Leibniz Institute of
Agricultural Development
in Transition Economies
(IAMO)
www.iamo.de/en

IAMO
Policy Brief

Nº 29

Issue No. 29
August 2016

Policy evaluation on the basis of the Farm Accountancy Data Network

Ulrich Koester
Jens-Peter Loy

According to recital (68) of the preamble to regulation (EU) No. 1306/2013, 'Each measure under the CAP should be subject to monitoring and evaluation in order to improve its quality and to demonstrate its achievements.' This policy brief investigates whether the officially-declared data set for policy evaluation, the Farm Accountancy Data Network (FADN), can be used to assess the impact that direct payments of the Common Agricultural Policy (CAP) actually have on official policy objectives. It is our opinion that FADN data are inadequate to be used in policy evaluation due to the specifics of selection of the sample. First, there is a mismatch between farms that are included in the sample and farms that are entitled to receive direct payments. Second, and possibly even more importantly, the information collected, so-called farm income, does not represent farmers' actual income. Third, the data are neither consistent in time nor between Member States. This policy brief reports on selected data problems for selected EU countries. The analysis leads to the final conclusion that the present setup of FADN data is inadequate for the data to be used to evaluate EU farm income policy. This conclusion is completely in line with the European Court of Auditors' Report (European Court of Auditors, 2016).

The setup of the FADN system[1]

According to the new legislation (European Union, 2013), the European Commission (EC) is responsible for evaluating Pillar 1 measures of the Common Agricultural Policy (CAP). Established in 1965, the Farm Accountancy Data Network (FADN), which provides an annual survey carried out by the Member States, is the basis for evaluating the income of agricultural holdings in the EU and the impacts of the Pillar 1 CAP policies (regulation 79/65/EEC). The FADN collects accounting data from a sample of the agricultural holdings to determine income measures of agricultural holdings for each Member State. The survey centers on specific agricultural holdings; small holdings and holdings with mainly non-agricultural income are excluded. Sample selection uses regional, size and type of farming stratums to represent the population. Currently, samples cover approximately 80,000 holdings, which represent 1.6 per cent of the population. The population covers about 90 per cent of the utilized agricultural area and 90 per cent of agricultural production. National Liaison Agencies are responsible for the data collection, and FADN results are a set of statistics calculated from the farm returns. Costs for collecting these data are reimbursed by the EC based on successfully completed farm returns. The Member States apply different organizational schemes to collect the FADN data. In most Member States, individual accounting data build the raw data base. Some countries, such as Romania, do not have a developed bookkeeping system; thus, data need to be estimated by surveys. The EC checks and approves the data.

The adequacy of the data set for identifying changes in the policy variable

Policy objectives address specific populations of the society or its endowments. Whether a sample provides statistically reliable information depends on the associated population. No single sample will

[1] Further information: http://ec.europa.eu/agriculture/rica/

allow the assessment of all policy measures, but a reasonable definition of the population should consider the objectives of the policies. The population and sample should allow the researcher to check the impact of specific policy measures with respect to the realization of policy objectives. Therefore, examining the representativeness of the FADN data must begin with the policy objectives.

The selection of farms in the FADN is based on a specific definition of a farm holding. According to regulation 79/65/EEC, the FADN should provide information on commercial farms. A commercial farm is defined as one that is large enough to provide an income sufficient to support the farmer's family. In practice, in order to be classified as commercial, a farm must exceed a minimum economic size. The minimum size differs across Member States, considering that the income needed to support a family depends on the economic environment, including the income of the non-farming population. The definition of a commercial farm also indicates that FADN is set up to provide information on the economic situation of family farms. When the FADN began in 1965, agricultural production units were, with few exceptions, family farms in the EU. Meanwhile, other types of production units such as corporations and partnerships have emerged in the EU, mainly due to EU enlargement. These entities are by no means family farms. Nevertheless, some countries include these entities in the FADN data. In Poland, the FADN tries to include corporations and partnerships, but has difficulties obtaining all the necessary information; the same holds true for Romania. Germany includes legal entities located in the New German Federal States (Bundesländer) in the data set, but not those from the Old German Federal States (Bundesländer).

The definition of farms included in the FADN data set is not the same for all individual Member States, or even for all regions in a specific country

According to regulation 79/65/EEC of 15 June 1965, the FADN should provide information on commercial farms. A commercial farm is defined as one that is large enough to provide a main activity for the farmer and a level of income sufficient to support his or her family. The inclusion of small and even partly semi-subsistence farms in some countries or the inclusion of legal entities in other countries is not in line with the definition of farms according to the quoted regulation in the original document.

