A Methodology and Costing for Approaches to Determining the Residual Error Rate for DG DEVCO

Version 4

September 2016

1. INTRODUCTION TO THE ASSIGNMENT

This document describes the methodology permitting DEVCO to estimate a representative overall Residual Error Rate, i.e. for all management modes and funding streams, including the EDF and the General Budget.

The Residual Error Rate (RER) is defined by DEVCO as "the ratio of the amount of ineligible expenses remaining undetected to the total amount of final payments carried out in a year." A 'residual error' can therefore be understood to be errors which remain once all possibilities for their detection have been exhausted.

The first RER measurement exercise was carried out from February 2012 to February 2013 by Moore Stephens LLP. Ever since, the exercise was repeated every year.

The RER work was subject to review by the Internal Audit Service (IAS) and the European Court of Auditors (ECA), the observations of whom have informed this revised methodology.

1.1. The Purpose of Measuring the Residual Error Rate

Measurement of the Residual Error Rate enables DEVCO to evaluate the effectiveness of its overall control framework, and forms an important part of the information at the Director General's disposal when signing the Declaration of Assurance in the Annual Activity Report. The Director General certifies that:

> "I have reasonable assurance that the resources assigned to the activities described in this report have been used for their intended purpose and in accordance with the principles of sound financial management, and that the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions.
>
> The reasonable assurance is based on my own judgement and on the information at my disposal, such as the results of the self-assessment, ex post controls, the work of the internal audit capability, the observations of the Internal Audit Service and the lessons learnt from the reports of the ECA for years prior to the year of this declaration."

The ECA concluded in its EDF Statement of Assurance for 2008 that "…there is scope for more explicit conclusions on how the results of the various controls contribute to the Director-General's assurance. A key indicator for the estimated financial impact of residual errors after all ex-ante and ex-post controls have been implemented would also provide the Director-General with a stronger basis for determining whether it remains below the materiality criteria set."

In its 2009 Annual Activity Report, DEVCO undertook to establish a "review of the DEVCO control strategy including consideration of an indicator for the estimated impact of residual errors."[1]

This methodology considers the audit approach adopted by the ECA, since measurement of the Residual Error Rate would be achieved through the performance of a number of procedures similar to those performed by the ECA in producing its Annual Report and providing opinions on DEVCO expenditure.

Previous efforts to measure the Residual Error Rate in other Directorates General have been performed with the express intention of mirroring the ECA's approach, with acceptance of the methodology by the ECA cited as an aim of the exercise. Moreover, although not a stated aim of this engagement, a high level of compatibility with the ECA's approach would leave open the possibility for the ECA to place reliance on the Commission's internal controls when performing its external audit, as well as the possibility of the ECA's work being capable of contributing to the Commission's measurement of its Residual Error Rate. The advantages of convergence of methodology are considerable, which is why this has been taken into account in designing the proposed approach.

It is important, however, to note an important distinction between the approach recommended for RER measurement and the ECA's financial audit approach, which is that RER measurement has a multi-annual dimension, while the ECA's audit is based on an annual approach designed to support its audit opinion on the annual accounts.

The methodology used to measure the Residual Error Rate has enabled DEVCO to address the ECA's recommendation. The Commission has also identified the benefits associated with measurement of the RER independently of the ECA's recommendation. Communication No 28 of 2003[2] sets out requirements for implementation of activity-based management in the Commission, including clarification of the methodology for the establishment of Annual Activity Reports. The document described the need for the Director General to draw attention to material deficiencies under any Activity Based Budget (ABB) activity, with a materiality threshold of 2% (i.e. "when the amount of the transaction…affected by the deficiency represents more than 2% of the budget allocated to the ABB activity…").The measurement of the Residual Error Rate in 2012 and the subsequent years has allowed the Director-General to produce a more informed declaration. The challenges presented by the need to measure the residual error under each ABB are discussed further below.

DEVCO believes that a weakness is significant and deserves to be disclosed as a reservation to the Declaration where the financial impact from the cases examined exceeds 2% of the total expenditure made for the year in question under the related spending area; e.g. causing a residual error rate (after all multi-annual controls) of more than 2% of payments.

[1] 2009 Annual Activity Report, s 3.5
[2] http://eur-lex.europa.eu/LexUriServ/site/en/com/2003/com2003_0028en01.pdf

The methodology for measurement of the residual error rate therefore takes account of the stated 2% 'materiality level' when determining the level of precision required.

If given unlimited resources, a methodology for measuring RER would be able to provide a measurement with a high level of precision for each geographic, thematic and budgetary area. It is unlikely, however, that resources are available to permit this. It is for DEVCO to match the level of assurance received to the resources available.

1.2. Factors Limiting the Accuracy of Residual Error Rate Measurement

The measurement of the Residual Error Rate presents a number of major challenges, which need to be addressed or mitigated when implementing a methodology for its measurement. These challenges include:

1. Residual Errors are those that have evaded all prevention, detection and correction controls in the existing control framework. Any methodology for measuring RER must be capable of identifying errors which have not been identified elsewhere;

2. The methodology must focus on transactions where there is no possibility of further correction of errors through application of standard controls. In effect, this entails examination of closed contracts. Many of the contracts closed during the period in question will relate to activities and payments that took place many years ago. Conclusions about the effectiveness of the controls operating over the related expenditure (whether effective or not) may not be relevant;

3. Error rates vary according to the characteristics of the transaction examined. DEVCO enters into transactions across a wide variety of geographical and thematic areas, employing numerous instruments for the execution of transactions. Any strategy for assessing the Residual Error Rate must take into account the diversity of DEVCO's activities;

4. The varying complexity of transactions, and the definition of a 'transaction'. A 'transaction' recorded on DEVCO's accounting system can represent many thousands of further transactions at beneficiary level (e.g. for a Programme Estimate). It can also represent a very small number of 'sub-transactions' (e.g. a supply contract payment, or Budget Support payment). This has clear implications on the amount of time required to assemble sufficient, appropriate evidence as to the legality and regularity of the transaction in question. Moreover, it does not necessarily follow that a transaction with a low relative value can be examined more easily than a high-value transaction. In many cases, the opposite is true (e.g. Budget Support payments compared to Programme Estimates);

5. The conditions governing legality and regularity of DEVCO's expenditure are complex. Conclusions on the legality and regularity of a transaction (or aspects of it) can differ between individuals, particularly where there is any ambiguity in the legal framework governing a transaction. Any methodology needs to mitigate this risk;

6. In order for the Residual Error Rate measurement relating to Year N to be considered by the Director General when signing the Declaration of Assurance, the final result must be available by March of Year N+1. This means that fieldwork supporting the measurement would have to commence during Year N (i.e. partly before the complete population of closed contracts is known). Auditors frequently commence detailed substantive testing work on transactions before the end of the period in question. The ECA addresses this by performing detailed substantive testing in Delegations during Year N. However, early commencement has an impact on the number of transactions that must be examined in order to produce a statistically reliable result, since performance of substantive procedures before the end of the year in question necessarily excludes transactions entered into after sample selection but before the end of the period;

7. The Director-General is obliged to consider all spending areas separately when giving the Declaration of Assurance in the Annual Activity Report. The Commission has expressed an interest in the methodology proposed in this paper providing the necessary assurance for each spending area. However, for reasons that are explained in greater depth elsewhere, assurance based on a statistically-derived sample will not be capable of being provided at spending area level to a sufficiently high level.

The complicating factors raised here are further detailed in Annex 1, along with actions that could help to mitigate the effects of these risks.

1.3. Statistical Sampling and Confidence Levels

In order to obtain results which can be relied upon by the Director-General, it is necessary for measurement of the Residual Error Rate to be performed on a statistical basis. The conclusions are derived from statistically selected and evaluated substantive testing.

However, the nature of the Commission’s transactions, and DEVCO’s requirements, dictate that results to a satisfactory level of confidence, derived on a purely statistical basis, will be beyond the material and logistical resources available. It is inevitable that evidence acquired from other sources needs to be taken into account when attempting measurement. Moreover, the measurement of the most likely Residual Error Rate covers a broad range – at a high level of confidence (i.e. 95%), the range of possible outcomes will be wide. The number of items that must be examined to narrow the

range of possible conclusions entails an intensity and scope of substantive work that exceeds the resources that can be reasonably allocated to this task.

The number of items that must be examined to obtain statistically meaningful results can be very high, especially if a high level of confidence is required, and the tolerable level of error (i.e. materiality) is low. See Annex 2, which contains a table showing the number of transactions that must be sampled in order to obtain a reliable result. It is clear that sample selections of this size could not be performed for *each* ABB or other sub-group.

A summary of DEVCO's corrections to payments made through effective operation of its own controls is contained at Annex 4. As illustrated in Annex 2, a prediction of the expected error rate helps to determine the sample size required. Consideration of the error rates measured and detected through implementation of controls can help to determine the expected residual error for sample size determination purposes.

It is clear that the greater the number of individual items examined, the more reliable the estimated error calculation will be. As the number of items sampled increases, the range within which the estimated error falls becomes narrower.

Throughout this document, reference is made to the confidence level attached to the outcome of the exercise. Statistical confidence is a concept which provides an indication of the likelihood that the result of a sampling exercise is reliable. The higher the confidence level, the greater the likelihood that the reported result is reliable.

Consider the probability distribution graphs attached at Annex 5. These graphs illustrate the likelihood that the results of an audit will be reliable at a 95% confidence level, determined by the error rate (1%) and the size of the audit sample (100, 180 or 240 items).

The graph representing a sample of 100 items reflects an Upper Error Limit of 4.7% with 95% confidence.[3] The area beneath the curve represents the range of possible outcomes, with the height of the curve reflecting the likelihood of the outcome. The peak of the curve is always at the projected error rate, in this case 1%. The shaded area represents the range of outcomes that can be estimated with 95% confidence.[4]

[3] The Lower Error Limit using the same data is 0.04%, which is too low to appear on the graph.

[4] This means that if the same exercise were performed 20 times, the error rate could be expected to be below 4.7%, and within the shaded area, 19 times. Once every 20 times, the result would exceed 4.7%. The unshaded area beneath the curve represents the possible outcomes that could be expected to occur every twentieth repetition of the exercise.

Note the effect of increasing the sample size. The likelihood that the projected error is accurate increases, and the range of possible outcomes reduces. With a sample size of 180, the Upper Error Limit (UEL) falls to 3.3%. At 240, the UEL is 2.9%. The increasing height of the curve represents the improved likelihood that the projected error is equivalent to the actual error within the population.

Auditors usually work to a confidence level of 95%, which has so far also been the case for the RER exercises.

2. THE EXISTING CONTROL FRAMEWORK

The Director-General relies upon a range of controls implemented by the Commission when making the annual Declaration. These controls make an important contribution to the detection and correction of errors, and so the implementation of a Residual Error Rate methodology does not replace them. Indeed, an estimation of the Residual Error Rate needs to be corroborated against the results of the existing control implementation in order to inform the Director-General's judgement as to the reliability of the error rate estimated by the RER exercise. This is of particular importance when estimating the impact of detected errors in sub-populations of the main population (e.g. ABBs where sample coverage is insufficiently broad to allow a statistically reliable result to emerge from the RER exercise alone).

