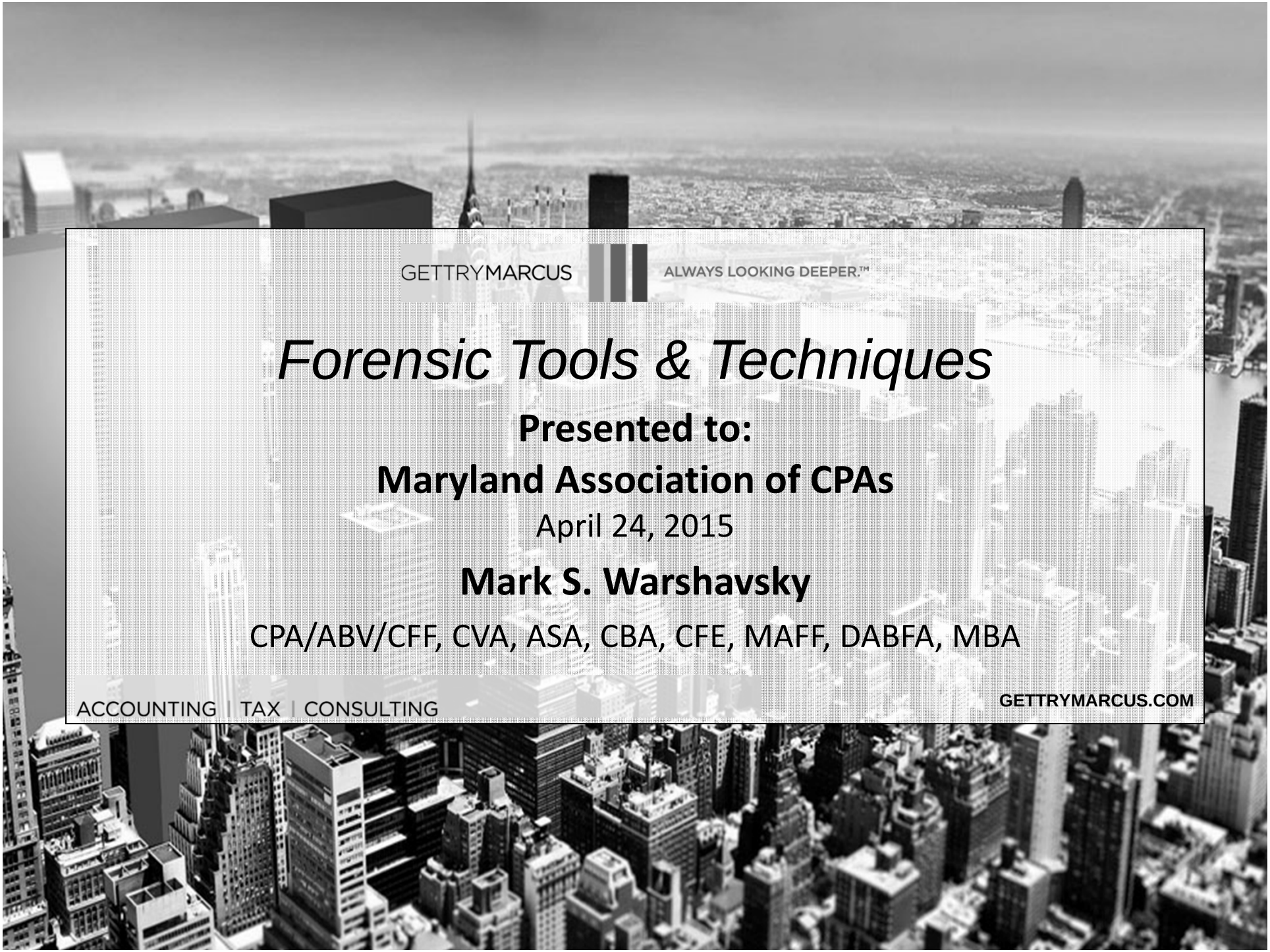

GETTRYMARCUS
ALWAYS LOOKING DEEPER.™
Forensic Tools & Techniques
Presented to:
Maryland Association of CPAs
April 24, 2015
Mark S. Warshavsky
CPA/ABV/CFF, CVA, ASA, CBA, CFE, MAFF, DABFA, MBA
ACCOUNTING | TAX | CONSULTING
GETTRYMARCUS.COM

Everything That You See/Hear Today is:

- Public record

  and/or

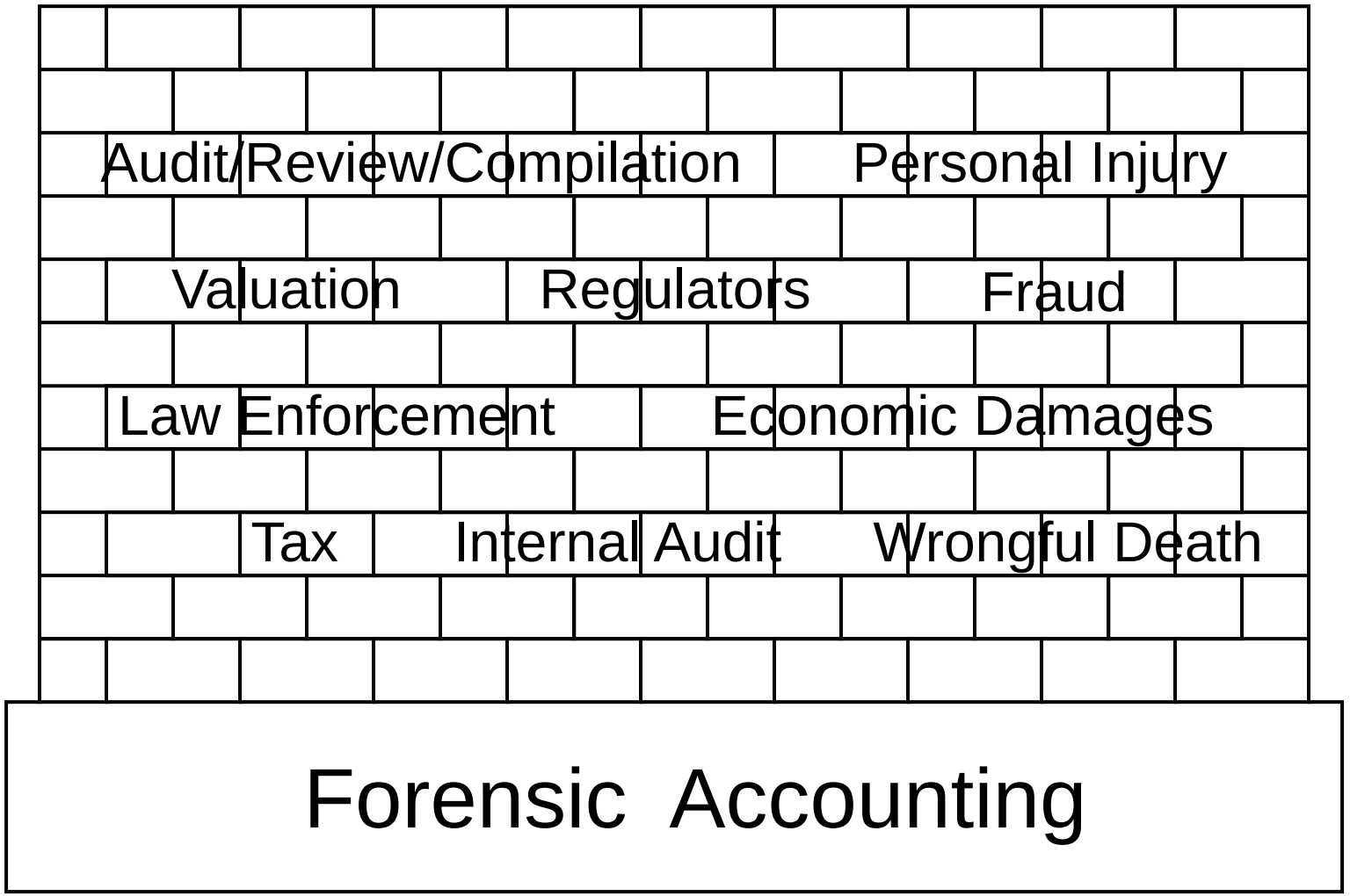
- Disguised

Seemingly Insignificant Details…

Forensic Accounting Defined…

The Art & Science of Investigating People & Money. ©

Foundational Discipline



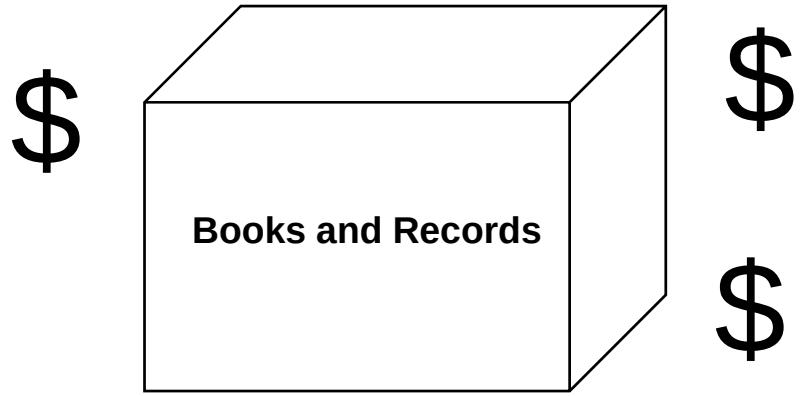
Why Is Forensic Accounting So Important?

- Your services are ***improved***
- It distinguishes you from your ***competition***
- It's more ***efficient***
- It ***broadens*** your practice base
- It ***defends*** against client claims
- It changes how you ***think***
- Your clients ***expect*** it!

Full-and-False-Inclusion

Foundational Yet Foreign:

- Routinely overlooked by traditional accountants
- Traditional accountants “do what they know” instead of what needs to be done, therefore,
- Traditional accountants focus on the “books and records”



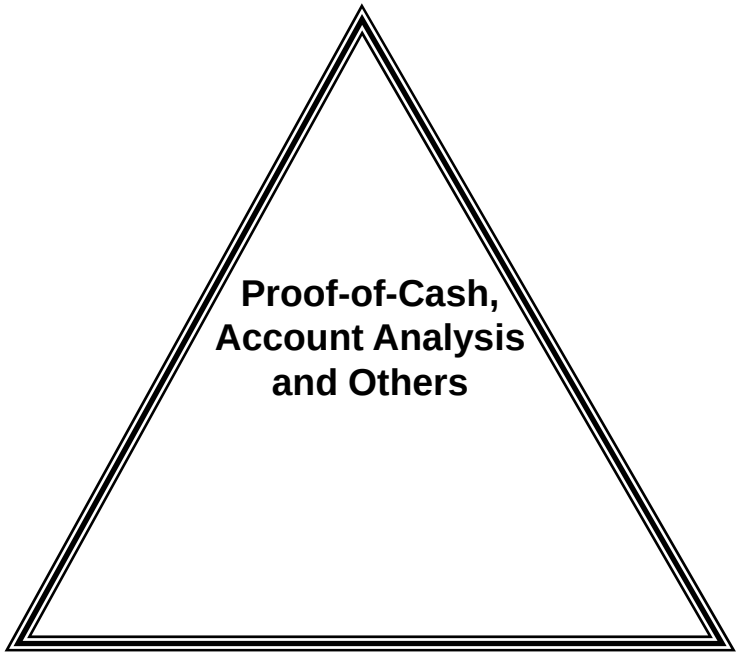
Full-and-False-Inclusion

…the *yellow* crime scene tape of forensic accounting…

Application of "ICE©"

C – Control

Bank Statements and Other Third Party Documents



I – Internal

Company Financial Information

E – External

Tax Returns Financial Reports

Why Isn't "ICE©" Sufficient?