No differentiation between been recipients and beneficiaries

The FADN data set does not allow differentiation between beneficiaries and recipients. Those farms receiving payments are not identical to the beneficiaries; a part of the received payment will be passed over to the landowners depending on several factors such as the structure and the competition on the land market.

Mismatch between farms included in FADN and those entitled to direct payments

The criteria for selecting farms for FADN purposes do not match the criteria defined for selecting those farms that are entitled to direct payments. The selection criterion for FADN is standard output, but for most direct payments it is the farm size measured in hectares. However, farm size measured in standard output (SO) and farm size measured in hectares is not closely related. The case of Romania may serve to illustrate the problem. The minimum farm size for being included in an FADN data set is 2,000 euros SO, while the minimum farm size to be entitled to direct payments is 1 hectare. The data on the SO per hectare for alternative agricultural products reveal that there are only three products that result in a SO of 2,000 euros per hectare or more. These are mushrooms, some permanent crops and laying hens. The majority of farms have to cultivate significantly more than one hectare in order to produce an output of at least 2,000 euros. Thus, farms included in the FADN data do not match those farms entitled to direct payments. This has significant implications for the assessment of direct payments by using FADN data. Moreover, this mismatch also distorts cross-country comparisons and the use of aggregated results for all EU member countries.

Lack of randomness of the sample within and across countries

Random drawing is an important quality criterion of samples for evaluating and testing hypotheses on the population. There is no doubt that all of the FADN samples are non-random (see inter alia European Court of Auditors, 2003). Sample participation is voluntary and the response rates are low. The EU designs sample stratifications to ensure representation of the population. However, the stratification of the FADN samples do not optimize the efficiency of income parameters and does not test their representativeness. The various countries we investigate (Germany, France, The Netherlands, Poland, Spain and Romania) show different strategies for the stratification schemes. However, the general structure is similar and based on farm size, farm type, and regions. The selection plan follows the farm structure surveys, and its accuracy may depend on the time between the farm structure survey (FSS) and the FADN surveys.

Specific problems illustrated for selected countries

Germany

The FADN sampling in Germany is based on the Test Enterprise Network (TBN = Testbetriebsnetz) sample, which covers all farms with a standard output above 25,000 euros. Standard outputs are calculated for 36 regions and for all relevant products;

the total standard output is calculated for each farm. In 2010, the size of the population for Germany based on this definition was 195,191. The FSS uses a different criterion based on the farmland and the number of the various livestock. The FSS has a population of 299,134 farms for 2010. Further, the number of farms, firms, individuals or organizations receiving direct area payments is estimated to be 332,127. Thus, the coverage of farms based on the FSS definition and the coverage of holdings or private individuals receiving area payments for Germany is much lower, at 65 and 59 per cent respectively. The German Federal Ministry of Food and Agriculture (BMEL) defines the selection plan for the TBN. The selection plan considers regional, farm type and farm size in accordance to their appearance in the FSS. At the state level the Ministries and Chambers of Agriculture organize the TBN-data collection. Accounting offices in coordination with the Ministry and the Farm Chambers carry out the data collection.

In 2010 about 5 per cent of the population based on the TBN definition of farms is selected for the sample. For the FADN statistics only a portion of the TBN data is used, about 80 per cent of the sample (~9,000 EU FADN out of ~11,000 TBN). Of these farms, ~10,500 are obliged to maintain bookkeeping and 500 are not. For the latter, bookkeeping is introduced for the TBN data collection and additional compensation is paid. The sample selection plan is stratified using various regions, farm sizes and types of farming, as defined in the Commission regulation No. 1242/2008. The sample is not redrawn every year. Only farmers who give up business or stop reporting are replaced in the sample in accordance with the selection plan. The selection of farms is arbitrary and likely based on the expectation on compliance to participate. Timely availability of bookkeeping results is of critical importance. As dairy farm results are available earlier in the year, this farm type is often overrepresented in the German sample. The results are not verified but farmers have no other incentive to avoid misreporting their own bookkeeping. Most parameters should be (fairly) accurate for the farms in the sample.