Annex 4 contains data summarising DEVCO's measurement of ineligible expenditure as a consequence of operation of standard controls. Data of this type should always be treated with caution, since there is a strong likelihood that the reported figures understate the level of error affecting transactions before operation of controls (inevitably, some ineligible items identified through control implementation will not be identified). Nevertheless, the data is of considerable use in estimating the likely residual level of error for the purposes of determining a sample size (the expected level of error needs to be taken into account when determining necessary sample sizes, as set out in Annex 2).

The principal existing controls are set out below.

2.1. Ex Ante "External Audit"

Audit firms perform assurance (audits) and other agreed-upon procedures (verifications) engagements on behalf of the European Commission in accordance with the Annual Audit Plans drawn up by the Commission. Under DEVCO's Annual Audit Plan 2016, 661 (22 of which closed) contracts (from a population of about 16,000) were selected for audit or verification, with around 63% of these selected on the grounds of risk and the remainder as a consequence of contractual or regulatory requirements.

DEVCO plans to engage audit work covering around 7% of the total cumulative amount paid out under the ca. 16.000 contracts of the basic population of contracts. With this 'audit coverage ratio', it is inevitable that there will be some overlap between contracts selected for RER measurement examination and contracts previously audited.

Results of audit work are recorded in the Audit Module. The results of audits performed on contracts audited permits *some* conclusions to be drawn on the error rate affecting the unaudited population, although care needs to be taken to recognise the factors affecting the reliability of such a method,

such as the selection of contracts for audit on a risk basis, and the potential for varying quality and relevance of audit work performed.

The results of the external audit work cannot be taken into direct account when measuring the Residual Error Rate. There are a number of reasons for this, including:

- The selection of transactions audited is mainly performed on a risk basis, meaning that the results cannot be projected across the unaudited population (this does, however, mean that error rates detected by external auditors should tend towards the upper end of the likely error range);

- The errors identified through the audit will have been corrected, and therefore have no effect on the Residual Error Rate. The effects of existing external audit on measurement of the Residual Error Rate are therefore limited to:

    - Providing an indication of the level of error existing in the unaudited population (bearing in mind that the risk-based method for the selection of contracts for audit selection means that the results of an audit are not easily extrapolated to unaudited contracts); and

    - Determining the amount of audit work that will need to be performed on a contract selected for the purposes of the RER exercise (i.e. if a transaction selected for examination has been audited previously, with limited ineligible expenditure detected, then the amount of work performed on that transaction for the purposes of RER can be reduced correspondingly). In order for this aspect of the proposed methodology to function effectively, it will be necessary to identify which transactions examined as part of RER have been subjected to previous audit work. Where recent audit work has been recorded in the Audit Module, this will be a relatively straightforward matter. Otherwise, identification of whether a previous audit has taken place will be more difficult, although Annual Audit Plans and accounting records indicating audit-related expenditure will assist.

- External audit work is performed by a variety of different audit firms: under the audit framework contract; directly appointed local firms; and other direct appointments. Even if all audit work has been performed competently and in compliance with the audit framework, there remains scope for implementation of audit approaches and interpretation of results which are divergent.

Only completed audits should be considered. Attempting to measure the reliance to be placed on ongoing audit work would introduce an undesirable element of complexity, with a corresponding risk that inappropriate conclusions would be reached.

2.2. Ex-Ante Controls (excluding audit and verification)

Ex-ante controls are the most important level of controls, since they represent the first level of controls carried out at local level (usually Delegation level, although controls exercised by implementing partners can also be regarded as part of the ex-ante control framework). The principal evidence of their operation is the examination and confirmation of eligibility by at least four separate individuals (two operational officers and two finance & contracts officers) who follow procedures set out in checklists. The precise effectiveness of the ex-ante control is difficult to evaluate, and the value of errors detected through the effective implementation is difficult to measure (DEVCO reports the amount related to corrections that have taken place because of intervention of an ex-ante control. However, this amount is likely to be understated, since many errors will be corrected before implementation of the control is recorded). Nevertheless, it is likely that the range of ex-ante controls deployed by the Commission are responsible for identifying more errors, and of greater cumulative value, than any of the other control types. Errors identified by DEVCO's controls and then recorded, including the ex ante controls, are set out in Annex 4.

It is difficult to envisage a situation in which the ex-ante controls could make a contribution to the Residual Error Rate measurement. Indeed, it could be said that measurement of the Residual Error Rate, above all other outcomes, results in emergence of a clearer view of the effectiveness of the ex-ante controls.

3. RER METHODOLOGY

3.1. The Definition of an Error

The Commission recognises that definitions of errors can vary between institutions. The complex nature of the legal basis for many transactions means that determining whether or not an error has occurred is not always straightforward.

It is considered that one effective means of mitigating the risk presented by divergent views on the definition of an error is the use of a detailed typology of errors. By clearly identifying some of the factors which would clearly be categorised as an error, the risk of omission and inconsistency would be much reduced. The ECA uses a detailed typology of errors to categorise errors as part of their financial audit of the EDF.

The Commission already has a typology of errors relating to ineligible expenditure set out in its Guidelines for Auditors.[5] The typology consists of ten categories of Financial Findings which give rise to ineligible expenditure. There are further categories relating to Management Control Findings and Compliance Findings, although these are not relevant for the purposes of RER measurement. The typology is designed to ensure that audit framework contractors (and other auditors) categorise errors detected as part of their audit work in a consistent way, and permit consistent recording of error types by DEVCO. The typology of errors could be extended to include a number of further categories, and to disaggregate some of the existing categories. For example, the existing category "procurement" can represent a wide range of different issues relating to procurement. We recommend that disaggregation of "procurement" into a more detailed range of matters which could give rise to ineligibility would reduce the risk of inconsistent treatment of procurement-related findings, as well as allow a better focus on the root causes of failures and the remedial action required.

A further category of finding used in financial audit reports is "Financial Findings for the Further Consideration of the Commission." This category is used when audit work reveals a state of affairs where is cannot be determined whether expenditure is eligible or not (for example, if there is a contradiction in the legal framework). The existence of this category illustrates further the difficulties that can be encountered in defining whether an error exists or not.

A Typology of Errors is included in Annex 7.

3.2. Characteristics of the Population

A basic analysis of the € 5.4 billion population of contracts closed in 2015 was performed. .

The analysis by number of invoices paid provides useful data that helps to predict the amount of time that sampling an individual contract would take. It is instructive to note that, although there are a significant number of contracts with only one invoice following prefinancing, higher value contracts tend to contain a greater number of invoices. Should the population selected for examination comprise only closed contracts, without considering the underlying invoices, the selection of a large number of contracts with a high number of underlying invoices is statistically inevitable. This would have a detrimental impact on the amount of time required to examine the population. For this reason, and for those set out in greater detail in section 3.6, it is considered that the sample should be selected from transactions within closed contracts, rather than whole contracts. Such an approach does not affect the validity of the extrapolation of results, although it does mean that a conclusion on the legality and regularity of an individual contract cannot be reached, only a conclusion on the portion of the contract represented by the individual invoice, as well as a conclusion on the overall population of closed contracts.

3.3. One Contiguous Population v Stratification

[5] DEVCO Guidelines for Auditors, p 23

The overall objective of the RER measurement exercise is the identification of the RER in the closed contract population. To the extent that resources are available, it is vital that the substantive work supporting the measurement entails examination of a sufficiently large number of transactions drawn from closed contracts to produce a statistically reliable and meaningful result. Looking at the sample size data presented in Annex 2, in order to produce a statistically meaningful result, a sample size of at least 150 is necessary where the level of materiality is 2%, and where no errors are expected to be found. The statistical importance of achieving a minimum sample size of around that order of magnitude is reflected in the ECA' approach, under which a sample of 180 items is selected.

The Commission has expressed an interest in being able to obtain assurance on the RER within different strata of the population. The population can be divided in a number of different ways, including:

- By ABB;
- EDF or General Budget financed;
- Geographically (i.e. by continent or region);
- By Management Mode (e.g Direct Management: Grants, Budget Support, Procurement; Indirect Management: Beneficiary Countries, International Organisations, Member State Agencies, Other).

In order to produce a statistically reliable result for each category selected, it would be necessary to perform a sample of at least 150 items *for each category*, in the same way as is necessary for the overall population. Such an approach could easily result in a need to examine transactions relating to over 1,000 contracts annually, which would clearly require an intensity and volume of work that would far exceed the resources that can be reasonably allocated to this task.

However, a sample size below that level is not completely without benefit. It is clear that, in performing substantive testing in relation to the overall population, all of the items selected can be attributed to any of the sub-categories mentioned above. Some categories will be better represented than others. The greater the value of contracts within a category within the overall population, the greater the number of items relating to that category will be selected.

Even small sample sizes allow a projected error rate to be calculated through "reverse calculating" the level of assurance that the sample results provide based on the sample size selected. However, given a small sample size, the upper error limits can be unacceptably high, since there is a significant risk that the projected error is not representative, even at low confidence levels. See Annex 3 for illustrations of the effect of small sample sizes on upper error limits.

A practical approach is nevertheless essential. Assurance in respect of sub-categories should be derived from the items already sampled from the overall population. In certain categories, the Commission may be prepared to accept a projected error rate where the upper error limit is sufficiently low for assurance to be derived (e.g. if the Commission is aware of other activities or circumstances which reduce the risk of error in that category, even at the lower confidence levels that smaller sample sizes produce). Should DEVCO find itself in a position where it is unable to accept the upper error limit implied by the sample size and projected error for a particular category, then a top-up sample would need to be drawn in the next seasonal sampling tranche (see 'Annual Timetable' at Annex 6).

An alternative approach that the Commission could consider is treating the sample selection as a multi-annual exercise: this would entail examining the number of transactions examined in connection with a particular category (e.g. ABB heading) over a period of several years in which several RER exercises have taken place. This would produce a 'sample size' that would be sufficiently large to offer a higher level of assurance. It should be noted, however, that such an approach would entail an extremely complicated methodology for extrapolation of the error rate, due to the selection of samples from multiple populations.

The results of the RER exercises have been recorded in a way which permits the use of the results of a multi-annual exercise as described above.

3.4. Managing DEVCO's Broad Geographic Scope

DEVCO activities are managed from 86 Delegations around the world, as well as from DEVCO Headquarters in Brussels.

A pragmatic approach to visits to Delegations in which substantive testing will be performed must be adopted ("on-the-spot" checks). Should the population of Delegations to be visited be determined only by the geographic location of the transactions selected in a sample, the number of Delegations to be visited would be likely to exceed 50% of all Delegations. An exercise of such scope would clearly be beyond the logistical and material means supporting this exercise.

By way of example, the ECA performs substantive testing in a total of around 19 Delegations as part of its annual financial audit. (seven Delegations for EDF-funded activities, and twelve for activities funded by the General Budget). The total resources devoted to the ECA's annual financial audit of development expenditure is equivalent to 14 auditor years (i.e. around 2,800 auditor days) with a budget of nearly € 300,000 for mission expenses (these figures include examination of expenditure administered by DGs DEVCO, NEAR, ECHO and FPI. They also represent an amalgamation of the two separate audit exercises conducted in respect of activities financed by the EDF and those financed by the General Budget). The scope of the ECA's audit extends some way beyond

measurement of the error rate. Nevertheless, the ECA's audit approach is based on practical consideration of the logistical matters affecting an audit exercise, and the RER methodology should be similarly pragmatic.

