

AUDITING: A JOURNAL OF PRACTICE & THEORY
Vol. 28, No. 2
November 2009
pp. 000-000

American Accounting Association
DOI: 10.2308/aud.2009.28.2.00

Data Diagnostics Using Second-Order Tests of Benford's Law

Mark J. Nigrini and Steven J. Miller

SUMMARY: Auditors are required to use analytical procedures to identify the existence of unusual transactions, events, and trends. Benford's Law gives the expected patterns of the digits in numerical data, and has been advocated as a test for the authenticity and reliability of transaction level accounting data. This paper describes a new second-order test that calculates the digit frequencies of the differences between the ordered (ranked) values in a data set. These digit frequencies approximate the frequencies of Benford's Law for most data sets. The second-order test is applied to four sets of transactional data. The second-order test detected errors in data downloads, rounded data, data generated by statistical procedures, and the inaccurate ordering of data. The test can be applied to any data set and nonconformity usually signals an unusual issue related to data integrity that might not have been easily detectable using traditional analytical procedures.

Keywords: Benford's Law; fraud detection; substantive analytical procedures; detection risk; audit risk.

Data Availability: The authors will consider providing the data for other academic research studies.

INTRODUCTION

SAS No. 99, *Consideration of Fraud in a Financial Statement Audit* (AICPA 2002), establishes standards and provides guidance to auditors with respect to the detection of material misstatements caused by error or fraud. The statement requires the auditor to evaluate whether transactions that are unusual may have been entered into to engage in fraudulent financial reporting or to conceal misappropriations of assets. This requirement assumes that unusual transactions can be identified. SAS No. 107, *Audit Risk and Materiality in Conducting an Audit* (AICPA 2006a), states that detection risk is both a function of the effectiveness of an auditing procedure and its application by the auditor. This risk is partly due to an auditor examining less than 100 percent of an account balance or class

Mark J. Nigrini is an Associate Professor at The College of New Jersey and Steven J. Miller is an Assistant Professor at Williams College.

We thank the management of the restaurant company for allowing the use of their corporate data in the case study and the simulations. We thank the auditor for allowing us access to a large file of journal entries. We also thank the reviewers and Dan Simunic (editor) for their comments and suggestions. Professor Miller was partly supported by NSF grant DMS0600848.

Editor's note: Accepted by Dan Simunic.

*Submitted: Month Year
Accepted: Month Year
Published Online: November 2009*