We analyze the selection plan and the actual sample for Schleswig-Holstein (SH), Baden-Württemberg (BW) and North-Rhine-Westphalia (NRW). The average sample size according to the selection plan for SH (BW, NRW) is 5.4 (5.0, 4.0) per cent of the total population based on the SO definition, which is close to the average relative sample size for the total sample for Germany. However, the relative sample sizes according to the selection plan vary significantly between farm sizes and farm types. For a stratified sample based on these criteria, we would expect the same relative size for each cluster (stratum). The relative sample sizes according to the selection plan in the various farm type, size and regional clusters vary between 0 and 18.5 per cent for SH, between 0 and 16.1 per cent for BW and between 0 and 11.4 per cent for NRW. The selection plan is the basis for the sample; however, the final sample differs because of non-reporting or other problems such as data quality. The difference between the selection plan and the final sample overall is negligible. For some stratums we find significant differences. At maximum for SH, the ratio between the actual selection and the selection plan is 160 per cent, at the minimum the actual selection reports only for 16.7 per cent of the selection plan. For BW we find a range from 30.0 to 34.5 per cent, for NRW the range is from 171 to 33 per cent. It appears that the authorities try to deliver a fixed total number of farms and shift between stratums because of the availability of reporting farms. The weight for the different stratums is calculated by the actual number of farms in the selection plan and the total number of farms in the population.

By sample stratification one can increase the precision (efficiency) of estimates for population parameters such as average income, etc. Further, stratification allows for more detailed analysis. Efficient stratification procedures use characteristics that correlate with the variance of the variables of interest, e.g. farm income likely varies with farm size. Thus, size stratums can significantly increase the precision of the average farm income. The FADN based on the TBN sample uses farm size, region, and farm type for the stratification. The stratification likely improves the precision; however, the EU should analyze its impact on precision and should explain its role in policy analysis.

The TBN and FADN concepts show differences that can result in significant deviations between income measures. In 2010 the total deviation between profit measured by the TBN and farm net income measured by FADN amounted to about 3 billion euros, a difference of almost 50 per cent. Kleinhanss (2013) explains this deviation by varying definitions of income indicators and depreciation procedures.

For comparison of incomes between regions, farm types and Member States, the income per working unit is used. The amount of family labor is crucial for this comparison. Reporting family labor is not necessary for tax results. Particularly for small and medium-size farms, significant deviations are obtained. The labor force in the FSS is always higher than for the TBN-data. 'The monetary accounts in Germany are important for the tax statement of the farm. However, the non – monetary information like area development and herd sizes has to be added from other sources. A comparative analysis in Germany found that FADN compared to FSS has a lower variance of cropping area and herd size development over time, although the same sample was considered (Gocht et al., 2012). An explanation is that the information is not always updated by the accountant (or farmer) but last year's values are carried forward to the maximum extent possible,' (Neuenfeldt and Gocht, 2014).

The Netherlands

The FADN in the Netherlands and France work similar to the German FADN. The random selection in the

Netherlands at first appears to be superior. However, the low response rate and the panel character of the sample limit the advantage. The weighting scheme also creates problems in estimating average or total income measures. The Netherlands provide account data from about 1,500 farms for the EU out of a total of 68,810 farms (3 per cent). The Netherlands apply the same threshold as Germany for farms in the FADN; they use only one regional SO for each product. Overall, 71 per cent of all farms match the SO threshold, and produce 99 per cent of the output measured in SO. The Netherlands use some additional and to some extent different stratification criteria, e.g. a cluster of organic farms of starch potato producers. In the data collection process, farms are recruited on a voluntary basis and stay in the sample as long as they agree to participate. The response rate for recruiting new farms is about 22 per cent, the recruiting rate is about 6 per cent per year (Van der Veen et al., 2014).

France

For France, the SO threshold reduces the population of agricultural holdings by 38 per cent. The French authorities deviate from the selection plan and set a minimum of 30 observations per stratum. The sample is small and has a high number of stratums. Stratums with less than 30 observations are ignored. Data collection accounting offices receive a high compensation. The sample is not random and representativeness is mainly tested for the stratification variables. Critical issues are the quality of the agricultural working units, the treatment of large legal entities and partnerships, and the consideration of significant non-agricultural incomes. Farms and particularly large legal entities with their own accountants are not considered in the sample. If 30 per cent of the farm income or more than 50,000 euros originate from other gainful activities, these activities are not considered. About 12 per cent of the farms represent partnerships. For these farms, no consolidated accounts are calculated and activities outside the partnerships are not considered.

Poland

The FADN is not a random sample in Poland. Rather, participating farms are selected to achieve representative values for the SO in various stratums based on farm structure surveys; the sample size in each stratum considers the variation in SO. A major bias is likely to occur with respect to the entire population of farms in Poland, as only 37 of all farms are considered for the FADN. The sample size for each stratum is determined by the Neyman procedure (Neyman, 1934), and the SO is the key variable; its variation is used to calculate the sample size for each stratum. Stratums with a higher variance for the SO have a greater sample size. The potential improvement in the efficiency of the sample is not tested.