- You must be:
  - *"Thinking Outside the… Triangle©"*
- That is where SCORE© comes in …

Use of "SCORE©"

	Flow of $ and/or Units	
Stakeholder	**In**	**Out**
S – Suppliers	**U**	**$**
C – Customers	**$**	**U**
O – "Owners" Investors/ Lenders	**$**	**$**
R – Regulators	n/a	**$**
E – Employees	**U**	**$**

"To a FORENSIC ACCOUNTANT with only a hammer in the toolkit, every problem looks like a nail."

How/Where Do You Start?

What Is a *Methodology*?

- A *way of doing things*…
- *Combines* criminal & civil investigation into one process

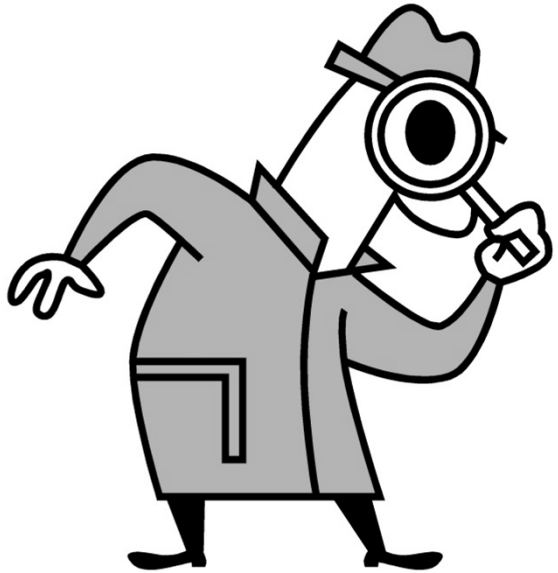
Financial Statement Analysis

- Indirect Methods
- Direct Methods

Financial Statement Analysis

Indirect Methods - Considerations

- Exploratory in nature
- Identify areas requiring further examination
- Lack specificity to support conclusions



Financial Statement Analysis
Indirect Methods

- Pattern Recognition
- “Eyeball”
- Expectations Based Analysis

Financial Statement Analysis

Indirect Methods

- Expectations Based Analysis
  - Financial records should be consistent with general understanding of the company and its operations
  - Example: Would expect to have audited financial statements for publicly traded companies

Expectations Based Analysis
Attributes

CASE	MANAGEMENT	PLANNING	FINANCIAL STATEMENTS	ACCOUNTING SYSTEM	INDEPENDENT ATTESTATION	OTHER
Best	Vision clearly defined Management structure and controls defined People linked to vision	Comprehensive business plan Comprehensive budgets	Monthly/Annual consolidated financials Compared to budget Accountability applied as appropriate	**Strong financial and accounting resources** **Single Comprehensive System**	Audit for pertinent years	Services/products well-defined Prototypes in place and working
Next Best	Management structure defined Controls in place Key people in place	Comprehensive budgets	Monthly financials Annual consolidated financials	**Strong financial and accounting resources**	Audits or Reviews for key years	Services/products well-defined
Most Likely	Key Controls in place	Budgets for selected	Annual consolidated	**Single System**	Reviews for key years	Some services or products in place
Undesirable	No internal linkage	"Back of the envelope"	Inconsistent	**Multiple Systems**	Compilation	Ideas of concepts
Worst	Internal barriers	None	None	**Patchwork**	None	Pre-idea

Financial Statement Analysis

Direct Methods

- Horizontal Analysis
- Vertical Analysis
- Common-Sizing
- Ratio Analysis
- Earnings Manipulation Tests

Financial Statement Analysis

ABC PRINTING, INC.
HISTORICAL INCOME STATEMENTS
YEAR ENDED DECEMBER 31

					COMMON-SIZING		
	2013	2012	2011		2013	2012	2011
Revenues							
Sales, net	1,167,028	1,197,591	1,123,830		100.0%	100.0%	100.0%
Gross Profit	1,167,028	1,197,591	1,123,830		100.0%	100.0%	100.0%
				HORIZONTAL ANALYSIS			
Operating Expenses Excluding Owners' Compensation							
Salaries	149,832	148,032	158,644	VERTICAL ANALYSIS	12.8%	12.4%	14.1%
Cost of labor	88,288	113,328	83,798		7.6%	9.5%	7.5%
Office stationery and expenses	21,946	18,076	21,981		1.9%	1.5%	2.0%
Electric	5,946	6,141	6,328		0.5%	0.5%	0.6%
Telephone	15,624	15,241	16,078		1.3%	1.3%	1.4%
Insurance	13,846	6,391	18,328		1.2%	0.5%	1.6%
Operating Exp Excl Off Comp, Dep'n	295,482	307,209	305,157		25.3%	25.7%	27.2%
Owners' Compensation							
Salaries	271,000	257,000	212,000		23.2%	21.5%	18.9%
Operating expenses, excl Dep'n/Amort'n	566,482	564,209	517,157		48.5%	47.1%	46.0%
Operating EBITDA	600,546	633,382	606,673		51.5%	52.9%	54.0%
Depreciation and Amortization							
Depreciation - Other	7,563	5,671	5,671		0.6%	0.5%	0.5%
Total Depreciation and Amortization	7,563	5,671	5,671		0.6%	0.5%	0.5%
Operating Income/(Loss) - EBIT	592,983	627,711	601,002		50.8%	52.4%	53.5%
Misc Income/(Expense)							
Interest/investment income	2,444	1,040	5,286		0.2%	0.1%	0.5%
Total Misc (Income)/Expenses	2,444	1,040	5,286		0.2%	0.1%	0.5%
Income/(Loss) before interest, taxes	595,427	628,751	606,288		51.0%	52.5%	53.9%
Interest Expense	(1,750)	(1,000)	(1,500)		-0.1%	-0.1%	-0.1%
Pre-Tax Income	593,677	627,751	604,788		50.9%	52.4%	53.8%
Less: Income Taxes	(1,000)	(1,000)	(1,000)		-0.1%	-0.1%	-0.1%
Net Income/(Loss)	592,677	626,751	603,788		50.8%	52.3%	53.7%

Ratio Analysis

Identifies the company's ability to:

- Meet its current obligations (Liquidity)
- "Cover" its leverage requirements (Coverage)
- Measure capital structure financed with debt (Leverage)
- Measure the efficiency in utilizing its assets (Operating)
- Measure efficiency to manage working capital (Working
- Capital)

Financial Ratios – Overall Assessment

	Median Qrtl RMA Curr Yr	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Pref. Direction Up	Pref. Direction Down	2004-2007 Better	2004-2007 Worse	2008-2012 Better	2008-2012 Worse
LIQUIDITY RATIOS:																	
Current Ratio	1.2	1.05	0.93	1.00	0.97	0.9	1.1	1.1	0.9	0.9	1.0	↑			✗		✗
Quick (Acid-Test) Ratio	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	↑			✗		✗
Revenue/Accounts Receivable	78.3	83.0	124.0	93.1	89.5	93.8	83.9	67.5	80.3	92.6	61.4	↑			✗	✓	
Average Collection Period	4.7	4.4	2.9	3.9	4.1	3.9	4.4	5.4	4.5	3.9	5.9		↓	✓	~		✗
Inventory Turnover	14.6	9.2	9.6	9.7	10.5	10.0	10.0	9.6	9.0	9.3	9.3	↑					✗
Days' Inventory	25.0	39.7	38.0	37.6	34.8	36.5	36.5	38.0	40.6	39.2	39.2		↓	✓	~		✗
COGS/Payables	19.1	18.2	18.2	16.9	21.6	18.7	17.8	20.8	16.9	16.2	15.1		~	✓	~		✗
Days' Payables	19.1	20.1	20.1	21.6	16.9	19.5	20.5	17.5	21.6	22.5	24.2		~	✓	~		✗
Revenue/Working Capital	81.0	161.5	-103.5	9046.8	-311.9	-124.0	65.8	160.2	-64.8	-59.3	309.3	↑			✗		✗
COVERAGE RATIOS:																	
Times Interest Earned	3.9	1.2	1.4	1.2	1.4	2.5	2.6	1.9	2.1	1.3	1.1	↑		✓			✗
NI+Non-Cash Expenditures / Current L.T. Debt	4.8	0.6	0.6	1.0	0.8	1.0	1.6	1.8	1.5	1.3	1.5	↑			✗		✗
LEVERAGE RATIOS:																	
Fixed Assets/Tangible Worth	1.7	4.0	4.2	5.5	5.1	3.6	4.4	5.1	6.2	N/A	N/A	↑		✓		✓	
Debt-to-Tangible Net Worth	2.1	5.2	5.6	7.4	6.9	4.7	7.2	8.8	10.4	N/A	N/A		↓		✗		✗
Debt-to-Equity	2.1	4.1	4.2	4.6	4.5	3.4	3.9	3.7	3.6	N/A	N/A		↓		✗		✗
OPERATING RATIOS:																	
Gross Profit Margin	26.00%	28.9%	28.8%	29.2%	29.6%	31.0%	30.6%	31.7%	32.8%	32.5%	31.5%	↑		✓		✓	
EBT/Tangible Worth	22.60%	9.2%	15.2%	12.6%	16.7%	42.3%	53.5%	55.3%	80.6%	N/A	N/A	↑		✓		✓	
EBT/Total Assets	6.30%	1.4%	2.2%	1.4%	2.0%	7.0%	5.9%	4.9%	N/A	2.1%	0.6%	↑			~		✗
Fixed Asset Turnover	9.1	3.5	3.7	3.6	3.8	4.1	4.9	5.1	4.7	5.1	5.7	↑		✓		✓	
Total Asset Turnover	4.5	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.2	2.3	2.5	↑			~		~
EXPENSE TO REVENUE RATIOS:																	
% Deprtn., Depltn., Amort./Revenue	1.50%	1.9%	1.9%	1.8%	1.9%	1.7%	1.7%	1.5%	1.6%	1.7%	1.5%		↓		✗		✗
% Officer's &/or Owner's Compensation/Revenue	0.00%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.1%	0.0%	↑			~		✗
Cash Flow Ratios:																	
Operating Cash Flows (OCF)		N/A	0.4	0.2	0.3	0.3	(0.1)	0.3	0.3	0.2	0.3	↑		✓	~		✗
Cash Interest Coverage		N/A	3.2	1.8	2.4	3.6	1.3	2.6	3.3	2.1	2.2	↑				✓	
Cash Flow to Total Debt		N/A	0.2	0.1	0.1	0.2	(0.0)	0.1	0.2	0.1	0.1	↑			✗		✗

