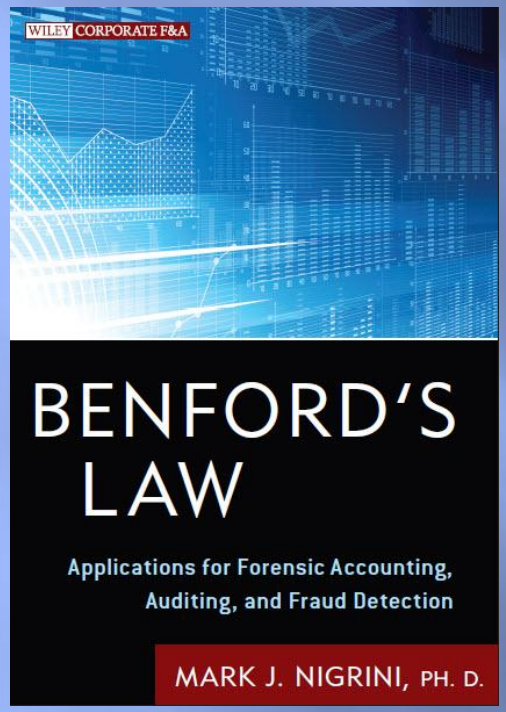

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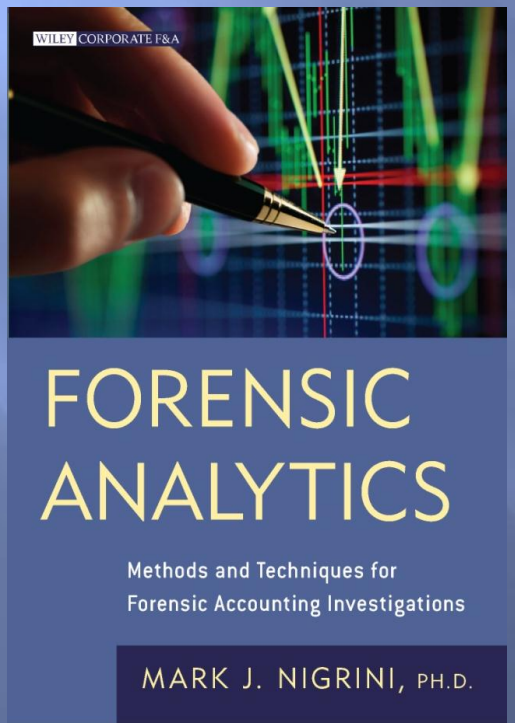
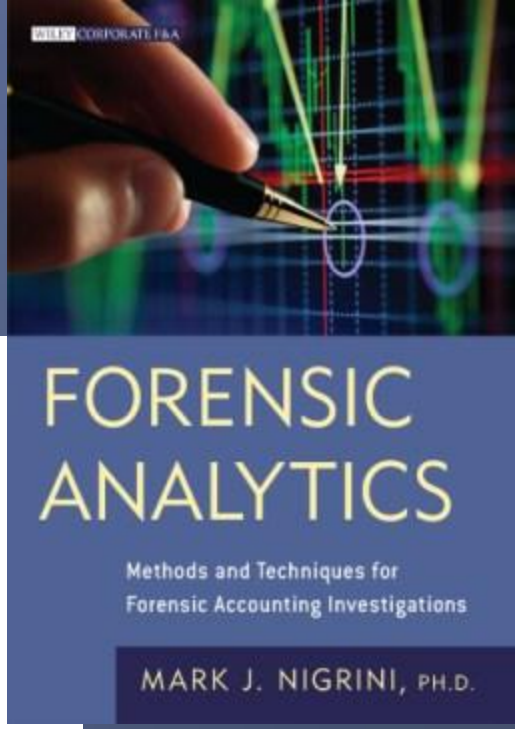
609-858-3820



CHAPTER 1



Architecture of Access

Tables and Queries

Excel to Access Conversion

Documenter and Other Notes

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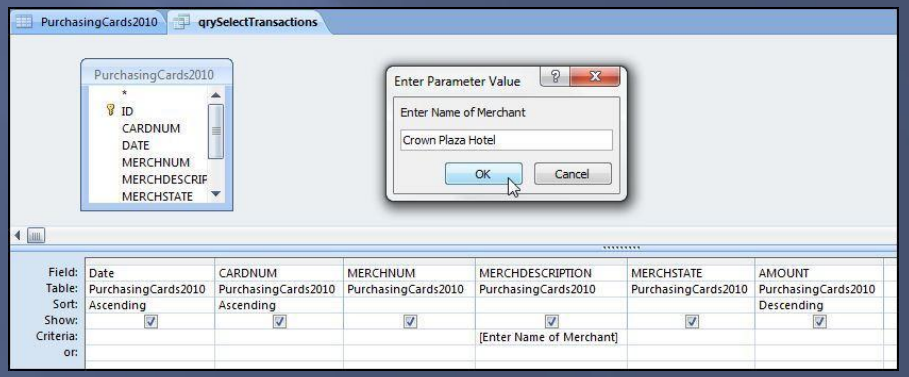


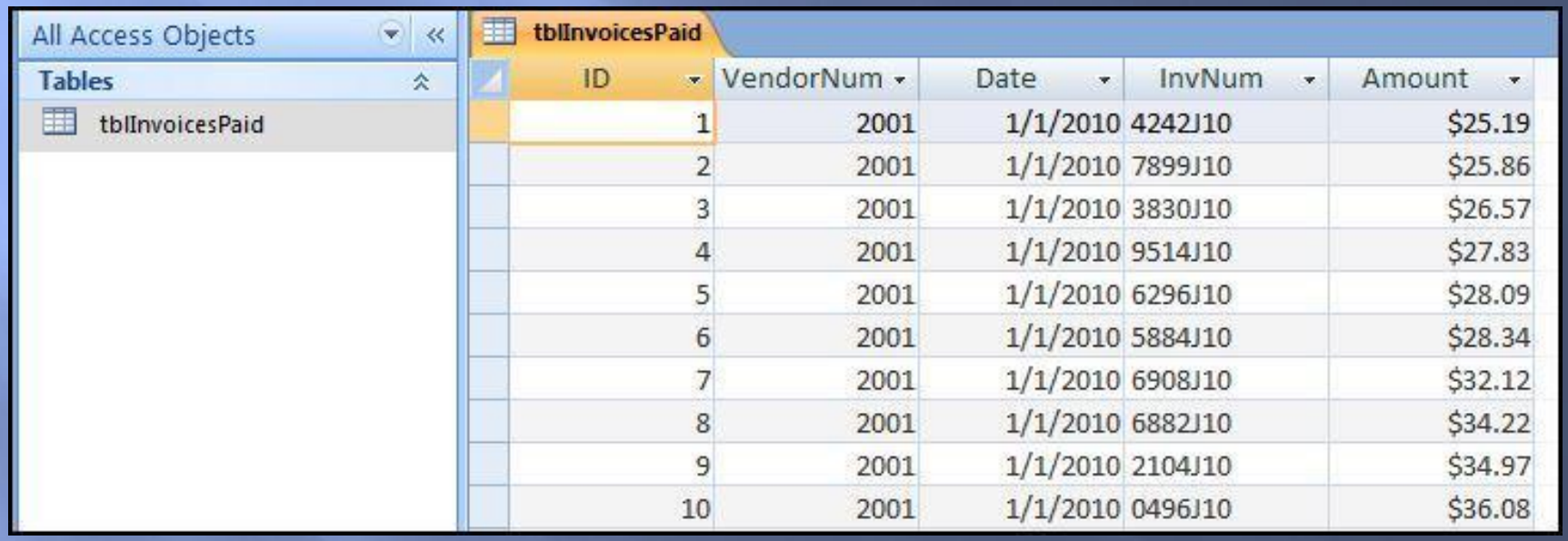
FORENSIC ANALYTICS

1) Access, Excel, and PowerPoint
2) High-level overview and Benford's Law
3) Data interrogation tests
4) Continuous monitoring (corr. and time-series)
5) Fraud risk assessment
6) Financial statement fraud
7) Analytics and purchasing card transactions
8) Concluding comments

INTRODUCTION

- Procurement and analysis of electronic data
- To reconstruct, detect, or support
- A claim of financial fraud
- Steps: Data collection, data preparation, data analysis, and reporting

