



EUROPEAN COMMISSION

Formal approach to non-statistical sampling

1. SITUATION

The population, from which to sample, shows that for 393 operations, expenditure has been declared. There is no possibility of increasing this number by e.g. sampling on expenditure claims since beneficiaries send in one claim per reference year. All data used originates from real declarations of expenditure and actual audit results.

The auditors want to assess the validity of the expenditure declared. They consider that the systems work but that improvements are necessary. They wish to be 70% confident about their assessment of the legality and regularity of the expenditure declared. However, caution and due consideration needs to be applied when evaluating this, given that their assessment will be based on a non-statistical approach.

The total value of the population is €141.596.219

Materiality is set at 2% = 2.831.924

2. STEP 1: DETERMINE THE INDIVIDUALLY SIGNIFICANT AMOUNTS

The first step the auditors will apply is to identify the operations which, individually, represent a significant amount or are significant because of their nature. For the benefit of this example, the individually significant amounts are determined as equal to materiality (2% of €141.596.219). The auditors can choose to use a lower level of materiality.

The selection gives the following results:

Project number	Amount declared
297	5.875.013
99	3.343.240
383	3.153.100
388	2.941.442

These projects will be excluded from sampling and will be treated separately. The total value of these projects is €15.312.795

3. STEP 2: DETERMINE THE SAMPLE SIZE TO AUDIT

From the remaining population (389 projects), a sample will have to be drawn with 70% confidence. The Confidence Factor to use is that of Monetary Unit Sampling which is, for the confidence level required: 1,21.

The sample size (monetary hits) is:

Remaining population value * Confidence factor

Planning materiality

This results in a sample size of:

$$\frac{126.283.424 * 1,21}{2.525.668}$$

= 60 hits

The planning materiality used in this example is 1, 7 % ¹

4. STEP 3: SELECT THE SAMPLE

The sample should be selected in accordance with the principles of systematic sampling. If other methods are used, the sample size should be increased by, at least, 20%.

The sample selection results in the following operations to audit:

Project number	Amount declared
11	166.902
16	545.000
31	237.916
40	821.048
44	643.775
53	310.868
61	195.049
71	386.178
78	455.591
84	542.841
88	770.601
90	396.414
93	1.066.056
95	1.384.586
97	652.783
100	1.427.310
105	308.857
109	484.994
118	75.728
129	375.476
136	98.040
146	1.217.661
149	1.012.018
152	682.857
154	133.073
163	374.368

¹ In this example, the planning materiality has been reduced.

167	1.140.535
174	870.830
176	348.378
192	917.940
197	189.185
205	377.540
215	987.676
218	1.954.073
219	1.596.306
221	880.190
226	387.768
233	319.035
245	464.511
253	470.482
259	99.140
273	535.165
280	501.653
286	231.974
295	121.929
306	234.388
316	518.008
324	587.694
330	527.649
338	680.629
343	459.577
350	419.180
359	289.467
368	573.957
370	1.425.054
375	830.078
382	2.323.053
385	282.995
386	2.660.525
393	941.169

5. STEP 4: AUDIT THE SAMPLE

The results of the audit are as follows:

Project number	Error rate	Error	Amount declared
11	0,00%	0	166.902
16	0,00%	0	545.000
31	0,00%	0	237.916
40	0,14%	1.109	821.048
44	4,35%	28.000	643.775
53	0,00%	0	310.868
61	0,00%	0	195.049
71	1,42%	5.492	386.178
78	0,00%	0	455.591
84	0,00%	0	542.841
88	0,00%	0	770.601
90	1,38%	5.462	396.414
93	6,33%	67.452	1.066.056
95	0,00%	0	1.384.586

97	0,00%	0	652.783
100	0,00%	0	1.427.310
105	0,87%	2.679	308.857
109	0,59%	2.840	484.994
118	0,00%	0	75.728
129	0,00%	0	375.476
136	29,60%	29.020	98.040
146	9,48%	115.439	1.217.661
149	0,00%	0	1.012.018
152	0,00%	0	682.857
154	0,00%	0	133.073
163	0,00%	0	374.368
167	1,84%	20.969	1.140.535
174	0,00%	0	870.830
176	20,54%	71.571	348.378
192	1,76%	16.126	917.940
197	1,86%	3.513	189.185
205	0,26%	975	377.540
215	0,00%	0	987.676
218	1,90%	37.115	1.954.073
219	0,00%	0	1.596.306
221	0,00%	0	880.190
226	0,00%	0	387.768
233	0,00%	0	319.035
245	1,61%	7.497	464.511
253	0,87%	4.093	470.482
259	0,00%	0	99.140
273	1,46%	7.840	535.165
280	0,00%	0	501.653
286	1,98%	4.596	231.974
295	58,56%	71.396	121.929
306	0,00%	0	234.388
316	23,14%	119.868	518.008
324	0,00%	0	587.694
330	0,00%	0	527.649
338	0,03%	210	680.629
343	53,87%	247.594	459.577
350	0,02%	84	419.180
359	0,00%	0	289.467
368	0,56%	3.206	573.957
370	0,00%	0	1.425.054
375	15,47%	128.391	830.078
382	0,00%	0	2.323.053
385	0,00%	0	282.995
386	2,28%	60.600	2.660.525
393	0,00%	0	941.169

The value of the sample is equal to €39.913.723. The total amount of errors in the sample is €1.063.137 (2,7%). The sum of the misstatement proportions amounts to 242,15%.

6. STEP 5: EVALUATING SAMPLE RESULTS

When the auditor detects misstatements in selected items, two separate evaluations should be made: qualitative and quantitative.

6.1. Qualitative evaluation

The qualitative evaluation involves investigating the cause of misstatements. This can lead the auditor to apply additional procedures, to revise the judgement on the quality of the management and control systems or to take actions as circumstances dictates.

6.2. Quantitative evaluation

This involves projection of the misstatements in order to determine how much misstatement the remaining population is likely to contain. The methodology is based on MUS and recognises that larger items are selected rather than smaller items. The formula to apply is the following:

$$\frac{\text{Sum of misstatement proportions} * \text{remaining population value}}{\text{Sample size}}$$

In the example given, the quantitative evaluation (the projection of error to the remaining population) leads to the following result:

$$\frac{2,42 * 126.283.424}{60}$$

= € 5.093.431 (4,03% of remaining population value).

The amount of projected errors has to be added to the results of the audit of the 100% strata in order to determine the maximum amount of error in the population. In this example, no errors were found in the 100 % strata

7. CONCLUSION

The conclusion that can be derived from this example is that the auditor can reasonably conclude that the population contains a material error. The difficulty with the non-statistical approach is that the achieved precision cannot be determined. The auditor will therefore have to decide whether or not to apply additional audit procedures or alternative strategies to evaluate the declared expenditure.

For illustration purposes, the 100% audit of 393 operations in the population showed an error amount of €5.529.496.