United States General Accounting Office

GAO

Report to the Chairman, Committee on the Budget, U.S. Senate

April 1990

TAX ADMINISTRATION

Potential Audit Revenues Lost While Training New Revenue Agents

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GAO

United States
General Accounting Office
Washington, D.C. 20548

General Government Division

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April 6, 1990

The Honorable Jim Sasser
Chairman, Committee on
the Budget
United States Senate

Dear Mr. Chairman:

In an effort to increase revenues, Congress provided the Internal Revenue Service (IRS) funds for an additional 2,500 examination staff in fiscal year 1987 and another 2,500 staff in fiscal year 1988. Most of these positions were for additional revenue agents—the IRS employees responsible for examining the more complex tax returns.

In 1988, in response to a Senate Budget Committee request, we assessed IRS' estimate of the amount of revenue generated by the first increment of increased examination staff. We reported that IRS' estimate of $847.5 million was overstated because (1) some of the assumptions used in computing the estimate were questionable and (2) IRS had failed to account for any unrealized revenues resulting from the use of experienced revenue agents, who would have otherwise been auditing returns, to train the new staff.[1]

As a follow-on to our report, you asked us for additional information on several issues relating to the yield generated by an increase in examination staff. This report responds to one of those issues—the extent to which experienced revenue agents are used to train new agents and the cost of that training in terms of unrealized revenues.

Results in Brief

Between July 1, 1986, and September 30, 1988, IRS hired about 7,300 revenue agents. We assessed the extent to which experienced revenue agents were involved in training 1,100 of those new hires in five IRS districts (a process that involves about 61 weeks of classroom instruction and on-the-job training (OJT) over a 26-month period) and the cost of that involvement in terms of unrealized audit revenues. We found that this cost was significant.

[1] Tax Administration: Difficulties in Accurately Estimating Tax Examination Yield (GAO/GGD-88-119, Aug. 8, 1988).

We determined that by the time IRS finishes training the new hires in those five districts alone, it could lose about $980 million in audit revenues. In November 1989, IRS published the results of its own research and concluded that the unrealized audit revenues associated with training 1,000 staff were about half as much—a difference that can be traced to various differences in our methodologies.

No matter whose methodology is used, the conclusion is the same—unrealized audit revenues associated with training new revenue agents have been substantial. Even using its lower estimate, IRS concluded that the government would not start realizing positive revenues from an increase of 1,000 staff-years until the third year of that increase. As a result, IRS is planning to start contracting out some of its training in fiscal year 1991 and is considering other alternatives to its current training program.

Overview of IRS' Training Program for New Revenue Agents

IRS' training program for new revenue agents consists of four phases spread out over 26 months (113 weeks). Each phase involves several weeks of classroom and OJT. Over the four phases, new agents spend about 20 weeks in a classroom, during which time they learn techniques and procedures for auditing tax returns. They also take about 41 weeks of OJT, during which time they audit returns under the supervision of a coach. Between the end of phases two and three of OJT and the next phase of classroom training (comprising a total of about 52 weeks) the new agents work their own cases.

Classroom instructors, OJT coaches, and OJT managers are involved in training new agents. IRS' procedures recommend a student to classroom instructor ratio of 8.3 to 1, with a typical classroom containing about 25 students and 3 instructors. The three instructors rotate responsibility among teaching, reviewing material they will be teaching, and giving trainees individual attention during class. IRS procedures also recommend that one OJT coach be assigned for every three trainees. A coach observes trainees during audits, reviews audit case files, prepares performance evaluations, and otherwise supervises trainees. An OJT manager oversees the work of a group of trainees and their coaches.

Objective, Scope, and Methodology

Our objective was to obtain information on the extent to which experienced revenue agents are used to train newly hired agents and the costs of that training in terms of unrealized revenues.

To obtain information on unrealized revenues, we judgmentally selected 6 of IRS' 63 district offices—Atlanta, Georgia; Chicago, Illinois; Dallas, Texas; Los Angeles, California; Manhattan, New York; and San Francisco, California. We selected those districts, after consulting with the Committee and IRS, in an attempt to achieve geographic coverage and to focus our work in districts that had hired a significant number of new revenue agents. IRS officials estimated that 7,330 revenue agents had been hired nationwide between July 1, 1986, and September 30, 1988—the period during which IRS was hiring the new agents authorized by Congress.[2] According to IRS' statistics, the six districts we selected accounted for 1,469 of those new hires.

