RUTGERS

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AUDIT DATA ANALYTICS

Audit Data Analytics (ADA)
One way to define…

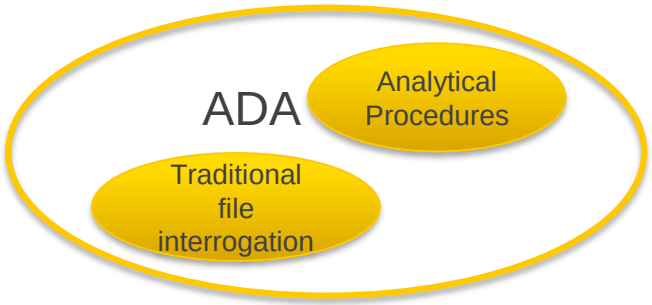
Audit Data Analytics (ADA) is the analysis of data underlying financial statements, together with related financial or non-financial information, for the purpose of identifying potential misstatements or risks of material misstatement.

ADA includes methodologies for:

- Identifying and analyzing anomalies in the data
- Identifying and analyzing patterns in the data including outliers
- Building statistical (e.g., regression) or other models that explain the data in relation to other factors and identify significant fluctuations from the model
- Synthesizing pieces of information from disparate analyses and data sources into wholes that are greater than the sum of their parts for purposes of overall evaluation

ADA defined in this way *includes:*

- Analytical Procedures (AU-C 520)—preliminary, substantive, and FS review—including reasonableness testing
- Traditional file interrogation



Definition of EDA

- Exploratory data analysis (EDA) is a data analysis approach emphasizing on pattern recognition and hypothesis generation.

- Features:
  - A philosophy/attitude
  - Flexible
  - Focus on the comprehensive understanding of the data
  - Use of simple descriptive measures
  - Emphasize on graphic representations of the data
  - Focus on tentative model building and hypotheses generation

ADA *mode* can be *exploratory* or *confirmatory*

	Exploratory mode	Confirmatory mode
When	Planning	Performance
Question	What is going on here? Do the data suggest something might have gone wrong? Where do the risks appear to be? What assertions should we focus on?	Do the data conform with and thus confirm my model for what ought to be?
Approach style	Bottom-up, inductive, few starting assumptions, assertion-free	Top-down, deductive, model-driven, starts with development of model based on assertions to be tested
Methods	Graphical visualizations used to discover patterns in and understand the data—possibly several to get different viewpoints	Comparison of actual data to model taking into account materiality, desired assurance and assertions being tested; more mathematical than graphical
Results	Identified risks, areas of focus, potential models for confirmatory stage	Identified anomalies, unexpected patterns, outliers and other significant deviations

ADA Examples

Exploratory

- Cluster analysis
- Text and data mining
- Data visualization
  - Scatterplots
  - Scatterplot matrices
  - Line charts
  - Spread charts
  - Needle graphs
  - Small multiples of graphics
  - Heat maps
  - Treemaps
  - Relationship maps

Confirmatory

- Analytical procedures
  - Regression analysis, ratio analysis
  - Reasonableness tests
- Recalculations
- Traditional file interrogation
  - Footing, extending
  - Duplicate detection
  - Out-of-range detection
  - Other 100% tests
- Journal entry testing (SAS 99)

Exploratory and confirmatory ADA is a spectrum of analytics and the processes are iterative, starting with exploratory