Spain

The Spanish FADN system is based on hired data collectors who are selected by a public tender. The sample is non-random. The decision about which farms are included in the FADN is made by the collecting agencies. This process and its implications are not evaluated. Spain and France use many stratums, which may create problems because of farm movements between classes. In 2009 Spain had 989,796 farm holdings. Applying the SO threshold reduces the number of farms by 39.6 per cent. These farms produce about 98 per cent of the SO, utilize 92 per cent of the agricultural area and hold 99 per cent of the livestock units. The sample size is 8,700 (2012), which is 1.45 per cent of the FADN population.

Further Information

Literature

Commission Regulation (EC) No. 1242/2008 of 8 December 2008 establishing a Community Typology for Agricultural Holdings.

European Commission (2016): The Farm Accountancy Data Network (FADN) is an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy, URL: http://ec.europa.eu/agriculture/rica/ (Accessed: 1 August 2016).

European Court of Auditors (2003): Sonderbericht Nr. 14/2003 über die Messung des landwirtschaftlichen Einkommens durch die Kommission zusammen mit den Antworten der Kommission. C 45/1.

European Court of Auditors (2016): Is the Commission's system for performance measurement in relation to farmers' incomes well designed and based on sound data? Special Report No. 1/2016.

Gocht A., Heckelei, T., Neuenfeldt, S., Röder, N., Storm, H. (2012): Modelling the Effects of the CAP on Farm Structural Change. Luxembourg: Publications Office of the European Union, JRC Scientific and Technical Reports, IPTS Technical Report.

Kleinhanss, W. (2013): Comparing Income Indicators between EU and German FADN Taking Adjustments of Data Conversion into Account. Presentation at the RICA Committee Meeting, 11.09.2013.

Neuenfeldt, S., Gocht, A. (2014): A Handbook on the Use of FADN Database in Programming Models. Thünen Working Paper 35.

Neyman, J. (1934): On the two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection. Journal of Royal Statistical Society 97 (4), 558–625.

Regulation (EEC) No. 79/65/EEC of the Council of 15 June 1965 setting up a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Economic Community.

Regulation (EU) No. 1306/2013 des Europäischen Parlaments und des Rates vom 17. Dezember 2013 über die Finanzierung, die Verwaltung und das Kontrollsystem der Gemeinsamen Agrarpolitik und zur Aufhebung der Verordnungen (EWG) Nr. 352/78, (EG) Nr. 165/94, (EG) Nr. 2799/98, (EG) Nr. 814/2000, (EG) Nr. 1290/2005 und (EG) Nr. 485/2008 des Rates.

Van der Veen H. B., Ge, L., van der Meer, R. W., Vrolijk, H. C. J. (2014): Sample of Dutch FADN 2012, design principles and quality of the sample of agricultural and horticultural holdings. Project report. LEI Wageningen UR, The Hague.

Contact

Prof. Dr. Dr. h.c. mult. Ulrich Koester
ukoester@ae.uni-kiel.de
Tel.: +49 431 880-4436
Fax:+49 431 880-4592

Department of Agricultural Economics
Christian-Albrechts-Universität zu Kiel
Wilhelm-Seelig-Platz 6/7
24118 Kiel
Germany
www.uni-kiel.de

Leibniz Institute of Agricultural Development in Transition Economies (IAMO)
Theodor-Lieser-Str. 2
06120 Halle (Saale)
Germany
www.iamo.de/en

Prof. Dr. Jens-Peter Loy
jploy@ae.uni-kiel.de
Tel.: +49 431 880-4434
Fax:+49 431 880-4592

Department of Agricultural Economics
Christian-Albrechts-Universität zu Kiel
Wilhelm-Seelig-Platz 6/7
24118 Kiel
Germany
www.uni-kiel.de

Printed edition: ISSN 2363-5800
ISBN 978-3-95992-020-9

Online edition: ISSN 2363-5797
ISBN 978-3-95992-021-6

IAMO

Leibniz Institute of Agricultural Development in Transition Economies (IAMO)

The Leibniz Institute of Agricultural Development in Transition Economies (IAMO) analyses economic, social and political processes of change in the agricultural and food sector, and in rural areas. The geographic focus covers the enlarging EU, transition regions of Central, Eastern and South Eastern Europe, as well as Central and Eastern Asia. IAMO is making a contribution towards enhancing understanding of institutional, structural and technological changes. Moreover, IAMO is studying the resulting impacts on the agricultural and food sector as well as the living conditions of rural populations. The outcomes of our work are used to derive and analyse strategies and options for enterprises, agricultural markets and politics. Since its foundation in 1994, IAMO has been part of the Leibniz Association, a German community of independent research institutes.

Leibniz Association