite different. This could mean that in practice the distribution of income between households could be more unequal than we assumed (in case of more than one household we divided the income equally).
- The Dutch FADN does not represent 6% of production and about 25% of the farms registered in the Farm Structure Survey. Some of the so-called 'farms' below the threshold of 16 ESU will be in poverty.
- The non-farm income does not include any capital gains, e.g. on stock market investments.
- Income from farm related activities as food processing, renting out buildings (e.g. for winter stocking of caravans), agri-tourism etc. are reported in farm income.
- Quota received free of charge from the government (but nowadays tradable at high prices) have not been valued in the balance sheet and land is valued at agricultural prices. That makes net worth valued at market prices on some farms much higher

than reported here. Quota that have been bought, are depreciated at 7% in the profit-and loss account, which lowers income.

- Non-farm income is related to the farmers / entrepreneurs and their spouses. Children who still live at home but have a job outside agriculture do not report their income in the FADN, even if they occasionally work a few hours in the weekend or in their holiday in the farm.
- Some additional reasons for underreporting non-farm income exist (see next section).

5. Data collection is often feasible

The example of the Dutch FADN shows that data collection is feasible. It's probably not the most efficient method if one is just interested in non-farm income. A question in the Farm Structure Survey of the type of non-farm job and the number of hours worked in that job good be a good and cheap proxy. But it is very attractive to have the non-farm income (and fiscal) data in an FADN if one wants to understand investment behaviour. Farmers who asks the LEI why we need this data, we often confront with a comparison between a full time Dutch farm couple and his Danish counterpart who is able to invest more, as his spouse works in a non-agricultural job. In the Dutch FADN the LEI does the accounting itself and gets all bank transactions from the farmer's bank electronically. In that case it is often not too difficult to get the data.

The example above, shows that we often get remarks from farmers that question the need to provide such data. The non-response for this type of data is relatively high, also compared to the non-response for the FADN in total. And in this case it is hard to control for the non-response as survey data is not available. There are three 'sources' for this non-response:

- A number of farmers question why the non-farm income of their spouse (in a total different job, sometimes even in her own business - we once had a farmer married to a dentist) should be of interest to agricultural policy. Dutch tax laws (and other policies) are nowadays more individualised as ever before, which also supports the idea that the decision to form one household is not something that influences policies. As one farmer famously remarked: do we lower the salaries of the university professors when their wives re-enter the job market as a school teacher?
- A number of farmers (probably) have important family investments outside agriculture. In some regions the non-response with large arable farms is high. These farmers argue that the CAP should look to the cost of production and farm structure, not to how the farm is financed. In Dutch cost price methodology, imputed costs for own labour and own capital are used. Or to put it in the terms of the theory of finance: the investment portfolio is not influenced by the debt-structure.
- More and more farms are becoming that large that they are incorporated with several persons holding the shares in the limited company. This is especially the case in horticulture and intensive livestock, but probably also spreads to other sectors.

6. More European data is attractive but not required

Data on non-farm income exists in a number of European countries. In the RICASTINGS-study on the feasibility of a new farm return for the European FADN³ a number of countries reported on having this data for at least sub-samples, with a willingness to exchange this data through the RICA/FADN-network: the Netherlands, Denmark, Germany, Austria, Sweden, Finland and the United Kingdom. On the other hand a number of countries strongly opposed to an obligation to collect such data, being afraid for a strong non-response that could damage the current FADN data flow. There are a number of reasons why the obligation to collect non-farm income data should not be a top priority, but data should be exchanged voluntary:

- Academics who would like to understand or model farm household behaviour can use excellent data sets from the Netherlands, Denmark or other countries mentioned. Such research is very much needed, and should be reported to a European audience, but does not need data that is representative for all European agriculture.
- The EU policy makers should learn that their influence on income distribution is modest, also with a view to the existence of non-farm income and national tax regimes, but it is questionable if they should take total income (and income distribution) as an objective. From a point of subsidiarity they could also leave this issue to the member states.
- The farm structure in candidate countries (as well as in Eastern Germany) is often bipolar, with a large part of the agricultural production capacity in limited companies or other 'legal entities'. In those cases non-farm income is very hard to collect, and probably even less relevant. Tax account statistics could be a good starter to look to regional income distributions.
- Taking the last two points together: agriculture is more and more becoming a normal business in a production chain, not so different from the McDonalds franchise taker or a car repair shop. In the USA the pork and poultry industry in North Carolina, the wine industry in California or the fruit industry in Florida are well known examples. Market structure, food safety and environmental protection are more important policy issues than remuneration of production factors.

7. Transatlantic co-operation should focus on micro-economic data, not necessary on non-farm income

There is a long way to go in analysing micro-economic data to support policy making at WTO or OECD scale. The effects of EU and USA agricultural policies, and policy proposals, could be better understood if we moved to a common analysis of micro economic data. This could already be the case without moving directly to include non-farm income in the analysis. In a paper for the OECD in 2000⁴, I argued why we should not restrict international policy research to macro-economic statistics:

³ Abitabile et al: The feasibility of a new farm return for the FADN, LEI, The Hague, 1999

⁴ K.J.Poppe: Towards consistent micro- and macro level economic statistics. Paper for the OECD meeting of agricultural accounts experts, OECD [std/na/agr(2000)8] Paris, 2000.

- Policies move to direct income payments that are regionalised, and paid out on a lot of conditions (e.g. cross compliance), like stocking rates etc. It is claimed that those payments are neutral to production levels.
- Execution of those policies is heavily supported by ICT, leading to large administrative databases that can sometimes be used for policy research.
- The ex-ante and ex-post analysis of such policies is only possible with representative micro economic panels like the FADN. They should include information on environmental performance.
- To model and understand farmer's behaviour under the CAP, national policies like environmental policies and income tax systems should be taken into account. Economists run increasingly the risk to specify empirical models that do not include all the relevant parameters.
- Improved econometric techniques on e.g. panel data, as well as micro economic theory (e.g. by including risk in its concepts) have results to offer. These techniques are often data intensive. The same holds for new trends in research in farm management (farm systems, management styles) and environmental research (life cycle analysis).
- Developments in ICT during the last 20 years have led to much cheaper data storage and processing capacity. That makes the joint exploitation of anonymous micro economic data sets at an international level in e.g. a GTAP-like consortium very well possible.

In conclusion: non-farm income data are relevant, but transatlantic co-operation is already far behind in micro-economic data as such; setting up a consortium to improve this, is attractive.

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More discussion on this paper is possible on the forum of www.pacioli.org and contributions on these topics to the Pacioli-10 workshop (December 1-4 2002, Venice, Italy) are most welcome.