

# The representativeness of the Farm Accounting Data Network (FADN): some suggestions for its improvement

FRANCO MARI

2020 edition





The representativeness of the  
Farm Accounting Data Network  
(FADN): some suggestions  
for its improvement

FRANCO MARI

2020 edition

Manuscript completed in November 2020.

The Commission is not liable for any consequence stemming from the reuse of this publication.

Luxembourg: Publications Office of the European Union, 2020

© European Union, 2020



The reuse policy of European Commission documents is implemented based on Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Except otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC-BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

Copyright for the cover picture: Damian Lugowski/Shutterstock

For any use or reproduction of photos or other material that is not under copyright of the European Union, permission must be sought directly from the copyright holders.

For more information, please consult: <https://ec.europa.eu/eurostat/about/policies/copyright>

The information and views set out in this publication are those of the authors and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.

Collection: Statistical working papers

Theme: Agriculture and fisheries

ISBN 978-92-76-26959-5

ISSN 2315-0807

doi:10.2785/06861

KS-TC-20-009-EN-N

## Abstract

The information produced by the Farm Accounting Data Network (FADN) is used to formulate common agricultural policy decisions. They, therefore, must be correct and present a clear and coherent picture of the primary sector. The representativeness of the sample supporting the survey, however, can be invalidated by some important factors. The first of these is the presence in the sample of farms not subject of investigation and the second is the different distribution between the farms in the sample and the ones in the field of observation. The developed analyses showed that both factors influence the FADN sample. The first factor, more precisely, is present in the sample of all Member States and derives from the positioning of the entry threshold to the FADN at levels of economic size too low to allow only commercial farms to enter the survey. The second factor, analysed only for Italy, arises from the replacement of non-responding farms with farms that have economic size and/or type of farming different from those of the fallen farms. The presence of the first factor is believed to depend on a "precautionary" behaviour of the Member States. The presence of the second factor, instead, derives from the difficulty of the Italian FADN to manage the considerable lack of response resulting from the adoption of a random sample.

## Introduction

The Farm Accounting Data Network (FADN) is a statistical survey that aims to collect information on farms necessary for the study of their economic functioning and their ability to produce income; essential information for the development of the common agricultural policy. As it is repeatedly highlighted in the regulations and manuals relating to the survey and also as it can be inferred from the small sample size of the survey, it can fulfil this ambitious and delicate objective only thanks to the adoption of a highly representative sample.

Moreover, especially in post-industrial economies, agriculture is increasingly assuming very important multifunctional characteristics such as, for example, agricultural tourism, energy production, social agriculture, land maintenance, and others. This diversified evolution of the primary sector, then, often depends really on the economic size of farms and, above all, requires equally diversified agricultural policies. For public intervention in agriculture to be effective, therefore, it is essential that the statistics that support agricultural policy decisions provide a picture of the primary sector as clear and coherent as possible.

Given the above, the purpose of this contribution is to highlight the main factors that can cause sample distortion, resulting in a reduction in the representativeness of the sample, and to examine their possible influence on the FADN sample.

## The basic concepts

The basic concepts of any statistical survey are the universe, the field of observation and the sample. With reference to the FADN, the universe is given by the set of farms surveyed with structural surveys by the statistical institutes of the Member States (MS) of the EU. The field of observation, instead, is the subset of the universe to which the survey is addressed, that is, the subset of the universe to which the farms of interest of the FADN belong. Finally, the sample is the subset of the field of observation to which the farms selected for the collection of information belong. Therefore, considering the relationships between universe, field of observation and sample, the essential prerequisites for obtaining reliable information from the survey are an accurate delimitation of the field of observation and an equally accurate selection of the sample.



For the identification of the farms belonging to the field of observation, the Regulation establishing the FADN (EU Council, 2009), in Article 5, provides the following indications: a) they have an economic size equal to or greater than a minimum (coinciding with the lower limit of an economic size class) to be determined by the member state; b) they are managed by farmers who have accounts, or who are willing to keep farm accounts, and who are willing to provide their farm data to the European Commission; c) as a whole, and at the level of the geographical district, they are representative of the field of observation. Other information useful for the purpose in question is provided in Article 2 of the Regulation relating to the identification of the minimum economic size (Threshold) referred to in point a) above (EU Commission, 2014). It is fully reported "The threshold referred to in Article 5 (1) of Regulation (EC) No 1217/2009 shall ensure that the field of observation of the survey represents the largest possible share of agricultural output, agricultural area and farm labour, of holdings run with a market orientation ". Finally, a further important clarification on the nature of the farms belonging to the FADN field of observation is provided by the manual "Farm Accounting Data Network. An A to Z of methodology" (FADN a, 2018). It is reported in full: " The field of observation consists of 'commercial' farms. In defining the FADN field of observation, the Commission follows the guidelines specified in Council Regulation (EC) No 1217/2009 of 30 November 2009 and subsequent amendments and adopts a pragmatic approach by including only those farms deemed to be commercial. A commercial farm is defined as a farm which is large enough to provide a main activity for the farmer and a level of income sufficient to support his or her family. In practical terms, in order to be classified as commercial, a farm must exceed a minimum economic size. However, because of the different farm structures across the European Union, a different threshold is set for each Member State. Consequently, the set of farms which constitute the FADN field of observation in a given country is represented by those agricultural holdings surveyed by the FSS, with an economic size exceeding the threshold set for that country".

