

## **Chapter 13 Revenue**

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### **Risk Evaluation, Analysis and Profiling in Revenue**



## Risk Evaluation, Analysis and Profiling

13.1 Revenue's Risk Evaluation, Analysis and Profiling System (REAP) was introduced to all Districts in 2006 and from 2008 there was a requirement that they use REAP in the selection of cases for audit. The system enables Revenue to risk assess the full taxpayer population and partly replaces manual screening of cases in each District. The cost to date of introducing the system is €3.5 million as set out in Figure 45.

**Figure 45 REAP Costs**

	€
Software Purchased	1,233,133
Cost of In-House Development	161,695
Project Team Staff Cost <sup>a</sup>	747,000
External Resources	246,335
Ongoing Maintenance Costs to date	873,976
Other (Licence and Training)	284,490
<b>Total</b>	<b>3,546,629</b>

Note:

- a These are the estimated costs of staff who were diverted to the core project team between November 2002 and December 2006.

13.2 The REAP system comprises

- software to interrogate, at central level, the information available to Revenue in relation to each taxpayer and assign a risk score to each case
- software used at District level to analyse the risk scores for all cases in the District and assign cases for audit or other interventions
- a Risk Profile Viewer to allow auditors to examine the reasons for particular risk scores in individual cases.

## Central Procedures

13.3 Risk ranking is carried out a number of times each year and the resultant ranking is available to each Region/District for their taxpayer base. In the course of this, software analyses the information held by Revenue in relation to each case. This information comprises both the details accumulated by Revenue during the course of its dealings with the taxpayer and data available from third parties. Analysis rules have been built into the system derived from the knowledge and experience of Revenue auditors. Risk scores are automatically assigned to each case reflecting the significance of the tax collection exposure based on the amount of tax at risk, the taxpayer's track record and an assessment of the results based on the rules that 'fired' for that case taking account of the confidence measurement assigned to each rule which, in turn, is based on its reliability as an indicator of risk. This results in a risk score being assigned to each case and a risk ranking of cases.

## Local Procedures

13.4 At local level, managers examine the risk ranked results and select cases for further examination and the most appropriate intervention for each. In doing so, they take into account not only the risk as assessed by REAP but also any further information they may have in relation

to the case. The Risk Profile Viewer enables the risk profile of individual cases to be examined and shows which rules ‘fired’, the scores given to those rules and the periods in question.

## Audit Focus

REAP has fundamentally changed the way that Revenue assesses the compliance risk associated with each taxpayer. Although the use of REAP across all Districts is still quite recent, I considered it opportune to review its use and consider how Revenue might assess its effectiveness. I sought to ascertain the extent to which the system is predictive and establish the degree to which there can be confidence in its effectiveness as a profiling tool.

## Use of REAP

13.5 Revenue set a target for 2008, and again for 2009, that 60% of its audit interventions would relate to the 20% of cases that presented the highest risk according to the REAP system. 58% of the audits actually completed in 2008 which were recorded on Revenue’s Audit Case Management System (ACM)<sup>40</sup> and for which there was a risk ranking in REAP<sup>41</sup> were ranked as being in the top 20% of risk. The breakdown of this 58% across the different audit categories is set out in Figure 46.

**Figure 46 Percentage of Settled Audits 2008 in Top 20% of Risk**

Type of Audit	Number Completed	Number Recorded in ACM	Number Risk Rated	Number in Top 20%	Percentage in Top 20%
Comprehensive Audits	3,904	3,854	3,398	1,756	52%
Single Tax/Duty Audits	6,082	4,891	4,471	2,637	59%
Multi Tax/Duty Audits	2,065	2,064	1,950	1,288	66%
Single Issue/Transaction Audits	1,363	1,363	1,147	642	56%
<b>Total Audits</b>	<b>13,414</b>	<b>12,172</b>	<b>10,966</b>	<b>6,323</b>	<b>58%</b>

13.6 Some of these audit cases settled in 2008 would have been selected prior to the full use of REAP in all Districts and some related to various special investigations and special projects carried out by Revenue. Not all of them, therefore, would be cases that were originally selected on the basis of the REAP ranking. Nevertheless, the results show that a significant portion of Revenue’s audit activity is focused on the areas of risk as identified by REAP.

