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An Analytical Procedures Application of Benford's Law

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This study introduces and describes digital and number tests that could be used by auditors as analytical procedures. The tests are based on Benford's Law which gives the expected frequencies of the digits in tabulated data (Benford 1938). The basis of Digital Analysis is that irregularities could cause the actual digital frequencies or number patterns to differ from the expected frequencies. The tests analyze the first, second, first-two, and last-two digit frequencies, with a multiples test for rounding and a test for number duplication. The approach taken at, and the results of, an internal audit application at a listed oil company are described. The corporate data showed a reasonably close conformity to Benford's Law and number duplications were the focus of audit effort. Other situations from practice are briefly described. Digital Analysis is a test for irregularities that could increase the effectiveness of analytical procedures. Digital Analysis could be applied to all situations where users want to test data integrity.

Mark J. Nigrini started his work with Benford's Law in 1989. His early work focused on reading and understanding the body of literature. He made contact with the academics in the field (mainly mathematicians) that were or had been active in research related to Benford's Law. In December, 1990 he gave his first talk to the Internal Revenue Service, Research Division, in Washington, DC, on the possibility of using Benford's Law to detect income tax evasion. At that time the set of Digital Analysis tests was limited to two tests. In August, 1992 he defended his Ph.D. dissertation ("The Detection of Income Tax Evasion Through an Analysis of Digital Distributions") at the University of Cincinnati. The dissertation developed and tested seven DA models on a sample of 200,000 US income tax returns from the 1980s. In July, 1994 he was invited to the Dutch Ministry of Finance to discuss the implementation of Digital Analysis as a tool to detect income tax evasion. Since that time Mark has published in the professional and academic literature and has been featured in business publications including The Wall Street Journal, radio, and TV. Mark has written Digital Analysis software that applies nine advanced tests to corporate data. Four new tests are in the developmental stage. He has given presentations to corporate, government, and academic audiences in North America, Europe, and South Africa and consults to a number of listed companies.