About the selection of the sample, in order to be representative, it must reproduce the characteristics of the field of observation (Pertichetti, 2020). It follows, therefore, that the sample must meet the following two conditions: 1) it must contain only and exclusively farms belonging to the field of observation; 2) the farms contained therein must present the same distribution presented by the farms in the field of observation. The deviation of the sample from these two conditions, therefore, is a sampling error that involves distortion of the sample and a reduction in its representativeness. The sample, therefore, will be the less representative of the field of observation, the greater the distortion under examination. The characteristics that farms must have to satisfy the first condition will be discussed in the next paragraph. The guarantee on the correct distribution of the farms in the sample (second condition), on the other hand, is provided by the procedure used for the extraction of the farms from the field of observation. This procedure, more precisely, consists in the classification of the farms of the field of observation according to three variables (geographical district, economic size and type of farming) and, therefore, in their stratification. The latter operation consists in the allocation of each farm in its own "layer" to which it belongs. This layer, which for each farm arises from its classification, is conceptually represented by the intersection of the three variables mentioned above. These variables (classification variables) are defined in the Regulation on the Typology of agricultural holdings (EU Commission, 2008), to which reference should be made for any further information. However, they can be briefly described as follows. The geographical districts correspond to the administrative regions into which the territories of the MS are divided, or with their aggregations or dis-aggregations. The economic size (ES), that is expressed in euros, provides an indication of the potential standard output of a given farm. Finally, the type of farming (Tof) defines the "type" of farm and is given by the percentage incidence of the economic size of a crop (or group of crops) on the total economic size of the farm. At the end of the stratification of the farms of the field of observation, therefore, a three-dimensional matrix composed of layers (districts) will be obtained. Furthermore, each layer will be divided into cells delimited by an economic size (or group of economic size) and by a type of farm (or group of types of farms). Each cell of each layer, therefore, will contain N farms which, given their location, will be characterized by having a good level of homogeneity with respect to the classification variables. When the stratification of the field of observation has been completed, the selection of the representative sample involves the extraction of the farms not from the field of observation as a whole, but from the individual cells of the matrix

seen above. In other words, the extraction of the representative sample involves the creation of a second three-dimensional matrix, identical to that seen for the field of observation, but, this time, relative to the sample. Each cell of this sample matrix, therefore, will contain  $n$  farms, where obviously it will be  $n < N$ . The sample matrix, in reality, may differ from the one of the field of observation because the possibility of grouping cells (clustering) is foreseen where the cells contain types of farms that are not very significant. In dealing with these types of farms, however, the topic under consideration does not represent a relevant aspect of the sampling. Its relevant aspects, instead, are the method of selecting farms from the field of observation and their number. As regards the method of selecting farms, it can be done on a random or voluntary basis. The advantage offered by random selection is that, by bringing into play the calculation of probability, it allows to calculate the standard errors of the estimates and, therefore, their degree of reliability. The adoption of the representative sample, however, should make this need less pressing. With the representative sample, in fact, the reliability of the estimates, although it cannot be measured, is ensured by the sample construction procedure which, as seen, makes the sampling error null and void. The advantages offered by the selection of farms on a voluntary basis, on the other hand, are the minimization of the error due to the lack of response and, probably, the best quality of the data collected. If a farmer participates in the survey on a voluntary basis, in fact, it is unlikely that there will be a lack of response or the provision of inaccurate data. Regarding the number of farms to be selected, however, the answer is very simple: as already mentioned, in order for the sample to be representative, the cells of its matrix must contain a number of farms in proportion to the number of farms contained in the cells of the matrix of the field of observation. Instead of proportional sampling, however, that of optimal allocation (Neyman's allocation) is often used. This second method calculates the number of farms to be extracted from each cell of the observation field on the basis of both their number and the variability (in terms of economic size and type of farm) existing between them. By reducing the number of farms in cells where there is little variability between them, however, the goal of this method is not to increase the representativeness of the sample (which is not possible by definition), but, given the same, to reduce the number.