13.7 At this stage of its implementation, the use of REAP is likely to vary from District to District and will depend on the expertise and ingenuity in using the Case Select Tool available in each District. Cases can be selected based on particular rules or combinations of rules that ‘fired’. Based on certain rules for particular sectors, programmes of low level inquiries by post have been initiated in some Districts with the aim of assessing risks highlighted by REAP. If the response to initial inquiries is unsatisfactory, the case proceeds to a higher-level intervention. REAP is also used by Districts to assist in selecting cases for audit as part of the various sectoral projects which are undertaken by Revenue.

<sup>40</sup> As yet, not all audits are recorded on the Audit Case Management System. The results are instead reported manually.

<sup>41</sup> Not all cases are risk ranked. For instance, cases that are no longer ‘live’ are excluded.

13.8 As well as taking account of the risk of underdeclaration, REAP rules also score the risk associated with failure to submit returns and failure to pay declared amounts. This means that the reason for a high risk ranking for many of the cases within Districts is not due to potential underdeclaration of taxes and the cases are already being dealt with by caseworkers elsewhere, mainly in the Collector General's Office. Districts use the Case Select Tool and the Risk Profile Viewer to determine these cases and, in general, the District takes no further action if satisfied that the risk is already being dealt with.

13.9 For each rule that 'fires', the Risk Profile Viewer presents an explanation of what the rule means as well as what the caseworker should consider in deciding what action to take. The focus of the intervention in any case should be on the risk identified by REAP. This has the benefit of improving the system through the feedback mechanism – if the rule properly identified a risk the rule is valid, if not the rule can be amended. It also has the advantage of allowing the case selection manager in each District to allocate cases to staff commensurate with their skills.

13.10 The quality of the data that the rules interrogate is clearly a key factor in determining the ability of REAP to accurately assess risk. A vital factor is the sector in which the case operates which is identified on the computer record by the NACE code. In 2007, Revenue operational divisions' business plans included a commitment to ensure that these codes were accurate. Planning Division continues to play a quality assurance role in relation to NACE codes.

13.11 A system is in place for each District to provide feedback to the central REAP unit in relation to individual rules and this is used to amend or drop rules. This is an important way in which the system can learn from the outcomes of interventions 'on the ground'. This feedback from Districts is co-ordinated at regional level.

13.12 The Accounting Officer informed me that a sectoral analysis was provided to Districts as part of each risk run. This enabled Districts and Regions to see the dominant sectors in the high-risk categories and tackle these risks on a sectoral basis. A project commenced in 2009 whereby each Region was examining one sector. Test cases in the top 20% of REAP had been randomly selected from the relevant sectors. These cases were being examined to establish the sector risks with a view to devising a sector specific strategy to counter those risks. Depending on the results of this exercise, decisions would be made about whether to extend the enquiries to cover the entire sector (regionally or nationally), what risks to address and how to encourage voluntary disclosure. The flexibility of REAP enabled a view to be taken of risk by sector at both national and District level and also through a specific risk rule or selection of rules.

### ***Effectiveness of REAP***

13.13 While REAP could still be considered to be 'bedding in' to Revenue's work practices, it is important that there is a clear focus from the start on ways of assessing its effectiveness.

### ***Change in Revenue Yield***

13.14 One of the expected outcomes of the use of REAP to identify cases for intervention would be an increase in the number of interventions which produce a yield – an accurate assessment of risk of underdeclaration and appropriate action by Revenue should produce a yield. The total number of audits completed and the percentage where there was a yield for 2008, 2007, 2004 and 2003<sup>42</sup> is set out in Figure 47. Care is needed in interpreting these figures both because only 58% of audits completed in 2008 were ranked by REAP in the top 20% and because of the relatively early stage of implementation of the system. The percentage of yielding audits in the

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<sup>42</sup> Analysis of audits by settlement amount is not available for 2005 and 2006.

comprehensive audit category has fallen since 2007, from 67% to 63%, and there has been a significant decrease over 2003 and 2004, when there were 82% and 86% yielding comprehensive audits, respectively. The percentage of yielding audits in each of the other audit categories has increased between 2007 and 2008. The percentages for 2008 also show an increase over those in 2003 and 2004 for the single and multi tax head audit categories.