At each of the six districts, we used a questionnaire to obtain information from persons responsible for training the new agents. Because of a low response rate, we dropped Manhattan from our review before beginning any analyses. Manhattan had accounted for 366 of the 7,330 agents hired nationwide. The remaining five districts accounted for 1,103, or about 15 percent, of the new hires. The information we received in response to our questionnaire and our analyses of that information relate only to those five districts and cannot be generalized to the rest of IRS.

Much of our audit work required us to use data generated by IRS' management information systems. We did not do special tests to assess the reliability of those data. However, we discussed with IRS personnel the procedures for processing the data, including any quality controls and validity checks. We also reviewed the data for reasonableness and consistency to identify any apparent anomalies. Appendix I has more specific information on our methodology.

We did our audit work between April 1989 and December 1989 and in accordance with generally accepted government auditing standards. The views of responsible agency officials were sought during the course of our work and have been incorporated where appropriate. They had no major objections to the presentation of the issues discussed in the report.

[2]The number of agents hired exceeded the number of new positions authorized by Congress because IRS not only hires agents to fill new positions but also to fill existing positions vacated through attrition (retirements, resignations, etc.).

New Agent Training Has Resulted in Significant Amounts of Unrealized Audit Revenues

We obtained information from the five districts on the amount of training new agents hired between July 1, 1986, and September 30, 1988, had received as of June 30, 1989. On the basis of information provided by the districts, we determined that:

- The greatest training burden during that time fell on IRS' most experienced revenue agents. Of the 1,515 training assignments in the five districts covered by our review, 75 percent were staffed by agents above grade 11.[3] Those agents generally have greater technical expertise and generally audit the more complex, higher yield returns, such as the returns filed by large corporations.
- Revenue agents in the five districts spent 502,448 hours instructing and coaching new hires during those training assignments (see app. II for a breakdown of these hours by district). The hours included time spent preparing for and/or finishing up a training assignment. Classroom instructors, for example, often need time before an assignment to review training material, and OJT coaches sometimes need time afterwards to complete trainees' performance ratings.
- Sixty-nine percent of the training assignments were staffed with agents who were auditing returns at the time they were selected for the assignment. More specifically, 361,187 of the 502,448 hours agents spent training new staff would have been spent auditing returns (see app. II for a breakdown by district). The other hours would have been spent on nonaudit tasks, such as managing an audit group or doing post-audit quality reviews.
- Using experienced agents to train the 1,103 agents hired by the five districts cost the government about $840 million in unrealized audit revenues as of June 30, 1989 (see app. II for a breakdown by district). This amount could increase to about $980 million by the time all of the new staff complete the four phases of training.

To compute unrealized audit revenues, we categorized the 361,187 diverted audit hours by revenue agent grade, fiscal year, and district. From IRS' management information system, we then identified the average audit yield achieved by revenue agents at those grade levels in those fiscal years in those districts (see app. II for yield information by district). By multiplying the average yield data by the diverted audit hours, we computed unrealized revenues.

[3]Each time a person taught or coached, we considered it a separate training assignment. For example, a phase of classroom training that involved three instructors was considered three training assignments.

Table 1 shows the unrealized audit revenues as of June 30, 1989, that were incurred for each phase of training and the number of trainees who completed that phase.

Table 1: Unrealized Revenues by Training Phase

Phase	Trainees completing phase	Unrealized revenues	Cumulative unrealized revenues per trainee[a]
1	1,006[b]	$279,124,960	$277,460
2	979	336,808,951	621,494
3	748	191,863,070	877,995
4	179[c]	29,806,166	1,044,510
Total		**$837,603,147**	

[a]This is the cumulative cost, in terms of unrealized revenues, incurred to train one new hire through each of the four phases.

[b]The number of trainees who completed phase one differs from the number of agents hired because (1) some new hires left IRS before completing the first phase of training and (2) some new agent positions were filled internally by tax auditors—the IRS employees who audit less complex returns. Tax auditors begin their revenue agent training at phase two.

[c]As of June 30, 1989, 848 of the 1,103 agents hired by the five districts were still employed by IRS, of whom 179 had completed all four phases of training.