Since the sample is selected on the basis of the criterion of proportionality with the field of observation, the weight of the farms contained in each cell of the same is given by  $N/n$ , where, as already mentioned,  $N$  is the number of farms present in a given cell of the field of observation and  $n$  is the number of farms present in the corresponding sample cell. This weight, evidently the same for all the farms in the same cell, must be used to carry over to the universe of the sample data collected with the survey. A particular carry-over to the universe is the one that is carried out with the values of the variables Standard Output, Agricultural Area Used and Annual Work Units (coverage variables). In fact, it is used to estimate the degree of coverage exercised by the sample on the field of observation and, therefore, the congruity of the sample size. In this regard, as can be seen from the website of the Italian FADN (RICA Italia a, 2020), it should be noted that for the carryover in question, Italian FADN uses Adult Bovine Units instead of Annual Work Units. The reasons for this replacement are not known, just as the norm under which it is carried out is not known. It is clear, however, that it represents an element of inconsistency with the European FADN.

The theoretical sample described so far is also called the selection plan. The actual sample, i.e. the one made up of the farms actually selected, is called the execution plan. Obviously, in order to guarantee the representativeness of the sample, the execution plan must coincide with the selection plan. Therefore, as also highlighted in the aforementioned FADN manual, any replacements of fallen farms (not responding to the survey), necessary to contain the phenomenon of non-response, can only take place by means of farms coming from cells of the observation field corresponding to the cells samples in which the falls occurred.

## Materials and methods

As already mentioned, the main causes of distortion of the sample are to be found in the presence of farms not belonging to the field of observation and/or in a distribution of the farms of the sample that does not comply with that of the field of observation.

As regards the first aspect, an essential role is played by the positioning of the entrance threshold to the survey. It is evident, in fact, that the positioning of this in correspondence with an economic size that is too high excessively reduces the field of observation, leaving out of the survey the farms that, instead, should participate in it. On the contrary, its positioning in correspondence with an economic size that is too low allows the entry to the survey of farms which, not having the right to participate, end up distorting the results. The choice of the economic size to which to place the entrance threshold to the survey, therefore, must be made taking into due consideration the indications provided in the survey regulations and manuals. As seen, these refer to commercial farms able to provide the farmer with the main occupation and a sufficient level of income to support his (or her) family. It should also be considered that to perform this last duty (support the family) the farmer needs an income at least close to the average income of the MS in which he lives. From this it follows that the farms to which the FADN refers are farms capable of producing a net income at least equal to half the average income of the MS. In fact, the farmer is not required to carry out the agricultural activity in an exclusive form but in the main form. In addition to agricultural activity, therefore, the farmer can also carry out another activity (non-agricultural activity) reaching, with the proceeds of this, to reach or approach the average income. The correct identification of the economic size at which to place the entry threshold to the FADN, therefore, involves the estimate of the net income obtainable from predetermined levels of standard output (economic size). Given its objective, the estimate under consideration can be approximated by the ratio between the FADN threshold and the average income. The quotient thus obtained, therefore, must be reduced by a percentage corresponding to the incidence on the value of production of variable costs, of the shares relating to fixed costs and taxes. Furthermore, considering that variable costs alone can normally reach and even exceed 50% of the value of production (European Commission, 2010), it follows that, as a first approximation, agricultural activity can represent the main occupation for a single farmer if the quotient seen above assumes a value at least equal to 1. That is, the entry threshold to the FADN must be set at an economic size equal to the average income of the MS. For values of this quotient less than 1, in fact, the deduction from it of the above costs leads to obtaining a net income lower than 50% of the average income of the MS, thus denoting a non-primary agricultural activity. Table 1 shows, for each MS, the entry threshold to the FADN (FADN b, 2018), the average income (Eurostat, 2020) and the value of their ratio. As can be seen, except for Slovakia where the threshold is set at an evidently excessive level, the quotient in question never reaches unity. This means that, with the exception already mentioned, the positioning of the threshold is always such as to allow entry into the sample of farms which, not being able to be considered commercial (because they are unable to provide the first job to the farmer), do not should participate in the survey. The presence of these farms, therefore, does nothing but distort the sample. In the case of Slovakia, on the contrary, the positioning of the threshold is such as to prevent access to the sample of farms which, given their economic size, would be entitled to participate in the survey. The distorting effect exerted by the presence in the sample of farms that are not entitled to participate in the survey is evidently the greater the smaller the value of the quotient under examination and the greater the number of farms belonging to the class of smaller economic size (whose lower limit coincides with the threshold). In this regard, the case of Italy is emblematic. It is known, in fact, and it is also clear from the selection plan, that in Italy there are a large number of small and very small farms. Obviously, these are part-time farms which, while performing very important functions especially from a social point of view, are far from being considered commercial farms. Having placed the entry threshold for the FADN at such a low level, however, allows many of these farms to access the sample and, therefore, distort the results of the survey. To understand the extent of this fact, it is sufficient to consider that the aforementioned FADN manual shows that the field of observation of the Italian FADN is made up of 536,550 farms. From the ISTAT report on the structure and characteristics of the economic units of



