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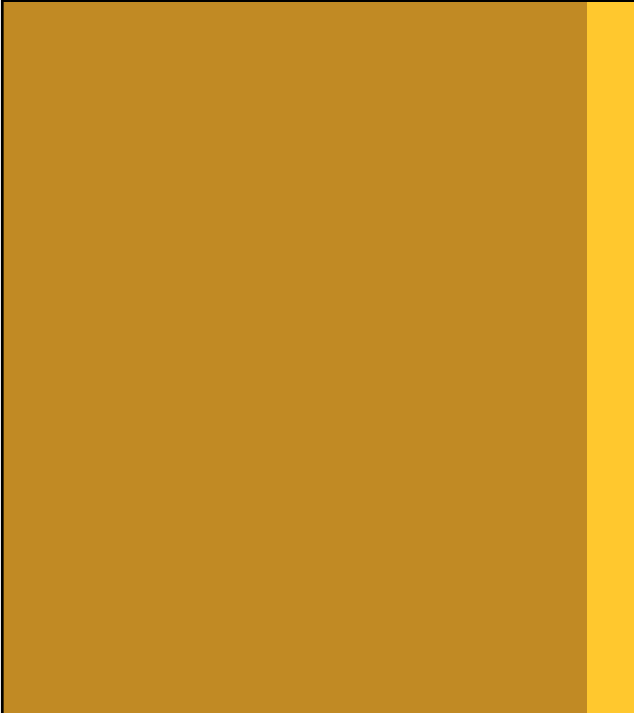


AGENDA

- Analytical Procedures
- Analyzing Audit Results
- Discuss Case Studies

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Unit 1: Analytical Procedures Workshop



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Learning Objectives

When you have completed this unit, you will be able to accomplish the following:

- Develop analytical procedures.
- Use analytical procedures to improve engagement planning.
- Utilize analytical procedures to identify risks of errors or fraud.
- Use analytical procedures to provide audit and review evidence.



Introduction

Analytical Procedures

- Improve engagement planning
- Identify risks of errors or fraud
- Provide audit evidence



Introduction

AU-C 520 Implications

- Evaluations of Financial Information
- Plausible Relationships
- Financial and Non-Financial
- Disaggregated Analytical Procedures



Introduction

Documentation

1. Develop the expected result of the procedures to be performed and tolerable misstatement.
2. Compare the recorded amount to the results obtained.
3. If results vary outside of the tolerable range, the accountant must do more:
 - Reviews – Obtain additional review evidence.
 - Audits – Obtain additional audit evidence.



Practice Aid, Analytical Review Procedures in a Review of Financial Statements

- Developed in December 2022 by AICPA's Audit and Attest Standards staff, with input from the AICPA Accounting and Review Services Committee
- Illustrates and demonstrates:
 - Forming expectations
 - Considering the precision of the expectation
- Provides a reasonable basis for obtaining "limited assurance"

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Practice Aid, Analytical Review Procedures in a Review of Financial Statements (cont'd)

- Four phases of the analytical procedure process:
 1. Expectation formation
 2. Identification
 3. Inquiry
 4. Evaluation
- Appendix: Financial Ratios

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Misconceptions

Misconceptions About Analytical Procedures

1. Many practitioners believe analytical procedures, especially during planning, are ineffective on engagements where the auditor is expected to make significant year-end adjustments.
2. Analytical Procedures require too difficult subjective judgments, such as "How much can an amount fluctuate before I need to investigate a difference? How much of the difference must I explain before I can stop?"



Misconceptions

Misconceptions About Analytical Procedures (continued)

3. Effective Analytical Procedures require a more thorough knowledge of the client's operations, especially non-financial considerations and their effects on the accounts.
4. Analytical Procedures must be customized for each engagement, thereby requiring more planning and greater knowledge of the client than tests of details.
5. Analytical Procedures are less effective evidence.
 - Use of Professional Skepticism



Professional Standards

- AU-C 500 – *Audit Evidence*
- AU-C 520 – *Analytical Procedures*
- AU-C 240 – *Consideration of Fraud in a Financial Statement Audit*
- AU-C 315 – *Understanding the Entity and Its Environment and Assessing the Risks of Material Misstatement*
- Statements on Standards for Accounting and Review Services (SSARS) – *AR-C Section 90 Reviews*
- Statement on Standards for Attestation Engagements No. 22 – *Review Engagements*



Uses for Analytical Procedures for Audits

1. Planning – “Regular”
2. Planning – Risk Assessment
3. Planning – Fraud
4. Review and Wrap-Up
5. Substantive Analytical Procedures (optional, not required by standards)



Question for Discussion

Which of the following is a risk assessment procedure performed by the auditor to obtain an understanding of the entity, its environment, and internal controls?

- a. Inquiries of management and others within the entity
- b. Analytical procedures
- c. Observation and inspection, including walkthroughs
- d. All of the above



Answer

d. All of the above

2. Planning – Risk Assessment AU-C 315 requires that when auditors perform risk assessment procedures (error or fraud), they do so to obtain an understanding of the entity and its environment, including internal control. These procedures include:

- Inquiries of management and others within the entity
- Analytical procedures
- Observation and inspection, including walkthroughs

Analytical procedures assist auditors in understanding where the risks of error or fraud may exist.



Uses for Analytical Procedures for Audits

Planning – Regular

- Results of planning analytical procedures may lead to changes.
 - Risk assessment
 - Testing strategy



Uses for Analytical Procedures for Audits

Planning Analytical Procedures Examples

- Accounts receivable increased disproportionately to sales
- Large increase in Property, Plant, and Equipment (PP&E)
- No large increase in PP&E, but repairs and maintenance increased significantly
- Decrease in payables
- Significant increase in sales
- No increase in advertising



Uses for Analytical Procedures for Audits

Planning – Risk Assessment

- Inquiries of management and others
- Analytical procedures
- Observation and inspection
 - Walkthroughs



Uses for Analytical Procedures for Audits

Reading and Scanning

- Unusual entries
- Omitted or misclassified transactions
- Unusual posting sources
- Atypical activity near end of period
- Unusual patterns