ACCESS TABLE



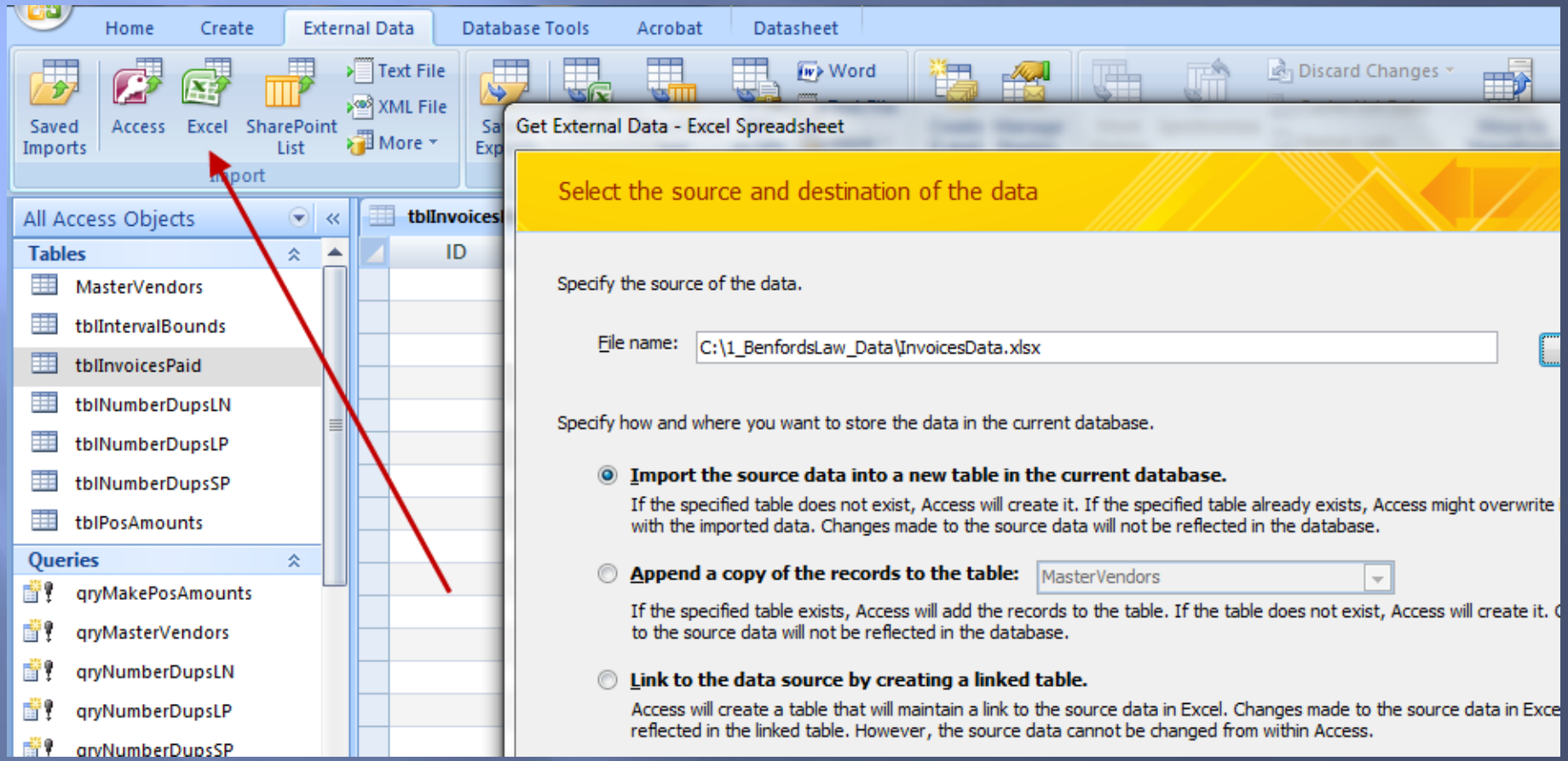
tblInvoicesPaid

ID	VendorNum	Date	InvNum	Amount
1	2001	1/1/2010	4242J10	$25.19
2	2001	1/1/2010	7899J10	$25.86
3	2001	1/1/2010	3830J10	$26.57
4	2001	1/1/2010	9514J10	$27.83
5	2001	1/1/2010	6296J10	$28.09
6	2001	1/1/2010	5884J10	$28.34
7	2001	1/1/2010	6908J10	$32.12
8	2001	1/1/2010	6882J10	$34.22
9	2001	1/1/2010	2104J10	$34.97
10	2001	1/1/2010	0496J10	$36.08

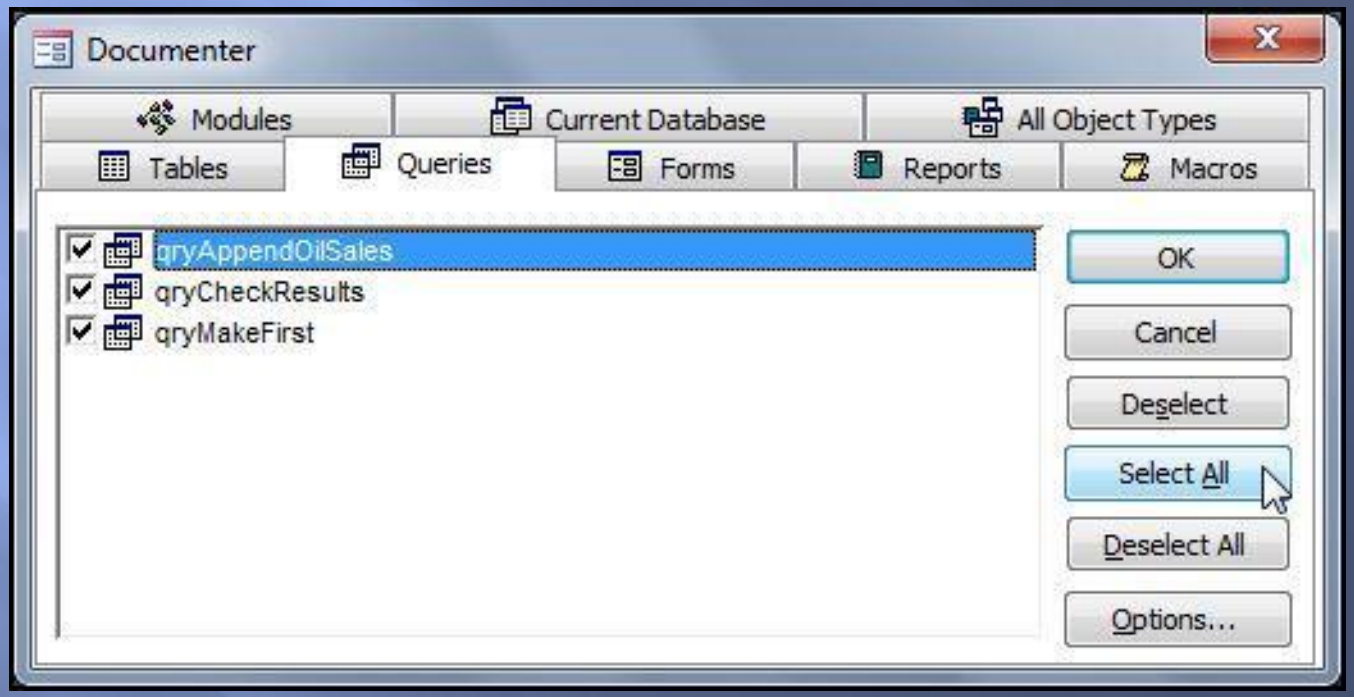
ACCESS OBJECTS

- **Tables:** Where transaction data are stored; Layout similar to Excel
- **Queries**: To select a subset of records that meet certain criteria; Also calculations and *Group By* procedures
- **Reports:** Organized presentation of the results of the forensic analytics work

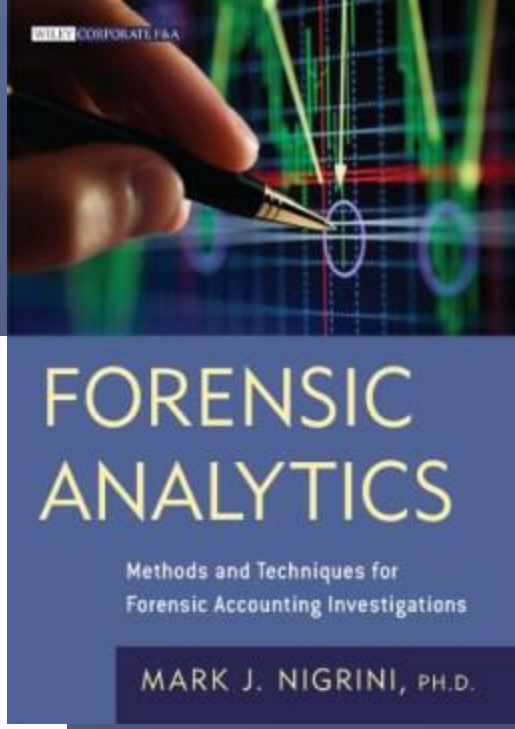
DATA IMPORT


Home
Create
External Data
Database Tools
Acrobat
Datasheet
Saved Imports
Access
Excel
SharePoint List
Text File
XML File
More
Import
Word
Discard Changes
All Access Objects
Tables
MasterVendors
tblIntervalBounds
tblInvoicesPaid
tblNumberDupsLN
tblNumberDupsLP
tblNumberDupsSP
tblPosAmounts
Queries
qryMakePosAmounts
qryMasterVendors
qryNumberDupsLN
qryNumberDupsLP
qryNumberDupsSP
ID
Get External Data - Excel Spreadsheet
Select the source and destination of the data
Specify the source of the data.
File name:
C:\1_BenfordsLaw_Data\InvoicesData.xlsx
Specify how and where you want to store the data in the current database.
Import the source data into a new table in the current database.
If the specified table does not exist, Access will create it. If the specified table already exists, Access might overwrite
with the imported data. Changes made to the source data will not be reflected in the database.
Append a copy of the records to the table:
MasterVendors
If the specified table exists, Access will add the records to the table. If the table does not exist, Access will create it.
to the source data will not be reflected in the database.
Link to the data source by creating a linked table.
Access will create a table that will maintain a link to the source data in Excel. Changes made to the source data in Exce
reflected in the linked table. However, the source data cannot be changed from within Access.

DOCUMENTER


Documenter
Modules
Current Database
All Object Types
Tables
Queries
Forms
Reports
Macros
qryAppendOilSales
qryCheckResults
qryMakeFirst
OK
Cancel
Deselect
Select All
Deselect All
Options...