	2004-2007		2008-2012	
Better	8	33.3%	6	25.0%
Worse	9	37.5%	17	70.8%
Same	7	29.2%	1	4.2%
	24	100.0%	24	100.0%

Risk Management Association, Philadelphia, PA

RMA SIC Code is 4451, Supermarkets and Other Grocery (except Convenience) Stores

Legend

↑ Should increase

↓ Should decrease

~ Should remain same

Earnings Manipulation Tests

Beneish “M” Score

- Professor Messod D. Beneish
- Measures probability of financial statement manipulation
- Comprised of 8 indices to derive “M” score
- Quantifies the change in key financial measures
- Score higher than -2.22 has higher probability of financial statement manipulation
- Can be modified for subject company

Earnings Manipulation Tests

Beneish "M" Score

- Days' Sales in Receivables Index (DSRI)

  Formula: $(\text{Receivables}_{t} / \text{Sales}_{t}) / (\text{Receivables}_{t-1} / \text{Sales}_{t-1})$

- Gross Margin Index (GMI)

  Formula: $\text{Gross Profit Percentage}_{t-1} / \text{Gross Profit Percentage}_{t}$

- Asset Quality Index (AQI)

  Formula: $$\frac{1-(\text{Current Assets}_{t} + \text{PPE}_{t}) / \text{Total Assets}_{t}}{1-(\text{Current Assets}_{t-1} + \text{PPE}_{t-1}) / \text{Total Assets}_{t-1}}$$

- Sales Growth Index (SGI)

  Formula: $\text{Sales}_{t} / \text{Sales}_{t-1}$

Earnings Manipulation Tests

Beneish "M" Score

- **Depreciation Index (DEPI)**

  Formula: $\frac{\text{Depreciation}_{t-1} / (\text{Depreciation}_{t-1} + \text{Net PPE}_{t-1})}{\text{Depreciation}_{t} / (\text{Depreciation}_{t} + \text{Net PPE}_{t})}$

- **SGA Expenses Index (SGAI)**

  Formula: $\frac{\text{SGAE}_{t} / \text{Sales}_{t}}{\text{SGAE}_{t-1} / \text{Sales}_{t-1}}$

- **Total Accruals to Total Assets Index (TATA)**

  Formula: $\frac{\text{WC}_{t-(t-1)} - \text{Cash}_{t-(t-1)} + \text{IT Payable}_{t-(t-1)} + \text{LTD}_{t-(t-1)} - \text{Depreciation Expense}}{\text{Total Assets}_{t}}$

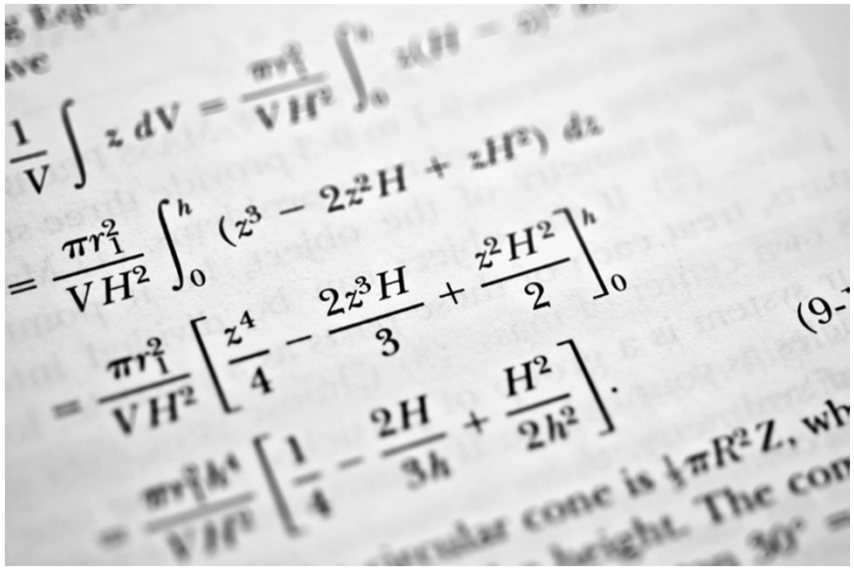
- **Leverage Index (LVGI)**

  Formula: $\frac{\text{LTD}_{t} + \text{Current Liabilities}_{t} / \text{Total Assets}_{t}}{\text{LTD}_{t-1} + \text{Current Liabilities}_{t-1} / \text{Total Assets}_{t-1}}$

Beneish “M” Score

The 8 Variable Formula

M = - 4.84 + 0.92*DSRI + 0.528*GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI – 0.172*SGAI + 4.679*TATA – 0.327*LVGI



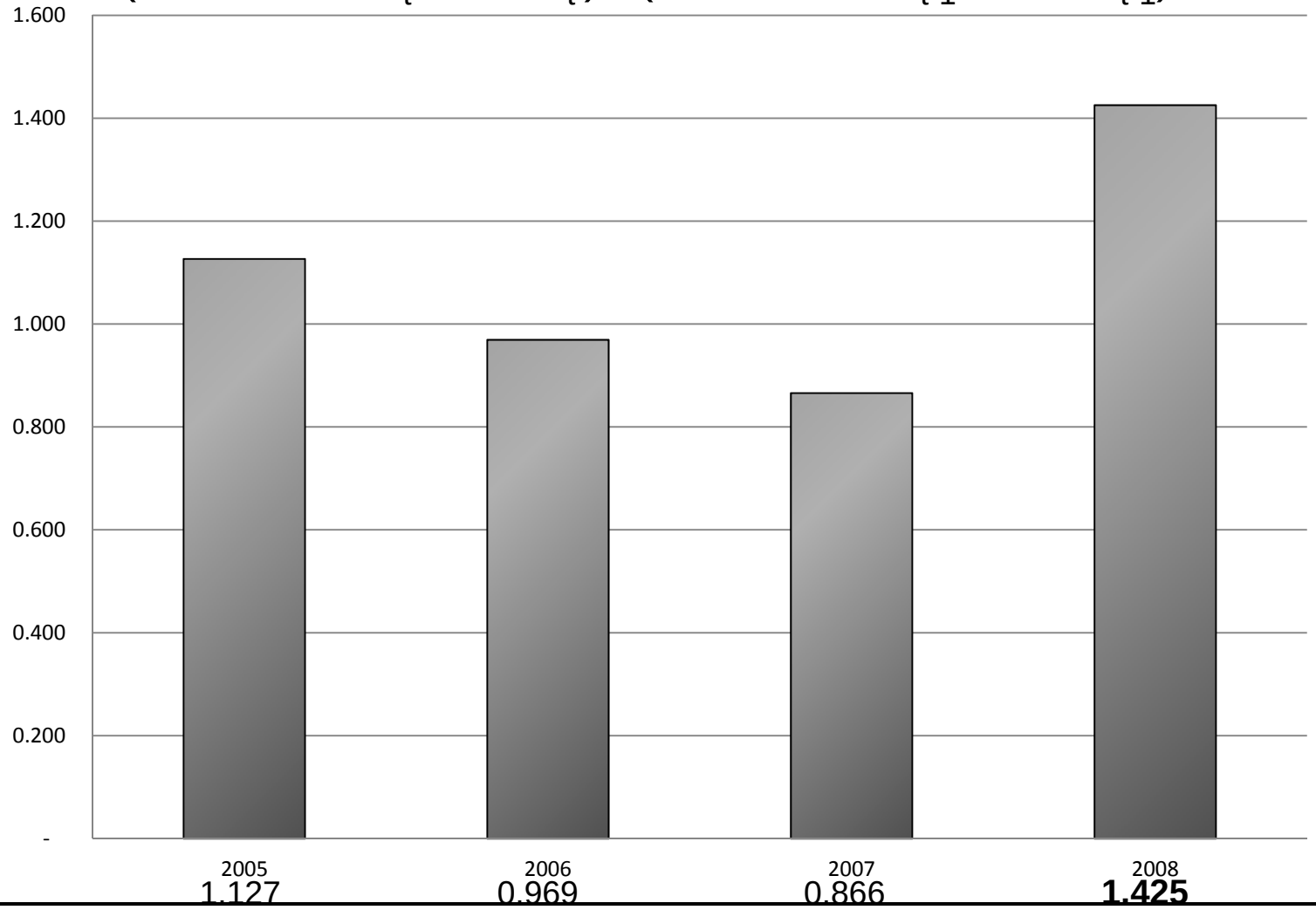
Days' Sales in Receivables Index (DSRI)

Formula: $(\text{Receivables}_{t} / \text{Sales}_{t}) / (\text{Receivables}_{t-1} / \text{Sales}_{t-1})$

- Measures days sales in receivables for current year v. prior year
- Should remain relatively stable, hence approximately 1.0
- Large increase in receivables relative to sales may suggest revenue inflation

Days' Sales in Receivables Index (DSRI)

(Receivables $_t$ /Sales $_t$) / (Receivables $_{t-1}$ / Sales $_{t-1}$)



Gross Margin Index (GMI)

Formula: Gross Profit Percentage $_{t-1}$/Gross Profit Percentage $_{t}$

- Compares prior year gross profit to current year gross profit
- Gross margin deterioration is when this ratio is greater than 1.0
- A disproportionate increase in this ratio could be indicative of earnings manipulation

Asset Quality Index (AQI)

Formula: $\frac{1-(\text{Current Assets}_{t} + \text{PPE}_{t}) / \text{Total Assets}_{t}}{1-(\text{Current Assets}_{t-1} + \text{PPE}_{t-1}) / \text{Total Assets}_{t-1}}$

- Measures non-current assets, other than PPE, to total assets
- Greater than 1.0
  - Increase in cost deferral?
  - Increase in intangible assets from acquisitions?