Exhibit A

	Current Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Last Month
(a) Sales												
(a) Cost of Sales												
Gross Profit												
Operating Expenses:												
-												
-												
-												
Net Income												
Accounts Receivable												
Write-Offs												
Allowance for Doubtful Accounts												
PP&E:												
• Additions												
• Disposals												
Accounts Payable												
Inventory												
Long-Term Debt												
Number of Employees												
Square Feet Utilized												
Number of Customers												
Number of Shipments												
-												
-												
-												
-												
-												

Uses for Analytical Procedures for Audits

Planning – Fraud

- Fraud risks
- Audit provides reasonable assurance
- Disaggregated analysis critical



Uses for Analytical Procedures for Audits

Planning – Fraud

- Disaggregated:
 - Revenue by month, by location
 - Revenue per customer
 - Revenue per month, by customer
 - Revenue per product line
 - Revenue per available square feet
 - Revenue per employee
 - Revenue per shipment
 - Revenue returns per month, per customer, per product line
 - Gross profit per customer, per location, per product line
 - Cash receipts to sales, by month, by location



Uses for Analytical Procedures for Audits

Infamous Audit Scandals

- WorldCom – DR assets, CR expenses every quarter
- Cendant Corp. “kept the books open”
- Sunbeam included “non-impaired” inventory in its write-off policy; subsequent sale with \$-0- CGS
- Phar-Mor – DR inventory, CR sales each quarter



Uses for Analytical Procedures for Audits

Common Sense Analytical Procedures

- American Express – Tino DeAngelis “Salad Oil”
- Cisco Systems and California Software – Shipped unordered goods and recorded returns in subsequent period
- ZZZZ Best – Revenues > industry

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Uses for Analytical Procedures for Audits

Review and Wrap-Up

- a. All items or issues identified in the planning phase have been addressed.
- b. The overall financial statement presentation is appropriate.

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Uses for Analytical Procedures for Audits

Substantive Analytical Procedures (optional)

- Level of assurance
- Follow up on unexpected results
- Audit evidence

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Uses for Analytical Procedures for Audits

Substantive Analytical Procedures (optional)

- Evidence-gathering activity
- Incorporates independent expectations or predictions
- Disaggregated data more meaningful

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Uses for Analytical Procedures for Audits

Substantive Analytical Procedures (optional)

- Independent expectations
- Use of audited or plausible third-party data
- Analytical procedures are applied to disaggregated segments or sub-units of an entity or balance
- Immaterial differences
- Material differences
- Significant risks – Not effective by themselves
- Tests of controls and substantive analytical procedures



Question for Discussion

The balance sheet shows the following:

Accounts receivable (net of \$40 allowance) \$960

To audit accounts receivable, the auditor would perform detailed testing on:

- a. The \$960 net receivable balance
- b. The \$1,000 gross receivable balance
- c. The \$1,000 gross receivable balance and the \$40 allowance balance
- d. The \$960 net receivable balance and the \$40 allowance balance



Answer

c. The \$1,000 gross receivable balance and the \$40 allowance balance

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Uses for Analytical Procedures for Audits

Substantive Analytical Procedures Examples

- Predicting restaurant sales
- Testing direct labor cost
- Predicting company sales
- Predicting room revenues for a hotel property
- Testing interest expense
- Testing sales commission expense

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Uses for Analytical Procedures for Audits

Analytical Procedures as a Substantive Test

1. Inherent and control risk
2. Nature of account being tested – Predictable?
3. Nature of assertion being tested:
 - Existence vs. completeness
 - Analytical procedures can be useful with completeness
4. Precision of expectation – How much difference (significance) from expected amount can be tolerated



Uses for Analytical Procedures for Audits

AP as a Substantive Test (continued)

5. Availability of reliable, independent data:
 - Outside the entity
 - Audited information
 - Non-financial information
6. Replace all or some detail tests (EXAMPLES)
7. Client explanations for differences must be substantiated with additional audit evidence (EXAMPLE)

QUESTION FOR DISCUSSION: Analytical Procedures as Tests for Understatement of Accounts Receivable



Uses for Analytical Procedures for Audits

Developing Expectations

1. Period-to-period comparisons
2. Analysis of relationships among financial statement accounts
3. Comparison to industry statistics
4. Analysis of financial data using non-financial data
5. Comparisons to anticipated results
6. Use of ratios



1. Period-to-Period Comparisons

- Stable relationships must exist or changes from period to period must be incorporated into the trend.
- Changes in the client's business must be incorporated to identify amounts where consistency is not expected.
- At least three periods should be compared, to identify trends and isolate aberrations.
- Comparisons should incorporate disaggregated data, to help isolate the reasons for unexpected differences.

1. Period-to-Period Comparisons

EXAMPLE:

	<i>X1</i>	<i>X2</i>	<i>X3</i>
<i>Sales</i>	\$2,300,000	\$2,714,000	\$3,202,520
<i>Cost of sales</i>	<u>1,909,000</u>	<u>2,252,620</u>	<u>2,658,092</u>
<i>Gross Profit</i>	<u>\$391,000</u>	<u>\$461,380</u>	<u>\$544,428</u>
<i>Accounts Receivable</i>	\$368,000	\$434,240	\$512,403
<i>Accounts Payable</i>	\$297,000	\$350,460	\$413,543

Disaggregated Data

		<i>X1</i>	<i>X2</i>	<i>X3</i>
Revenues:	Gasoline Sales	\$1,380,000	\$1,628,400	\$2,562,016
	Repairs	690,000	814,200	480,378
	Other	<u>230,000</u>	<u>271,400</u>	<u>160,126</u>
		\$2,300,000	\$2,714,000	\$3,202,520
Cost of Sales:	Gasoline	\$1,242,000	\$1,465,560	\$2,305,814
	Repairs	483,000	569,940	336,265
	Other	<u>184,000</u>	<u>217,120</u>	<u>16,013</u>
		\$1,909,000	\$2,252,620	\$2,658,092
Gross Profit:	Gasoline Sales	\$ 138,000	\$ 162,840	\$ 256,202
	Repairs	207,000	244,260	144,113
	Other	<u>46,000</u>	<u>54,280</u>	<u>144,113</u>
		\$ 391,000	\$ 461,380	\$ 544,428



Disaggregated Data

- OTHER EXAMPLES
 - Inventory
 - Office payroll expense



2. Analysis of Relationships

- This approach uses known information (financial and/or non-financial) to develop an expectation.
- Relationship analytical procedures rely on the auditor's knowledge of the client's operations, industry, and accounting practices to develop expectations related to the client's account balances.
- When changes have occurred at the client from period to period, the auditor must develop assumptions for each key factor supporting his/her expectation.