CHAPTER 5



Benford's Law formulas

Benford's Law research

The basic digit tests

Access steps

Prepared by:
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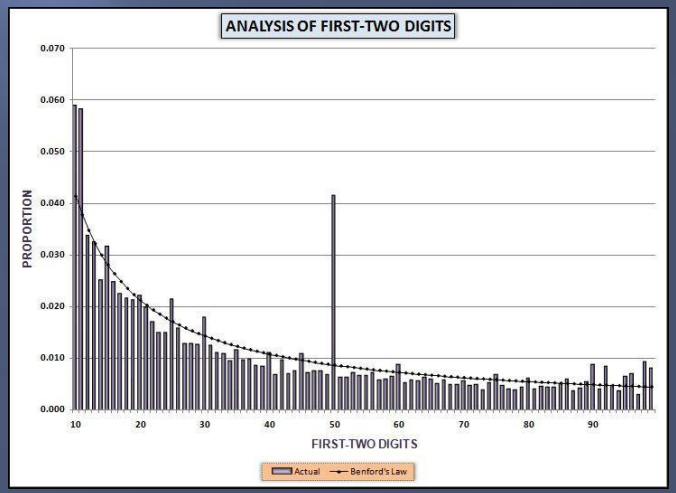


BENFORD'S ORIGINAL TABLE

TABLE I

PERCENTAGE OF TIMES THE NATURAL NUMBERS 1 TO 9 ARE USED AS FIRST DIGITS IN NUMBERS, AS DETERMINED BY 20,229 OBSERVATIONS

Group	Title	First Digit									Count
		1	2	3	4	5	6	7	8	9	
A	Rivers, Area	31.0	16.4	10.7	11.3	7.2	8.6	5.5	4.2	5.1	335
B	Population	33.9	20.4	14.2	8.1	7.2	6.2	4.1	3.7	2.2	3259
C	Constants	41.3	14.4	4.8	8.6	10.6	5.5	1.0	2.9	10.6	104
D	Newspapers	30.0	18.0	12.0	10.0	8.0	6.0	6.0	5.0	5.0	100
E	Spec. Heat	24.0	18.4	16.2	14.6	10.6	4.1	3.2	1.8	4.1	1389
F	Pressure	29.6	18.3	12.8	9.8	8.3	6.4	5.7	4.4	4.7	703
G	H.P. Lost	30.0	18.4	11.9	10.8	8.1	7.0	6.1	5.1	3.6	690
H	Mol. Wgt.	26.7	25.2	16.4	10.8	6.7	5.1	4.1	3.8	3.2	1800
I	Drainage	27.1	23.9	13.8	12.6	8.2	5.0	5.0	2.5	1.9	159
J	Atomic Wgt.	47.2	18.7	6.5	4.4	6.6	4.4	3.3	4.4	5.5	91
K	n^{-1}, $\sqrt{n}$, ...	25.7	20.3	9.7	6.8	6.6	6.8	7.2	8.0	8.9	5000
L	Design	26.8	14.8	14.3	7.5	8.3	8.4	7.0	7.3	5.6	560
M	*Digest*	33.4	18.5	12.4	7.5	7.1	9.5	5.5	4.9	4.2	308
N	Cost Data	32.4	18.8	10.1	10.1	9.8	5.5	4.7	5.5	3.1	741
O	X-Ray Volts	27.9	17.5	14.4	9.0	8.1	7.4	5.1	5.8	4.8	707
P	Am. Leagues	32.7	17.6	12.6	9.8	7.4	6.4	4.9	5.6	3.0	1458
Q	Black Body	31.0	17.3	14.1	8.7	6.6	7.0	5.2	4.7	5.4	1165
R	Addresses	28.9	19.2	12.6	8.8	8.5	6.4	5.6	5.0	5.0	342
S	n, n^2, ...$n!$	25.3	16.0	12.0	10.0	8.5	8.8	6.8	7.1	5.5	900
T	Death Rate	27.0	18.6	15.7	9.4	6.7	6.5	7.2	4.8	4.1	418
Average		30.6	18.5	12.4	9.4	8.0	6.4	5.1	4.9	4.7	1011
Probable Error		±0.8	±0.4	±0.4	±0.3	±0.2	±0.2	±0.2	±0.2	±0.3	—

At the foot of each column of Table I the...

A BIT OF CALCULUS

discontinuous.

Selecting the third digital order, Fig. 4, the area under the 1-curve can be written

$$A_1''' = \int_{100}^{199} y_1\,dx + \int_{199}^{999} y_2\,dx + \int_{999}^{1000} y_3\,dx, \qquad (5)$$

where the ordinates of the first rising section of the curve are

$$y_1 = \frac{a - 88}{a}. \qquad (6)$$

The descending section of the curve has ordinates

$$y_2 = \frac{111}{a} \qquad (7)$$

and the last rising section between 999 and 1,000 has ordinates

$$y_3 = \frac{a - 888}{a}. \qquad (8)$$

The curves are plotted to semi-logarithmic coördinates and

$$x = \log a, \qquad (9)$$

$$dx = da/a. \qquad (10)$$

The integrals after making these substitutions give the value

$$A_1''' = \log_e \frac{1990}{999} + \frac{8}{1000}.$$

A similar operation yields for the 1-curve in the second digital order

$$A_1'' = \log_e \frac{190}{99} + \frac{8}{100}$$

BENFORD'S LAW

TABLE 5.1 The Expected Digit Frequencies of Benford's Law

	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 (Spring): 72–91.

The table shows that the expected proportion of numbers with a first digit 2 is 0.17609 and the expected proportion of numbers with a fourth digit 4 is 0.10002.

THE FORMULAS

$$P(D_1 = d_1) = \log\left(1 + \frac{1}{d_1}\right) \quad d_1 \in \{1, 2, \ldots, 9\} \tag{5.1}$$

$$P(D_2 = d_2) = \sum_{d_1=1}^{9} \log\left(1 + \frac{1}{d_1 d_2}\right) \quad d_2 \in \{0, 1, \ldots, 9\} \tag{5.2}$$

$$P(D_1 D_2 = d_1 d_2) = \log\left(1 + \frac{1}{d_1 d_2}\right) \quad d_1 d_2 \in \{10, 11, \ldots, 99\} \tag{5.3}$$

where P indicates the probability of observing the event in parentheses and log refers to the log to the base 10. The formula for the expected first-two digit proportions is shown in Equation 5.3. For the first-two digits, the expected frequencies are also highly skewed, and range from 4.139 percent for the 10 combination down to 0.436 percent for the 99 combination. The first-two digits of 110,364 are 11.

$$P(D_1 D_2 = 64) = \log(1 + (1/64)) = 0.006733 \tag{5.4}$$

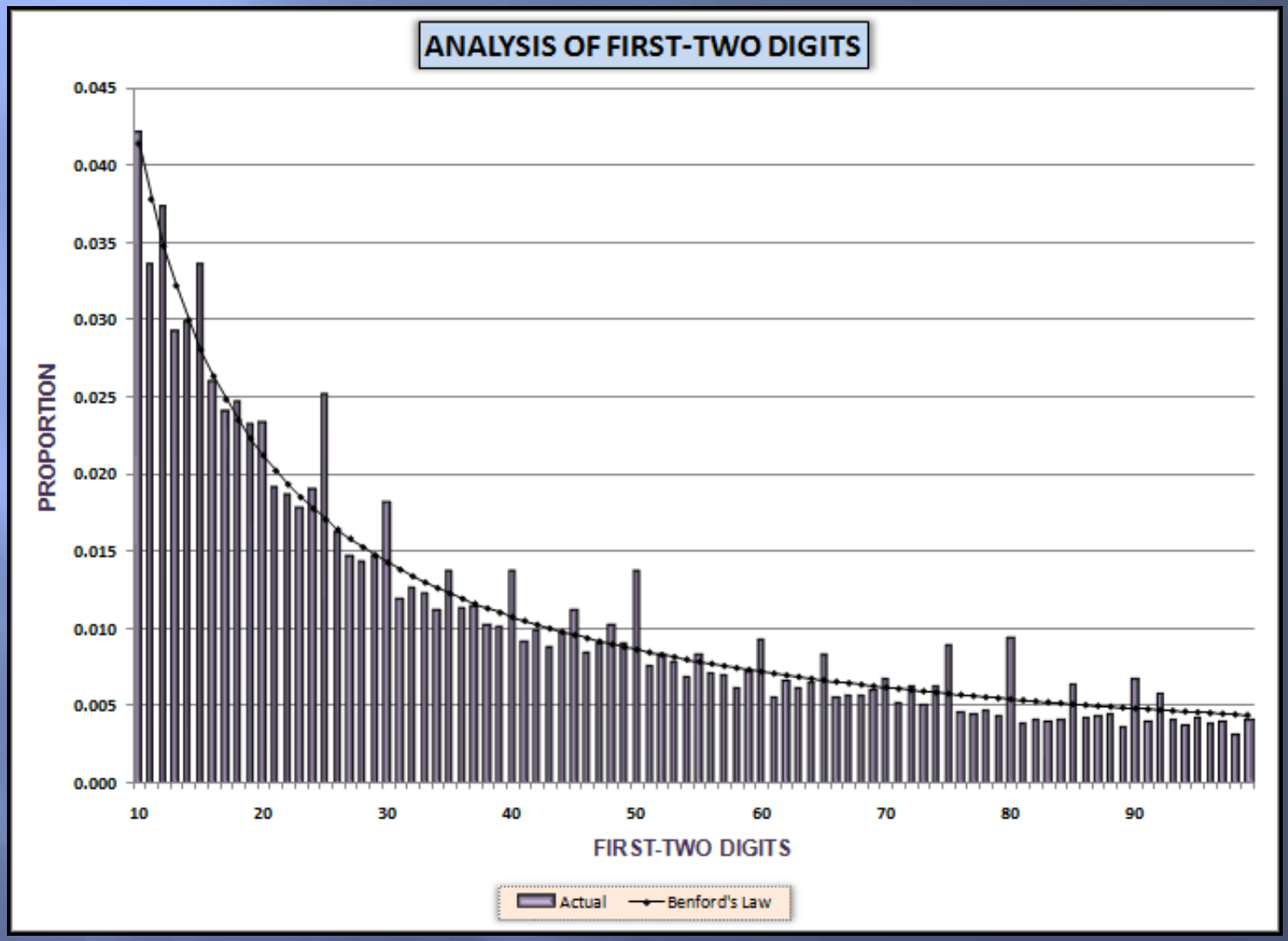
LITERATURE TO 1980

- 1948, mental numbers
- 1960, scale invariance (x by a constant)
- 1965, can't use middle 3 digits as random numbers
- 1969, article in *Scientific American*
- 1971, first Fibonacci numbers paper
- 1972, use Benford to test forecasts
- 1976, Raimi's review paper