Sales Growth Index (SGI)

Formula: $\text{Sales}_{t} / \text{Sales}_{t-1}$

- Compares current year sales to prior year sales
- Significant variations could indicate manipulation
- Large increases from year-to-year is indicative of "growth companies"
- More susceptible to manipulation

Depreciation Index (DEPI)

Formula: $\frac{\text{Depreciation}_{t-1} / (\text{Depreciation}_{t-1} + \text{Net PPE}_{t-1})}{\text{Depreciation}_{t} / (\text{Depreciation}_{t} + \text{Net PPE}_{t})}$

- Measures rate of depreciation in prior year to rate of depreciation in current year
- Greater than 1.0
  - Depreciation rate slowed
  - Change in estimated useful lives or methods

SGA Expenses Index (SGAI)

Formula: $\frac{SGAE_t / Sales_t}{SGAE_{t-1} / Sales_{t-1}}$

- Compares ratio of selling, general and administrative (SGA) expenses to sales for current year v. prior year
- Should remain relatively stable around 1.0
- A disproportionate increase in this fraction is problematic

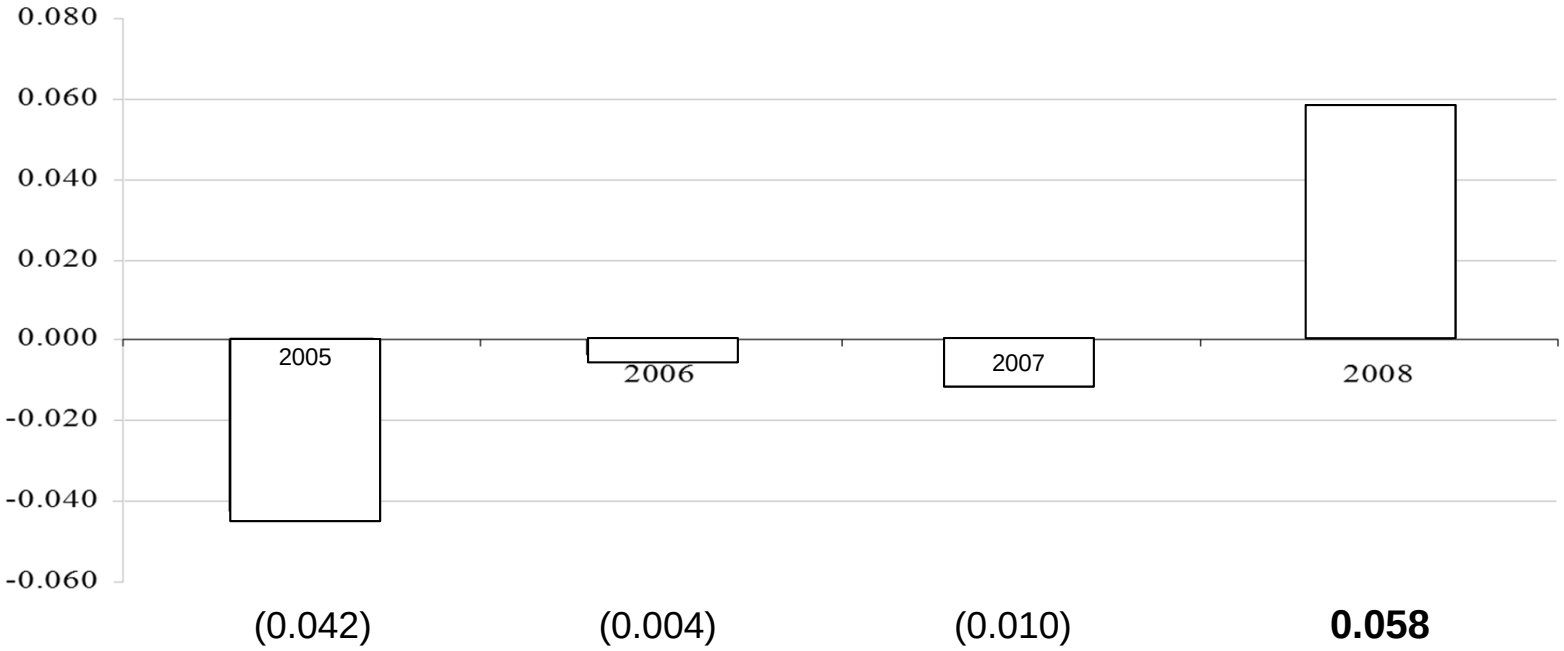
Total Accruals to Total Assets Index (TATA)

Formula: $\frac{WC_{t-(t-1)} - Cash_{t-(t-1)} + IT\ Payable_{t-(t-1)} + LTD_{t-(t-1)} - Depreciation\ Expense}{Total\ Assets_{t}}$

- "Accruals" can be liabilities or assets
- Accounts receivable is also an "accrual"
- Large increases/decreases could be a strong indicator of financial statements manipulation
- Accruals provide a common opportunity to commit and conceal a fraud

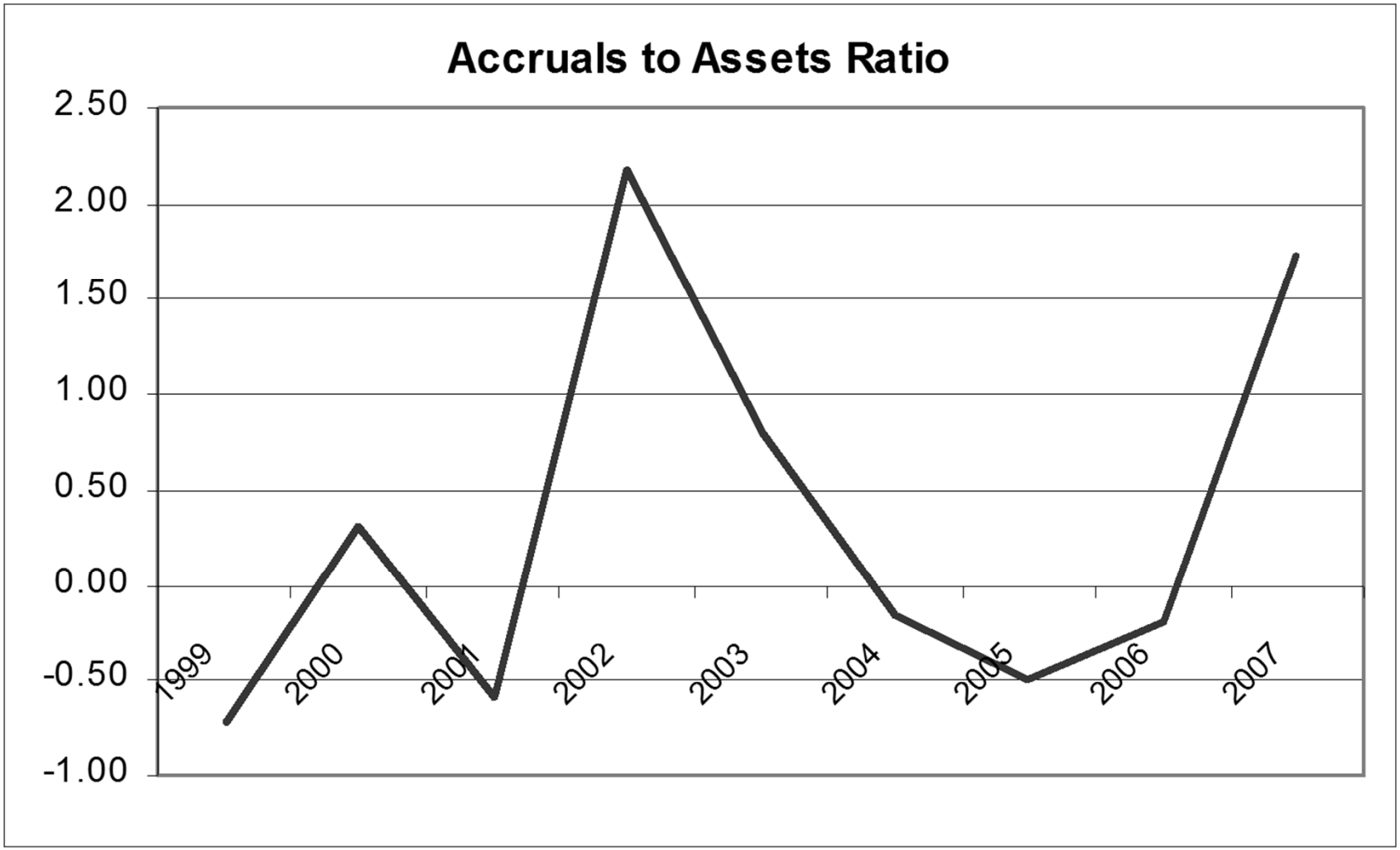
Total Accruals to Total Assets Index (TATA)

Formula: $\frac{WC_{t-(t-1)} - Cash_{t-(t-1)} + IT\ Payable_{t-(t-1)} + LTD_{t-(t-1)} - Depreciation\ Expense}{Total\ Assets_{t}}$