2. Analysis of Relationships

Interrelationship Among Accounts

- Sales increases
- Wages increases
- Net income increases

QUESTIONS FOR DISCUSSIONS:

High employee turnover

Copper price increase



Questions for Discussion

Identify potential effects on related financial statement amounts of the following economic changes:

- High turnover of employees during the current year.
- An increase in the price of copper from \$3.00 to \$3.40 per pound, when your client is a wire and cable manufacturer.

Case Study 1: Analytical Procedure to Test Warranty Accrual



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3. Comparison to Industry Standards

- Some, but not all, data useful for non-public entities
- Examples
- Websites
- Published surveys
- Trade associations
- Other clients

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Case Study 2: Tar Heel Community Hospital



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4. Use of Non-Financial Data

- Data expressed in non-monetary terms can provide strong predictive information for recorded balances.
- Analysis requires enhanced knowledge of the client and tailoring for each engagement.
- Evaluating results requires more professional judgment.
- EXAMPLES

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Non-Financial Applications

- Coin-operated laundromat
- Bagel manufacturer
- Sales of beer at a hockey game
- Revenue from union dues
- Room revenue at a hotel
- Restaurant revenue
- Sales of training courses



Example Non-Financial Measurements

- Sales or cash flow from operations to number of employees
- Sales or cash flow from operations to available or usable square feet
- Sales or cash flow from operations to number of shipments
- Sales or cash flow from operations to number of customer orders
- Operating expenses per employee
- Cost of services provided by participant



Question for Discussion

Analysis of financial data using non-financial data:

- a. Is not permitted by auditing standards because the data are not financial
- b. Can provide strong predictive information for recorded account balances
- c. Reduces the need for professional judgment in performing analytical procedures
- d. Increases audit efficiency because the auditor does not need to have obtained a knowledge of the client for analyzing non-financial data



Answer

b. Can provide strong predictive information for recorded account balances

Case Study 3: Using Non- Financial Data



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5. Comparison to Anticipated Results

- Don't need budgets or projections – Any reasonable expectations can be used
- Emphasizes knowledge of organization
- Don't perform backwards:
 - Assume everything "SALY"
 - All changes are "variances"
 - Variances explain changes in business
- EXAMPLE

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6. Use of Ratios

- It is normally more effective than trend analysis.
- For ratio analysis to be most effective, it should be performed at the disaggregated level.



Disaggregated Ratios – Sales

- Sales per month
- Sales per month by customer
- Sales per employee
- Sales per product line
- Sales per square feet
- Sales per shipment
- Sales returns to sales per month
- Sales returns to sales per customer
- Ratio of non-recurring sales to recurring sales



Substantive Analytical Procedures Issues

- a. Profitability ratios – Useful for small companies?
- b. Select a few and use them.
- c. Ratios identify trends & aberrations to be examined using other forms of analysis and testing.
- d. “Quality of Earnings” ratio is an extremely good indicator of potential misstatements, recommended for consideration on all audit and review engagements.



Ratio Analysis

- Liquidity
- Efficiency
- Coverage
- Profitability
- Cash flows



Liquidity Ratios

- Current ratio
- Quick ratio
- Working capital

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Efficiency Ratios

- Accounts receivable turnover
- Days' sales in accounts receivable
- Inventory turnover
- Days' inventory on hand
- Operating cycle
- Accounts payable turnover
- Accounts payable days outstanding
- Asset turnover

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Coverage Ratios

- Debt to equity
- Current debt to equity
- Times interest earned



Profitability Ratios

- Gross profit ratio
- Profit margin
- Operating expenses to sales
- Rate of return on assets
- Rate of return on equity



Cash Flows Ratios

- Quality of earnings (extremely valuable)
- Operating cash flows to sales
- Debt coverage
- Operating cash flows to current liabilities
- Cash GAP
- Cash to daily cash expenses
- Operating cash flows to number of employees
- Operating cash flows to square feet of operating or retail space



Cash GAP

$$\begin{aligned} &\text{Billing Lag, plus} \\ &\text{Collection Period, plus} \\ &\text{Inventory Sales Period, minus} \\ &\text{Payment Period} \\ &= \\ &\text{Cash GAP} \end{aligned}$$



Evaluating Differences from Expected Amounts

- Substantive analytical procedures for revenue
- Questions for discussions

Case Study 4: Analytical Procedures on Sales



Benford's Law

- Benford's Law predicts the expected digit frequencies in a list of numbers.
- **Theory:** The theory was developed when pages of the logarithm book beginning with 1 and 2 were more worn than the pages with 8 and 9.
- Benford formulated that the expected frequencies of the various digits in lists of numbers using a mathematical assumption are based on geometric sequences.



Benford's Law

- The following table shows the expected digital frequencies and the probability based on the digit:

Digit	1 st	2 nd	3 rd	4 th
0	N/A	.11968	.10178	.10018
1	.30103	.11389	.10138	.10014
2	.17609	.10882	.10097	.10010
3	.12494	.10433	.10057	.10006
4	.09691	.10031	.10018	.10002
5	.07918	.09668	.09979	.09998
6	.06695	.09337	.09940	.09994
7	.05799	.09035	.09902	.09990
8	.05115	.08757	.09864	.09986
9	.04576	.08500	.09827	.09982

- As you can see, 1 in the first digit has the highest probability (30.103%) versus the digit 9, which has 4.576%.



Benford's Law

- Identify fabricated numbers
- Natural vs. non-natural numbers
- Test a data set for predictable digit distribution
- **Non-natural number – Mailing address**



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Benford's Law – Criteria to Consider

1. The data set should describe the sizes of similar phenomena.
 - An example is the revenues of companies on the NYSE.
2. There should be no built-in minimum or maximum values in the data set.
 - As an example, if rent had a minimum floor of \$4,000, a data set of rent would have an excess of first-digit 4s. This would create a skew of the data and an expected pattern whereby there would be no transactions with first-digit 1s, 2s, or 3s.