CONFORMITY TO BENFORD

- Numbers should represent the sizes of facts or events
- No built-in maximum or minimum
- Numbers should not be identification numbers (bank account numbers or flight numbers)

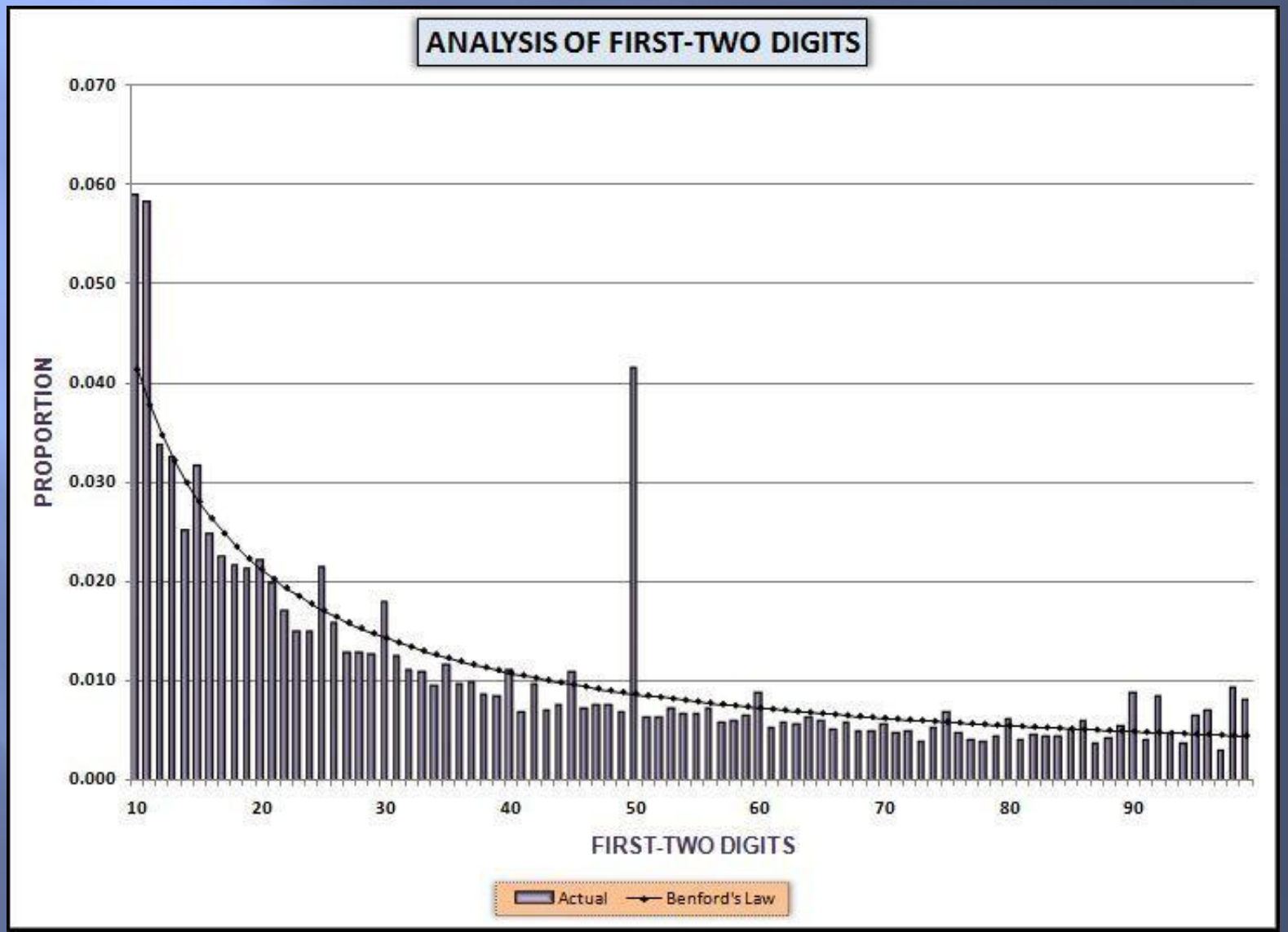
INVOICE AMOUNTS



FIRST-TWO DIGIT FINDINGS

- Spike at 24 when vouchers are needed @ $25
- Spikes below psychological cutoffs of 48, 49, 98, and 99
- Systematic frauds (e.g., credit card balances)
- Comparing two inventory sheets
- Spike at 14 for U.K. revenue numbers
- Spike at 24 for purchasing cards
- Spike at 48 for employee reimbursements

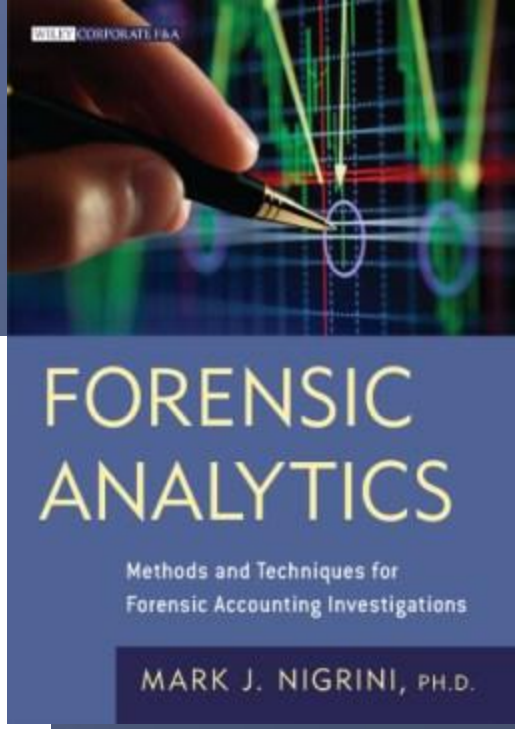
FIRST-TWO DIGITS



SUMMARY

- Benford's Law gives the expected frequencies of the digits in tabulated data
- Large bias toward the low digits
- Some important papers in the 1940 to 2000 period
- Applies to datasets that meet the three conditions
- Works best on datasets with > 1,000 records
- Easy to spot excess activity below control thresholds
- Access can calculate the digit frequencies
- Excel can be used to graph the results

CHAPTER 8

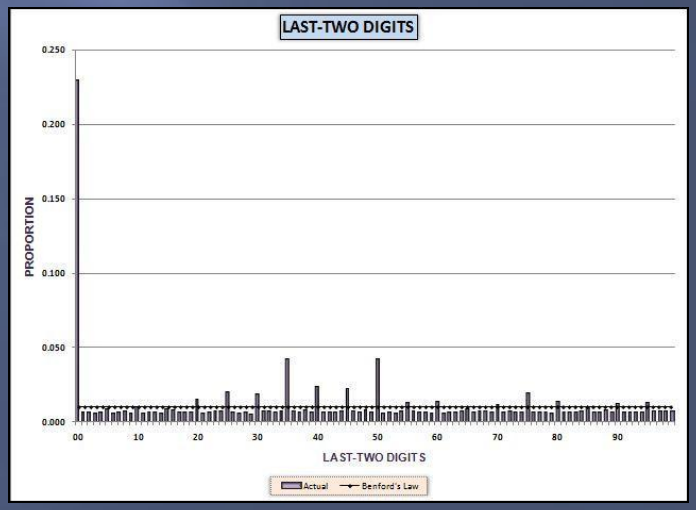


Number duplication test

Last-two digits test

Completes the initial cycle of tests

Access and Excel



Prepared by:

Mark J. Nigrini

NUMBER DUPLICATION

tblNumberDupsLP

Rank	Count	Amount	FirstTwo
1	6022	$50.00	50
2	2264	$1,153.35	11
3	1185	$1,083.45	10
4	1056	$150.00	15
5	1018	$988.35	98
6	976	$1,159.35	11
7	956	$25.00	25
8	938	$90.00	90
9	907	$928.45	92
10	729	$994.35	99
11	672	$30.00	30
12	657	$250.00	25
13	631	$200.00	20
14	624	$100.00	10
15	617	$300.00	30

NUMBER DUPLICATION

- Link to first-order large positive spikes
- Link to summation large positive spikes
- Numbers below thresholds
- Odd numbers that have occurred often
- Relatively large counts
- Numbers linked to inefficiencies

NUMBER DUPLICATION

tblNumberDupsSP

Rank	Count	Amount	FirstTwo
1	204	$5.25	5
2	152	$9.38	9
3	145	$6.45	6
4	144	$0.29	0
5	130	$5.00	5
6	118	$2.35	2
7	110	$4.40	4
8	100	$6.25	6
9	100	$0.59	0
10	91	$0.91	0

DRILL DOWN RESULT

qryViewSummation

Rank	Amount	Count	FirstTwo
20918	$26,763,475.78	1	26
21037	$263,674.47	1	26
21038	$261,673.33	1	26
21039	$260,599.30	1	26
21875	$26,974.99	1	26
21876	$26,961.39	1	26
11255	$26,961.25	2	26
21877	$26,940.31	1	26
21878	$26,937.89	1	26
21879	$26,931.62	1	26
21880	$26,920.71	1	26
21881	$26,915.31	1	26

