Why Use Statistical Sampling?
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We all know that taxpayer’s business records are often voluminous. The tax that is due is most often determined at the transaction level, requiring the auditor to look at the source record to make a proper audit determination as to whether an error in reporting exists. A taxpayer could have hundreds, thousands, or even millions of transactions in any tax reporting period. Tax auditors typically audit tax periods that extend into the years, so it is often quite impractical to audit every business transaction. But if the auditor did so, that is giving equal and complete coverage to each transaction within the scope of the audit, than the auditor has done a detailed audit. In a detailed audit, the auditor will compute a total error amount for all audited transactions. This total error could equal zero (no change audit) or could represent a net tax overpayment or underpayment. If a detailed audit is possible and practical, it is always the preferred method of determining total error.

But sifting through all transactions is not going to be practical in many audit cases, so the auditor must decide between two alternatives. The auditor could ignore certain business transactions (no audit of certain transactions). Or, the auditor could take a sample and presume that the audited sample results, if projected to the population, will be relatively accurate. (Oftentimes, the auditor will do both). Note that if a sample is projected, the detailed audit is the standard by which we should judge any sample results. We should be able to use a sample projection if we can prove with enough confidence, that the difference between the sample projection and the true total error, had a detailed audit been performed, is relatively small. But how can this possible if a detailed examination is never performed?

The key to proving the accuracy of the sample lies in how the sample is taken from the population. Within the profession, auditors can take samples in a variety of different ways. But in essence, all different sampling methods can be reduced to two kinds of sampling. To do a statistical sample, the auditor must take a probability sample. A probability sample is any sample where all population units have a chance at selection - and this chance of selection is known, but not necessarily equal. Anything other than a probability sample is a judgmental sample, the other basic form of sampling. Probability samples include simple random samples, where all members of the sampled population have equal chance of being selected into the sample. Or more commonly, auditors will use stratified random samples. In a stratified random sample, the population is divided into groups, or strata. Within each stratum, all stratum units have an equal chance at being selected into the sample. But across the strata, the chances for selection for all population units differ across the strata, but the probability of selection for any unit in a stratified population is known. Finally, in judgmental sampling, the probability of selection is not known for any of the units, and includes block sampling that is common in auditing.

The auditor can use the audit results of a probability sample (ether a simple random or a stratified random sample), and objectively prove, using probability theory, the accuracy
of the sample. That is, the projected results can be compared to a detailed audit with some degree of confidence, had one been done. In any other type of sampling other than probability sampling, accuracy cannot be objectively measured. In all other types of sampling, accuracy of the projected sample results is a matter of subjective judgment (hence the name judgmental sampling).

Therefore, if objective proof of the accuracy of the sample is a concern, then the auditor should be using probability sampling. But there are other concerns as well. These include efficiency and accuracy.

With regard to accuracy, we would like to use a sample of the smallest size to give us the accuracy we desire. In most cases, this is going to be from a probability sample. Block samples tend to be less accurate for any given sample size, when compared to probability samples. This often has to do with the fact that the probability sample will come from the entire population, and a block sample will only come from one (or a few) portions of the population (there are other statistical reasons for this as well, which we will not discuss here). But on the other hand, convenience often enters into the picture, and auditors opt to take a block sample in any case. But the price that is paid is that the sample results will likely not be as accurate given the number of units to be audited, and no objective statement of accuracy can be made about the projected sample results.

We believe, as auditors, that accuracy is always of the utmost concern, and therefore, statistical sampling, when possible, should be the preferred method of sampling. To that end, the Multistate Tax Commission offers a course in statistical sampling for tax auditors. The Commission also invites others, including those in private practice, to take the training if there is interest. Please visit www.MTC.gov for fee schedules, class times, and registration information.