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Benford's Law – Criteria to Consider

3. The data set should not be made up of assigned numbers. Assigned numbers are numbers given to things in place of words, such as social security numbers, bank account numbers, telephone numbers, etc.

Examples:

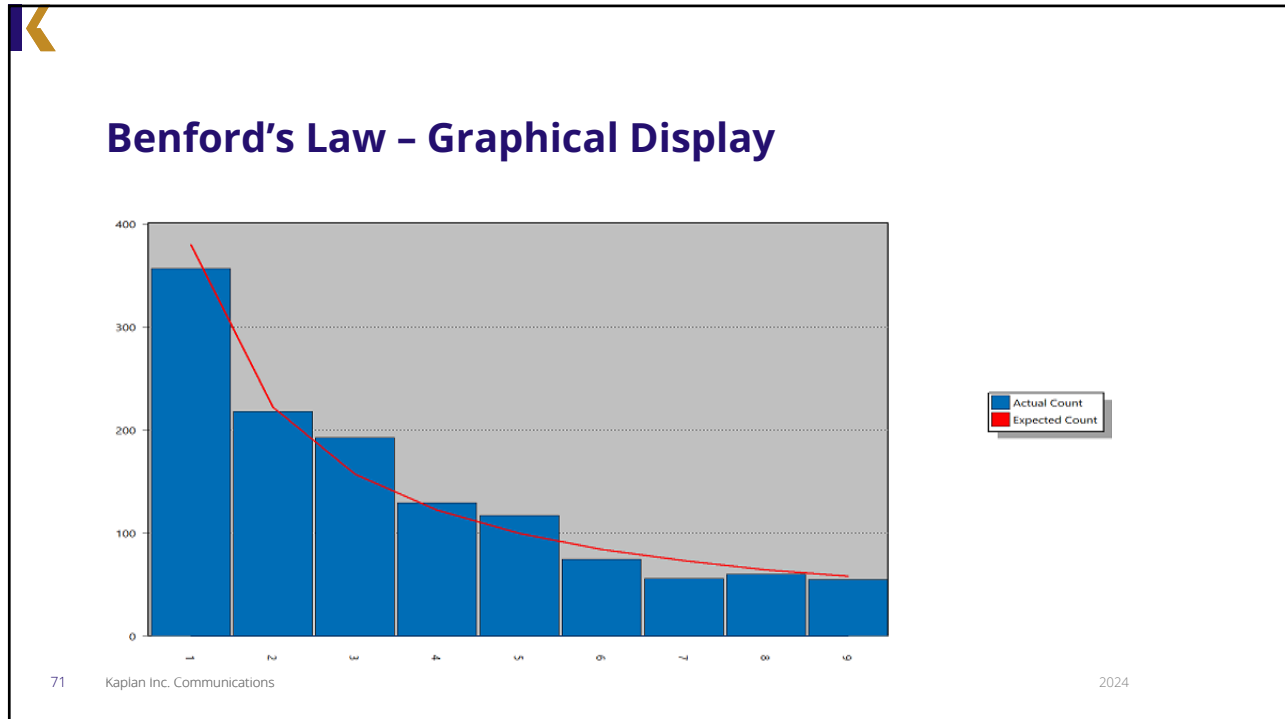
- SSN: 155-55-1698
- Telephone: 732-964-9999
- Bank Account: 7778889999
- EIN: 12-3456789



Benford's Law – Criteria to Consider

4. The data set should have more small items than big items.

For example, a franchisor may have a lot of large transactions when they sell a franchise license as compared to a manufacturing company selling hearing aids (many small transactions).



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Question for Discussion

When is Benford's Law not appropriate?

- a. Large data set
- b. Many small transactions
- c. Even distribution of small transactions and large transactions
- d. Data sets with pre-established minimum values

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Answer

d. Data sets with pre-established minimum values

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Using Benford's Law as an Audit Procedure

- EXAMPLE – unauthorized disbursements

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Benford's Law in Popular Culture

- 2020 Netflix series "Connected"
- 2017 Netflix series "Ozark"

QUESTIONS FOR DISCUSSIONS

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Case Study 5: JMT, Inc.

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Summary of Strategies for Effective Analytical Procedures

1. Beware of two-year comparisons. The prior year may contain anomalies that should be removed before comparing to the current year; trends will not be highlighted as they should.
2. Don't calculate ratios that will not be used.
3. Get the whole story when investigating fluctuations from expected amounts or activity, not just the partial story for increases or decreases.
4. Don't assume amounts are always consistent over time. Incorporate changes in the client's business in developing your expectations for recorded amounts.



Summary of Strategies for Effective Analytical Procedures

5. Client's explanations for variances must be corroborated with audit evidence when analytical procedures are used as a substantive audit test.
6. Scanning accounting records for unusual activity can be a powerful analytical procedures tool.
7. Customize analytical procedures for each engagement.
8. Quantify amounts to investigate and amounts explained. Incorporate materiality and risk.
9. Prior year unaudited amounts cannot be considered reliable predictive amounts for the current year in substantive analytics.



Summary of Strategies for Effective Analytical Procedures

10. Documentation is required:

- Planning analytical procedures
- Risk assessment procedures including fraud
- Follow-up review analytical procedures
- Substantive analytical procedures

Unit 2: Data Analytics for Audits and Reviews Using Technology



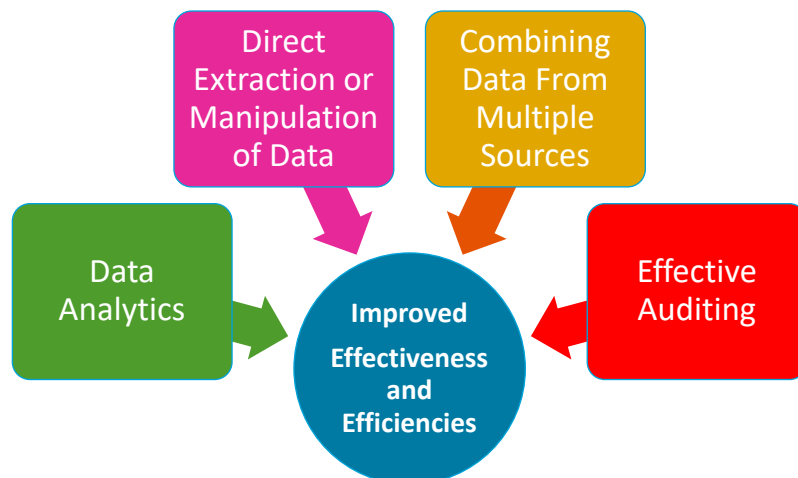
Learning Objectives

When you have completed this unit, you will be able to accomplish the following:

- Make the connection between data analytics and its use in audits and reviews.
- Describe what computer aided audit tools can be used to aid in the audit process.
- Use data analytic tools for various accounting applications.