COMPARE +VE AND -VE

qryNumberDupsCompare

LP_Rank	LP_Count	LP_Amount	LN_Rank	LN_Count	LN_Amount
1	6022	$50.00	1	160	($119.80)
2	2264	$1,153.35	2	111	($139.80)
3	1185	$1,083.45	3	108	($29.95)
4	1056	$150.00	4	88	($239.60)
5	1018	$988.35	5	86	($359.40)
6	976	$1,159.35	6	78	($994.35)
7	956	$25.00	7	74	($479.20)
8	938	$90.00	8	67	($599.00)
9	907	$928.45	9	60	($150.00)
10	729	$994.35	10	60	($838.60)
11	672	$30.00	11	54	($34.95)
12	657	$250.00	12	52	($718.80)

LAST-TWO DIGITS TEST

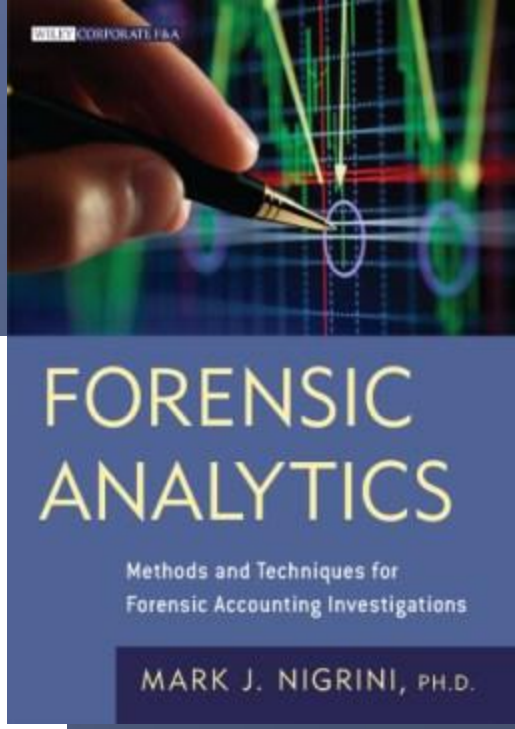
The last-two digit tests is generally run on data tables where we are looking for signs of number invention in data tables where we don't really want number invention. Examples might include:

- Census population numbers (quite relevant in 2010)
- Election results
- Inventory counts
- Odometer readings at the time of warranty claims
- Weights of fish catches by trawlers
- Temperature readings at automated weather stations
- Deduction numbers on individual tax returns
- Web site hit statistics or banner ad clicks
- Coupon redemption counts

SUMMARY

- Num Dup test looks at the actual numbers
- Separate tests for small and large +ve and -ve
- Look for numbers associated with FTD spikes, control thresholds, and psychological thresholds
- Last-two digits test looks for number invention
- Interesting results from invoices data
- Num Dup and LTD tests can be run in Access or Excel

CHAPTER 10



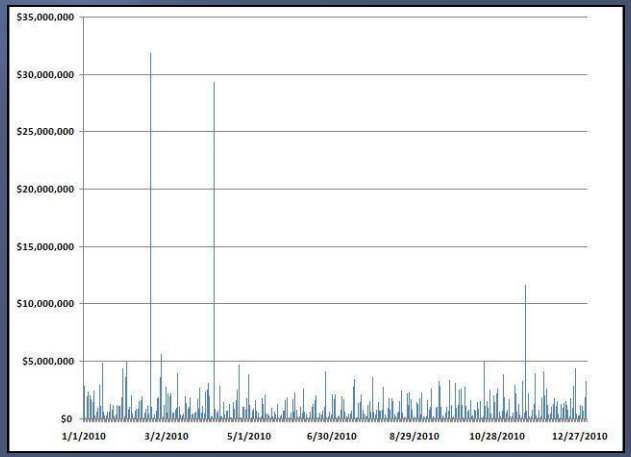
People don't know when to stop

Look for largest in a group

Most overtime, most refunds, most travel

Most growth of a subset

Prepared by:
Mark J. Nigrini



INTRODUCTION

- Samples of high-risk transactions
- A subset is a group of records with something in common
- Examples: Vendors, customers, locations
- Look for largest $$$ or largest growth
- Tests can detect fraud or errors
- Tests can be run in Access or Excel

LARGEST VENDORS

qryLargestVendors

VendorNum	InvoicesCount	InvoicesSum
16721	51	$48,945,037.31
2088	62	$33,969,172.65
2508	1697	$22,255,032.87
2817	43	$19,067,059.18
17141	3	$17,839,333.34
2786	1396	$17,283,574.49
16059	3	$16,528,575.56
14728	115	$16,174,568.28
3630	13973	$15,288,401.29
2001	4736	$12,207,770.41
6118	46	$10,678,566.27
16637	30	$10,638,664.03
2101	14	$10,230,544.38

FINDINGS

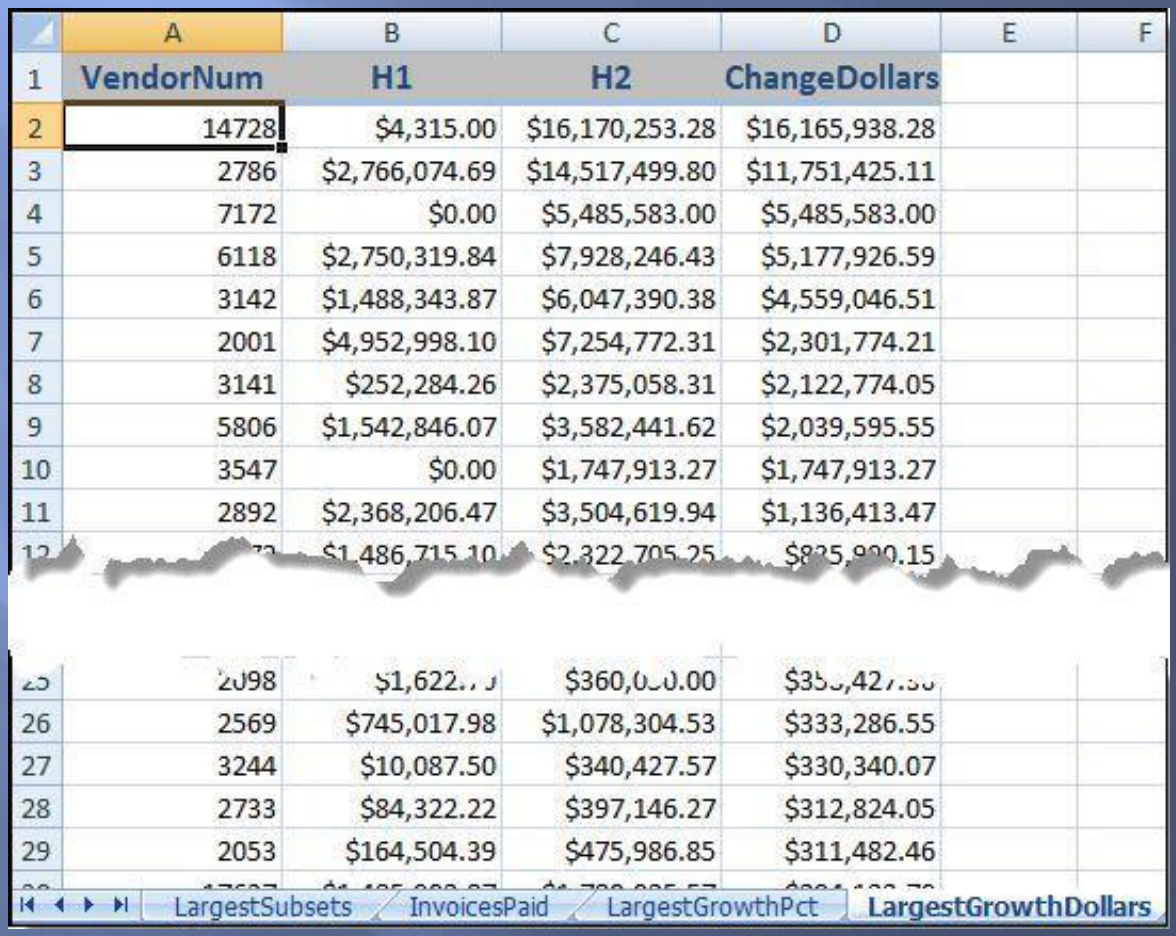
- 35,000 Hewlett-Packard invoices per year
- 1,300 overtime hours per year
- 12,000 invoices from a printing shop
- 100,000 FedEx invoices per month
- Excessive refunds
- Large negative inventory balances
- Two vendors, 100 checks each per month

LARGEST GROWTH RESULTS

qryTotalSorted

VendorNum	Sum1	Sum2	ChangePct
14728	$4,315.00	$16,170,253.28	374,645.2
4967	$805.00	$379,739.42	47,072.6
2879	$300.00	$81,169.50	26,956.5
5769	$83.75	$21,966.03	26,128.1
5843	$18.00	$4,195.16	23,206.4
2098	$1,622.70	$360,050.00	22,088.3
6547	$69.40	$12,673.80	18,162.0
16731	$70.00	$11,058.86	15,698.4
3719	$175.00	$24,445.00	13,868.6
5778	$137.50	$17,578.62	12,684.5
2764	$1,915.00	$243,100.00	12,594.5
2493	$376.50	$46,466.14	12,241.6
20914	$6.00	$667.00	11,016.7
6854	$20.00	$2,040.00	10,100.0
4251	$276.00	$27,534.00	9,876.1
14390	$21.01	$1,861.47	8,759.9
15510	$20.00	$1,738.28	8,591.4
11893	$200.00	$14,603.00	7,201.5