The possibility that Delegation visits need not be performed at all should be considered. Our proposed methodology is not based on a requirement to perform on-the-spot checks. The principal reason for visiting Delegations in person would be to access all necessary documentation and to discuss findings with key personnel. In many cases – particularly in respect of older contracts – Delegation and project staff will no longer be available, leaving access to documentation as the only reason for visiting the country in question. In many instances, it would be more efficient and less costly to arrange for documentation to be sent to DEVCO Headquarters. The value of on-the spot checks is at its highest when activities are ongoing, or very shortly after their completion. By definition, this exercise will concentrate on completed activities - many of the activities will have been completed for a very long time. As a consequence, the value of on-the-spot checks will be much diminished, and they should not be included automatically for every transaction.

Therefore, the methodology should not envisage visiting a large number of Delegations, for the following reasons:

- It is not possible to visit a sufficiently large number of Delegations to be statistically significant;
- There are a number of other exercises which entail visits to Delegations and beneficiary countries (ECA audits, external audits by framework contractors and local auditors, internal audits, verification missions, inspection missions), and the local performance of RER measurement work would be unlikely to contribute to the sum of knowledge acquired through existing procedures;
- Key personnel will often no longer have involvement with the contract in question;
- Activities will all have been completed, and the benefits of on-the-spot checks will, in most cases, be limited.

The results of early RER measurement work may reveal that the benefits of performing local substantive testing would outweigh the disadvantages set out above in some cases, particularly if difficulties are encountered in repatriating necessary documentation to the Headquarters. In those circumstances, the need to insert local visits into the timetable would need to be reconsidered, and the proposed methodology incorporates provision for visiting three Delegations during each seasonal sampling tranche, i.e. nine Delegations each year.

3.5. How Long Does it Take To Sample a Transaction?

One of the principal factors determining the resources that will need to be devoted to carrying out a proposed methodology will be the amount of time required to examine a single item.

The amount of time required to examine an item is subject to enormous variation, with many variables affecting the time required, including:

- The period of time elapsed since the contract concerned was opened;
- The complexity of the contract;
- The nature of the contract: a supply contract for the supply of a single product will be likely to comprise a very small number of transactions, often only one. A Programme Estimate will often be the subject of multiple replenishments, each of which can represent several hundred transactions at beneficiary level;
- The location of supporting documentation relating to the contract;
- The ease with which information concerning previous control procedures (e.g. audits and expenditure verifications) affecting the contract can be identified.

A straightforward supply contract could occupy as little time as one hour to establish whether it is free from error (assuming that physical inspection of goods is excluded from the scope of the work). An examination of a payment under a complex Programme Estimate could take over two weeks (or more, if no reliable previous audit work had been undertaken on that contract).

The ECA has shared information concerning the amount of time taken to perform its annual financial audit. The figures are indicative only, and naturally include activities that would not form part of a RER measurement exercise. Nevertheless, there are several common characteristics, and the performance of statistically-based substantive testing and related work is easily the aspect of the annual audit which occupies the most time.

The ECA's audit of the EDF requires in excess of 1,000 auditor days to complete. Included in this time is the substantive examination of 180 transactions.

The ECA's auditors estimate that transactions authorised by DEVCO Headquarters require - on average - between 1 and 3 days to inspect. Transactions authorised by Delegations require longer, on average, being around 1 week's work per transaction. However, it must be appreciated that the ECA's audit focuses on transactions executed during the year in question. RER measurement will necessitate a multi-annual approach, implying a greater degree of complexity, and also more time to examine each sampled item.

For the purposes of this methodology, based on the experience of delivery of previous RER exercises, the audit of EU funds, the guidance provided by the ECA, and subject to the assumptions set out below, it is estimated that the average amount of time required to examine one item is 6 working days. This is based on the following assumptions:

- On-the-spot checks to determine the existence/reality of ultimate expenditure are not required for every transaction[6];
- Time taken to retrieve information is borne by the European Commission directly;
- Results of previous control activities are taken into account to reduce the amount of detailed substantive testing required;
- DEVCO is able to provide reliable, complete and timely information concerning the previous exercise of control functions in respect of items selected;

3.6. Sample Selection

The ECA employs Monetary Unit Sampling (MUS) in its sample selection and error evaluation as part of its annual financial audit. Using MUS, the 'sampling unit' is the individual unit of currency used. For example, where the total population value is € 1,000,000, and the sample size is 100, the individual items which account for each 10,000th euro spent is selected for sampling (the sampling interval). This approach means that each item in the population has a chance of selection which increases in accordance with its value (any item whose value exceeds € 10,000 will certainly be selected).

One aspect of the MUS approach is that it is at its most efficient when a low error rate is expected and found. For audit purposes, once errors are identified using a MUS sampling methodology, sample sizes must be extended by a considerable margin to produce results which demonstrate that a population is not affected by material error. This characteristic is less of a concern for the RER *measurement* exercise, since - unlike when delivering an *audit* opinion - the Commission has discretion to accept a lower level of confidence in the results.

The sample selection for RER should also be performed on an MUS basis. This will make the results more directly comparable to the results of the ECA's audit.

In 2015, contracts with a total cumulative value paid of € 5.4 billion were closed by DEVCO. The total value comprises 12,253 invoices[7]. A sample size of 210 (240 sampling intervals) had a sampling interval of around € 22.5 million. The starting point for sampling must be identified on a random basis. After that, each transaction straddling each 22.5 millionth euro spent is examined.

[6] See section 3.4 for more detailed discussion of the suggested approach to on-the-spot checks

[7] Excluding prefinancing invoices

It is not necessary to perform examination of whole contracts for the purposes of this exercise. The sample should be drawn from the most detailed level of transaction that the accounting system is capable of identifying, and which represents an accurate valuation of the contractual activity already performed. The most detailed transaction recorded centrally is the accepted amount for an individual invoice, excluding pre-financing invoices. Using the information in the previous paragraph, the population from which the sample should be drawn comprises the 12,253 invoices which combine to form the total closed contract value.[8]

Pre-financing is excluded from the sample population, since it does not represent the performance of contractual activity, and pre-financing payments represent a wholly different class of transactions. Conclusions reached following a detailed examination of pre-financing transactions tell nothing about other classes of transactions. Moreover, most errors that an examination of pre-financing would expose[9] would also be revealed by an examination of other payments - the reverse is not true. Furthermore, the Commission adopts the view that pre-financing errors are generally subject to subsequent 'regularisation' in any case.

In summary, the steps to be taken in selecting the sample are as follows:

1. Identify all contracts closed in the period September (year N-1) to August (year N), ;
2. Identify and list all invoices ;
3. Remove pre-financing invoices ;
4. Identify the number of items that need to be examined to provide desired level of assurance;
5. Select items from detailed invoice listing using MUS, using the 'accepted amount' as the item value.

Further explanatory material relating to the sample selection procedure is contained in Annex 8.

3.7. Where transactions cannot be completed

In some cases, it will not be possible to complete work on a transaction due to the lack of available documentation. This could be a result of the following:

- Lack of engagement by entity under scrutiny;
- Documentation is not available due to legal restrictions such as data protection or internal entity rules;

[8] In the final selection, pre-financing invoices would be excluded, for the reasons explained in the following paragraph.

[9] E.g. overpayment of pre-financing.

- The body no longer exists and has been subsumed into a predecessor body; or
- Conditions of civil disorder or natural disaster make access impossible.

In such a situation, the RER contractor should make a judgement on the risk of an undetected error being present and consider the risk of misstating the residual error on the transaction. The decision of how to calculate the error should be made in consultation with the Commission and the final decision will be approved by the Commission.

The contractor has a number of possibilities:

- Consider if the lack of documentation implies that there is an error as the contractual obligation to provide documentation has not been fulfilled.
- The lack of documentation implies that there is the possibility of an error but due to an unforeseen circumstance such as a natural disaster, documentation is not available so it is impossible to quantify. In such a case, the auditor may consider categorising this as an unquantifiable error.
- Where there is another reason for lack of evidence, the auditor may consider that having no error would underestimate the error. However, to conclude that the entirety of the transaction is subject to error would be excessive. In such a case, the auditor may consider the use of estimation. This could be done by considering earlier audit and verification reports for projects of similar risk (same region/ subject matter).

3.8. Error Evaluation

Error evaluation should be performed in accordance with MUS principles. Annex 9 contains a worked example using data derived from DEVCO's closed contracts listing for 2010.

The example illustrates the method whereby actual errors detected in the sample are extrapolated across the sampling interval used, and then further to the rest of the population.

The steps taken when evaluating the error rate are as follows (compare with the example shown in Annex 10):

1. List all of the contracts/transactions where errors have been identified;

2. List the recorded payment amount (column B) and the correct amount (column C);

3. Calculate the difference between B and C for each line (column D);

4. Calculate the Error Rate for each contract/transaction (column E);

5. Extrapolate the Error Rate for each transaction to the sampling interval to give the projected error (column F). In the first transaction in the given example, the error rate of 2.07% is projected to the sampling interval of € 20.417 million, giving a projected error of € 422,958;

6. Calculate the overall projected error by summing the transaction projected errors in Column F (€6.084 million);[10]

3.9. Dealing With Budget Support

Budget support is the transfer of financial resources directly to the National Treasury of a partner country, following satisfaction of agreed conditions for payment. The financial resources become part of the global resources of the recipient country, and are used in accordance with the public financial management system of that country. The Commission implements budget support directly through its services and performs all control functions: no implementation tasks are delegated to third countries.

In 2009, 115 new Budget Support contracts were entered into, with a total value of € 3.8 billion. This represents 42% of new commitments entered into in 2009.

The ECA usually finds little or no quantifiable error related to budget support payments.

Measurement of the eligibility of budget support payments is dependent upon criteria which are completely different to those applicable to payments under any other instrument.

Budget support has a risk profile which is entirely different from that of all other DEVCO activities. Nevertheless, budget support should be included within the scope of this RER measurement exercise. In view of the very high values of individual transactions (which would result in the selection of a significant number of budget support contracts compared to other contract types using the MUS method), it would be prudent to supplement assurance relating to regularity of budget support payments with corroborative information from a different source in conjunction with the RER exercise. Budget support transactions is expected to be an area in which there is an enhanced likelihood that the transaction selected has been previously examined by the ECA as part of its annual audit. Accordingly, there is considerable scope for placing reliance on the ECA's conclusions in this area. Furthermore, Delegations frequently use experts engaged under central framework contracts to perform ex-ante assessments of the extent to which governments have complied with general and specific criteria set out in the annexes to the Financing Agreement. This type of previous work also provides scope for placing reliance.

3.10. The Contribution of Existing Controls

[10] This can also be achieved by multiplying the total of the error rates (Column E) by the Sampling Interval (I), i.e. 29.8% x 20,417,314 = 6,084,056

The results of audits already performed on expenditure selected for examination provide the most important means of obtaining information that will permit the quantity of substantive work performed to be reduced (see section 2).

There is considerable scope for reducing the amount of substantive work that will need to be performed in respect of a selected contract if it has been the subject of demonstrable, detailed previous examination. The contribution made by existing controls would need to be determined shortly after sample selection, and so the ability to identify the previous performance of external audits and ex-post controls is vital (see Annex 10). The extent to which substantive work is reduced will need to be left to the judgement of the auditor. However, the factors to consider in determining the effect should include:

- The competence of the performer of the previous control work;
- The level of risk inherent for the contract type in question;
- The coverage of the previous control work;
- The results of the previous control work;
- An assessment of the overall risk of undetected error remaining in the controlled population.