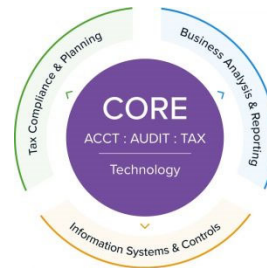
Why Use Technology?





Introduction

- New CPA exam – January, 2024
- Focus on data and technology
- 3 core sections
- And choose 1 of 3 disciplines



Common Terminology

- Analytical procedures in audits and reviews:
 - Evaluations of financial information through analysis of plausible relationships among both financial and nonfinancial data
 - Investigation of identified fluctuations or relationships that are inconsistent with other relevant information
- Big Data – Extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions



Common Terminology

- Data – Facts and statistics collected together for reference or analysis
- Data analysis – Analyzing data directly from data source
- Data analytics – Science (and art) of examining raw data and drawing conclusions on the data
- Data extraction – Obtaining information directly from a data source
- Data visualization – Presentation of data in a visual format



Common Terminology

- Predictive analytics – Analytics performed in order to give decision makers an understanding of the future consequences of decisions based on known data trends and assumptions
- Descriptive analytics – Analytics aimed at explaining a trend or pattern in data
- Business intelligence – Using technology to transform data into actionable intelligence
- Structured data – Any data or information that is located in a fixed field within a defined record or file, usually in databases or spreadsheets
- Unstructured data – Any data that doesn't fit neatly into traditional structured formats or databases



Rutgers AICPA Data Analytics Research Initiative (RADAR)-Shared Goals

Goal No. 1

Active engagement by firms and universities in fundamentally applied research for continuous improvement of the profession

Goal No. 2

An auditing profession that has improved audit effectiveness through the integration of data analytics and related technologies into everyday practice

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RADAR CONCLUSIONS

- Identifying and categorizing items for further analysis or testing requires flexibility and significant judgment.
- Determining how and when to apply filters and the level of evidence obtained are areas of significant judgment.
- Filtering assists in determining the nature, timing and extent of procedures.
- When using filtering techniques, professional judgment will be needed to determine how to appropriately assess potential errors identified.
- The development and application of filters will typically require relevant and disaggregated data.
- Appropriate procedures will need to be performed to assess the reliability of the data set being used.

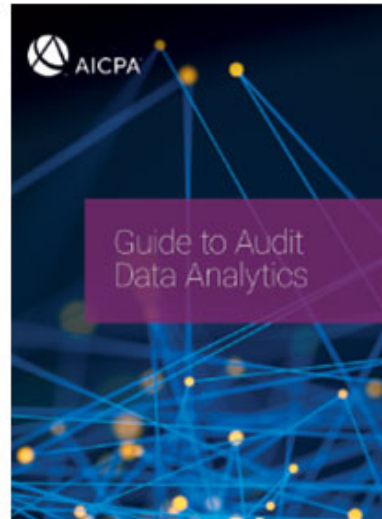
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AICPA Guide to Data Analytics

In December 2017, the AICPA released a guide to data analytics, which provided guidance to encourage auditors to make more use of technology-based audit data analytics.



Big Data

- Big Data is being generated by everything around us at all times.
- Every digital process and social media exchange produces it. Systems, sensors, and mobile devices transmit it.
- Big Data is arriving from multiple sources at an alarming velocity, volume, and variety.
- To extract meaningful value from Big Data, you need optimal processing power, analytics capabilities, and skills.



Big Data Analysis

- What are our big picture goals?
- What are our granular goals?
- Where are we falling short and where are our weak points?
- What structured data is available to us?
- What unstructured data is available to us?
- What data do we need to combine with our available data to generate a meaningful analysis?



Question for Discussion

The biggest challenge to the public accounting profession over the next five years will be:

- a. Automation
- b. Regulatory changes
- c. New technology
- d. Perceived value
- e. All of the above



Answer

e. All of the above

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Statement on Auditing Standards (SAS) No.142 *Audit Evidence*

- It was issued July 2020 and is effective for audits of periods ending on or after December 15, 2022.
- It is a rewrite of AU-C 500 *Audit Evidence* and amends other sections, but not AU-C 520 *Analytical Procedures*.
- Take care not to confuse data analytics with analytical procedures; the terms sound similar but are different.
- Analytical procedures are a subset of data analytics.
- Data analytics of Big Data using CAAT will be discussed shortly.

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SAS No. 142 Audit Evidence

- Key points applying in SAS No.142 concepts when evaluating analytical procedures as audit evidence are:
 - Relevance and reliability of information used in procedure, including its source
 - Is analytical procedure sufficiently precise and detailed (i.e., fit for purpose)?
 - Whether results of analytical procedure corroborate or contradict assertions in financial statements

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Technologies – Computer Aided Audit Tools (CAAT)



TeamMate®



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CAAT

Microsoft Excel

- Most commonly used tool in the profession
- Used to capture everything from a reconciliation of prepaid expenses to capturing thousands of rows of data generated for analysis purposes
- Has strong computing capability
- User-friendly
- Basic tasks such as:
 - Filtering
 - Sorting
 - Creating pivot tables
 - Writing "IF" formulas



CAAT



- IDEA is an advanced data analytics tool built for internal/external auditors that provides full functionality from importing complex files to performing extraction and interrogation of data.
- The program can read flat or relational databases, spreadsheets, print files, and many more file types. Commands are both pre-programmed (click of a button) and customizable with the scripting feature.
- IDEA also has several add-ins, including "smart-analyzer" and a data visualization add-in.