the agricultural sector, however, it appears that the active agricultural enterprises, in the same year, were only 413,336 (ISTAT, 2019). Finally, it should be noted that ISTAT defines "active agricultural enterprise" as the economic unit which has its main activity in agriculture and which produces revenue. Definition identical, in substance, to that of the accounting/commercial farms to which the FADN refers.

The sample distortion coming from the different distribution of farms between real and theoretical sample, instead, can only be highlighted by the comparison between execution and selection plans. In this contribution, therefore, it can only be highlighted for Italy. In this regard, table 2 shows the summations, of the relative and absolute values, of the differences between the execution and selection plans of 2018 (RICA Italia b, 2020), broken down by regions and groups of economic size. The sum of the relative values, involving the compensation between the positive and negative variations that occurred at the level of the groups of the types of farms contained in the single crossings (region x economic size), highlights only the final result of the compensations. Therefore, if negative, it highlights the extent of the non-response error. On the contrary, if positive, it highlights the number of farms in excess of those foreseen in the selection plan. About this second aspect (surplus of farms), it should be noted that, in reality, these are replacements of fallen farms carried out with farms belonging to cells in the observation field that do not correspond to those of fallen farms. Their presence, therefore, as already mentioned, is a sampling error. The sum of the absolute values, instead, by adding together the negative and positive changes, highlights the extent of the total deviations that occurred in the single crossings. From reading the table, therefore, it emerges that, at the Italian level, the variance that occurred between the execution plan and the selection plan involved as many as 6,830 farms, or 61.5% of the sample and that, in any case, a lack of response equal to 800 farms (7.2% of the sample). In concrete terms, this means that the FADN survey in question was characterized by a lack of response equal to about 31% of the farms in the sample, which was "remedied" with the replacement of farms belonging to cells in the field of observations not corresponding to those of the sample that suffered the falls (sampling error), for a number of farms equal to about 24% of the sample. In detail, moreover, it can be seen that the greatest lack of answers occurred in groups with an economic size > 1,000,000, between 8,000 and 25,000 and between 500,000 and 1,000,000. The surplus surveys, on the other hand, were mainly carried out by groups of economic size between 50,000 and 100,000 and between 25,000 and 50,000. Finally, table 3, that is complementary to table 2, shows the summations of the differences between the execution and selection plans, broken down by regions and groups of farm types. Each intersection, therefore, is made up of the different economic size groups. As can be seen, the general information that can be drawn from the table in question is identical to that already seen in table 2. In detail, however, it can be seen that most of the non-responses occurred in group 9 and, subsequently, in groups 8, 7, 10, 3 and 1. Surplus surveys, on the other hand, were concentrated in groups 5, 6 and 2. Unfortunately, the decoding of these groups is very complex because they are national groupings made up of a mix of variable EU codes from region to region. It is therefore not possible to summarize in a few words the types of farms more or less available to the survey.