As noted in table 1, only 179 of the new agents still employed as of June 30, 1989, had completed all four phases of training. Using the cumulative per-trainee figures shown in the table, we determined that it could cost about $141 million in additional unrealized revenues to finish training the other 669 agents, assuming the 669 stay with IRS through all four phases. In total, the government could invest about $980 million in unrealized revenues to train the 1,103 agents hired by five districts. For its investment, the government would have no more than 848 new, fully trained revenue agents—the number of the 1,103 new hires still with IRS as of June 30, 1989.

In November 1989, IRS published the results of an internal reassessment of its process for estimating audit yield. As part of that reassessment, IRS determined that the training associated with an increase of 1,000 revenue agent staff-years nationwide would cost about $527 million in unrealized revenues.[4] IRS also concluded that it would not be until the third year that the total amount of tax revenues generated by the staffing increase would exceed the cumulative amount of unrealized revenues associated with training the new staff.

[4]This assessment was documented in a research report entitled Evaluation of the IRS System of Projecting Enforcement Revenue published by IRS in November 1989.

The difference between our estimate of unrealized revenues and IRS' can generally be attributed to various differences in methodology. As described in more detail later, (1) IRS excluded the yield from audits of large corporations in its computation while we did not; (2) IRS used a different grade-level mix of instructors and coaches than we did; (3) we based our computation on the average yield from actual audits while IRS based its on yield rates that were less than the average; and (4) we expressed unrealized revenues in terms of the additional taxes and penalties recommended by revenue agents as a result of their audits, while IRS expressed unrealized revenues in terms of the additional taxes, penalties, and interest it would expect to eventually collect. Except for the latter, each of these differences caused IRS' estimate of unrealized revenues to be lower than ours. Our analysis of the differences indicated that use of our methodology would have increased IRS' estimate from $527 million to about $1 billion. Using IRS' estimates of revenue generated by the new staff, we determined that this increase would probably delay realization of positive revenues from the third year to the fourth.

We believe that our methodology was more appropriate for the period covered by our review because IRS was training about 7,300 newly hired revenue agents nationwide (1,103 in our five districts alone). IRS' methodology might be appropriate during periods when it is hiring, and thus training, a much smaller number of agents. At a more modest level of hiring, for example, IRS might be better able to find enough experienced agents to train the new staff without having to divert its highest graded agents from audits of large corporations.

Yield From Large Corporations

In computing unrealized revenues, IRS used average audit yield data from its management information system but excluded the yield from audits of large corporations. Large corporations are those reporting assets of at least $250 million on their tax returns. Responses to our questionnaire indicated that about 14 percent of the diverted audit hours in the five districts for which we accumulated data was from agents who were involved in large corporate audits. Accordingly, we included the yield from those audits in our computation of unrealized revenues.

According to IRS officials, they excluded yield from large corporations because teams of agents audit these corporations and the temporary removal of one team member would not affect the audit. There may be some merit to IRS' belief that the impact of training on large corporate audits would be mitigated by the fact that other members of the audit team can cover for a member who is removed from the audit. That may not always be the case, however. The examination division chief in one district told us that because of the need to train new staff, his district spent fewer staff years on large corporate audits than it had planned. The chief said also that audit yield had been reduced and taxpayer relations had diminished due to delays of up to 6 months in completing the audits.

A more compelling argument for IRS' methodology is that the extent to which team members have to be diverted to training would probably vary depending on the number of new agents that have to be trained. If the number were small enough, for example, IRS might be able to staff its training assignments with little or no impact on the large corporation audit teams. If the number were large enough, however, IRS might not be able to staff its training assignments without diverting several agents from those teams.

Given the above, IRS' assumption that the training demands associated with a future increase of 1,000 revenue agent staff-years would not affect large corporate audits could be valid. During the period covered by our study, however, IRS was training about 7,300 new agents nationwide. Our discussions with district office officials indicated that those demands had a major impact on large corporate audits.

We determined that (1) IRS' estimate of unrealized revenues would have been $415 million higher, or $942 million, if it had included large corporate audit yield in its methodology and (2) our estimate would have been $204 million lower, or about $634 million, if we had excluded that yield.

Grades of Instructors and Coaches

IRS' computation was based, in part, on the assumption that 48 percent of its instructors and coaches are grade 11 revenue agents, 38 percent are grade 12 agents, and 14 percent are grade 13 agents. IRS used data from its management information system for fiscal year 1986 to arrive at these percentages. IRS officials expressed the belief that the fiscal year 1986 data best reflect the grade-level mix of instructors and coaches that would be used to train 1,000 new revenue agents.