**Figure 47 Percentage of Yielding Audits 2003, 2004, 2007 and 2008<sup>a</sup>**

Audit Category	2003	2004	2007	2008
	Percentage of Yielding Audits <sup>b</sup>			
	%	%	%	%
Comprehensive	82	86	67	63
Single Taxhead	52	46	54	61
Multi Taxhead	60	49	57	64
Single Issue <sup>c</sup>	n/a	n/a	49	71

Notes:

- a Analysis of audits by settlement amount is not available for 2005 and 2006.
- b Figures are based on audit results recorded on the Audit Case Management System. Not all audits are recorded on that system.
- c The categorisation of audits changed in 2005. Information for this category is not available for 2003 and 2004.

13.15 The Accounting Officer informed me that the percentage of yielding audits in the comprehensive audit category in 2003 and 2004 was heavily influenced by cases from the Bogus Non-Resident Account and the Offshore Assets investigations. These cases were guaranteed to deliver a high proportion of yielding cases. 56% of the comprehensive cases for 2003 and 42% of 2004 were from these investigations. The percentage of such cases in 2007 and 2008 fell to 23% and 13%, respectively. The steady rise in yielding cases from the other categories of audit is likely to be a reflection of better targeting by case selectors as their skills and confidence in REAP improves.

13.16 In relation to REAP cases which fail to produce a yield, the Accounting Officer stated that a structured feedback process was in place to enable each auditor to report on rules that were falsely contributing to the risk of a case. This was rarely a case specific issue but was generally related to a specific sector. The relevant rule could then be turned off for the particular sector and rectified in the next risk run. This was part of the normal knowledge management cycle and enhancement process. The same rules in relation to classification of a case as yielding or non-yielding applied to REAP and non-REAP selected cases. Essentially, once a liability was established a case is regarded as yielding unless there was a proven inability to pay i.e. no assets, no continuing trade or insufficient income.

13.17 Revenue is currently working on a model to improve yield predictability from REAP scores. This model is being built on an analysis of both yielding and non-yielding cases. The prototype model had identified cases that Revenue believe had a higher propensity to yield and these had been distributed for testing to two Regions.

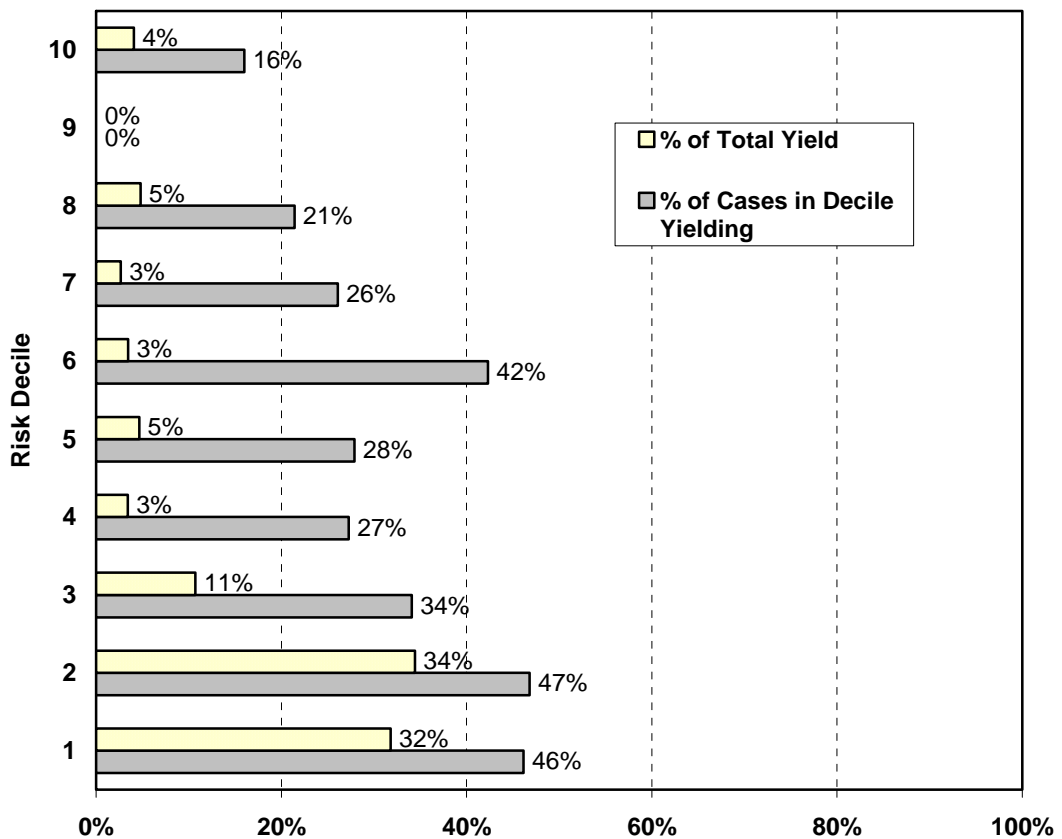
13.18 The Accounting Officer stated that data is currently being analysed to evaluate the results of audits sourced from REAP by comparison with non-REAP selected audits.