**Table 1: FADN threshold and average income in the EU Countries**

	FADN threshold (thousand euro)	Average income. Year 2018 (euro)	FADN threshold /Average income (number)
<b>Slovakia</b>	25	9 365	2.67
<b>France</b>	25	26 201	0.95
<b>Belgium</b>	25	29 241	0.85
<b>Germany</b>	25	30 548	0.82
<b>Bulgaria</b>	4	5 611	0.71
<b>Czech Republic</b>	8	11 293	0.71
<b>Netherlands</b>	25	35 947	0.70
<b>Luxembourg</b>	25	42 063	0.59
<b>Austria</b>	15	31 641	0.47
<b>Latvia</b>	4	8 475	0.47
<b>Hungary</b>	4	8 587	0.47
<b>Lithuania</b>	4	8 691	0.46
<b>Sweden</b>	15	32 687	0.46
<b>Croatia</b>	4	9 312	0.43
<b>Poland</b>	4	9 584	0.42
<b>Denmark</b>	15	36 516	0.41
<b>Spain</b>	8	21 198	0.38
<b>Italy</b>	8	21 339	0.37
<b>Slovenia</b>	4	12 902	0.31
<b>Romania</b>	2	6 670	0.30
<b>Estonia</b>	4	13 438	0.30
<b>Portugal</b>	4	13 510	0.30
<b>Finland</b>	8	31 075	0.26
<b>Greece</b>	4	15 713	0.25
<b>Ireland</b>	8	35 127	0.23
<b>Malta</b>	4	17 890	0.22
<b>Cyprus</b>	4	21 062	0.19
<b>United Kingdom</b>	25	34 196	0.73

Source: Our elaboration from FADN and Eurostat data

**Table 2: Differences between 2018 execution and selection plans, by regions and economic size groups**

	Economic size groups (thousand euro)						Total
	8-25	25-50	50-100	100-500	500-1000	> 1000	
<b>Sum of the relative values of the differences</b>							
Valle D'Aosta	-3	8	6	-15	:	:	-4
Piemonte	-35	21	52	17	-33	-41	-19
Lombardia	14	75	62	30	-12	-258	-89
Trentino	-13	45	38	-60	-17	-7	-14
Alto Adige	-36	7	34	-26	-11	-4	-36
Veneto	-54	2	59	41	30	-208	-130
Friuli-Venezia Giulia	-26	11	48	3	1	-61	-24
Liguria	-21	5	6	17		-7	0
Emilia-Romagna	-38	-28	51	79	12	-147	-71
Toscana	-25	18	45	18	-34	-37	-15
Marche	-3	46	37	-20	-29	-48	-17
Umbria	-21	24	14	8	-19	-38	-32
Lazio	-31	24	-3	21	-35	-56	-80
Abruzzo	27	57	20	-71	-25	-25	-17
Molise	-3	16	13	-8	-1	-17	0
Campania	47	19	23	-73	-21	-44	-49
Calabria	-7	73	22	-51	-31	-29	-23
Puglia	-51	27	33	-15	-34	-37	-77
Basilicata	-8	20	21	-5	-21	-17	-10
Sicilia	-52	19	22	-14	-23	-23	-71
Sardegna	-52	-6	19	66	-25	-24	-22
<b>Italy</b>	<b>-391</b>	<b>483</b>	<b>622</b>	<b>-58</b>	<b>-328</b>	<b>-1 128</b>	<b>-800</b>
<b>Sum of the absolute value of the differences</b>							
Valle D'Aosta	17	38	82	111	:	:	248
Piemonte	55	39	58	83	37	41	313
Lombardia	76	99	86	54	30	270	615
Trentino	37	77	84	70	17	7	292
Alto Adige	42	55	70	76	11	4	258
Veneto	56	18	59	71	60	208	472
Friuli-Venezia Giulia	36	23	52	35	29	63	238
Liguria	63	39	40	57		7	206
Emilia-Romagna	60	42	57	93	44	147	443
Toscana	57	46	59	50	34	37	283
Marche	33	52	37	56	29	48	255
Umbria	55	60	40	28	25	38	246
Lazio	33	46	27	67	41	56	270
Abruzzo	43	69	66	197	31	25	431
Molise	35	28	35	32	15	17	162
Campania	75	45	53	111	27	44	355
Calabria	135	125	122	107	31	29	549
Puglia	103	109	65	69	40	37	423
Basilicata	36	36	35	27	21	17	172
Sicilia	112	73	70	36	23	23	337
Sardegna	52	24	41	94	25	26	262
<b>Italy</b>	<b>1 211</b>	<b>1 143</b>	<b>1 238</b>	<b>1 524</b>	<b>570</b>	<b>1 144</b>	<b>6 830</b>

Source: Our elaboration from 2018 Italian execution and selection plans

## Results

The analyses carried out in this paper have shown that the results of the FADN survey are influenced by two very important sample distortion factors: the presence in the sample of farms not belonging to the field of observation and the mismatch between the theoretical and actual sample distribution.