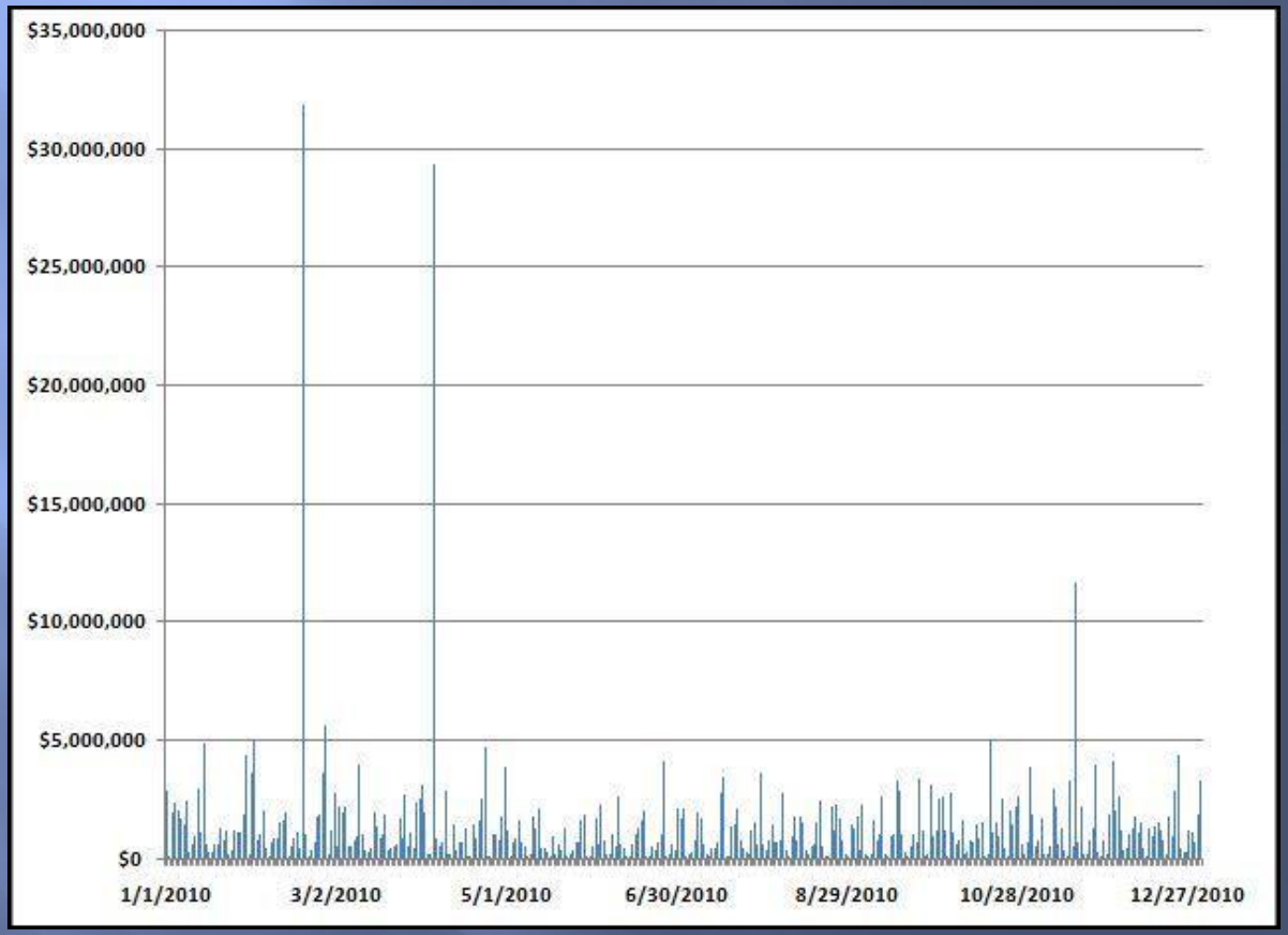
EXCEL: RESULTS ($)



	A	B	C	D	E	F
1	VendorNum	H1	H2	ChangeDollars		
2	14728	$4,315.00	$16,170,253.28	$16,165,938.28		
3	2786	$2,766,074.69	$14,517,499.80	$11,751,425.11		
4	7172	$0.00	$5,485,583.00	$5,485,583.00		
5	6118	$2,750,319.84	$7,928,246.43	$5,177,926.59		
6	3142	$1,488,343.87	$6,047,390.38	$4,559,046.51		
7	2001	$4,952,998.10	$7,254,772.31	$2,301,774.21		
8	3141	$252,284.26	$2,375,058.31	$2,122,774.05		
9	5806	$1,542,846.07	$3,582,441.62	$2,039,595.55		
10	3547	$0.00	$1,747,913.27	$1,747,913.27		
11	2892	$2,368,206.47	$3,504,619.94	$1,136,413.47		
12		$1,486,715.10	$2,322,705.25	$835,990.15		
25	2098	$1,622..	$360,0..0.00	$35.,42..		
26	2569	$745,017.98	$1,078,304.53	$333,286.55		
27	3244	$10,087.50	$340,427.57	$330,340.07		
28	2733	$84,322.22	$397,146.27	$312,824.05		
29	2053	$164,504.39	$475,986.85	$311,482.46		

LargestSubsets | InvoicesPaid | LargestGrowthPct | LargestGrowthDollars

USING DATES AS THE SUBSET



EXAMPLE OF A LARGE ERROR

Ohio Department of TAXATION

P. O. Box 182382
Columbus, OH 43218-2382
tax.ohio.gov

January 24, 2011

BOSSETTI,DENISE S
[redacted]

Social Security Number(s)
[redacted]

Dear Taxpayer:

We are unable to deposit your Ohio income tax refund electronically as requested because you split the refund into a paper check and an electronic deposit(s). Instead, you will receive a paper check for the total refund amount. If there are no adjustments to your return, you will receive a check for the amount of refund listed below after we are finished processing your return.

Account Type	Account Number	Requested Amount
CHECKING	[redacted]	0.02
TOTAL		200,000,000.00

SUMMARY

- Can be innovative in choice of subset variable
- People don't know when to stop once they have figured out how to cheat the system
- Test can detect frauds and errors
- Tests can point to efficiency gains
- Largest subsets: Access or Excel (pivot tables)
- Largest growth: Easier in Excel
- Results should be carefully interpreted

RECENT APPLICATIONS

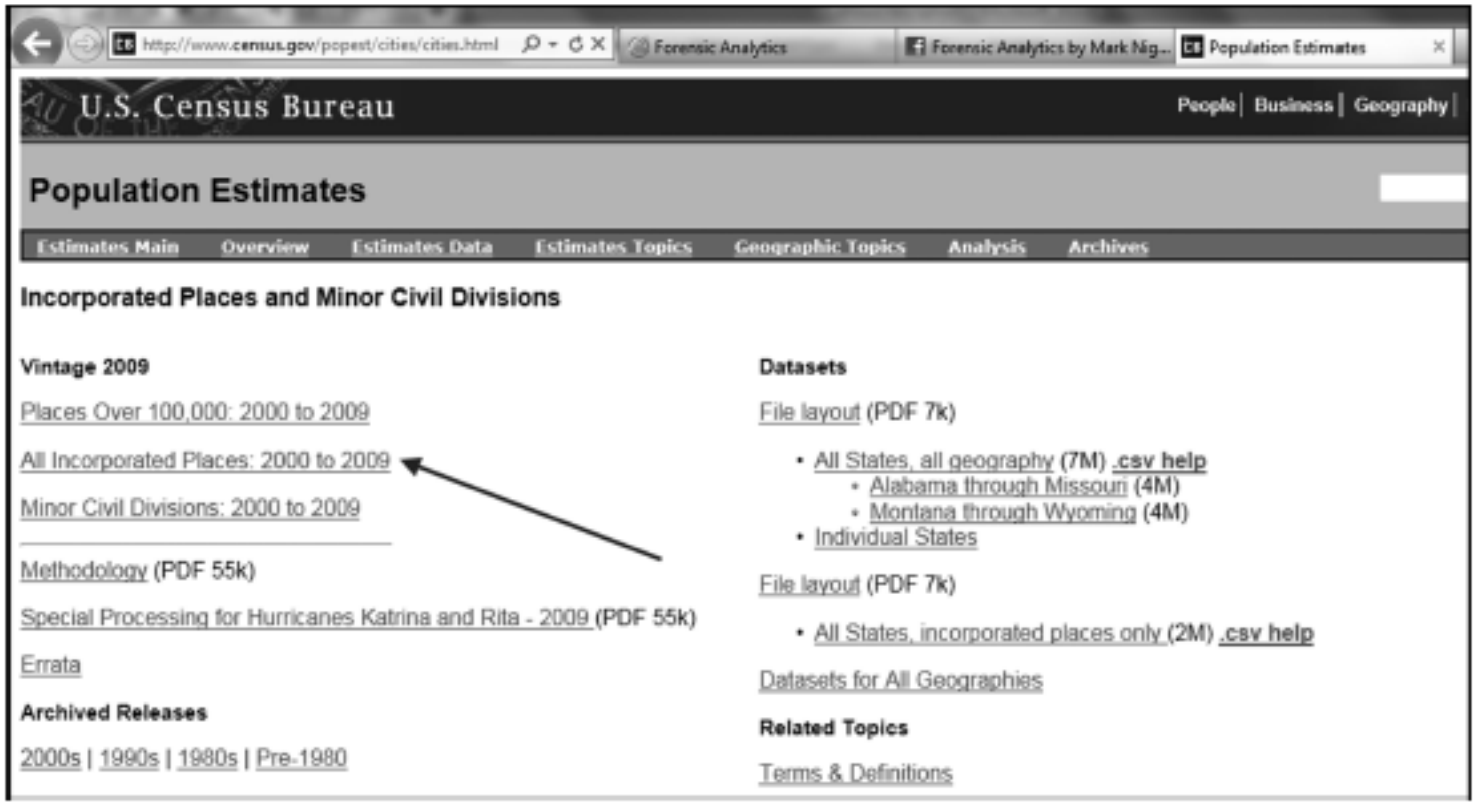


FIGURE 1.1 Source of the Town and City Populations on the Census Bureau Web site

Source: www.census.gov.