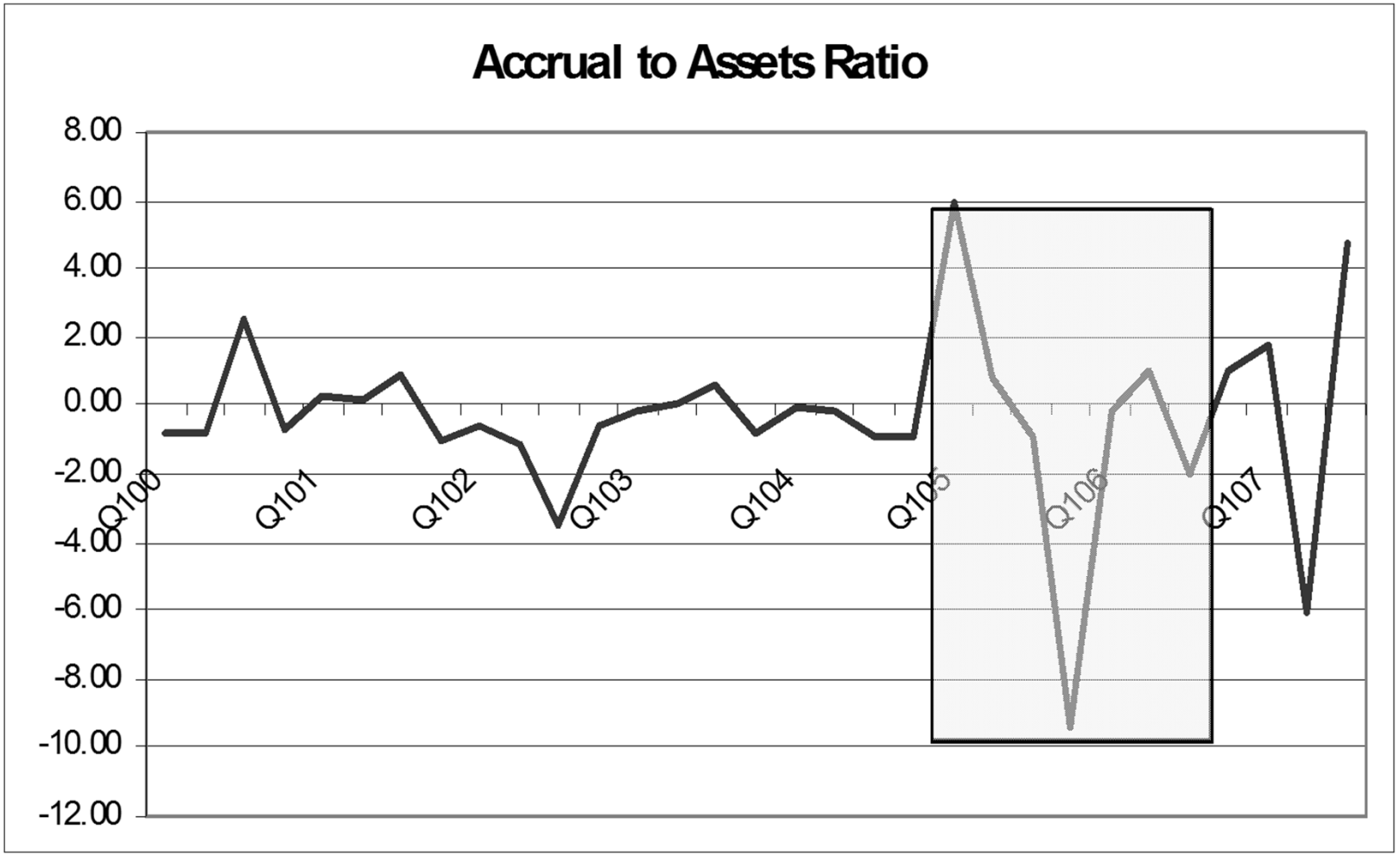


(0.042) (0.004) (0.010) **0.058**

Significant Increase in 2002 (TATA)



Dramatic Variations in 2005 (TATA)



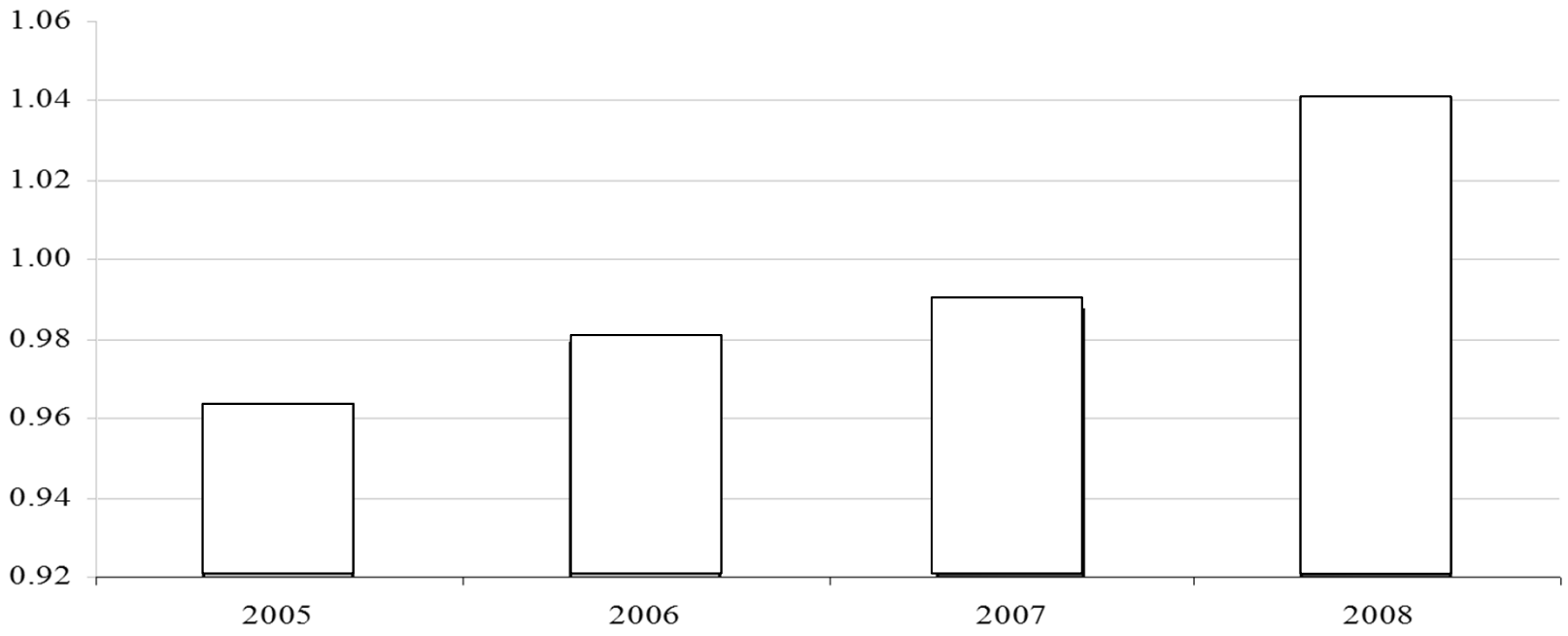
Leverage Index (LVGI)

Formula: $\frac{\text{LTD}_{t} + \text{Current Liabilities}_{t} \;/\; \text{Total Assets}_{t}}{\text{LTD}_{t-1} + \text{Current Liabilities}_{t-1} \;/\; \text{Total Assets}_{t-1}}$

- Greater than 1.0 indicates increased leverage
- Higher leveraged companies are more prone to financial statement manipulation

Leverage Index (LVGI)

$$\frac{\text{LTD}_t + \text{Current Liabilities}_t \ / \ \text{Total Assets}_t}{\text{LTD}_{t-1} + \text{Current Liabilities}_{t-1} \ / \ \text{Total Assets}_{t-1}}$$



0.964 0.979 0.988 **1.041**

Beneish "M-Score"

A Real Life Example - Enron Corporation

Ratios	Per Beneish-Mean		Enron
	Non-Fraudsters	Fraudsters	
1) Days in Sales in Receivables (DSRI)	1.031	1.465	0.625
2) Gross Margin (GMI)	1.014	1.193	1.448
3) Asset Quality (AQI)	1.039	1.254	1.308
4) Sales Growth (SGI)	1.134	1.607	1.526
5) Depreciation (DEPI)	1.001	1.077	1.017
6) Sales, General and Administrative (SGAI)	1.054	1.041	0.649
7) Total Accruals to Total Assets (TATA)	0.018	0.031	0.012
8) Leverage (LVGI)	1.037	1.111	1.041

Beneish "M-Score"

A Real Life Example – Enron Corporation

M= –4.84 + 0.92*DSRI + 0.528*GMI + 0.404*AQI + 0.892*SGI
+ 0.115*DEPI – 0.172*SGAI + 4.679*TATA – 0.327*LVGI

M= –4.84 + (0.92*0.625) + (0.528*1.448) + (0.404*1.308) + (0.892*1.526)
+ (0.115*1.017) – (0.172*0.649) + (4.679*0.012) – (0.327*1.041)

M= –4.84 + .5750 + .7645 + .5284 + 1.3612 + .1170 – .1116 + .0561 – .3404

M= (1.8898) = greater than (2.22)

Beneish “M-Score”

Another Real Life Example

ZZZZ Best Carpet Cleaning Service (Z Best)
Founded by Barry Minkow

- NASDAQ traded company
- $18 per share, or $180 million value
- Over 1,000 employees
- Four very troubling “Beneish Ratios”

Beneish "M-Score"

Another Real Life Example – Z Best

	Per Beneish-Mean		
Ratios	Non-Fraudsters	Fraudsters	Z Best
1) Days in Sales in Receivables (DSRI)	1.031	1.465	177,622.00
2) Asset Quality (AQI)	1.039	1.254	2.043
3) Sales Growth (SGI)	1.134	1.607	3.905
4) Total Accruals to Total Assets (TATA)	0.018	0.031	0.064

- Z Best had no A/R in Year 1,
- However in Year 2 it had reported A/R of almost $700,000
  - Year 2 A/R later determined to be fictitious
- Z Best's Collapse
  - Minkow sentenced to 25 years in prison for security fraud, racketeering, money laundering, tax evasion and bank fraud

Use of Technology

Computer Assisted Forensic Tools & Techniques (CAFTTs)

Use of Technology

Computer Assisted Forensic Tools & Techniques (CAFTTs)

- Create databases of hard copy data
- Import unlimited data into working files
- Profile certain characteristics
- Perform testing on 100% of database
- Greater analytical capabilities
- Does not replace judgment

Examples of Fraud Uncovered by CAFTTs

- Fictitious vendors
- Altered invoices
- Checks under approval limits
- Duplicated payments
- Payroll schemes