The information in IRS' management information system may not be completely reliable, however. Because all persons involved in training use a common training code, the system does not differentiate between the staff-years of those doing the training and those being trained. New agents can be promoted to grade 11 before they complete their four phases of training, which would cause their training time to be included in the grade 11 training time statistics used by IRS in its methodology. We do not know to what extent that might have happened.

Information provided in response to our questionnaire indicated that a larger percentage of higher graded agents than IRS took into account were involved in training the agents hired during the period covered by our review. For example, our analysis showed that grade 13 agents accounted for 28 percent of the 361,187 diverted audit hours—twice the percent attributed to grade 13s by IRS. The greater the involvement of higher graded agents in training new staff, the larger the amount of unrealized revenues, because higher graded agents generally audit higher yield returns.

IRS personnel responsible for staffing the training assignments at three districts said that their first priority was to assign the most highly qualified agents. Generally, these individuals said they prefer to staff most assignments with grade 12 agents because of their experience, then with grade 11s, and finally with grade 13s. They prefer to use grade 11 and 12 agents before grade 13s because 13s work cases that are dissimilar to those worked by new agents and because they must be diverted from high-yield audits. All three individuals said that because of the large amount of hiring during the period covered by our review, they had to draw more heavily from grade 13 agents than would otherwise have been necessary.

It seems reasonable to assume that the extent to which IRS must divert higher graded revenue agents to training assignments can be controlled if the number of revenue agents hired is small enough. But, an increase of 1,000 staff-years, which was the hypothesis on which IRS based its computation, would probably equate to more than 1,000 new agents to train in the year of the increase. Besides hiring the newly authorized staff, for example, IRS would also have to hire staff to fill positions vacated by attrition. In that regard, IRS noted in its November 1989 research report that even in a year when its examination staff is not expanding, IRS must still hire about 1,500 persons to replace staff who retire or quit.

If IRS had used our grade-level mix of instructors and coaches, its estimate of unrealized revenues would have been $96 million higher, or $623 million.

Computation of Average Yield

According to IRS' study, it was not clear from available data whether (1) revenue agents who are temporarily assigned to be instructors put their in-process audits on hold until they return from training or (2) the audits are completed before the training assignment begins. If the former is true, it would mean that a training assignment delays the completion of ongoing audits. If the latter is true, it would mean that a training assignment delays the start of new audits. Because it had no data to determine what actually happens, IRS assumed that half of the audits affected by a training assignment would be in process and half would be new starts. IRS' computation was based on the premise that returns are examined in decreasing order of potential audit yield and, therefore, new starts will yield less than work-in-process. Accordingly, IRS computed the unrealized revenues associated with in-process work by using the average yield from actual audit results. IRS calculated revenues associated with new audits by using a yield that it assumed to be 73 percent of the average for individual returns and 60 percent of the average for corporate returns.

We computed our results using only average yield. Without information on the specific audits not being done because of training, it is a matter of conjecture whether our assumption or IRS' assumption is more correct. IRS does have a system for scoring a return's audit potential that is intended to ensure that the highest yield returns are audited first. Nevertheless, we chose to use average yield because returns filed by large corporations are not covered by that scoring system and many other returns are selected for audit for reasons other than their scores. In such cases, there seems to be no reason to believe that new audits would necessarily yield less than in-process audits.

We determined that IRS' estimate of unrealized revenues would have been $105 million higher, or $632 million, if it had computed its estimate using 100 percent of average yield.

Dollars Collected Versus Recommended

Our computation of unrealized revenues was expressed in terms of the additional taxes and penalties recommended by revenue agents as a result of their audits. IRS' computation was expressed in terms of the additional taxes, penalties, and interest to be collected. Because some taxpayers successfully appeal agents' findings, thus reducing the amount of additional taxes and penalties they owe, and because IRS is not always able to collect owed taxes, the amount of additional taxes and penalties eventually collected as a result of a particular audit will often be less than the amount recommended by the agent. On the other hand, the imposition of interest on the additional taxes causes the amount eventually collected to increase. All factors considered, IRS believed that the amount eventually collected exceeds the amount originally recommended and computed unrealized revenues accordingly.

However, as we discussed in our August 1988 report and as acknowledged by IRS in a recent reassessment of its revenue estimating process, IRS does not yet have reliable data to support that position. Thus, rather than assume that IRS would end up collecting more than the recommended amount, which is what IRS assumed, we used the more conservative approach and computed our estimate of unrealized revenues on the basis of amounts recommended. If IRS had done likewise, its computation of unrealized revenues would have been $34 million lower, or $493 million.