RECENT APPLICATIONS

	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Table 4. Annual Estimates of the Resident Population for Incorporated Places in New Jersey: April 1, 2000 to July 1, 2009												
3	Geographic Area	Population Estimates										April 1, 2000	
4		July 1, 2009	July 1, 2008	July 1, 2007	July 1, 2006	July 1, 2005	July 1, 2004	July 1, 2003	July 1, 2002	July 1, 2001	July 1, 2000	Estimates Base	Census
5	New Jersey	8,707,739	8,663,398	8,636,043	8,623,721	8,621,837	8,611,530	8,583,481	8,544,116	8,489,469	8,430,921	8,414,378	8,414,350
6	Absecon city	8,573	8,368	8,046	7,997	7,906	7,824	7,783	7,663	7,632	7,637	7,638	7,638
7	Allendale borough	6,609	6,578	6,550	6,576	6,646	6,696	6,716	6,743	6,760	6,706	6,689	6,699
8	Allenhurst borough	697	699	702	709	716	721	723	722	721	720	716	718
9	Allentown borough	1,840	1,844	1,856	1,868	1,883	1,894	1,894	1,894	1,891	1,887	1,882	1,882
10	Alpha borough	2,377	2,391	2,392	2,407	2,430	2,454	2,469	2,486	2,486	2,482	2,482	2,482
11	Alpine borough	2,503	2,464	2,419	2,374	2,326	2,305	2,282	2,254	2,226	2,193	2,183	2,183
12	Andover borough	634	636	642	647	651	652	657	656	655	658	658	658
13	Asbury Park city	16,562	16,533	16,553	16,726	16,869	16,987	17,013	17,018	17,025	16,977	16,932	16,930
14	Atlantic City city	39,620	39,416	39,596	39,661	39,978	40,187	40,235	40,060	40,163	40,449	40,517	40,517
15	Atlantic Highlands borough	4,592	4,596	4,621	4,661	4,690	4,725	4,728	4,732	4,726	4,717	4,707	4,705
16	Audubon borough	8,880	8,891	8,941	8,974	9,006	9,024	9,072	9,115	9,125	9,166	9,182	9,182
17	Audubon Park borough	1,054	1,058	1,065	1,069	1,075	1,079	1,086	1,093	1,094	1,100	1,102	1,102
18	Avalon borough	2,087	2,088	2,104	2,122	2,114	2,143	2,163	2,142	2,151	2,146	2,143	2,143
19	Avon-by-the-Sea borough	2,239	2,200	2,182	2,191	2,217	2,256	2,260	2,253	2,247	2,250	2,244	2,244
20	Barnegat Light borough	846	839	834	832	819	813	798	788	774	766	764	764
21	Barrington borough	6,941	6,947	6,974	7,000	7,019	7,002	7,034	7,057	7,047	7,073	7,084	7,084
22	Bay Head borough	1,273	1,268	1,267	1,260	1,256	1,262	1,264	1,255	1,241	1,239	1,238	1,238
23	Bayonne city	58,359	57,201	57,094	58,000	59,306	60,129	60,472	61,230	61,895	61,826	61,842	61,842
24	Beach Haven borough	1,403	1,391	1,379	1,365	1,348	1,322	1,316	1,306	1,289	1,281	1,278	1,278
25	Beachwood borough	10,881	10,845	10,790	10,733	10,702	10,711	10,708	10,617	10,425	10,389	10,375	10,375

FIGURE 1.2 Census Bureau Data with the State Total in Row 5 and the Town and City Numbers Starting in Row 6

RECENT APPLICATIONS

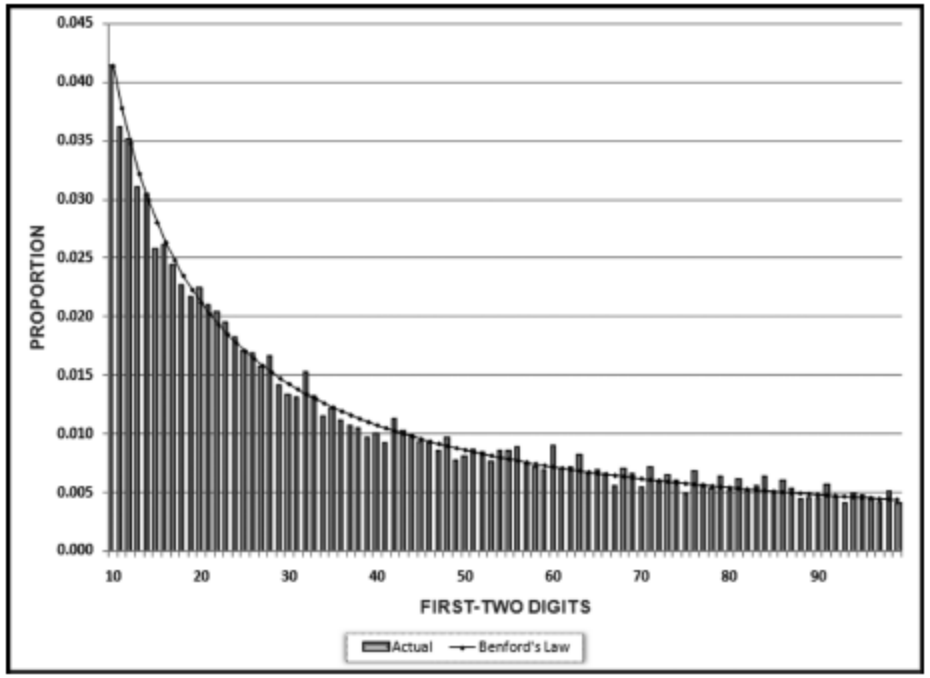


FIGURE 1.3 First-Two Digits of the Town and City Populations. The Line Shows the Proportions of Benford's Law and the Bars Show the Actual Proportions.

RECENT APPLICATIONS

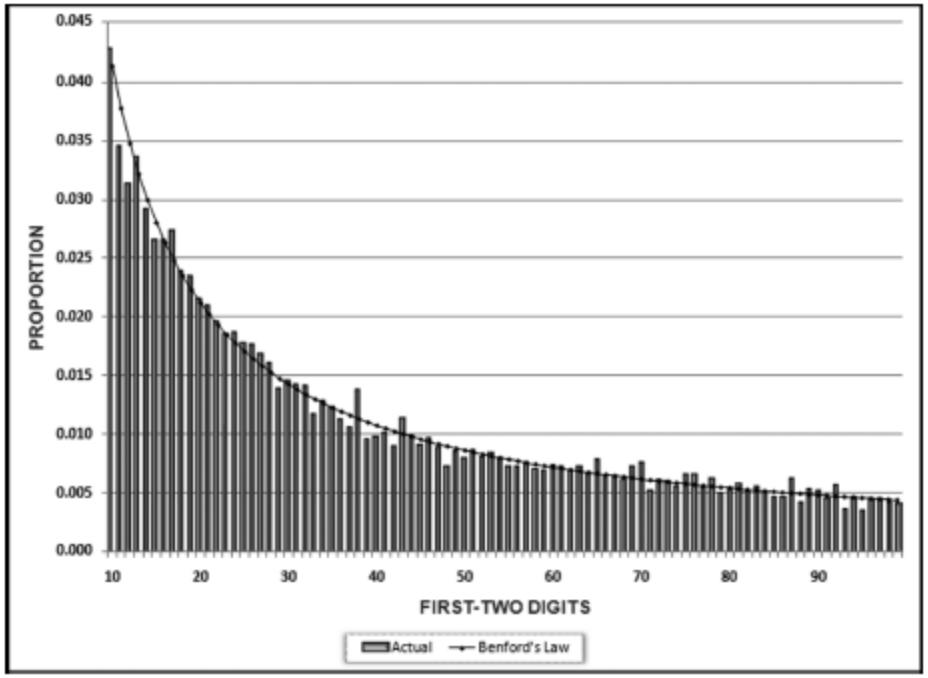
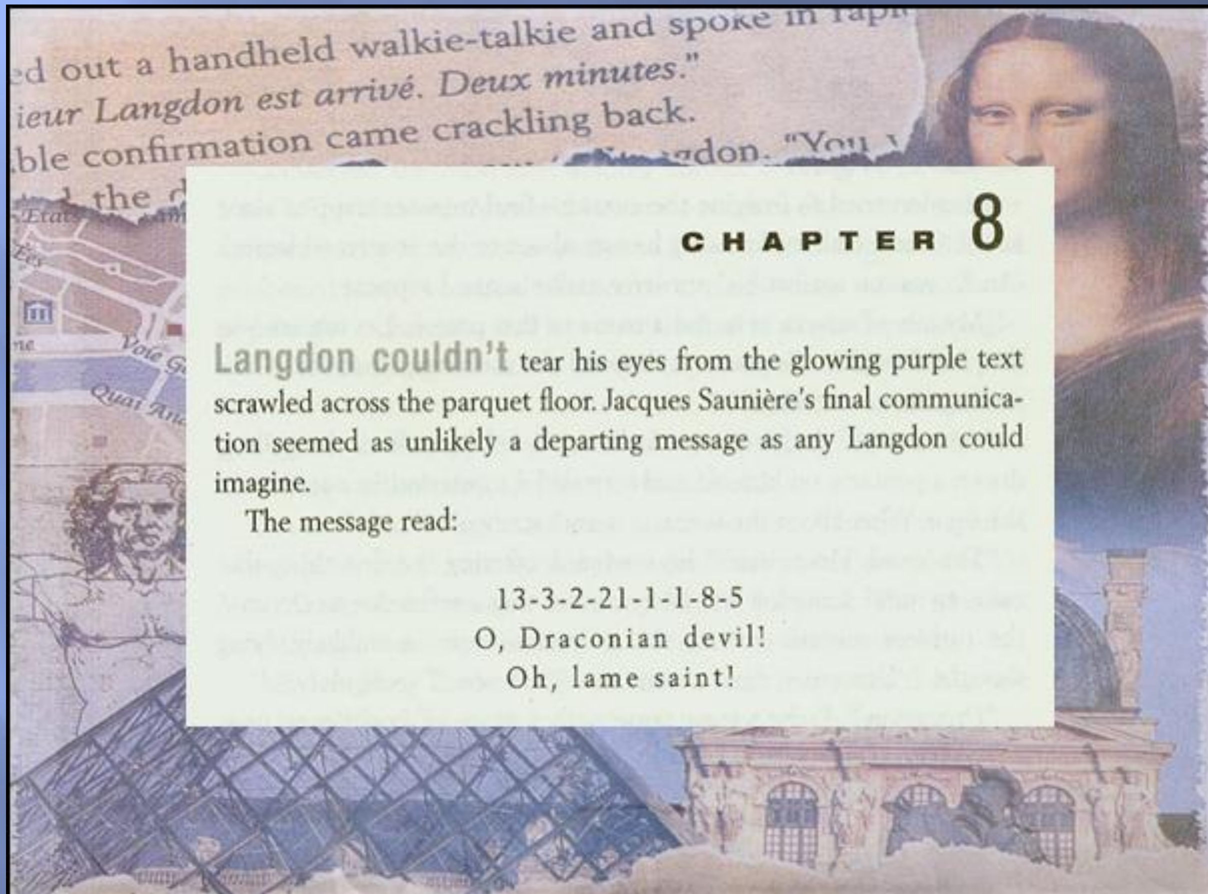