CAAT



- Galvanize (ACL) is an advanced data analytics tool built for internal/external auditors that provides full functionality from importing complex files to performing extraction and interrogation of data.
- Galvanize (ACL) was built on a computer programming light platform that provides for functions to be developed and written to standardize and streamline processes and functions to create efficiency and effectiveness.
- Scripting.



CAAT

TeamMate®



- TeamMate Analytics is based in Microsoft Excel as an add-in.
- TeamMate Analytics was conceived and has been designed to be a tool for every auditor—not just “the data guy,” but every auditor on your team regardless of their IT skill level.
- TeamMate uses familiar auditor-friendly terminology and is built to be a point-and-click operation.
- Help and tutorials are built in to understand the purpose of each function.



CAAT



- A sophisticated fraud investigation tool designed to perform multidimensional analysis on a transaction ledger
- Was designed to ingest, understand, and perform advanced queries on the data
- Multidimensional analysis on each transaction and assigns a transaction “risk” score to those transactions
- Next generation of AI technology, as the computer is performing the analysis and identifying the anomaly

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CAAT

Function	IDEA	Galvanize (ACL)	TeamMate Analytics	MindBridge AI
Importing all file types	Yes	Yes	Yes	Excel only or direct system connection
Journal entry testing	Yes	Yes	Yes	Yes
Sampling	Yes	Yes	Yes	No
Stratification	Yes	Yes	Yes	No
Risk score assignment and multidimensional analysis to transactions	No	No	Yes	Yes
Data joins, appends, and aggregations	Yes	Yes	Yes	No
Scripting	Yes	Yes	No	No
Data visualization	Yes	No	Yes	Yes
Can handle large data sets	Yes	Yes	Limited to Excel size and processing speed	Yes
Benford's Law	Yes	Yes	Yes	No
Pivot tables	Yes	Yes	Yes	No

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CAAT



- Validis (CCH audit accelerator) has developed technology that connects directly with accounting packages and extracts core data such as the general ledger, accounts receivable subsidiary ledger, and accounts payable subsidiary ledger.
- This tool allows auditors to receive a standard set of data with pre-written reports that can be utilized in the audit process.
- The tool is designed to alleviate the pain of tracking down data and putting it into an easy-to-use format (Cloud view or Excel).

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CAAT

- PDF conversion – Auditor nightmare!!
- Export to spreadsheet with Adobe



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CAAT

- Power BI is a suite of business analytics tools that delivers insights throughout an organization.
- Power BI is used to connect to hundreds of data sources, simplify data prep, and drive ad hoc analysis.



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CAAT

- **Alteryx**
 - Easy to use
 - EY alliance

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CAAT

- **SPSS (IBM)**
 - Statistical software platform
 - User-friendly

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Question for Discussion

Which software is utilized at your firm?

- IDEA
- Galvanize (ACL)
- TeamMate Analytics
- Power BI
- MindBridge
- Validis (CCH audit accelerator)
- Alteryx
- SPSS
- None of the above

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Data Analytic Techniques

- Audits
- Reviews



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Data Analytic Techniques

Acquiring Data

Journal Entry Testing

Joining or Matching Data

Appending Data

Specific Audit Areas

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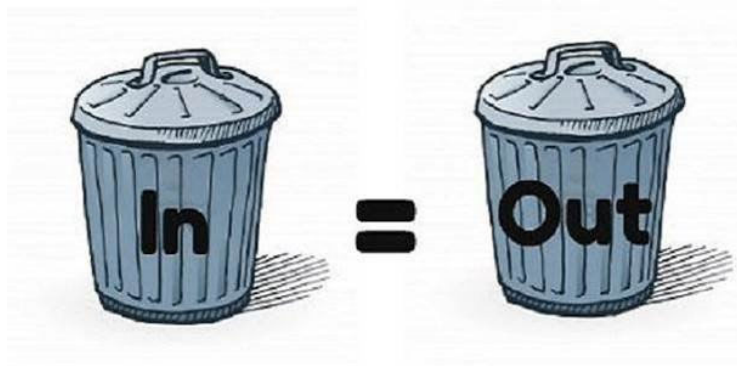


Data Analytic Techniques – Acquiring Data

- Data analytic projects don't work without data!!!!
- One of the most common challenges in the industry is accessing useable and reliable data.



Data Analytic Techniques – Acquiring Data





Data Analytic Techniques – Acquiring Data

- Process starts with client data entry
- What data is captured and what data is not captured?
- Walkthrough of client data entry to report production process
- EXAMPLE – not-for-profit organization



Data Analytic Techniques – Acquiring Data

- **Clients provide me PDFs—I guess I have to live with them...**





Data Analytic Techniques – GL Fields

- Account number
- Account description
- Sub account number
- Sub account description
- Batch #
- AJE# if different than batch
- Journal source code
- Transaction date
- Period posted (if different than transaction date)
- User posted by
- Time posted
- Description of transaction
- Debit amount
- Credit amount

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Data Analytic Techniques – Acquiring Data

- **Technology Alert!**
- There are now tools available and ones being built that can:
 - Create a direct bridge into an accounting package
 - Extract out all the reports/produce them in a readable format with the click of a button!

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-
- The diagram shows a central red figure standing on a pedestal, representing the total cost of capital. Three arrows point from this central figure to three groups of grey figures, each representing a component of the cost of capital:
- Depreciation** (purple text and arrow): Points to a group of three grey figures on the left.
 - Acquisition Accounting** (orange text and arrow): Points to a single grey figure in the middle.
 - Monthly Expense Accrual** (blue text and arrow): Points to a group of three grey figures on the right.