Digital Analysis
Procedures Employed

- Analyze data
- Identify *digit* and *number patterns*
- Locate anomalies

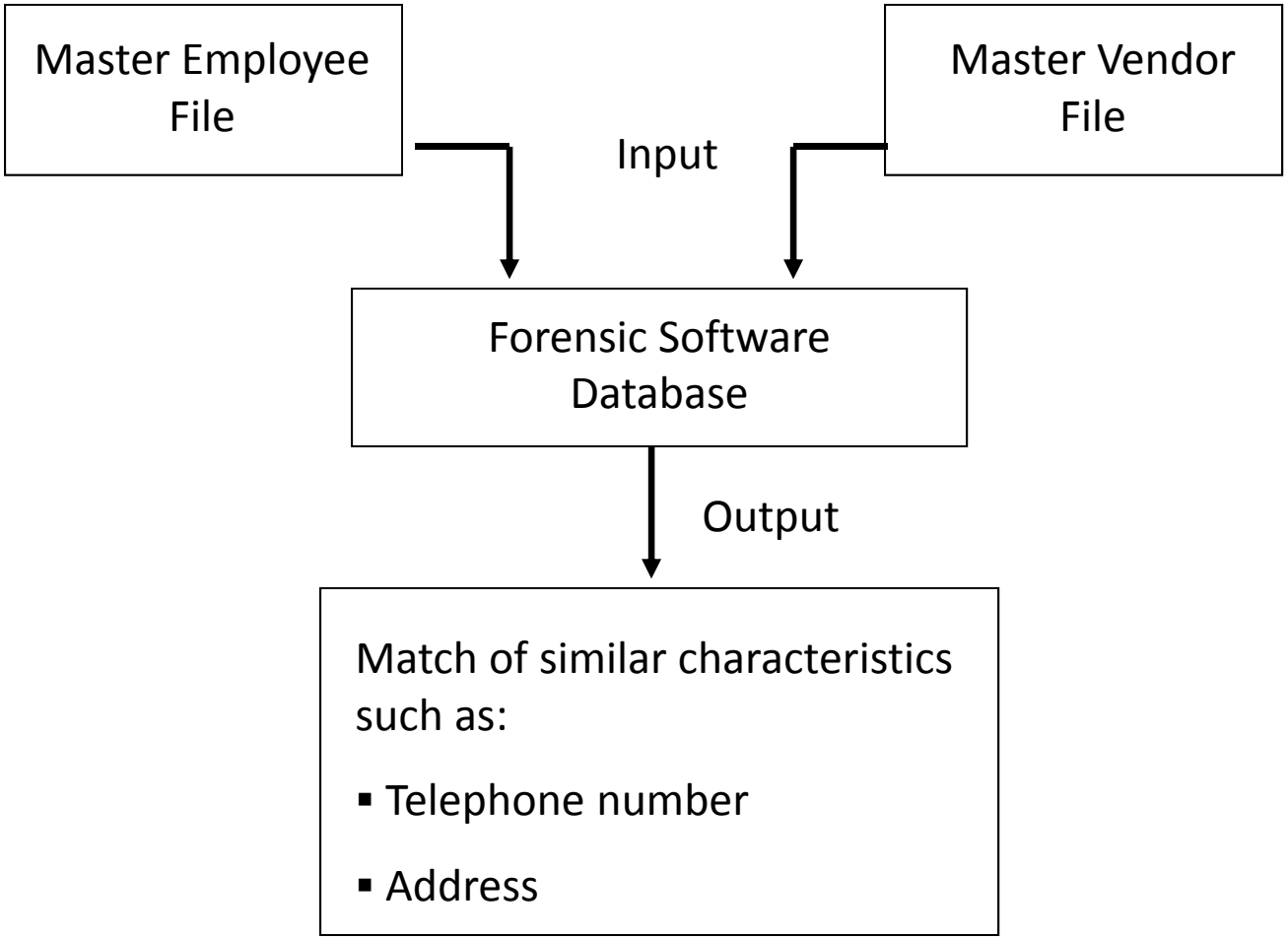
Digital Analysis - Techniques

- Link Analysis
- Gap Detection
- Duplicate Numbers
- Rounded Numbers
- Benford’s Law
- Others

Link Analysis

- Review relationships between two databases
- Examples of when to utilize link analysis:
  - Ghost employees
  - Fictitious vendors
- How to perform link analysis:
  - Determine the link between two databases
  - Join databases

Use of Technology to Uncover Fraud



Link Analysis

ABC Company, Inc.

List of Employees and List of Vendors

MASTER EMPLOYEE FILE						MASTER VENDOR FILE				
EMPL_ID	FIRST_NAME	LAST_NAME	ADDRESS	CITY_STATE_ZIP	JUST_NUM EMP	VEND ID	NAME	ADDRESS1	CITY_STATE_ZIP1	JUST_NUM_VEN
180	ROBERT	CLARK	P.O. BOX CLAPHILL RD	LA GRANGEVILLE, NY 12540	12540	V00768	AVIATION SAFEGUARDS	DIV OF COMMAND SECURITY CORP	LAGRANGEVILLE, NY 12540	12540
531	WILLIAM	GREEN	100 WILHERM LN	WEST ISLIP, NY 11795	10011795	V00405	BILL GREEN	100 WILHERM LN	WEST ISLIP, NY 11795	10011795
7	WILLIAM	COVER	104 CANTERBURY CIRC	EAST STROUDSBURG, PA 18301	10418301	V00781	DO NOT USE (BILLY COVER)	104 CONTERBURY CIRLCE	E STRAUDSBURG, PA 18301	10418301
714	MARK E.	WIND	12 FIRWOOD RD	PT. WASHINGTON, NY 11050	1211050	V00826	MARK OF EXCELLENCE	12 WILLOWDALE AVE	PORT WASHINGTON, NY 11050	1211050
549	DAVID	MALAVE	1425 MAIN ST.	JERSEY CITY, NJ 07303	142507303	V00163	DALTILE CORP.	1425 MAIN ST.	JERSEY CITY, NJ 07303	142507303
565	ROBERT S.	CASA	17 ADELPHI RD	HICKSVILLE, NY 11801	1711801	V00046	RON'S RAPID DELIVERY	17 WEST NICHOLAI ST.	HICKSVILLE, NY 11801	1711801
502	ANDREW	KRUG	294 TREE RD	CENTEREACH, NY 11720	29411720	V00880	ANDREW KRUG	294 TREE RD	CENTERREACH, NY 11720	29411720
884	JOSO	MARIN	30-25 47TH ST	ASTORIA, NY 11103	30254711103	V00877	MARIN, JOSO	30-25 47TH ST.	ASTORIA, NY 11103	30254711103
166	THOMAS	BEHNKEN	58 COTTAGE RD	CARMEL, NY 10512	5810512	V00668	DO NOT USE (TOM BEHNKEN)	58 COTTAGE RD	CARMEL, NY 10512	5810512

Gap Detection

- Identify missing items in a numerical sequence or a range of dates
- A gap indicates missing items and could include one or more missing items
- Use gap detection to uncover missing:
  - Invoice numbers
  - Credit memos
  - Check numbers

Gap Detection
Missing Check Numbers

Check Number Gaps					Analysis of Located Checks		
Beginning	End	Number Missing	Missing Check	Have Void Copy	Payee	Amount	Date Cleared
7233	7233	1					
			7233	y			
7314	7315	2					
			7314		Ficticious Consulting Co.	$4,250.00	10/19/2004
			7315	y			
7407	7408	2					
			7407	y			
			7408	y			
7543	7544	2					
			7543	y			
			7544	y			
7653	7654	2					
			7653		Ficticious Consulting Co.	$4,970.00	11/7/2004
			7654	y			
7777	7778	2					
			7777		Ficticious Consulting Co.	$8,760.00	11/20/2004
			7778	y			
7867	7868	2					
			7867		Ficticious Consulting Co.	$8,970.00	11/27/2004
			7868	y			
11321	11331	11	11321				
			11321		Ficticious Consulting Co.	$37,892.00	2/8/2009
			11322		Ficticious Consulting Co.	$36,756.20	3/24/2009
			11323	n			
			11324	n			
			11325	n			
			11326	n			
			11327	n			
			11328		Ficticious Consulting Co.	$34,694.00	3/24/2009
			11329	n			
			11330	n			
			11331	n			
11341	11342		11341		Ficticious Consulting Co.	$28,992.00	4/26/2009
			11342	n			

Duplicate Numbers Test

- Meaningful inferences can be drawn
- Road map for further investigation
- Identify abnormal recurrences of specific numbers
- Investigate small groups of numbers that appear to be unusual
- Example: invoices, check numbers, credit memos

Duplicate Numbers Test

Dollar Amount	# of Records	Total Dollar Amount	% of Records	% of Total Dollar Amount
10.00	469	4,690.00	2.21%	0.00%
15.00	144	2,160.00	0.68%	0.00%
18.00	41	738.00	0.19%	0.00%
18.50	129	2,386.50	0.61%	0.00%
20.00	201	4,020.00	0.95%	0.00%
22.00	37	814.00	0.17%	0.00%
25.00	651	16,275.00	3.07%	0.01%
30.00	45	1,350.00	0.21%	0.00%
40.00	114	4,560.00	0.54%	0.00%
50.00	42	2,100.00	0.20%	0.00%
100.00	204	20,400.00	0.96%	0.01%
150.00	41	6,150.00	0.19%	0.00%
200.00	91	18,200.00	0.43%	0.01%
250.00	38	9,500.00	0.18%	0.01%
300.00	208	62,400.00	0.98%	0.04%
301.50	111	33,466.50	0.52%	0.02%
400.00	34	13,600.00	0.16%	0.01%
450.00	22	9,900.00	0.10%	0.01%
500.00	91	45,500.00	0.43%	0.03%
550.00	16	8,800.00	0.08%	0.01%
600.00	34	20,400.00	0.16%	0.01%
650.00	10	6,500.00	0.05%	0.00%
700.00	23	16,100.00	0.11%	0.01%

Rounded Numbers Test

- Same idea as the Duplicate Numbers Test
- Identify abnormal recurrence of rounded numbers
- Abnormal recurrences are good indicia of estimation
- People tend to estimate when they create contrived numbers

Rounded Numbers

Dollar Amount	Number of Records	Aggregate Withdrawals	Percentage of Aggregate Withdrawals
10s	6,287	$108,667,550	0.25971
25s	5,533	$106,764,875	0.22856
100s	4,054	$104,427,800	0.16747
1000s	2,369	$ 97,216,000	0.09786

Benford's Law

- First identified in the late 1800s
- Further developed by Frank Benford - 1920s
- Digit sequences follow a predictable pattern
- Identifies possible errors, potential fraud or other irregularities
- Proved by 20 lists containing 20,229 numbers
- Statistical method still applied today

Benford's Law

The specific probabilities of the digit placement being any number are listed below:

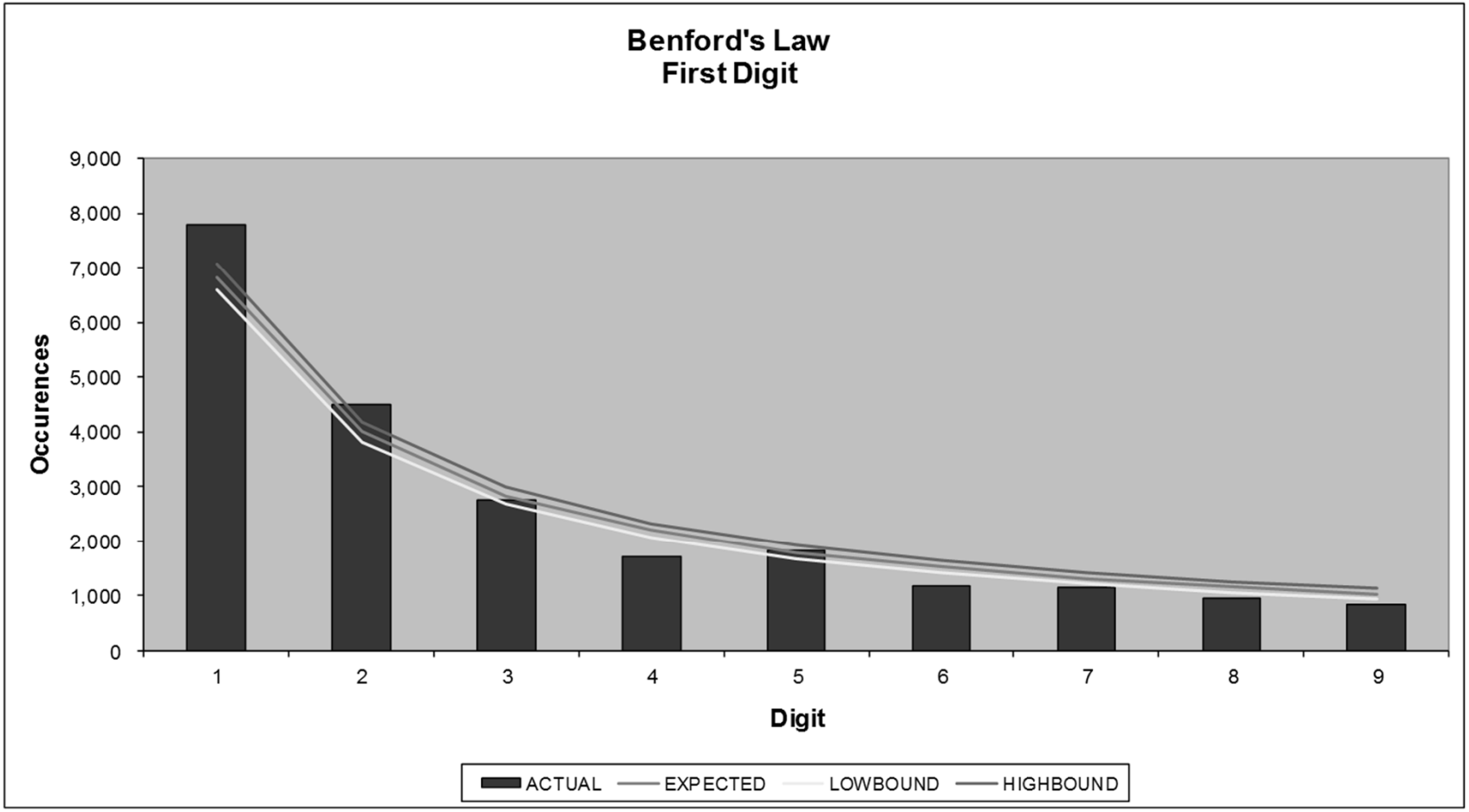
	Position in Number			
Digit	1st	2nd	3rd	4th
0		.11968	.10178	.10018
1	.30103	.11389	.10138	.10014
2	.17609	.10882	.10097	.10010
3	.12494	.10433	.10057	.10006
4	.09691	.10031	.10018	.10002
5	.07918	.09668	.09979	.09998
6	.06695	.09337	.09940	.09994
7	.05799	.09035	.09902	.09990
8	.05115	.08757	.09864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

Source: Nigrini, M.J. 1996. A Taxpayer Compliance Application of Benford's Law: *The Journal of the American Taxation Association* 18:72-91.

Benford's Law – Major Digit Tests

- Can provide a roadmap for the investigation
- Can provide indirect evidence
- Existence of a pattern or benchmark

Benford's Law
First Digit Test



Benford's Law – Major Digit Tests

First and Second Digits Tests

- Analysis starts with the leftmost digit
- Determined by its placement in the number
- The first digit of 7,380 is "7"
- The second digit of the number 7,380 is "3"

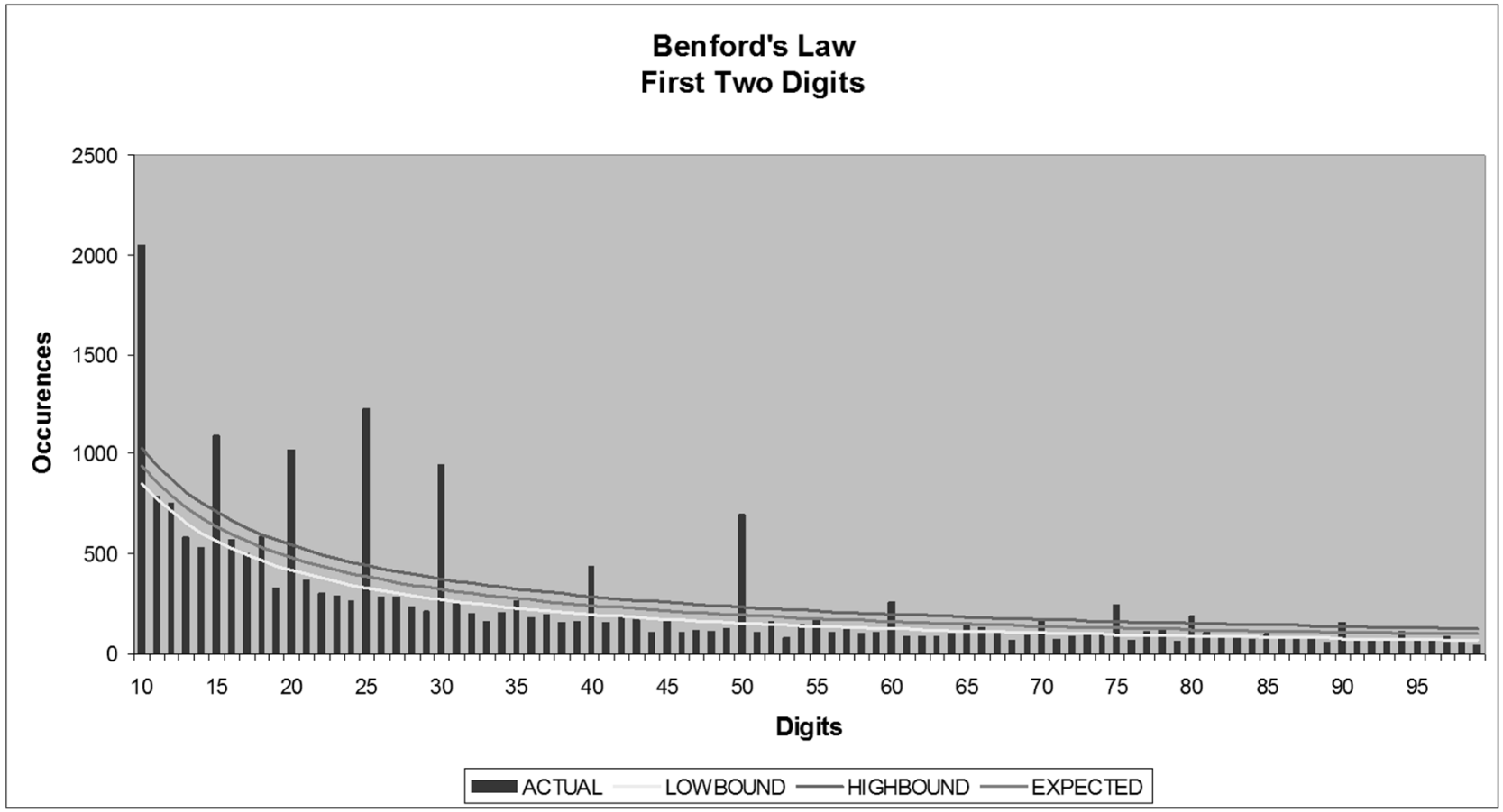
Benford's Law – Major Digit Tests

First-Two Digits Test

- More focused than single digit test
- Uses the first two leading digits
- The analysis starts with the leftmost digit
- The first-two digits of 7,380 are "73"
- 90 possible first-two digit combinations
- Identifies anomalies not readily apparent in single digit test

Benford's Law

First-Two Digits Test



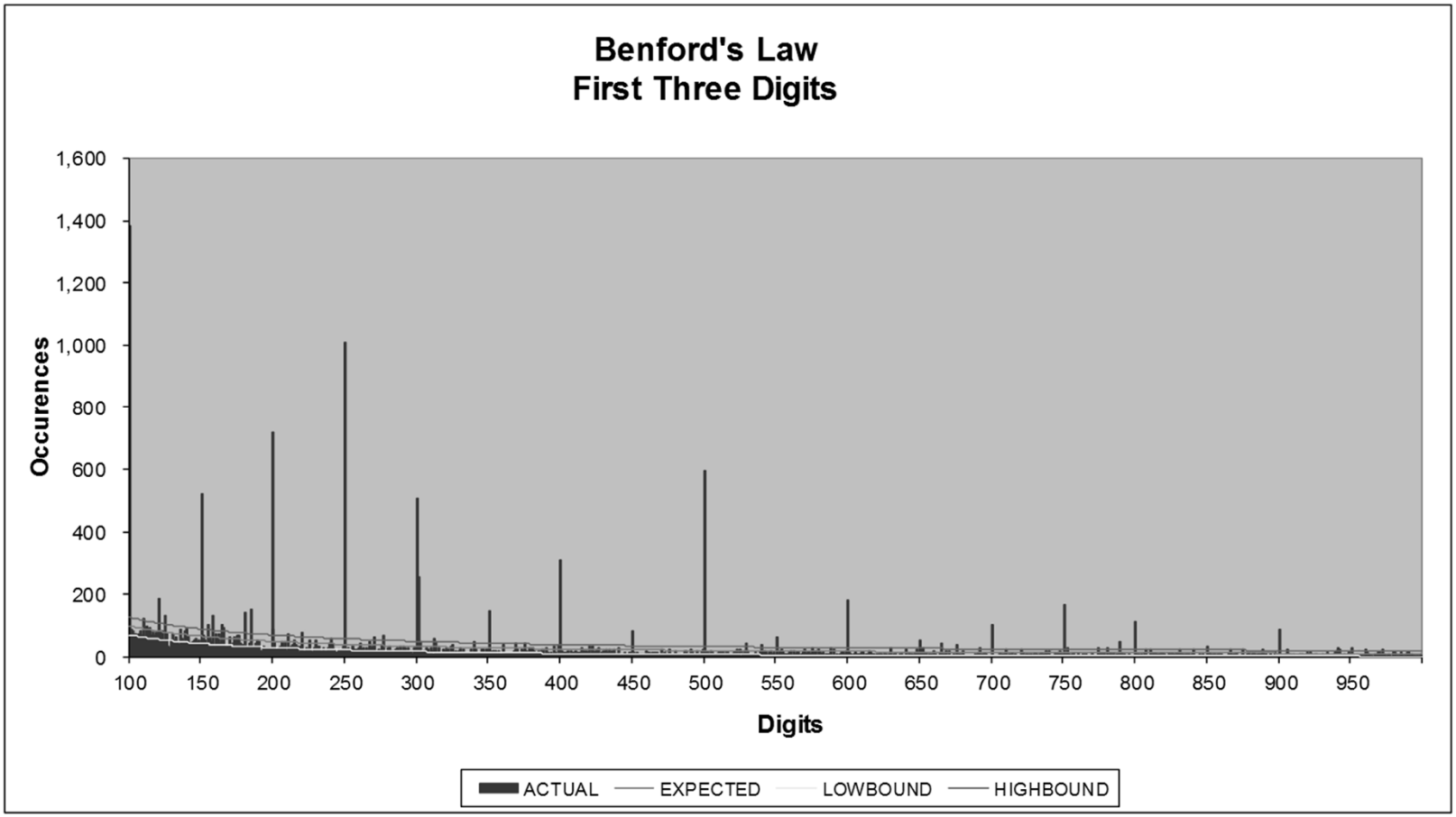
Benford's Law – Major Digit Tests

First-Three Digits Test

- More focused than single and first-two digit tests
- Uses the first three leading digits
- The analysis starts with the leftmost digit
- The first-three digits of 7,380 are "738"
- 900 possible first-three digit combinations
- Identifies anomalies not readily apparent in single digit test