Where the reliability, thoroughness or relevance of the previous control work cannot be judged to have reached an appropriate level, it cannot be relied upon, and substantive testing must be performed as if the control work had not taken place. Where the reputation of the entity performing the work is unknown, it may be possible to place partial reliance on the work and merely test a small proportion of the expenditure to confirm that some assurance can be placed on it.

In order for any reliance to be placed on previous controls, it will be necessary to reliably identify all instances where those controls have operated. There remains a risk that the implementation of previous controls may not be easily identified, particularly where contracts began many years previously.

The ECA's previous DAS audit work represents a clear source of reliable corroborative evidence concerning individual transactions, where transactions selected have been previously examined by the ECA. The methodology includes provision for examining whether a transaction has been previously examined by comparing transaction details with the lists of transactions selected for the ECA's audit in previous years (see Illustrative Audit Programme at Annex 11 – Previous Control Work). This approach also provides an opportunity to ensure that errors detected by the ECA (and other control mechanisms) have in fact been corrected.

3.11. Annual Timetable

The Commission has indicated that the results of RER measurement relating to contracts closed in Year N should be available by February of Year N+1.

This requirement should be compared with the timetable for the ECA' financial audit work. The results of the ECA's substantive audit work must be available by June of Year N+1. Compliance with this timetable necessitates the performance of audit work before the end of the year in question. As a consequence, initial substantive work needs to be selected on the basis of a population of transactions that is not yet complete. Such an approach is unavoidable, particularly in view of the wide geographic dispersal of the expenditure concerned. Even if beneficiary countries are not visited, large volumes of documentation will need to be located, collated, transported and examined.

A similar approach must be adopted in respect of RER measurement. It will not be possible to perform statistically-valid substantive work, and perform detailed analysis of the results, with follow-up work where necessary, and deliver the results before February, if work does not start before identification of all contracts closed in that year.

The ECA, when performing its financial audit work, commences its substantive work during the Summer of Year N, shortly after finalisation of the Annual Report relating to the previous year.

RER substantive work, mirroring the ECA's approach, should commence upon completion of the work relating to the previous period. Substantive work should therefore commence in February of Year N. The year in question should be divided into three four-month intervals, in order to manage the workload effectively. An additional advantage of performing the work at intervals throughout the year is that issues identified in early selections can be responded to and inappropriately chosen items replaced. Such corrections could risk compromising the 'statistical purity' of the exercise, and should therefore be performed only in relevant circumstances. These replacements should be performed only after careful consideration of the consequences of adjusting the sample, and comparison against the expected advantages.

The year should be divided into three sections, with the total sample for the year in question being drawn and examined in three tranches.

A suggested annual timetable is reproduced at Annex 6. This is supplemented by the flowchart at Annex 10 showing the activities to be performed during the measurement cycle.

3.12. Options for DEVCO Management

The cost of performing RER measurement work will be determined largely by the sample size that is determined by the Commission to be necessary to provide the required level of assurance.[11]

Costs are calculated by assuming that much of the substantive work will be performed by auditors with at least 3 years' experience, supervised by Managers with at least 6 years' experience, with overall responsibility resting with an experienced Partner. The involvement of each staff type would be in accordance with the following approximate ratio: 90:8:2. This equates to an average approximate daily time cost of € 1,000.

The two options are based on two different confidence levels, as requested in the Terms of Reference. The confidence levels used are 95% and 80%.

The two options are accompanied by a further choice between selecting individual transactions from closed contracts for sampling, or selecting whole contracts for examination. Whichever option is chosen, the number of items selected remains the same (e.g. either 120 whole contracts or 120 individual transactions). The examination of whole contracts would result in around 50% more time being required per contract selected, for the reasons set out in sections 3.2 and 3.6. Examination of all transactions under the selected number of whole contracts would not result in a more reliable measurement of the overall Residual Error Rate than selection of the same number of individual transactions. It would, however, enable the error rates affecting individual contracts selected to be measured, although there would be some risk to likelihood of the timetable being respected.

The following presumptions are made:

- The work will be designed to give assurance over the global population. Assurance may be derived in respect of sub-populations – and the larger the sample size, the greater the likelihood that useable assurance will be provided in respect of a given sub-group - but this will be as a by-product of the work already performed. Sample top-ups can be performed to expand the assurance provided for sub-categories, but this does not form part of this costing. Sample sizes should be extended beyond the bare minimum suggested by a sample size calculation to ensure that adequate information will be obtained in respect of the most important sub-groups within the global population (e.g. Budget v EDF);

- Individual data concerning invoice payments within closed contracts can be provided for all contracts within the global population (the individual sampling unit should be individual invoices rather than contracts, although they would still be selected from a list which reconciles to the closed contract list);

- Sampling of each transaction will require an average of 6 working days. Early performance of this work may result in this estimate being revised upwards or downwards;

[11] An alternative approach would be to identify the available resources for performing this work, and then calculate the level of assurance that work performed within that budget would provide.

- Sampling of a whole contract will require an average of 7.5 days. This estimate is based on audits of DEVCO's operations;

- Substantive fieldwork will be performed in 3 tranches throughout the year, preventing an excessively intensive period of fieldwork following the year end. It would not be possible to perform all substantive work and evaluate the results between the year end and delivery of the Annual Activity Report in any case;

- The sample size will be weighted in favour of the final third of a given year, reflecting the tendency for contracts to be closed before the end of the year rather than at the beginning;

- The final report informing the Director-General's Statement of Assurance will be based upon substantive work performed which relates to the first two thirds of the year in question, and the final third of the previous year (as illustrated in Annex 6). The multi-annual nature of the assignment means that this will be unlikely to affect the result. Should enquiries reveal that omission of the final third of the year in question might materially affect the result, then additional resources will need to be devoted to taking account of contracts closed in that period;

- Field visits to delegations will not be performed routinely, although provision is made for up to three Delegations to be visited as part of each sampling tranche if the characteristics of the transactions selected indicate that *in situ* work would be beneficial.

Option 1 (95% confidence recommendation)

In order to reach a conclusion with an acceptable level of accuracy, using a confidence level of 95%, a sample of around 180 items is required (see Annex 2, and the graphs in Annex 5). Taking into account the need to allow for the performance of sampling in three tranches, a sample of 240 items is recommended(80+80+80).

In the event that such an exercise revealed an actual projected error of 1%, consultation of Annex 3 reveals that the Commission could be 95% confident that the actual error rate is below 2.9%. With 80% confidence, the actual error rate could be estimated to be below 2.0%. It is for the Commission to judge whether such a confidence level is acceptable.

This option would require up to 1,440 auditor days to perform.

Option 2 (80% confidence)

A lower confidence level will result in smaller sample sizes, lower cost and, of course, less assurance. In order to reach a conclusion with a lower level of accuracy, and assuming that all other assumptions remain the same except for the confidence level required, a sample of around 100 items is required. As under Option 1, and taking into account the need to allow for the performance of sampling in three tranches, in this case it is recommended to sample 120 items (35+35+50).

In the event that such an exercise revealed an actual projected error of 1%, consultation of Annex 3 reveals that this would indicate an upper error limit of 2.7% *with the confidence level maintained at 80*%. With a confidence level of 95%, the upper error limit based on that sample size would be 4.2%. It is for the Commission to judge whether such a limit is acceptable.

This option would require around 720 auditor days to perform.

Summary Table

The table below summarises the resources required for the two options proposed, along with an indication of the reliability of the results where the work performed indicates an error rate of 1%.

		Transactions Only	**Upper Error Limit**	
Option No	**No of Items Sampled**	**Days**	**95%**	**80%**
1	240	1,440	2.9%	2.0%
2	120	720	4.2%	2.7%

In accordance with the proposed approach set out in section 3.4, it is recommended that three Delegation visits per sampling tranche should be performed (i.e. nine each year). Each visit would take one week, performed by two auditors, resulting in annual reimbursable costs of € 93,600 as set out below.

	Unit Cost €	**Units per mission**	**No of Missions**	**Cost €**
Chargeable Travel Time	1,000	4	9	36,000
Per Diems	200	12	9	21,600
Travel Costs	2,000	2	9	36,000
TOTAL				**93,600**

3.13. Conclusion

The principal factors that will affect measurement of DEVCO's Residual Error Rate have been set out and a statistically-based methodology is proposed accordingly. The proposed methodology is tailored to suit DEVCO's specific objectives and characteristics, although it is based upon universal principles. Two alternative approaches were discussed, with different confidence levels, as set out in section 11 above.

The output is an estimate of DEVCO's Residual Error Rate in respect of contracts closed during the period in question.

4. ANNEXES

Annex 1: Challenges and Potential Mitigating Actions

This table addresses the challenges described in the introduction section of this report.

Challenge	Mitigating Action
Residual Errors have evaded all prevention, detection and correction controls in the existing control framework. Any methodology for measuring RER must be capable of identifying errors which have not been identified elsewhere.	• Obtain a clear understanding of the potential limitations of the existing controls • Determine extent to which contract in question has been exposed to additional controls, and consider the effects (e.g. audit or ex-post control) • Focus on areas where existing controls have been established to suffer from weaknesses
The methodology must focus upon transactions where there is no possibility of further correction of errors. In effect, this will entail examination of closed contracts. Many of the contracts closed during the period in question will relate to activities that took place many years ago. Conclusions about the effectiveness of the controls operating over the related expenditure (whether effective or not) may not be relevant and documentation may be difficult to locate.	• Reporting of results must enable the timing of the identified control failure to be identified, and contain sufficient information to enable a conclusion as to whether the control failure continues to exist. • Where contracts have had no activity on them in the last five years, they should be removed from the population.
Error rates vary according to the characteristics of the transaction examined. DEVCO enters into transactions across a wide variety of geographical and thematic areas, employing numerous instruments for the execution of transactions.	• Use of standard audit programmes which are designed to cope with wide variety of instruments and thematic areas • Ensure adequate spread of contracts selected across geographic, thematic and instrumental areas.
A 'transaction' recorded on DEVCO's accounting system can represent many thousands of further transactions at beneficiary level (e.g. for a Programme Estimate). It can also represent a very small number of 'sub-transactions' (e.g. a supply contract payment, or	• Allow for adequate time to examine complex transactions in detail; • Efficient identification of previous controls exercised on complex

Budget Support payment).	transactions (e.g. previous audits). • Prepare sample population at the most detailed level possible (i.e. at transaction level rather than contract level).
The conditions governing legality and regularity of DEVCO expenditure are complex. Conclusions on the legality and regularity of a transaction (or aspects of it) can differ between individuals, particularly where there is any ambiguity in the legal framework governing a transaction.	• Use of standard 'audit programmes' for all substantive work • Use of a detailed typology of errors.
In order for the Residual Error Rate measurement relating to Year N to be considered by the Director General when signing his Declaration of Assurance, the result must be available by February of Year N+1. This means that fieldwork supporting the measurement would have to commence during Year N (i.e. before the complete population of closed contracts is known). Early commencement has an impact on the number of transactions that must be examined in order to produce a statistically reliable result.	• Sampling performed at intervals during the year • Interim substantive work commences shortly after conclusion of the previous year's exercise. • Error evaluation adjusted to ensure that different timing of sampling exercises is properly taken into account • Results of previous years' sampling can be taken into account when determining the effectiveness of controls in individual areas • Where the completion of work on a transaction cannot be completed for legal and/or logistical reasons, a number of different options could be considered. 1. Estimation of the error rate based on analysis of previous control work, with geographical and thematic similarities, performed under the central DEVCO audit framework contract. 2. Application of a blanket error rate to each transaction for which work cannot be completed. 3. Record a notional error premium, based on the measured error for successfully completed transactions, for each transaction where work cannot be completed.