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Journal Entry Testing

Weekends	Search for transactions posted on weekend dates. This is useful for organizations whereby the employees do not work on weekends. Transactions posted on non-working days may be indicative of Fraud
Keyword Search	- Extraction of All transactions posted with an identified word included within the description or memo field. - Typical searches are for words indicative of manual override such as: "error", "quota", "reclass", "override", "mistake", "correction", "estimate"
Unusual Times	Extraction of the transactions posted at time periods defined by the user. Typically, this would include a search for times outside of normal working hours.
Unusual postings	- Focused search to identified transactions to accounts that are out of place. - Common examples include transactions which are debits to liabilities and credits to income, transactions posted to revenue whereby the other side of the transactions is other than receivables or deferred income, and re-classifications among profit and loss accounts to distort classification (manual adjustments to EBITDA accounts; inflating revenue/expenses to increase top line, etc.).

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Join or Match Functions

- The join function works when there is a common field among two databases and layers an additional column or columns onto a database.
- Example: One-to-One

Employee master	
Emp#	Name
X1	Jimmy
X2	Logan
X3	Xavier

Logical Access	
Emp#	Access
X1	Full
X2	Read-Only
X3	Read-Only

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Join or Match Functions

Many-to-One

- A many-to-one join can be performed when combining a transaction register with a master file.

account	date	name	amount
50001	1/1/2017	sam smith	1.00
50001	1/1/2017	pete smith	38.00
50002	1/1/2017	sam smith	75.00
50002	1/1/2017	pete smith	112.00
52000	1/1/2017	plumbers llc	334.00
52001	1/1/2017	electrician llc	371.00
52001	1/1/2017	tony's pizza	408.00
52001	1/1/2017	vinny's pizza	445.00
53001	1/1/2017	bounce castle	741.00
53001	1/1/2017	bounce castle	741.00
53001	1/1/2017	bounce castle	741.00
54001	1/1/2017	tony's pizza	408.00
54001	1/1/2017	vinny's pizza	445.00
55002	1/1/2017	tony's pizza	408.00
55002	1/1/2017	vinny's pizza	445.00

Prefix	Category
50	Payroll and benefits
52	consulting and professional fees
53	occupancy
54	other direct expenses

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Join or Match Functions

Many-to-Many

- This is a join procedure whereby we are taking two discrete databases and joining them together. These databases contain multiple instances of each primary key.
- Consider the ability to summarize 1 database to avoid a many-to-many join.**
- EXAMPLES**
 - Selecting samples by budget category
 - Testing eligibility in a defined benefit plan (existence/completeness)

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Join or Match Functions

CHECK_NUMBER	VENDOR_ID	DATE	PAYMENT	Name	Address
11817	John Smith	1/3/2017	22020.00	John Smith	123 Easy Street
11818	John Smith	1/7/2017	311.28	John Smith	1234 East Street
11819	John Smith	1/7/2017	61.20	Harry Jones	13 Snowman Way
11820	John Smith	1/7/2017	201.66	Harry Jones	14 Snowman Way
11821	John Smith	1/7/2017	854.51	Harry Jones	13 Snowman Way
11822	John Smith	1/7/2017	114.70	Executive Director	35 pkwy 18
11823	John Smith	1/7/2017	124.56	Executive Director	35 pkwy 18
11824	John Smith	1/7/2017	641.27	Executive Director	96 Tpk dr
11825	John Smith	1/7/2017	306.54		
11826	John Smith	1/7/2017	476.80		
11827	John Smith	1/7/2017	801.21		
11828	Harry Jones	1/7/2017	346.84		
11829	Harry Jones	1/7/2017	331.94		
11830	Harry Jones	1/7/2017	158.45		
11831	Executive Director	1/7/2017	91.80		
11832	Executive Director	1/7/2017	345.20		
11833	Executive Director	1/7/2017	87.00		
11834	Executive Director	1/7/2017	800.99		

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Join or Match Functions

Common Joins in Practice:

- Comparison of employee master file to vendor master file for address matches
 - Matching key: address *expectation is NOT to find a match*
- Comparison of participant valuation report contributions to payroll file contributions
 - Matching key: employee ID
- Identification of related party transactions by combining one of the following: the cash disbursement journal, the sales journal, expense ledger, general ledger with a listing of known related parties
 - Matching key: name
- Matching summarized bank data by date with summarized cash transactions in the general ledger by date
 - Matching key: date

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Append Function

- In certain cases, files are exported into multiple sheets in one workbook (i.e., a general ledger exports to six different tabs in one Excel file).
- In practice, this is seen on files with weekly data on a different tab.
- The goal is to collate this data so you have 1 database, not several workbooks with discrete data.

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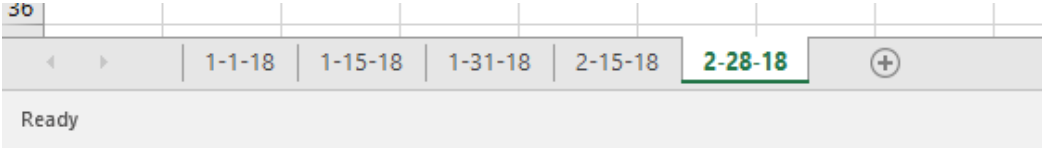
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Append Function Example

Consider a payment register provided to you with multiple sheets



The screenshot shows a portion of an Excel spreadsheet. The top row contains dates: 1-1-18, 1-15-18, 1-31-18, 2-15-18, and 2-28-18. The date 2-28-18 is highlighted with a green border. To the right of the dates is a button with a plus sign (+). Below the spreadsheet, the status bar displays the word 'Ready'.

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Accounts Payable

Common file requests:

- Accounts payable aging detail
- Check register
- Vendor master file
- General ledger

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Accounts Payable

Manual Audit Procedures

- Obtain check register, selected XX transactions haphazardly
- Eyeball accounts payable this year vs. accounts payable last year
- Make haphazard selections from accounts payable aging schedule

Automated Procedures

- Obtain check register, stratify population, and use random sampling on each strata
- Join accounts payable aging for 3-year period by vendor and do search queries (blank years, new vendors, no change vendors)
- Combine check register subsequent to year end with accounts payable aging to identify what was paid and what was not to consider sampling from accounts payable

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Accounts Payable

- Summarization or aggregation of AP detail at a cutoff date over a multiple-year period or by month to evaluate cutoff/lapses in invoices
- Summarization of AP detail by vendor over a multiple-year period to compare vendors
- Duplicate test
- Summarization of general ledger transactions by type by month/year to identify write-offs or other unusual activity
- Join subsequent payments with year-end AP detail