### Consistency with Random Audit Results

13.19 Another means of assessing the effectiveness of risk assessment is through the results of the Random Audit Programme and one of the stated objectives of that programme is to validate the risk-based approach.

13.20 Figure 48 shows the percentage of random audits from the 2007 programme in each REAP risk decile<sup>43</sup> that produced an audit yield and the percentage of the total random audit yield that arose in each risk decile. As these cases were selected entirely at random, the results when compared with the risk score from the REAP system should provide a good indication of the accuracy of the risk score assigned to each case. The expectation would be a high percentage of yielding audits in the higher risk deciles and a low percentage in the lower risk deciles.

**Figure 48 Random Audits 2007 - % of Yielding Audits and % of Yield by Risk Decile**



13.21 The highest percentage of yielding audits is in the two highest risk deciles with just under 50% of audits in each decile producing a yield and the extra tax collected from those two deciles accounts for 66% of the total yield. This means that over 50% of cases in these high risk categories did not produce a yield.

13.22 A trend of a decreasing percentage of yielding audits as the risk decreases would also be expected but there are significant increases in the percentage in the sixth and tenth deciles. While

<sup>43</sup> The risk-assessed cases have been sorted into ten equal categories or deciles of risk. The cases in decile 1 are the 10% of cases assessed by REAP as having the most risk with those in decile 10 being the 10% with the least risk.

none of the cases in the ninth decile produced a yield, a surprising 16% of cases in the tenth decile, which should represent the cases with the least amount of risk, did produce a yield and this accounted for 4% of the total yield. At least 20% of cases in risk deciles four to eight produced a yield accounting in total for almost 20% of the yield.

13.23 Figure 49 shows the average yield for random audits from the 2007 programme in each risk decile. Falls in average yields as the risk decreases are to be expected but the average yields for the eighth and tenth deciles are greater than some of the deciles assessed with greater risk. However, these are influenced by high yields in respect of one case in each decile.

**Figure 49 Random Audits 2007 - Average Yield by Risk Decile**

Risk Decile	Number of Cases	Average Yield
1	52	4,062
2	47	4,864
3	44	1,619
4	33	689
5	43	718
6	26	884
7	23	765
8	28	1,141
9	15	–
10	25	1,080
<b>All Deciles</b>	<b>336<sup>a</sup></b>	<b>1,977</b>

Note:

- a The random audit cases included in this analysis are those that were completed at December 2008 and which were included in the October 2007 REAP risk run.

## Conclusions

Although still at a relatively early stage of its implementation across all Districts, the influence of REAP on Revenue's compliance activities is increasing. Therefore, it is essential that Revenue continually assess the robustness of the risk assessment. Feedback from audit staff and continual amendment of the set of rules embedded in the system will help in this regard.

Analysis of the results of random audits by reference to the risk rating predicted by REAP would seem to provide a means of establishing whether the use of REAP is leading Revenue to focus on areas of greatest risk. To maximise the effectiveness of targeted interventions, it should focus on cases which will produce the highest yield. The development of a yield prediction model, on which work has commenced, may assist in this regard.

In addition, the fact that almost all risk classes contributed at least 3% of the total yield from random audits would suggest that in-depth analysis of these 'outliers' may, in fact, isolate factors which the REAP model does not currently allow for. There would be merit in conducting such an analysis.