IRS Is Taking Steps to Reduce the Unrealized Revenues Associated With Training New Agents

Regardless of the specific amount, it is clear that the use of experienced revenue agents to train new agents carries a significant cost in terms of unrealized audit revenues. IRS has recognized that fact in its budget request for fiscal year 1991.

IRS' fiscal year 1991 budget request includes several initiatives intended to raise revenues through enhanced enforcement. One of those initiatives calls for an increase of 1,040 examination positions to enable IRS to audit more tax returns. In the past, IRS would have forecast a positive revenue impact in the first year of such an initiative. However, for the 1991 initiative, IRS has forecast a negative revenue impact of about $18 million in fiscal year 1991. It then forecasts a relatively small positive impact in fiscal year 1992 of $2.4 million growing to about $297 million in fiscal year 1993.

Considering our findings and IRS' own internal research, which showed that it would not be until year three that an increase of 1,000 staff-years would start generating positive revenues, IRS' expectation of positive revenues in year two (fiscal year 1992) seems somewhat optimistic. That optimism might be the result of a second initiative in the 1991 budget that asks for $7.5 million so that IRS can contract out its training of new revenue agents. By using contract trainers, IRS hopes to lessen the amount of unrealized revenues associated with its training effort.

Examination officials said that they are also considering ways to restructure the training program to reduce the amount of time new agents spend in training and thus increase their productivity. In light of the training costs discussed in this report, it is essential that IRS explore alternatives to its present training program. It might be advisable, however, to first test the alternatives in a controlled environment to assess their impact on the quality, as well as the cost, of training.

The differences between our results and IRS' also seem to indicate that the size of a staffing increase has a direct bearing on the extent to which IRS has to divert higher graded revenue agents away from auditing—an important consideration in deciding on the size of any future increase.

As arranged with the Committee, we are sending copies of this report to the Secretary of the Treasury, the Commissioner of Internal Revenue, and other interested parties. We will make copies available to others upon request.

Major contributors to this report are listed in appendix III. Please contact me on 275-6407 if you or your staff have any questions concerning the report or our continuing work for the Committee.

Sincerely yours,

Jennie S. Stathis

Jennie S. Stathis
Director, Tax Policy and
Administration Issues

Contents

Abbreviations

IRS Internal Revenue Service

GAO's Methodology for Computing Unrealized Audit Revenues

Our assessment of the unrealized audit revenues associated with training newly hired revenue agents was based primarily on information obtained from experienced agents who participated in that training and from data in IRS' management information systems. This appendix describes our methodology for obtaining and analyzing that information.

After consulting with IRS and the requester, we initially selected 6 of IRS' 63 district offices for inclusion in our assessment. From each of the six districts, we obtained (1) the names of all classroom instructors, OJT coaches, and OJT managers who were involved in training new agents during the period covered by our review; (2) the number of times each of those persons was assigned to instruct, coach, or manage new agents; (3) the beginning and ending dates of each of their training assignments; and (4) the training phase involved. From that information, we identified 874 different individuals who were involved in a total of 1,899 training assignments.

We sent separate questionnaires to those individuals for each training assignment in which they were involved and asked them, among other things, for information on their grade levels, their duties before being assigned to training, and what they would have been doing had they not been assigned to training. To obtain the most accurate information possible, we asked them to use their time and attendance records in answering our questions. If records were no longer available, we asked them to provide their best estimates. Table I.1 shows the number of questionnaires distributed to and returned by each of the six districts as of November 21, 1989.

Table I.1: Number of Questionnaires Distributed to and Returned by IRS Districts

	Number of questionnaires		
District	**Distributed**	**Returned**	**Response rate**
Atlanta	200	178	89%
Chicago	283	243	86
Dallas	533	429	80
Los Angeles	329	246	75
Manhattan	384	226	59
San Francisco	170	157	92
Totals	**1,899**	**1,479**	**78%**

Before beginning our analyses, we decided to exclude Manhattan because of its low response rate. Of the 874 persons to whom we sent questionnaires, 166 (who were involved in 384 training assignments) were in Manhattan. The information we obtained in response to our questionnaires and our analysis of that information relate only to the 5 districts covered by our review and cannot be generalized to the rest of IRS' 63 districts.