	4. Classify as an unquantifiable error.
The Director General is obliged to consider all ABBs separately when giving his Declaration of Assurance in the Annual Activity Report. The Commission has expressed an interest in the methodology proposed in this paper providing the necessary assurance for each ABB.	• Results of previous years' sampling can be taken into account when determining the effectiveness of controls in individual areas; • Commission will need to accept lower confidence levels in respect of individual ABB areas or other sub-groups (e.g. geographic areas, thematic areas).

Annex 2: Sample Sizes

The table below shows the sample sizes required given a range of confidence levels, tolerances of misstatement and expected levels of error. The sample size is based on a Poisson Distribution, rounded to the nearest whole number.

Confidence Level	Expected Error Rate Ratio[12]	Tolerable Misstatement as % of Population (≈ Materiality)					
		5%	4%	3%	2%	1%	0.5%
95%	0	60	75	100	150	300	600
95%	0.1	74	92	123	**184**	368	736
95%	0.2	93	116	155	232	463	925
95%	0.3	120	150	200	300	600	1199
95%	0.4	162	203	270	405	809	1618
95%	0.5	231	289	385	577	1154	2308
90%	0	47	58	77	116	231	461
90%	0.1	56	70	93	139	277	554
90%	0.2	69	86	114	171	341	682
90%	0.3	87	109	145	217	433	866
90%	0.4	115	143	191	286	572	1144
90%	0.5	160	200	267	400	799	1597
80%	0	33	41	54	81	161	232
80%	0.1	38	48	63	**95**	189	300
80%	0.2	46	57	76	113	226	405
80%	0.3	56	70	93	139	277	554
80%	0.4	71	89	118	177	354	707
80%	0.5	95	119	159	238	475	949

[12] The expected error rate ratio denotes the expected errors as a ratio of tolerable misstatement. For example, where tolerable misstatement/materiality is 2%, a ratio of 0.1 indicates that expected errors are 0.2%.

Annex 3: Upper Error Limits

The tables below illustrate the effect on the upper error limit dependent upon the projected error that substantive testing has implied, the size of the sample used to perform that substantive testing and the confidence level required. For example, if the projected error following selection of a sample of 160 items is 1%, one can state with 95% confidence that the level of error in the entire population is below 3.6%. Unsurprisingly, upper error limits reduce with larger sample sizes and lower projected errors. It should be noted that it is only with genuinely enormous sample sizes and very low levels of projected error that the upper error limit falls below 2%. Nevertheless, it should be noted that greater sample sizes produce diminishing returns – once sample sizes are greater than around 150 items, the marginal benefit of sampling another item diminishes (if the projected error remains the same). The amounts are based on the gamma distribution, which is a continuous probability distribution associated with the Poisson distribution.

95% Confidence

Sample Size	40	80	120	160	200	240	280	320	360	400
Projected Error										
0.0%										
0.5%	8.4%	4.7%	3.4%	2.8%	2.4%	2.1%	1.9%	1.8%	1.7%	1.6%
1.0%	9.3%	5.5%	4.2%	3.6%	3.1%	2.9%	2.7%	2.5%	2.4%	2.3%
1.5%	10.2%	6.3%	5.0%	4.3%	3.9%	3.6%	3.4%	3.2%	3.1%	3.0%
2.0%	11.0%	7.1%	5.7%	5.0%	4.6%	4.3%	4.0%	3.9%	3.7%	3.6%
2.5%	11.9%	7.9%	6.5%	5.7%	5.3%	4.9%	4.7%	4.5%	4.4%	4.2%
3.0%	12.7%	8.6%	7.2%	6.4%	5.9%	5.6%	5.3%	5.1%	5.0%	4.9%
3.5%	13.4%	9.3%	7.9%	7.1%	6.6%	6.2%	6.0%	5.8%	5.6%	5.5%
4.0%	14.2%	10.0%	8.5%	7.7%	7.2%	6.9%	6.6%	6.4%	6.2%	6.1%
4.5%	15.0%	10.7%	9.2%	8.4%	7.9%	7.5%	7.2%	7.0%	6.8%	6.7%
5.0%	15.7%	11.4%	9.9%	9.0%	8.5%	8.1%	7.8%	7.6%	7.4%	7.3%

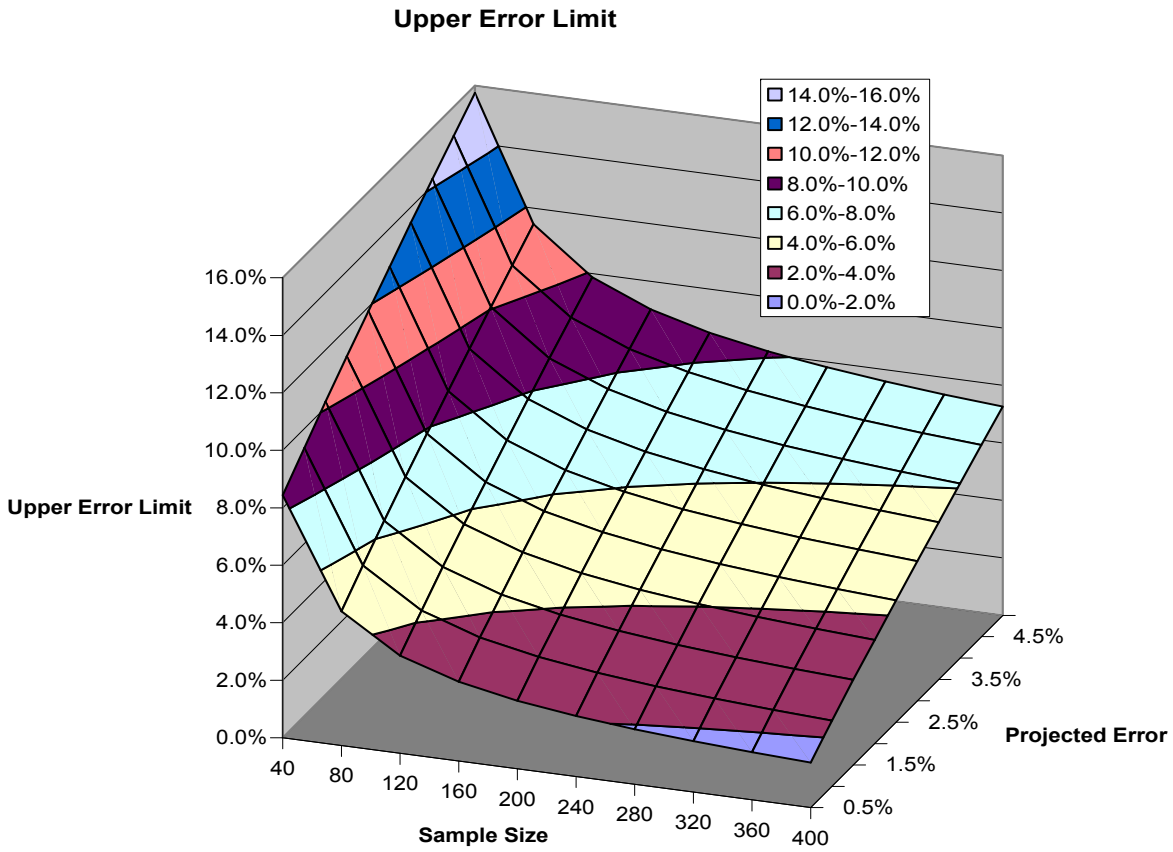
90% Confidence

Sample Size	40	80	120	160	200	240	280	320	360	400
Projected Error										
0.5%	6.6%	3.7%	2.7%	2.2%	1.9%	1.7%	1.6%	1.5%	1.4%	1.3%
1.0%	7.4%	4.5%	3.5%	3.0%	2.7%	2.4%	2.3%	2.2%	2.1%	2.0%
1.5%	8.2%	5.2%	4.2%	3.7%	3.3%	3.1%	2.9%	2.8%	2.7%	2.6%
2.0%	9.0%	6.0%	4.9%	4.3%	4.0%	3.8%	3.6%	3.4%	3.3%	3.2%
2.5%	9.7%	6.7%	5.6%	5.0%	4.6%	4.4%	4.2%	4.1%	3.9%	3.9%
3.0%	10.5%	7.3%	6.2%	5.6%	5.3%	5.0%	4.8%	4.7%	4.5%	4.4%
3.5%	11.2%	8.0%	6.9%	6.3%	5.9%	5.6%	5.4%	5.3%	5.1%	5.0%
4.0%	11.9%	8.7%	7.5%	6.9%	6.5%	6.2%	6.0%	5.9%	5.7%	5.6%
4.5%	12.6%	9.3%	8.2%	7.5%	7.1%	6.8%	6.6%	6.4%	6.3%	6.2%
5.0%	13.3%	10.0%	8.8%	8.1%	7.7%	7.4%	7.2%	7.0%	6.9%	6.8%