From the regulations and manuals of the FADN it appears that the farms of interest of the survey are those able to provide the first job to the farmer and a sufficient level of income to support his or her family. The verification of the existence of the first distorting factor, therefore, was carried out by estimating the net income retractable from the standard production level at which the entry threshold to the survey was set and, therefore, comparing it to the average income of the MS. The estimate in question was made by comparing the entry threshold to average income and, therefore, by deducting from the quotient thus obtained a percentage corresponding to the incidence on standard output of variable costs, of the shares relating to fixed costs and taxes. Considering that variable costs alone normally affect about 50% of the value of production, it follows that in all cases in which the quotient in question is less than 1, the net income retractable from the standard output level at which the threshold is placed is not sufficient for agricultural activity to be considered a 'principal activity'. In these cases, in fact, the deduction from the quotient of the above costs will result in a net income of less than 50% of the average income. The analysis developed, therefore, showed that in no MS the quotient in question is such as to prefigure agricultural activity as the main activity. In all MS, therefore, it can be stated that farms close to the threshold are certainly not able to provide the farmer with the first job. A particular case is that of Slovakia where the entry threshold to the FADN is set at such a high economic dimension as to exclude from the survey farms that, instead, should participate in it. Obviously, the sampling distortion that this factor entails is the greater the smaller the value of the quotient examined above and the greater the number of farms belonging to the economic size group whose lower limit is set by the threshold. Italy, having one of the lowest quotient and being rich in small and very small part-time farms, is certainly one of the MS in which the distorting action of this factor is greater.

The examination of the second distortion factor (different distribution of farms between real and theoretical sample), requiring a comparison between the selection and execution plans, was performed only for Italy. It showed an initial lack of response equal to over 31% of the sample size. This fact, combined with the persistence of a lack of response equal to 7.2% of the sample, denotes a replacement of the fallen farms with farms coming from cells of the observation field that do not correspond to the cells of the sample in which the fall occurred. This last fact, therefore, represents a sample error equal to 24% of the sample size.

The distortion phenomena highlighted above, much greater than expectations, leads to questions about the reasons for their existence. In this regard, about the first factor, considering that it is found in all MS, it is believed that it may derive from a "prudential" behaviour of the MS. More precisely, it is believed that they fear that the positioning of the threshold at higher levels of economic size could be considered as an index of good profitability of the sector and therefore lead, in some way, to a decrease in the attention of the community agriculture policies, with a consequent reduction in financial aid to the primary sector. The explanation of the mismatch between the theoretical and actual sample distribution, on the other hand, is believed to derive from the difficulty of the Italian FADN to correctly manage the large extent of the lack of response generated by the adoption of a randomly selected sample. Random selection, however, that is neither necessary nor required.

**Table 3: Differences between 2018 execution and selection plans, by regions and type of farming groups**

	Type of farming groups												Total	
	1	2	21	22	23	3	4	5	6	7	8	9		10
	<b>Sum of the relative values of the differences</b>													
Valle D'Aosta	-10					14				106	-107	-7		-4
Piemonte	33	6				-6	2	19		-11	-27	-35	0	-19
Lombardia	99	35				6	62			-17	-22	-236	-16	-89
Trentino	-50					-13	39	84		-14	-29	-20	-11	-14
Alto Adige	-82					-12	-3	75		13	-24	-3		-36
Veneto	-5	-10				5	27	-3		6	-34	-108	-8	-130
Friuli Venezia Giulia	4	26				-14	24	-7		-10		-48	1	-24
Liguria	9		-13	18	15		26			-44		-11		0
Emilia Romagna	4	45				-6	3	2		20	-34	-93	-12	-71
Toscana	-4	39				17	-24	-7		-9		-28	1	-15
Marche	42	-8				-7	-4	3		-11		-39	7	-17
Umbria	58	9				-3	-13	0		-14	-10	-41	-18	-32
Lazio	-55					15	-14	16		-16	13	-30	-9	-80
Abruzzo	-117					62	88	14		-33		-38	7	-17
Molise	21	5				-19	5	-9		17	-5	-16	1	0
Campania	-21					20	1	13		-20	-13	-48	19	-49
Calabria	-44					-23	-16	53	159	-84		-35	-33	-23
Puglia	32	4				-27	-88	84	25	-19	-32	-43	-13	-77
Basilicata	-4	-19				-7	-5	23		4	9	-14	3	-10
Sicilia	41					-56	-52	-14		4	31	-24	-1	-71
Sardegna	-19					-19	-33	-7		12	65	-14	-7	-22
<b>Italy</b>	<b>-68</b>	<b>132</b>	<b>-13</b>	<b>18</b>	<b>15</b>	<b>-87</b>	<b>39</b>	<b>339</b>	<b>184</b>	<b>-120</b>	<b>-219</b>	<b>-931</b>	<b>-89</b>	<b>-800</b>
	<b>Sum of the absolute values of the differences</b>													
Valle D'Aosta	10						16			106	107	9		248
Piemonte	45	50				24	36	35		23	39	35	26	313
Lombardia	107	75				26	82			35	32	240	18	615
Trentino	50					15	59	88		20	29	20	11	292
Alto Adige	82					16	15	87		25	24	9		258
Veneto	25	26				19	75	21		16	44	230	16	472
Friuli Venezia Giulia	38	28				16	44	9		16		78	9	238
Liguria	23		17	58	25		28			44		11		206
Emilia Romagna	36	81				38	29	42		38	34	131	14	443
Toscana	12	71				37	58	27		23		28	27	283
Marche	50	86				19	22	7		19		39	13	255
Umbria	60	43				13	29	10		18	14	41	18	246
Lazio	65					41	16	46		34	27	30	11	270
Abruzzo	169					64	102	14		33		38	11	431
Molise	21	25				19	15	9		21	11	30	11	162
Campania	133					34	15	41		42	15	48	27	355
Calabria	54					25	16	119	183	84		35	33	549
Puglia	38	30				27	88	84	37	27	32	43	17	423
Basilicata	20	33				15	7	33		12	25	16	11	172
Sicilia	73					56	74	38		12	49	24	11	337
Sardegna	53					19	33	7		26	95	16	13	262
<b>Italy</b>	<b>1 164</b>	<b>548</b>	<b>17</b>	<b>58</b>	<b>25</b>	<b>523</b>	<b>859</b>	<b>717</b>	<b>220</b>	<b>674</b>	<b>577</b>	<b>1 151</b>	<b>297</b>	<b>6 830</b>