Using information provided in the questionnaires, we first computed the number of hours instructors and coaches actually spent training. We (1) determined the number of days between the training assignment's starting date and ending date; (2) multiplied the number of days by 8 hours, the number of hours in a standard workday; and (3) adjusted our computation to exclude weekends and holidays and those days, such as the day after Thanksgiving, on which district officials said they postponed training because of potentially high absenteeism. We then adjusted those hours to account for responses in which instructors, coaches, and managers indicated that they did not spend 100 percent of their time during the assignment actually training. The amount of time an OJT coach might actually spend training, for example, generally varies depending on the number of trainees for which the coach is responsible. To those adjusted hours we added any hours the instructors, coaches, and managers said they spent preparing for the training assignment and/or finishing up after the assignment. As a result, we determined that instructors, coaches, and managers spent 502,448 hours training agents hired between June 30, 1986, and September 30, 1988, in the five districts.

The next step in our methodology was to determine how many of those 502,448 hours would have been spent examining tax returns were it not for the training—referred to by us as diverted audit hours. This step was necessary because not all of the instructors, coaches, and OJT managers were directly involved in audits before their training assignment. Some, for example, were group managers or were involved in the district office's post-audit quality review function. To compute diverted audit hours, we asked instructors and coaches to estimate on a percentage basis what they would have been doing had they not been assigned to training. For those who were group managers or were involved in other nonaudit tasks, we asked whether their tasks were reassigned to agents who otherwise would have been auditing returns. If they were, we considered the instructor's, coach's, or OJT manager's hours to be diverted from audits.

Respondents sometimes told us that they would have been taking leave or receiving training if they had not been involved in training new agents. According to IRS officials, however, an individual's leave and training would not be lost but would be deferred until after the training assignment. Thus, the full impact of the training assignment would not be realized until later when the respondent eventually took the leave or received the training. To reflect that fact, we adjusted the respondent's answer to our questionnaire—assuming, in doing so, that the task from which the leave or training hours would eventually be diverted would be the same as the respondent's primary task at the time he or she was assigned to train. Assume, for example, that a respondent's questionnaire indicated that if he had not been involved in a 4-week (160 hour) training assignment he would have spent 80 hours examining returns, 60 hours on leave, and 20 hours working on a special project. We assumed that when the respondent eventually took the deferred leave, it would divert time from his primary task—examining returns—and thus we adjusted his response to indicate that the training assignment eventually caused him to lose 140 hours of audit time.

As shown in table I.2 classroom instructors, OJT coaches, and OJT managers would have spent 361,187 (72 percent) of the 502,448 total training hours examining tax returns had they not been assigned to train new revenue agents between July 1, 1986, and June 30, 1989.

Table I.2: Allocation of Training Hours to Other Activities

Activity	Number of training hours
Examining returns	361,187
Group manager	93,485
Other nonaudit tasks	47,816
Total	**502,448**

Note: Because of the procedure we followed in computing our estimates, the numbers for the individual activities do not add to the total.

The final step in our methodology was to compute unrealized audit revenues in the five selected districts. To do that, we first categorized the 361,187 diverted hours by grade level. Responses to our questionnaire showed that less than 1 percent of the diverted audit hours involved grade 9 revenue agents, 36 percent involved grade 11s, 35 percent involved grade 12s, and 28 percent involved grade 13s. We further categorized the diverted audit hours by fiscal year and by district. Then, from IRS' management information system, we identified the average audit yield achieved by revenue agents at those grade levels in those fiscal years in those districts. Finally, we multiplied the average yield data by the diverted audit hours to compute unrealized revenues.

Sampling Errors for Key Estimates Used in This Report

Not everyone to whom we sent a questionnaire responded. Because of our high response rate, however, and because we had certain information about the nonrespondents, such as their grade levels and the phase or phases to which they were assigned as instructors or coaches, we assumed that the information they would have provided would be similar to the respondents' information. Therefore, we projected our results to the universe of respondents and nonrespondents. Such projections require that sampling errors be reported. Sampling error is a measure of the precision or reliability with which an estimate from a particular sample approximates the results of a census. From the sample estimate, together with an estimate of its sampling error, interval estimates can be constructed with prescribed confidence that the interval includes the average result of all possible samples. Table I.3 shows the projections and confidence intervals for the major estimates included in this report.