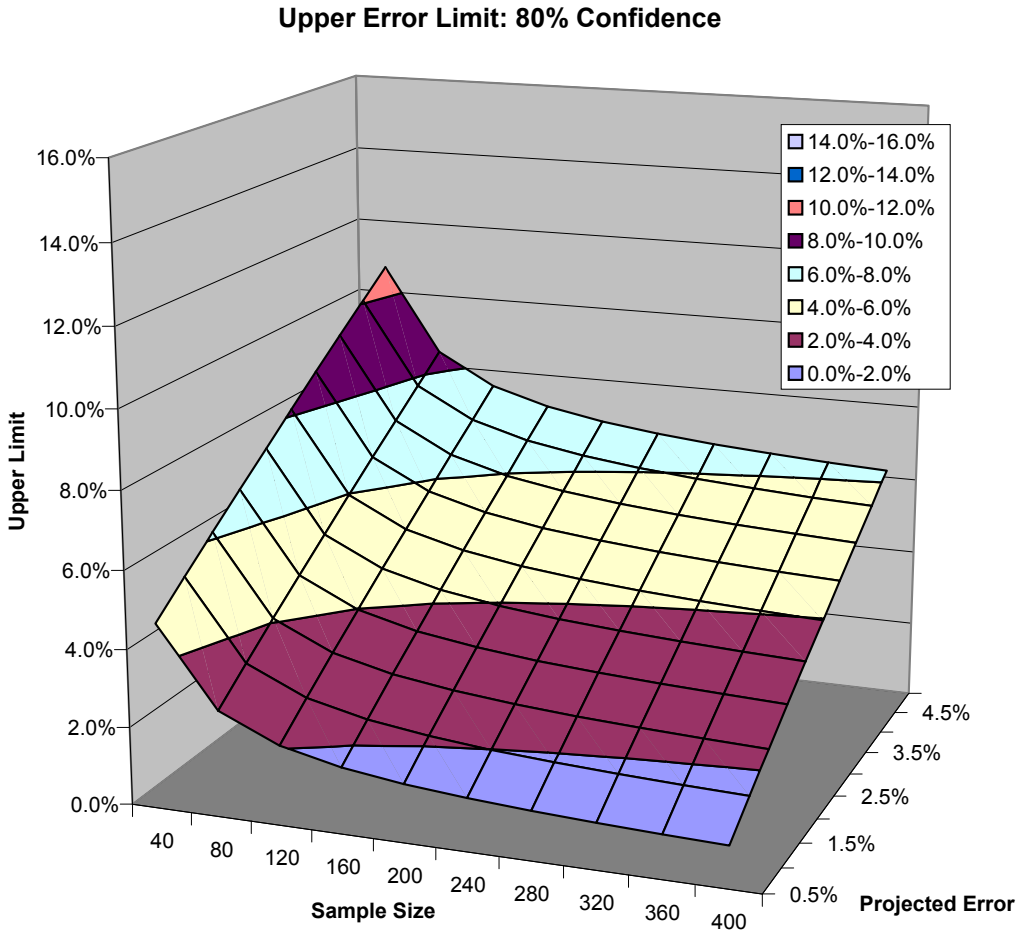
80% Confidence

Sample Size	40	80	120	160	200	240	280	320	360	400
Projected Error										
0.5%	4.8%	2.7%	2.0%	1.7%	1.5%	1.4%	1.3%	1.2%	1.1%	1.1%
1.0%	5.5%	3.4%	2.7%	2.4%	2.1%	2.0%	1.9%	1.8%	1.7%	1.7%
1.5%	6.1%	4.1%	3.4%	3.0%	2.8%	2.6%	2.5%	2.4%	2.3%	2.3%
2.0%	6.8%	4.7%	4.0%	3.6%	3.4%	3.2%	3.1%	3.0%	2.9%	2.8%
2.5%	7.5%	5.3%	4.6%	4.2%	4.0%	3.8%	3.7%	3.6%	3.5%	3.4%
3.0%	8.1%	6.0%	5.2%	4.8%	4.5%	4.4%	4.2%	4.1%	4.0%	4.0%
3.5%	8.8%	6.6%	5.8%	5.4%	5.1%	4.9%	4.8%	4.7%	4.6%	4.5%
4.0%	9.4%	7.2%	6.4%	6.0%	5.7%	5.5%	5.4%	5.2%	5.2%	5.1%
4.5%	10.1%	7.8%	7.0%	6.5%	6.3%	6.1%	5.9%	5.8%	5.7%	5.6%
5.0%	10.7%	8.4%	7.6%	7.1%	6.8%	6.6%	6.5%	6.4%	6.3%	6.2%

The chart below shows a visual representation of the upper error limits with a confidence level of 95%:



The chart below shows a visual representation of the upper error limits with a confidence level of 80%:

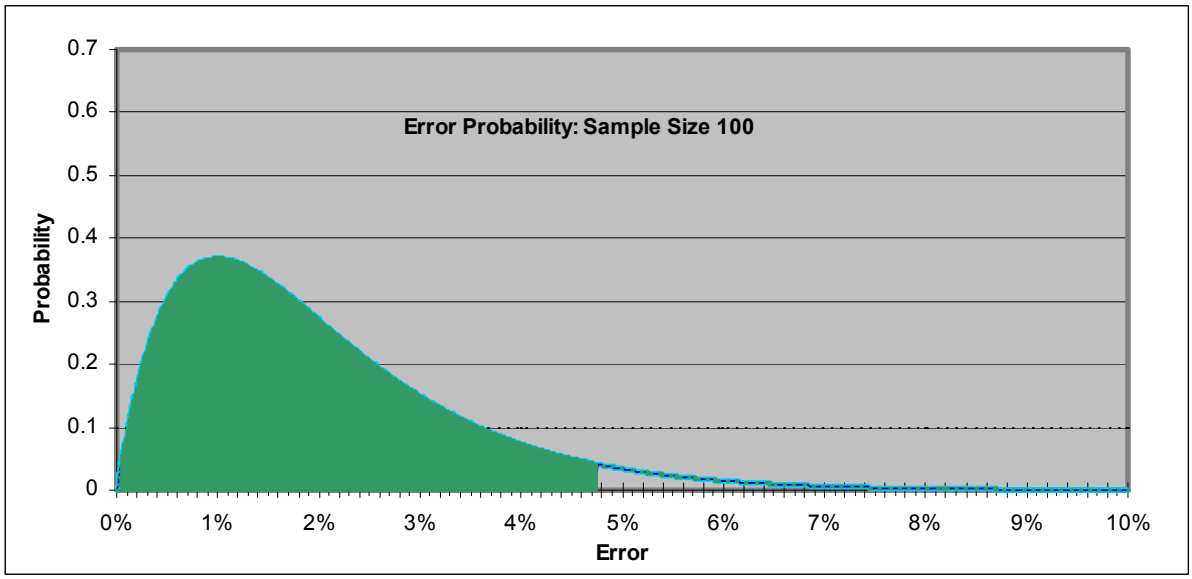


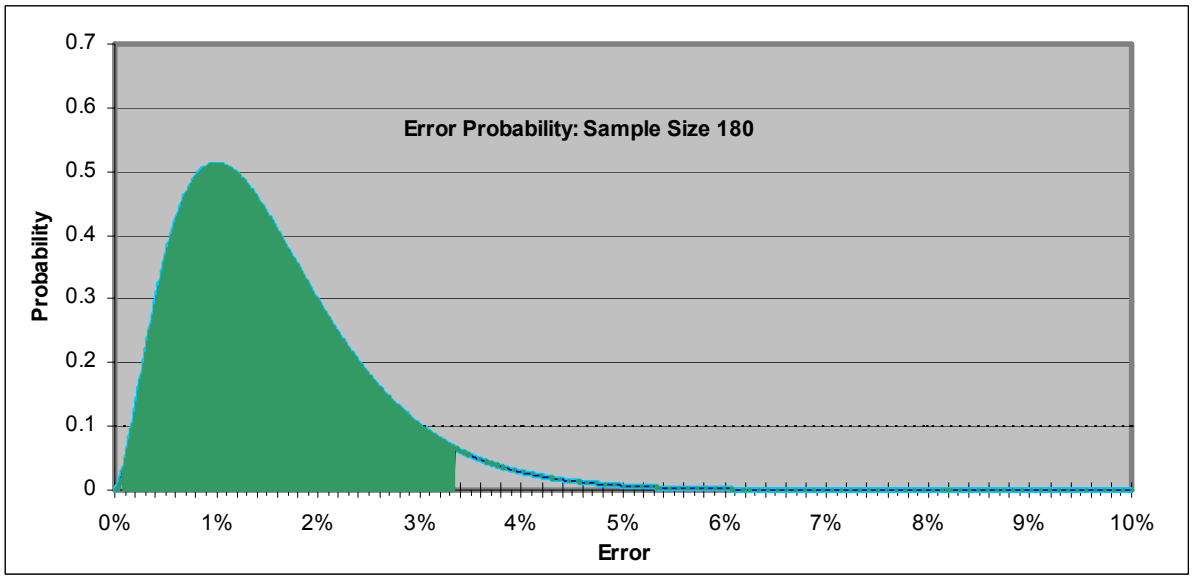
Annex 4: Ineligible Expenditure Identified by DEVCO

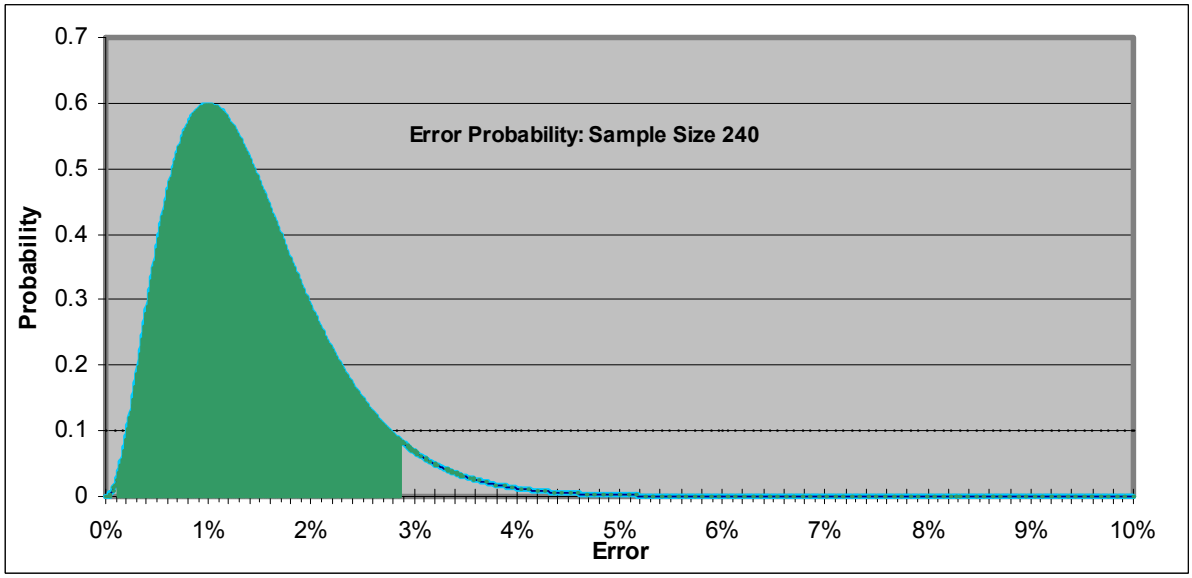
All figures shown in €,000. The table shows the results of implementation of DEVCO's own key controls by measuring the corrections applied to invoiced amounts as a consequence of application of those controls.

		2008				2009				2010 (PartYear)			
		Gross	**Accepted**	**Ineligible**	**%**	**Gross**	**Accepted**	**Ineligible**	**%**	**Gross**	**Accepted**	**Ineligible**	**%**
Budget	**Invoice**	822,308	813,648	8,661	1.05%	697,364	687,062	10,301	1.48%	305,918	303,484	2,434	0.80%
	Cost Claim	2,799,073	2,737,451	61,622	2.20%	2,581,094	2,534,883	46,211	1.79%	1,027,171	1,023,142	4,029	0.39%
		3,621,382	**3,551,099**	**70,283**	**1.94%**	**3,278,458**	**3,221,946**	**56,512**	**1.72%**	**1,333,089**	**1,326,626**	**6,463**	**0.48%**
EDF	**Invoice**	N/A	N/A	-	-	999,333	994,832	4,500	0.45%	407,394	403,946	3,448	0.85%
	Cost Claim	N/A	N/A	-	-	1,633,654	1,624,805	8,849	0.54%	726,287	706,265	20,022	2.76%
				-	**-**	**2,632,987**	**2,619,638**	**13,349**	**0.51%**	**1,133,681**	**1,110,211**	**23,470**	**2.07%**
DEV	**Invoice**	2,924	2,918	7	0.22%	1,253	1,236	17	1.37%	363	360	2	0.69%
	Cost Claim	21	21	-	-	20	20	-	0.00%	-	-	-	-
		2,945	**2,939**	**7**	**0.22%**	**1,272**	**1,255**	**17**	**1.34%**	**363**	**360**	**2**	**0.69%**
ELARG	**Invoice**	204,260	199,269	4,991	2.44%	239,634	236,035	3,599	1.50%	102,856	101,745	1,111	1.08%
	Cost Claim	1,228,714	1,201,844	26,870	2.19%	930,506	914,167	16,339	1.76%	201,294	192,426	8,868	4.41%
		1,432,974	**1,401,113**	**31,861**	**2.22%**	**1,170,140**	**1,150,202**	**19,938**	**1.70%**	**304,150**	**294,171**	**9,979**	**3.28%**
RELEX	**Invoice**	1,015	1,008	7	0.66%	5,950	5,889	61	1.02%	2,594	2,593	1	0.02%
	Cost Claim	14,572	14,572	-	-	37,348	37,319	29	0.08%	12,052	12,020	32	0.27%
		15,587	**15,581**	**7**	**0.04%**	**43,298**	**43,208**	**89**	**0.21%**	**14,646**	**14,613**	**33**	**0.22%**
TOTAL		**5,072,888**	**4,970,731**	**102,157**	**2.01%**	**7,126,155**	**7,036,249**	**89,906**	**1.26%**	**2,785,928**	**2,745,981**	**39,948**	**1.43%**