Accounts Receivable

Common file requests:

- Accounts receivable aging detail
- Cash receipt journal
- Sales journal
- General ledger
- Customer master file



Accounts Receivable

Manual Audit Procedures

- Obtain accounts receivable aging detail, foot, crossfoot
- Make xx haphazard selections
- Select cash receipts after year-end and manually tie back to the accounts receivable aging to see what was collected

Automated Procedures

- Combine cash receipt journal by invoice subsequent to year-end with accounts receivable aging to identify what was paid and quickly identify what was not
- Obtain accounts receivable aging, stratify population, and use random sampling on each strata for confirmation selections (consider stratifying by paid after year-end vs. not paid)
- Join accounts receivable aging for 3-year period by customer and do search queries (blank years, new customers, no change customers, or slow paying customers)
- Re-age the accounts receivable aging to identify any instances where the client is manually modifying the aging buckets

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Accounts Receivable

- Join the sales journal and accounts receivable journal by customer to identify any significant concentrations of accounts receivable to sales to identify instances of accounts receivable collectability
- Summarization of activity by customer in accounts receivable by type (invoice, journal entry, cash payment, currency adjustment)
- Join subsequent payments with year-end accounts receivable detail

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Accounts Receivable

- Sampling – Stratify the accounts receivable invoice population for confirmation testing.
- Age the accounts receivable listing by invoice date to verify the aging schedule provided was not manipulated.
- Combine 3 years of aging history to identify instances of slow moving customers or payments and to help perform a retrospective review of the allowance for doubtful accounts.



Payroll

Common file requests:

- Payroll processor report by pay period
- Timekeeping/timesheet data
- Employee master file
- General ledger



Payroll

Manual Procedures

- Reconciliation of payroll from 941 report to general ledger
- Sampling timesheet system or payroll general ledger
- Year-over-year analytic of payroll data

Automated Procedures

- Script import of payroll journals from third-party payroll provider
- Summarization of payroll register for 3-year period and comparison of employee compensation
- Graphically display payroll by department for 3-year period
- Sampling of payroll register or general ledger (stratify by department or other disaggregated metric)

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Payroll

- Importing – Create a script to import payroll processor master file data
- Duplicate or unauthorized payments
- Individuals set up as vendors AND W-2 employees
- Unapproved overtime hours
- Unauthorized salary increase

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Travel and Entertainment

Common file requests:

- General ledger
- Credit card detail reports
- Travel and entertainment tracking system data
- Check register

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Travel and Entertainment

- Split purchases
- Duplicate submissions for the same bill
- Abuse of spending
- Unauthorized expenses or expenses approved above authorization limits

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Fixed Assets

Common file requests:

- General ledger
- Physical inventory count with tag ID
- Fixed asset register with depreciation calculations
- Shipping/receiving logs

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Fixed Assets

- Join the physical inventory count with the fixed asset register by tag ID.
- Analyze the receiving log close to cutoff with the physical count.
- Compare additions and deletions in the general ledger to the fixed asset rollforward or directly to the fixed asset register.
- Identify purchases/assets received not included in fixed assets (potential theft).

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Check Register and Cash Disbursements

Area	Considerations
Gap Detection	Gap detection on check number; investigate significant gaps in checks
Significant Vendors	Summarize by vendor – Document understanding of significant vendors & select on test basis
Significant Checks	Extract checks > a certain dollar value or approval limit
Unusual Vendors	Last names of employees; vendors with 1 check or minimal checks, round even numbers (shell company schemes, pass-through entity issues)
Related Party Considerations	Obtain listing of board members; obtain listing of board member affiliations if applicable (company they work for, ownership interests, may be needed for 990 disclosure)
Completeness	Compare CD journal to disbursements indicated in general ledger – Are you missing a portion of the population (wire transfers?)
Compare	Obtain a check register over a multiple-year period and join that data together. Once joined, you can compare vendors year over year to identify any significant or unusual trends. Consider filtering the data to identify instances whereby vendors started, vendors dropped off, or vendors have significant fluctuations in activity.

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Revenue Considerations

Area	Considerations
Internal Controls	What are the organization's internal procedures surrounding revenue? Do they use separate software? Do the sales staff talk to the accounting staff? The controls will significantly impact the data available and the testing that can be performed.
Completeness	If the systems permit, match the revenue from the billing system to the general ledger revenue (reconcile differences such as basis of accounting, cash vs. non-cash, items not recorded, certain bequests with no valuation). Do the accounting staff corroborate the data/contracts provided by the sales staff?
Stratification	Stratify the population in a variety of ways: • Extract all amounts over a threshold (individually significant). • Segregate by a number (for example, average dollar value of transactions) or by a character (for example, sales by state). • Segregate outliers such as related-party customer transactions from the population using key word extractions.
Summarization	Summarize the transaction register in a variety of ways: • Sales by month • Sales by product line • Sales by customer
Join	• Join the sales journal and the purchases journal to do comparisons of margin by product line within a period of time. • Join the AR journal and the sales journal and identify instances whereby current sales are a significant portion of AR (indicative of slow collection)

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Question for Discussion

Are there any analytics the firm may incorporate into the next audit or review engagement?

Open Discussion



SAS No.145 *Understanding the Entity and its Environment and Assessing the Risks of Material Misstatement*

- It is a rewrite of AU-C 315 *Understanding the Entity and its Environment and Assessing the Risks of Material Misstatement* and amends other sections; it does not amend AU-C 520 *Analytical Procedures*.
- It includes extensive guidance regarding the use of information technology and the consideration of general IT controls in planning an audit and performing a risk assessment that includes analytical procedures. It does not fundamentally change the key audit risk concepts.
- It clarifies and enhances certain aspects of the identification and assessment of the risks of material misstatement to drive better risk assessment and, therefore, enhance audit quality.
- The auditor performs analytical procedures as risk assessment procedures to help identify inconsistencies, unusual transactions or events, and amounts, ratios, and trends that indicate matters that may have audit implications.



Reminders

☐ **Post event evaluation:** Please complete the course evaluation that will be pushed out to you as a pop up link on your screen. We welcome your feedback!

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