Table I.3: Sampling Errors for Key Estimates in Report

Item estimated	Estimate cited in report	Sampling error	95 percent confidence interval estimate range: Upper limit	Lower limit
Percent of training assignments staffed by agents above grade 11	75	1	76	74
Hours spent by experienced staff training new agents	502,448	4,809	507,257	497,639
Training hours that would have been spent auditing returns	361,187	4,012	365,199	357,175
Unrealized audit revenues	$837,603,147	$9,303,945	$846,907,092	$828,299,202

District Office Information

The following tables provide information for each of the five districts included in our analysis.

Table II.1: Information on New Revenue Agents Hired by Five IRS Districts

	Number of agents		
District	Hired between July 1 and Sept. 30, 1986	On board as of June 30, 1989	Fully trained as of June 30, 1989
Atlanta	156	108	0
Chicago	210	169	5
Dallas	311	231	92
Los Angeles	298	233	57
San Francisco	128	107	25
Totals	**1,103**	**848**	**179**

Table II.2: Hours Spent Training Agents Hired in Five Districts as of June 30, 1989

District	Hours spent training
Atlanta	71,411
Chicago	93,774
Dallas	175,134
Los Angeles	104,755
San Francisco	57,374
Total	**502,448**

Table II.3: Diverted Audit Hours by Grade Level and District as of June 30, 1989

District	Grade 9	Grade 11	Grade 12	Grade 13	Total
Atlanta	•	21,404	18,323	14,368	**54,095**
Chicago	•	2,432	28,006	29,925	**60,363**
Dallas	213	51,291	34,781	33,828	**120,113**
Los Angeles	2,536	35,939	30,161	14,106	**82,742**
San Francisco	•	19,856	16,333	7,685	**43,874**
Totals	**2,749**	**130,922**	**127,604**	**99,912**	**361,187**

Note: Chicago used a proportionately lower number of grade 11 revenue agents as instructors and coaches than did the other four districts. According to the Chief of Chicago's Examination Training Branch, most grade 11 revenue agents in Chicago lacked the experience needed to train and coach new staff. The branch chief attributed this to the fact that Chicago was a no-growth district in terms of examination staff between 1981 and 1986. The district's experienced revenue agents were promoted to higher grades during this time, creating an experience gap between the higher graded agents and the more recently hired grade 11 agents.

Table II.4: Unrealized Audit Revenues by Grade Level and District as of June 30, 1989

District	Grade 9	Grade 11	Grade 12	Grade 13	Total
Atlanta	$ •	$28,387,565	$20,261,216	$50,561,934	**$99,210,715**
Chicago	•	1,596,299	39,732,861	125,316,551	**166,645,711**
Dallas	36,204	86,370,365	60,312,966	202,050,006	**348,769,541**
Los Angeles	985,308	16,695,103	44,495,803	84,977,161	**147,153,375**
San Francisco	•	10,553,740	41,009,251	24,260,814	**75,823,805**
Totals	**$1,021,512**	**$143,603,072**	**$205,812,097**	**$487,166,466**	**$837,603,147**

Table II.5: Average Hourly Yields for *Fiscal Years 1986 Through 1989* in Five Districts

	Average yields			
District	**Grade 9**	**Grade 11**	**Grade 12**	**Grade 13**
Atlanta				
Median	•	$775	$1,049	$3,273
Range	•	$402–$2,848	$575–$1,650	$969–$4,361
Chicago				
Median	•	$539	$1,533	$3,777
Range	•	$280–$892	$964–$1,787	$3,401–$5,945
Dallas				
Median	$170	$1,204	$1,114	$5,155
Range	$170	$316–$2,140	$1,091–$2,576	$4,230–$7,181
Los Angeles				
Median	$187	$660	$1,623	$4,572
Range	$182–$590	$286–$702	$1,057–$2,600	$3,185–$11,096
San Francisco				
Median	•	$574	$2,227	$3,032
Range	•	$362–$5,051	$1,125–$3,526	$1,898–$6,499

Note: Average hourly yield is computed by dividing the total increase in taxes and penalties recommended by agents in a fiscal year by the number of hours spent auditing returns that year. The average hourly yield can vary significantly not only between districts but also between fiscal years within the same district. The ranges in this table show the highest and lowest average hourly yields realized in each district during the 4 years in question. There is no range for grade 9s in Dallas because Dallas used grade 9s to instruct or coach only in fiscal year 1988.

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