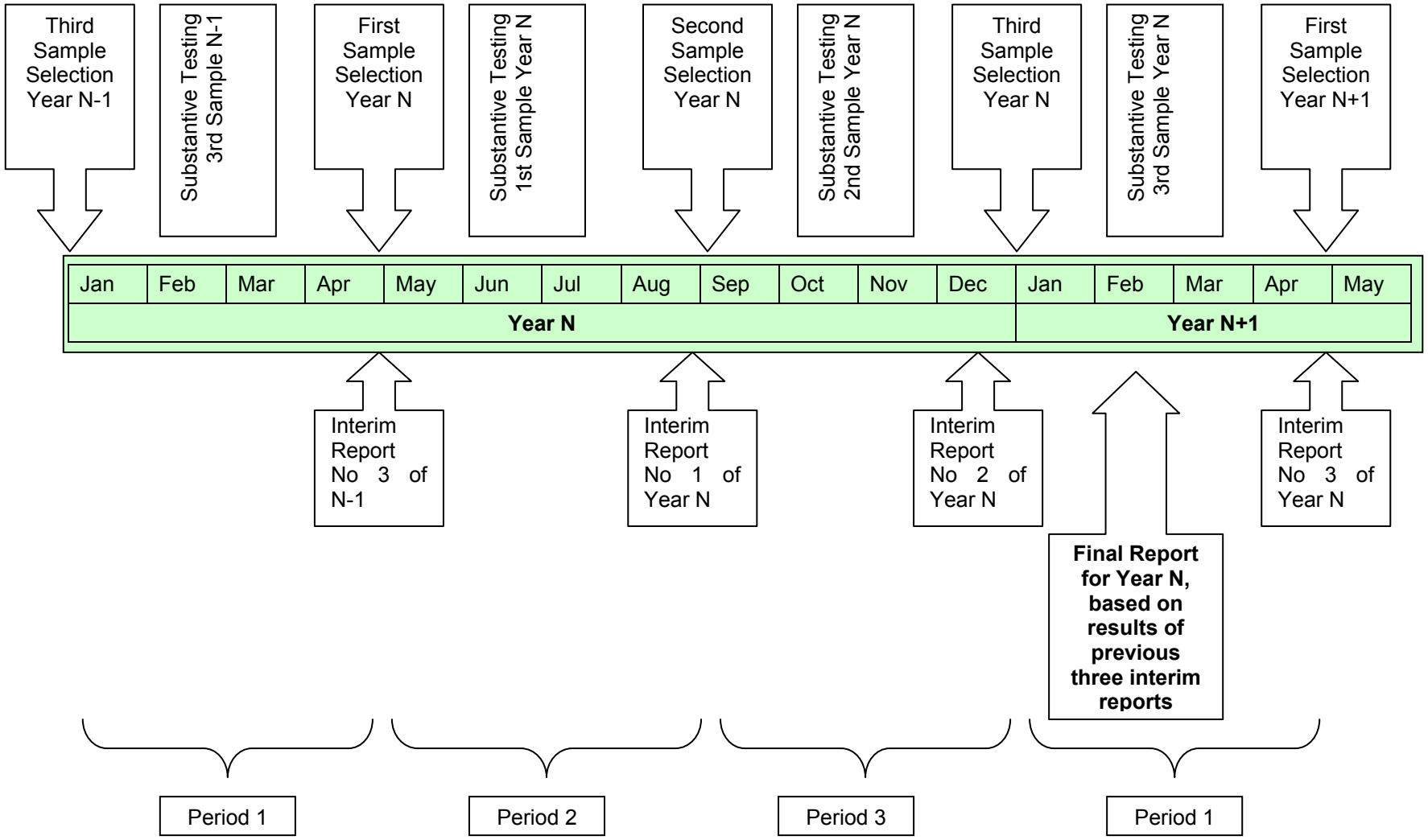
Annex 5: Probability and Confidence Level Graphs







Annex 6: Suggested Annual Timetable



Annex 7: Illustrative Typology of Errors

Typology of errors for the purpose of the audit module:

1	Missing / inadequate documentation
2	Incorrect procurement procedure applied
3	Expenditure outside contractual period
4	Expenditure includes VAT / other taxes
5	Incorrect exchange rate used
6	Budget exceeded
7	Expenditure not for project purposes
8	Fraud and irregularities
9	Income not declared / not reported
10	Other financial findings

Annex 8: Explanatory Material Relating to Sample Selection Procedure

Consider the transactions relating to a fictitious contract set out below.

Invoice No	Type	Accepted Amount €	Invoiced Amount €	Paid Amount €	Cleared Amount €
1	Pre-financing	200,000	200,000	200,000	-
2	Interim Payment	150,000	150,000	150,000	-
3	Interim Payment	100,000	100,000	100,000	-
4	Interim Payment	150,000	150,000	150,000	-
5	Final Payment	320,000	350,000	120,000	200,000
		720,000			
	COLUMN TOTAL	**920,000**	**950,000**	**720,000**	**200,000**

Only the four figures surrounded by a bold box are included in the sample population. The total value of these transactions is € 720,000. This is the same as the amount paid. However, the Paid Amount column includes €200,000 pre-financing. For the reasons explained below, pre-financing payments should be wholly excluded from the sample population.

The invoiced amount should not form the sampling population because it includes amounts that the Commission has already identified as ineligible.

The paid amount should not form the sampling population because it includes pre-financing amounts which do not represent completed contractual activity. Consider the effects of using the five invoices under the 'paid amount' as forming the sample population:

- Selection of Invoice No 1 would result in a conclusion being reached relating only to the legality and regularity of the advance payment, since no activity has yet taken place. No conclusion as to the eligibility of contractual activity could be reached.

- Selection of Invoice No 5 would present extrapolation problems. The sample amount would be €120,000, although the value of the contractual work performed amounts to €320,000. Errors could not, therefore, be extrapolated across the sample population without introducing significant complexity, and potential for inaccuracy, into the process.

The table below illustrates the information that would be included in the population from which the sample will be drawn, based on 5,509 contracts closed in the year:

Contract No	Invoice No	Type	Accepted Amount €	Invoiced Amount €	Paid Amount €	Cleared Amount €
0001	1	Pre-financing	200,000	200,000	200,000	-
0001	2	Interim Payment	150,000	150,000	150,000	-
0001	3	Interim Payment	100,000	100,000	100,000	-
0001	4	Interim Payment	150,000	150,000	150,000	-
0001	5	Final Payment	320,000	350,000	120,000	200,000
0002	1	Pre-financing	400,000	40,000	400,000	
0002	2	Interim Payment	350,000	350,000	-	350,000
0002	3	Final Payment	250,000	250,000	200,000	50,000
0003	1	Pre-Financing	50,000	50,000	50,000	-
0003	2	Final Payment	60,000	60,000	10,000	50,000
etc…	…	…	…	…	…	…
etc…	…	…	…	…	…	…
5058	1	Pre-Financing	300,000	300,000	300,000	-
5058	2	Interim Payment	250,000	250,000	250,000	-
5058	3	Final Payment	500,000	500,000	200,000	300,000
5059	1	Pre-Financing	60,000	60,000	60,000	
5059	2	Pre-Financing	90,000	90,000	90,000	
5059	3	Final Payment	300,000	300,000	150,000	150,000
			3,675,000,000			
		GRAND TOTAL	**5,213,000,000**	**5,300,000,000**	**3,675,000,000**	**1,538,000,000**

As in the previous table, only amounts surrounded by a bold box are included in the population. Pre-financing, shown in shaded lines, is excluded.

The value of the population will be approximately equivalent to the 'paid amount' (i.e. €3.675 billion) – this represents the difference between the total accepted amount (€5.213 billion) and the total amount of pre-financing (€1.538 billion, which is approximately equivalent to the 'cleared amount')[13]

[13] The amounts are not exactly equivalent, since some pre-financing will have remained uncleared, and will be the subject of a recovery order. Their inclusion would complicate the illustration unnecessarily.

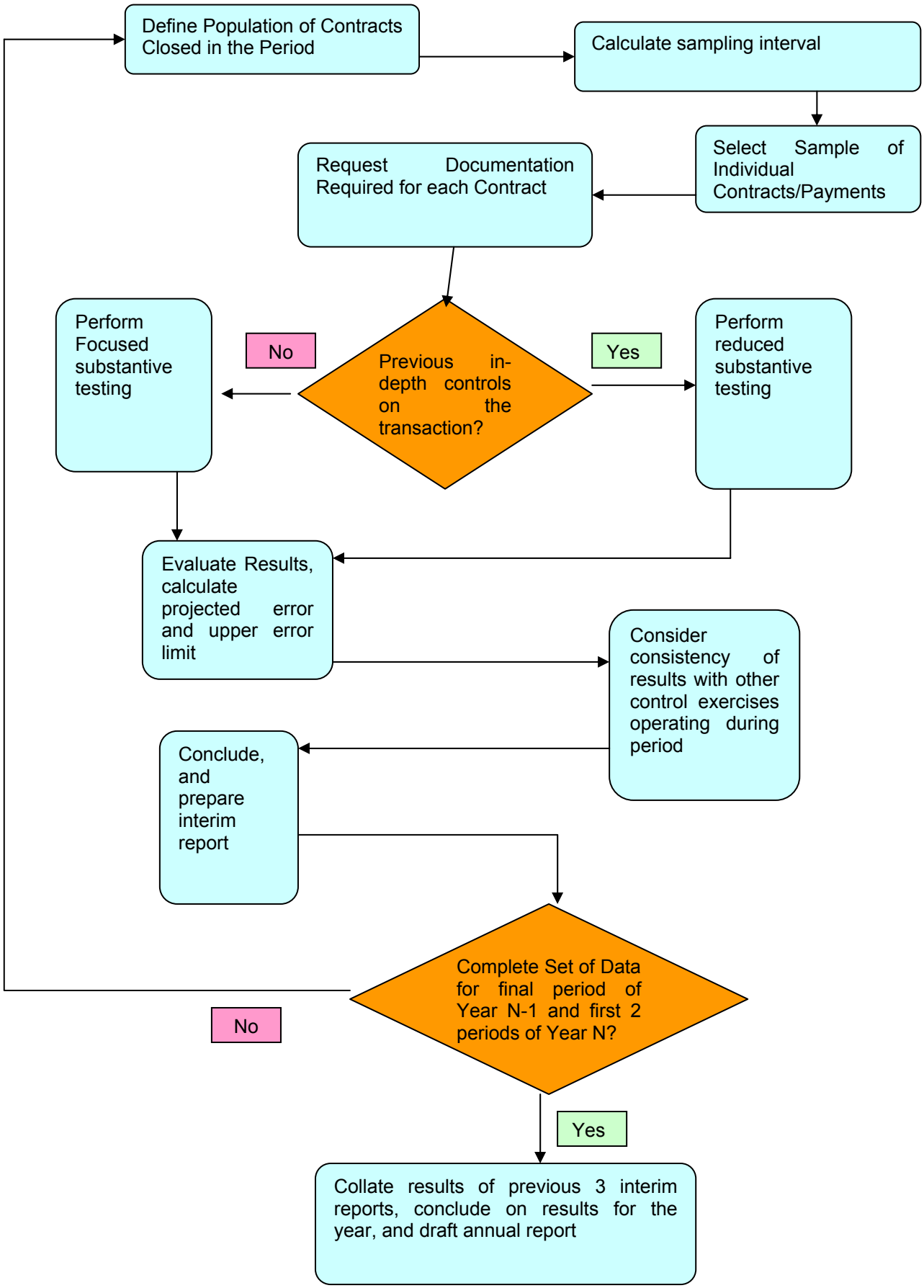
Annex 9: Error Rate Calculation Example

The information below shows a dummy error evaluation of an imaginary set of errors following a statistically derived sample of 180 items drawn from transactions executed under contracts closed in 2010. No consideration has been given to the contract type, or nature of the transaction in any way, in determining the error rates for each transaction: they are presented for illustrative purposes only.