Source: Our elaboration from 2018 Italian execution and selection plans



## Concluding remarks

The task of the FADN is to respond correctly to the knowledge needs of the EU regarding the economic functioning and income-generating capacity of commercial farms. Considering that the survey is based on a representative sample, the objective of the contribution was to highlight the main factors that can have a distorting action on the sample and estimate the extent of their possible impact on the FADN sample.

The distorting factors considered were the presence in the sample of farms not belonging to the field of observation (non-commercial farms) and the mismatch between the theoretical and actual sample distribution. With regard to the first factor, it has been seen that, according to the FADN, a farm can be defined "commercial" if it is able to produce a net income at least equal to half the average income of the MS in which it is located. For all MS in the EU, therefore, the net income retractable by farms of an economic size equal to the entry threshold to the survey was estimated. Considering the reasons of the estimation, it has been simplified with the ratio between the entry threshold and the average income of the MS, net of a percentage equal to the incidence, on the value of production, of variable costs, of the shares relating to fixed costs and taxes. Considering that the variable costs alone can affect the value of production by more than 50%, it was judged that agricultural farms in which the above quotient assumes values lower than 1 cannot be considered commercial. In these cases, in fact, the deduction of costs from the value of production would result in obtaining a net income of less than 50% of the average income of the MS, denoting a non-principal economic activity. The results of the analysis showed that in no MS the quotient obtained is greater than 1, suggesting the presence in the sample of many non-commercial farms. On the contrary, the quotient of Slovakia, being much greater than 1, denotes a very narrow field of observation. In this case, therefore, the participation in the survey by farms that would have the right to participate is not allowed. The estimate of the second distortion factor, however, involving the comparison of the theoretical sample with the real one, was carried out only for Italy. The analysis led to the ascertainment of a sampling error that affected a number of farms equal to 24% of the sample, to which is added an appreciable non-response error (7.2%). It has also been seen that the sampling error in question arose from the replacement of the fallen farms with farms coming from cells in the observation field that did not correspond to the sample ones in which the fallen farms were located.

The causes of the onset of the distorting factors examined, of course, can be many. However, it is believed that the first factor mainly depends on the fear that the positioning of the survey threshold in correspondence with larger economic sizes could be seen as an index of good profitability of agricultural activities, with a consequent reduction of attention and aid to the primary sector. The existence in Italy of the second distorting factor, however, can only be attributed to the difficulty of the Italian FADN to correctly manage the consistent lack of response generated by the random selection of the sample.