Benford's Law

First-Three Digits Test



Benford's Law - Requirements

- Data sets should describe similar data (stock market quotes)
- No built-in minimum or maximum numbers
- Data should consist of more small items / less large items
- Data should not represent aggregated totals
- No assigned numbers (social security numbers)

WPN “CONCEPT”

- ***W***ords
- ***P***ictures
- ***N***umbers

WPN "CONCEPT"

Teaching Process to Explain Complex Issues

Words:

- Core of any expert report
- Lays the foundation to explain events

Pictures:

- Includes charts, graphs and diagrams
- Creates a visual tool for the reader

Numbers:

- Are an essential part of any report
- Should be kept to the point

Words - Key Indicators by the Numbers

For the Years 2011 through 2013

$67,573,234	Company & affiliates disbursements reviewed
$2,672,598	Affiliate loans due to the Company at January 5, 2013
$1,848,731	Funds deposited for which we do not know the origin
$930,225	Customer payments not deposited into bank account
$736,875	Total of remaining Company payments to unknown payees
432	Approximate number of bank statements reviewed
10	Other potential affiliated companies
2	“Inactive” affiliated companies that received funds

Words -"Valuation/Litigation Report Card©"

Pivotal Element	Explanation of Focus and Inquiry	Observation				
		VL	L	N	H	VH
	Scoring Summary					
Expert's Business Valuation Credentials	**This element will determine the technical capability of the opposing expert and whether he/she has met his/her own professional standards, and whether in fact he/she ascribes to any objective valuation standards. The preponderance of recent court cases clearly establishes the need for an expert to obtain requisite technical training. Also, determining the technical standards applied (e.g. NACVA, USPAP, AICPA) gives an indication of capability.** **Husband's expert is a CPA, and recently completed his Accredited in Business Valuation (ABV) from AICPA, but acknowledges that his firm recently entered the valuation field this year. Consequently, his experience is very light.**		X			
Purpose and Use	**This element should be clearly explained in the beginning of the document and will drive the remaining results. For example, a valuation for the potential sale of a business may well have a different result than a valuation for the estate filing of a business. Consequently, the same set of facts used for different purposes could conceivably result in different answers** **We found no disagreement with Mr. Expert's statement of purpose and use.**			X		
Standard of Value	**The "standard" of value is pertinent to the legal matter at hand, and is perhaps the most easily exploited element of a valuation. For example, an opposing expert applying a non-standard value (e.g. the "estimate of sales price" used by business brokers) can sometimes be precluded from testimony for not meeting the respective state's standard definition, say "fair market value."** **Mr. Expert applied a legal standard of value inconsistent with the laws of this state. Specifically, the law requires a "fair value" standard for valuation in martial dissolution, but Mr. Expert has applied a fair market value standard.**	X				

Pictures…


BOX NO.
FROM
DESTROY
THRU
CONTENTS JOURNAL ENTRIES
VIKING
Stock No. 1015
Logging
ELITE
ELMA
93

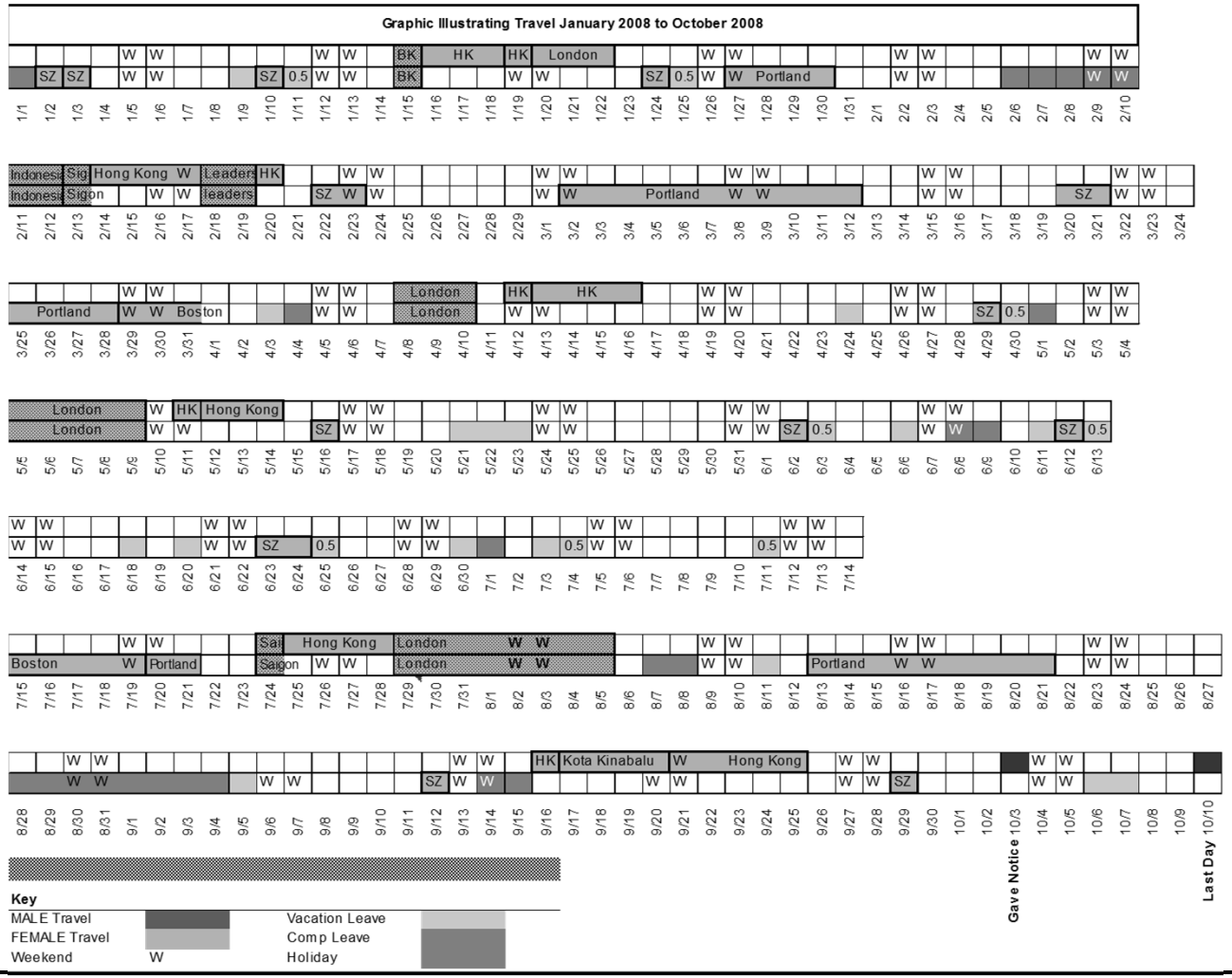
Pictures…

CPA Opinions Not Issued Timely

Auditor	**# 1**	**# 2**				
Fiscal Year End (FYE)	June 30, 2008	June 30, 2009	June 30, 2010	June 30, 2011	June 30, 2012	June 30, 2013
Opinion Date	September 16, 2008	February 24, 2010	September 29, 2010	Unknown	September 27, 2012	March 5, 2014
Opinion: Months After FYE	2.6	7.9	3.0	n/a	2.9	8.2
Restated	No	Yes	No	Yes	No	Yes

Pictures ... “The Affair”

BLINDED CO
MALE/FEMALE Travel Comparison
2008



Numbers…

Smith v. Smith
Comparison of Robert Smith's Statement of Net Worth to Bank/Brokerage Statements

Financial Institution	Account Name	Account Number	Balance as of 12/31/20xx per Statements	Balance Per Statement of Net Worth	Difference
Bank Accounts					
ABC Bank	Interest Checking	xx71 1613	$4,038.67	$745.00	$3,293.67
ABC Bank	Money Market	xx71 1614	102,972.87	99,394.00	3,578.87
Community Bank	Interest Checking	xx53 2357	29,433.99	37,330.92	(7,896.93)
First Union Bank	Regular Checking	xxxx 1070 4753	0.00	59.00	(59.00)
First Union Bank	Unsecured Line of Credit	xxxx 5623 0086	5,100.00	0.00	5,100.00
Subtotal of Bank Accounts			141,545.53	137,528.92	4,016.61
Brokerage Accounts					
United Investment		33864 3F	567,389.25	550,000.00	17,389.25
United Investment		33865 4F	321,024.22	300,000.00	21,024.22
Future Wealth		xxxx 2145	1,023,645.00	1,000,000.00	23,645.00
Future Wealth		xxxx 2146	890,231.06	900,000.00	(9,768.94)
AH Trading		xxxx347	12,362.44	12,000.00	362.44
Subtotal of Brokerage Accounts			2,814,651.97	2,762,000.00	52,651.97
Total			**$2,956,197.50**	**$2,899,528.92**	**$56,668.58**

Numbers…

"We're a Small Company and Don't Have the Staff to Copy All the Records"

44.6 Seconds to Print Each General Ledger

Smith v. Jones
Entities Owned
General Ledger Print Times

		Print Command Start Times					
		Military Time			Regular Time		
Entity	Year	Hour	Minute	Second	Hour	Minute	Second
ABC Management LLC	2010	17	7	30	5pm	7	30
ABC Management LLC	2007	17	10	59	5pm	10	59
ABC Management LLC	2008	17	11	39	5pm	11	39
ABC Management LLC	2009	17	12	9	5pm	12	9
Main Street Inc.	2007	17	12	47	5pm	12	47
Main Street Inc.	2008	17	13	18	5pm	13	18
Main Street Inc.	2009	17	13	46	5pm	13	46
Main Street Inc.	2010	17	14	14	5pm	14	14
Longview Properties LLC	2007	17	15	4	5pm	15	4
Longview Properties LLC	2008	17	15	34	5pm	15	34
Longview Properties LLC	2009	17	16	28	5pm	16	28
Longview Properties LLC	2010	17	16	58	5pm	16	58
Westwood Inc.	2007	17	17	36	5pm	17	36
Westwood Inc.	2008	17	18	11	5pm	18	11
Westwood Inc.	2009	17	18	42	5pm	18	42
Westwood Inc.	2010	17	19	23	5pm	19	23
Total Time Span From First To Last General Ledger Printed					**11 minutes 53 seconds**		
Average Computer Operator Time To Print All 16 General Ledgers					44.6 seconds		
Source: Cover Sheets To The General Ledgers Provided For Each Entity.							

"To the FORENSIC ACCOUNTANT with a toolbox, every unique problem can be addressed with its own solution."

Don’t end up with a *MESS*…

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Thank You!

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Questions & Answers