A	B	C	D (B – C)	E (D x B)	F (E x I)
Contract and Transaction Ref No	**Recorded Amount**	**Correct Amount**	**Difference**	**Error Rate**	**Projected Error (sample size = 180)**
119xxx-121578	3,676,154	3,600,000	76,154	2.07%	422,958.37
101xxx-038323	12,000,000	11,000,000	1,000,000	8.33%	1,701,442.80
106xxx-099123	2,964,425	2,958,424	6,001	0.20%	41,329.43
076xxx-045666	2,935,894	2,735,894	200,000	6.81%	1,390,877.92
051xxx-101xxx	1,829,159	1,828,000	1,159	0.06%	12,934.34
072xxx-100xxx	947,075	900,000	47,075	4.97%	1,014,858.15
076xxx-135xxx	959,233	958,233	1,000	0.10%	21,281.64
101xxx-038xxx	792,287	791,287	1,000	0.13%	25,760.32
125xxx-100xxx	790,303	780,000	10,303	1.30%	266,175.86
131xxx-098xxx	544,170	542,170	2,000	0.37%	75,026.37
112xxx-075xxx	183,701	173,701	10,000	5.44%	1,111,411.18
				29.80%	**6,084,056**

Sample Size	180		**G**	
Population Value	3,675,116,453		**H**	Total Contracts Closed in 2009
Sampling Interval	20,417,314		**I**	H/G
Projected Error (€)	6,084,056		**J**	Sum of Individual Projected Errors
Projected Error (%)	0.17%			J/H
Upper Error Limit (95%)	1.97%			See Annex 2

Annex 10: Suggested Process for Each Fieldwork Phase



Annex 11: Illustrative Audit Programme

The audit programme set out below is designed to illustrate the tests that will be applied at an individual transaction level. One similar audit programme will be completed for each transaction selected.

SUMMARY[14]		
1	Document Recorded Amount of Transaction	
2	Document Correct Amount	
3	Record Error Rate	
4a	ABB Category of Contract	
4b	Geographic Area of Contract	
4c	EDF or General Budget	
4d	Instrument	
INITIAL EXAMINATION OF TRANSACTION[15]		
1	Verify the suitability of the transaction for review as well as the accuracy, completeness and reliability of the transaction amount recorded in the accounts by:	
a.	Confirming that the contract is closed	
b.	Confirming that the descriptive data relating to the contract and transaction have been correctly recorded in the accounting system (i.e. transaction type, instrument etc)	
c.	Confirm whether there are any recovery orders in respect of the contract and, if so, whether they affect the transaction selected.	
d.	Review all transactions recorded under the contract in order to determine whether any of the transactions have been mis-recorded. Perform a reconciliation of all transactions, and examine the reasons for discrepancies identified. Issues identified by this review may include: uncleared advances; mis-description of transactions; evidence of significant amounts of ineligible expenditure etc.	
2	Obtain a copy of the contract for the project to fully understand the contractual basis of the agreement.	
a	Document the key risks (inherent and control risks) based on a review of the contract	
b	Document the key sources of evidence demonstrating legality and regularity of underlying transactions (this will be determined largely by the contract type, e.g. timesheets and evidence of output, e.g. report, for service contracts)	
PREVIOUS CONTROL WORK		
1.	Document details of any previous control work carried out on this contract (e.g. audits, ex post control, ECA audit work,), and consider the effect on the transaction.	
2.	Consider and document the extent to which substantive work can be reduced based upon the previous control work undertaken. The factors to be considered are: a) The coverage of the previous control work; b) The results of the previous control work;	

[14] The information recorded in the Summary section will be consolidated for all transactions examined. This is the information that enables the overall Residual Error Rate to be determined, once all of the transactions selected have been examined.

[15] The tests in the Initial Examination section are designed to ensure that the sample has been validly selected, and that there are no clear errors in the accounting data that would prevent the results from being extrapolated across the whole population. The review should also allow the auditor to obtain an early understanding of some of the key features of the transaction.

	c) An assessment of the risk of undetected error remaining in the controlled population; d) The competence of the performer of the previous control work; e) The overall level of risk of the contract type in question; and f) Any other matters.
3.	Establish if any subsequent recovery order was issued on this contract/payment and record details as necessary.
4.	Document a clear conclusion on the level of substantive testing to be carried out on the contract/payment. Previous control work has: a) No impact; full detailed substantive testing to be undertaken; b) Some impact; limited substantive testing to be undertaken; or c) Complete reliance; no further substantive testing
SUBSTANTIVE TESTING	
1.	Prepare a detailed testing schedule for underlying transactions based on the eligibility requirements set out in the contract.
2.	Identify the underlying transactions to be examined. Ensure that the selection of items for examination will result in a firm conclusion being capable of being reached in respect of the high level transaction concerned. Obtain necessary documentation.
3.	Perform detailed substantive testing.
	Note: Substantive procedures may include but are not limited to: General: a) Agreeing the Financial Report to the underlying accounting records including the trial balance and general and program ledgers. b) Examining material journal entries and other adjustments made during the course of the closing process of Financial Report. c) Reconciling the Financial Report with the balance of cash-on-hand and/or in bank accounts. The income for the Project (including funds received from the Commission and other income generated by the Project such as bank interest) less the expenditure incurred, after considering any reconciling items, must reconcile with the balance of cash-on-hand and/or in bank accounts. d) Agreeing budget (comparative) figures in the Financial Report to the appropriate sources (e.g. budgets in the Agreement Terms and Conditions). e) Verifying that correct exchange rates have been applied for currency conversions where applicable and in accordance with Agreement Terms and Conditions. f) Reviewing, where applicable, the procedures used to control funds channelled to other implementing entities that have been contracted.
	Assets: a) The purchase and procurement of assets and compliance with Agreement Terms and Conditions. The Auditor examines supplies (e.g. vehicles, equipment, tools, various materials and products, whether procured by the beneficiary or directly procured by the Commission for the beneficiary's use) for compliance with procurement rules as per agreement terms and conditions. b) Verify the existence (e.g. physical inspection of assets), valuation, ownership, recording and classification and disclosure of assets; c) Verify the procedures for the disposal or transfer of assets at the closing of the Project if this is specified in the Agreement Terms and Conditions.
	Cash and Bank: a) Perform tests and procedures with regard to existence, valuation, ownership, recording and classification and disclosure of cash and bank funds held by the Project; b) Review cash and bank reconciliations. c) Review evidence supporting balances at end of contract.
	Implementation of Activities:

	a) Examine whether the financial aspects of the Project i.e. expenditure incurred and assets purchased can be justified in relation to activities realised, results obtained and the Project budget. b) Review relevant information such as annual work plans, progress reports (both internal and external), evaluation reports etc.
	Eligibility of Expenditure. Verify if expenditure: a) is related to the foreseen contractual activities; b) was incurred during the implementation period; c) is accurately recorded in the financial report and is identifiable, verifiable and substantiated by supporting evidence; *d)* complies with the conditions identified in **(1)** above
	Conformity with Budget: a) Ensure that the budget presented in the Financial Report corresponds with the contractual budget and that reported expenditure was foreseen in the budget. b) Ensure that the total amount of expenditure does not exceed any maxima laid down in the Agreement Terms and Conditions. c) Ensure that any amendments to the budget of the action comply with the Agreement Terms and Conditions for such amendments (including requirements for an addendum).
	Accuracy, Recording and Classification a) The Auditor verifies that the expenditure for a transaction is properly classified under the headings and subheadings of the Financial Report, is accurately and properly recorded in the Entity's accounting system, is supported by appropriate evidence and documents and is properly valued (e.g. use of correct exchange rates).
	Reality (occurrence / existence) a) Obtain sufficient appropriate audit evidence as to whether the expenditure has occurred(reality of the expenditure) and - where applicable - assets exist; b) Verify the reality of the expenditure for a transaction or action by examining proof of work done, goods received or services rendered on a timely basis, at agreed quality and prices or costs.
	Compliance with Procurement, Nationality and Origin Rules a) Verify whether the Entity has complied with such rules and whether the expenditure concerned is eligible.
	Notes Concerning Types of Expenditure and Income: Technical Assistance and other services a) Review technical assistance and other services, whether procured by the beneficiary or directly procured by the Commission for the beneficiary's use, for compliance with procurement rules in the Agreement Terms and Conditions. Salaries b) Review direct salary charges to determine whether salary rates are reasonable for the position concerned, are in accordance with relevant rules of the Entity's human resources policies (i.e. employment contracts and other conditions), are supported by appropriate payroll records and in accordance with Agreement Terms and Conditions. c) Review salary related components such as overtime, allowances and fringe benefits received by employees. Travel and transportation d) Review travel and transportation charges to determine whether they are adequately supported and approved in accordance with the Entity's policies and procedures and whether they are in accordance with the Agreement Terms and Conditions. Indirect costs e) Review allocation methods to determine that the indirect cost pool includes only allowable items and that it complies with Agreement Terms and Conditions.

	Income f) Review whether income for the Project (including grants and funding received from other donors, revenue generated by the Entity such as for example interest income and income in kind) has been added to the EC Project funds in accordance with the Agreement Terms and Conditions, criteria for accuracy, recording, completeness (including proper allocation of income attributable to various activities) and disclosure of income in the Financial Report.
4.	Perform and document results of substantive testing and calculate the total error for the contract/payment.
CONCLUSION	
1	Complete the **Summary** information at the front of this audit programme, based on the results of the substantive work performed. Confirm that the evidence assembled supports the conclusions documented. If confirmation is not possible, discuss with assignment manager, and identify the work that needs to be performed to enable confirmation.
2	Attach a summary of errors identified, categorised according to the classifications contained in the typology of errors.