To conclude, considering the FADN strategic for EU agriculture, the elimination of the distorting factors highlighted is necessary. Regarding the first factor, which is certainly the most misleading, the only possible solution, as well as the most rational, is to link the positioning of the entry threshold to the FADN to the average income of the MS. This, of course, to the extent that the agricultural holdings of interest to the FADN are actually commercial ones. If, on the other hand, the FADN is also interested in the economic functioning of small or very small economic farms (part-time farms), then, for clarity, the best thing to do is to remove the reference to "commercial" farms from the regulations and survey manuals. In the first hypothesis, any cognitive needs about important aspects of part-time companies (land maintenance, environmental sustainability, etc.) can be efficiently satisfied by means of ad hoc surveys. The elimination of the second distortion factor, on the other hand, requires Italy to be more committed and determined to reduce the phenomenon of non-response. In this regard, the selection of a sample on a voluntary basis, as occurs in the vast majority of MS, could prove to be a solution to the problem.

## References

European Commission (2008). Commission Regulation (EC) No 1242/2008 of 8 December 2008 establishing a Community typology for agricultural holdings OJ L 335, 13.12.2008

European Commission (2010). Developments in the income situation of the EU agricultural sector. Available on [https://ec.europa.eu/agriculture/rica/pdf/hc0301\\_income.pdf](https://ec.europa.eu/agriculture/rica/pdf/hc0301_income.pdf)

European Commission (2014). Commission Delegated Regulation (EU) No 1198/2014 of 1 August 2014 supplementing Council Regulation (EC) No 1217/2009 setting up a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Union. OJ L 321, 7.11.2014.

European Council (2009). Council Regulation (EC) No 1217/2009 of 30 November 2009 setting up a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Community. OJ L 328, 15.12.2009.

Eurostat (2020). Annual net earnings. Earning case: Single person without children earning 100% of the average earning, year 2018. Available on <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

FADN (2018). Farm Accounting Data Network. An A to Z of methodology. Version 02/07/2018 14:46:12. Available on [https://ec.europa.eu/agriculture/rica/pdf/site\\_en.pdf](https://ec.europa.eu/agriculture/rica/pdf/site_en.pdf)

Istat (2019). Statistiche report. Strutture e caratteristiche delle unità economiche del settore agricolo. Anno 2017

Pertichetti, M. (2019). Statistica sociale. Elementi di tecnica dei campioni. Università degli Studi di Perugia, Corso di Laurea in Scienze per l'Investigazione e la Sicurezza. Available on [https://www.terni.unipg.it/files/scienze\\_della\\_formazione/statistica\\_2019/09\\_elementi\\_di\\_tecnica\\_dei\\_campioni.pdf](https://www.terni.unipg.it/files/scienze_della_formazione/statistica_2019/09_elementi_di_tecnica_dei_campioni.pdf)

RICA (2020). Available on <https://rica.crea.gov.it/piani-di-selezione-788.php>



## **Getting in touch with the EU**

### **In person**

All over the European Union there are hundreds of Europe Direct Information Centres. You can find the address of the centre nearest you at: <https://europa.eu/contact>

### **On the phone or by e-mail**

Europe Direct is a service that answers your questions about the European Union. You can contact this service

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696 or
- by electronic mail via: <https://europa.eu/contact>

## **Finding information about the EU**

### **Online**

Information about the European Union in all the official languages of the EU is available on the Europa website at: <https://europa.eu>

### **EU Publications**

You can download or order free and priced EU publications from EU Bookshop at: <http://bookshop.europa.eu>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see <https://europa.eu/contact>)

### **EU law and related documents**

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex at: <https://eur-lex.europa.eu>

### **Open data from the EU**

The EU Open Data Portal (<http://data.europa.eu/euodp/en/data>) provides access to datasets from the EU. Data can be downloaded and reused for free, both for commercial and non-commercial purposes.

# The representativeness of the Farm Accounting Data Network (FADN): some suggestions for its improvement

The information produced by the Farm Accounting Data Network (FADN) is used to formulate common agricultural policy decisions. They, therefore, must be correct and present a clear and coherent picture of the primary sector. The representativeness of the sample supporting the survey, however, can be invalidated by some important factors. The first of these is the presence in the sample of farms not subject of investigation and the second is the different distribution between the farms in the sample and the ones in the field of observation. The developed analyses showed that both factors influence the FADN sample. The first factor, more precisely, is present in the sample of all Member States and derives from the positioning of the entry threshold to the FADN at levels of economic size too low to allow only commercial farms to enter the survey. The second factor, analysed only for Italy, arises from the replacement of non-responding farms with farms that have economic size and/or type of farming different from those of the fallen farms. The presence of the first factor is believed to depend on a “precautionary” behaviour of the Member States. The presence of the second factor, instead, derives from the difficulty of the Italian FADN to manage the considerable lack of response resulting from the adoption of a random sample.

---

**For more information**

<https://ec.europa.eu/eurostat/>