FIGURE 2.7 Digits of the Population Numbers Multiplied by π

RECENT APPLICATIONS



CHAPTER 8

Langdon couldn't tear his eyes from the glowing purple text scrawled across the parquet floor. Jacques Saunière's final communication seemed as unlikely a departing message as any Langdon could imagine.

The message read:

13-3-2-21-1-1-8-5
O, Draconian devil!
Oh, lame saint!

RECENT APPLICATIONS

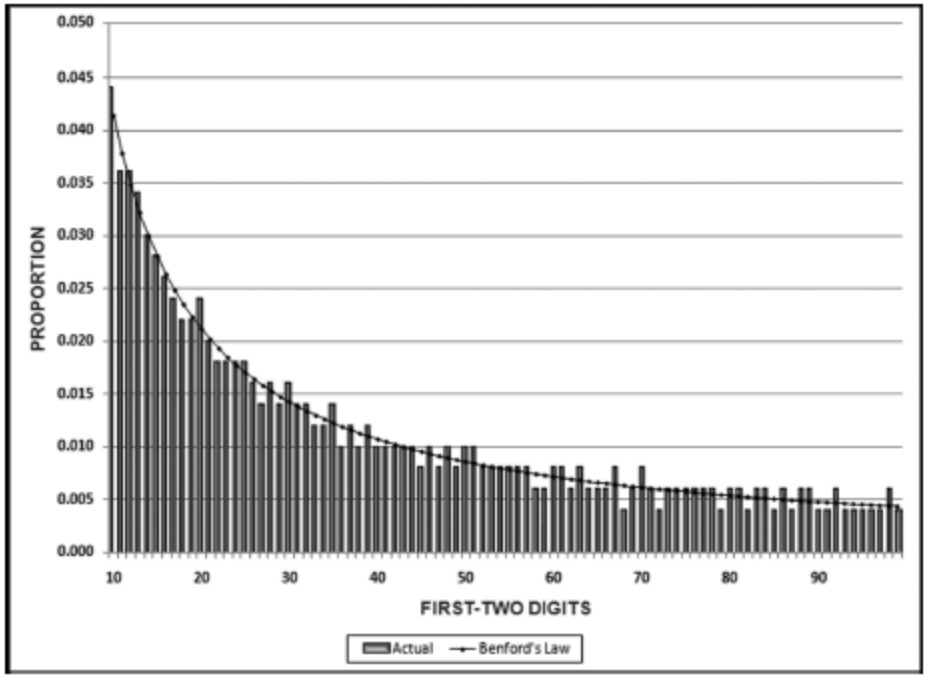


FIGURE 3.2 First-Two Digits of 500 Fibonacci Numbers

RECENT APPLICATIONS

C2 =VALUE(DEC2OCT(D2))

	A	B	C	D	E	F
1	State	Town	2009 Base 8	July 1, 2009	July 1, 2008	July 1, 2007
2	Alabama	Abbeville city	5562	2,930	2,931	2,939
3	Alabama	Adamsville city	11256	4,782	4,789	4,797
4	Alabama	Addison town	1305	709	711	717
5	Alabama	Akron town	661	433	437	437
6	Alabama	Alabaster city	72245	29,861	29,337	28,810
7	Alabama	Albertville city	47223	20,115	19,852	19,520
8	Alabama	Alexander City city	35412	15,114	15,090	15,005
9	Alabama	Aliceville city	4561	2,417	2,443	2,403
10	Alabama	Allgood town	1341	737	730	717
11	Alabama	Altoona town	1706	966	967	966
12	Alabama	Andalusia city	21237	8,863	8,862	8,615
13	Alabama	Anderson town	543	355	354	351
14	Alabama	Anniston city	56011	23,561	23,529	23,536
15	Alabama	Arab city	20120	8,272	8,135	7,882
16	Alabama	Ardmore town	2410	1,288	1,243	1,186

FIGURE 3.11 Town and City Data with a Field Showing the Base 8 Population Numbers

RECENT APPLICATIONS

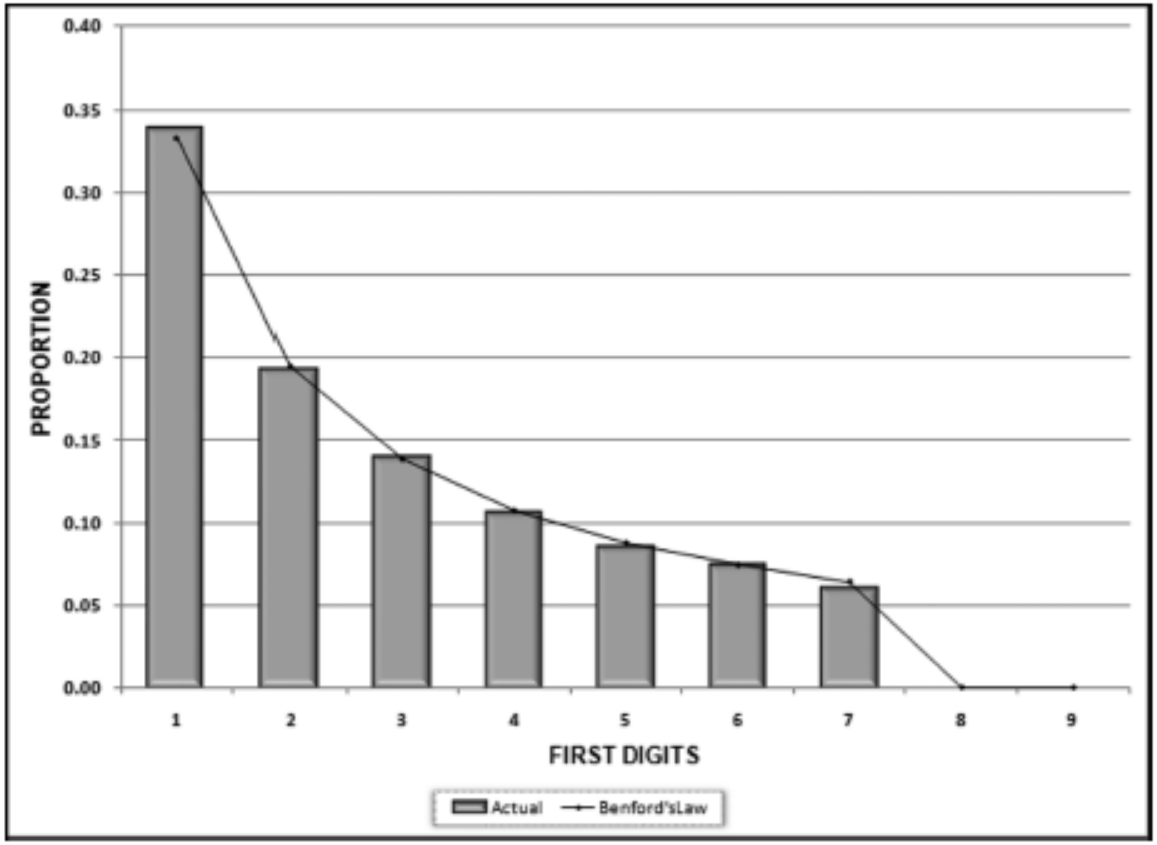
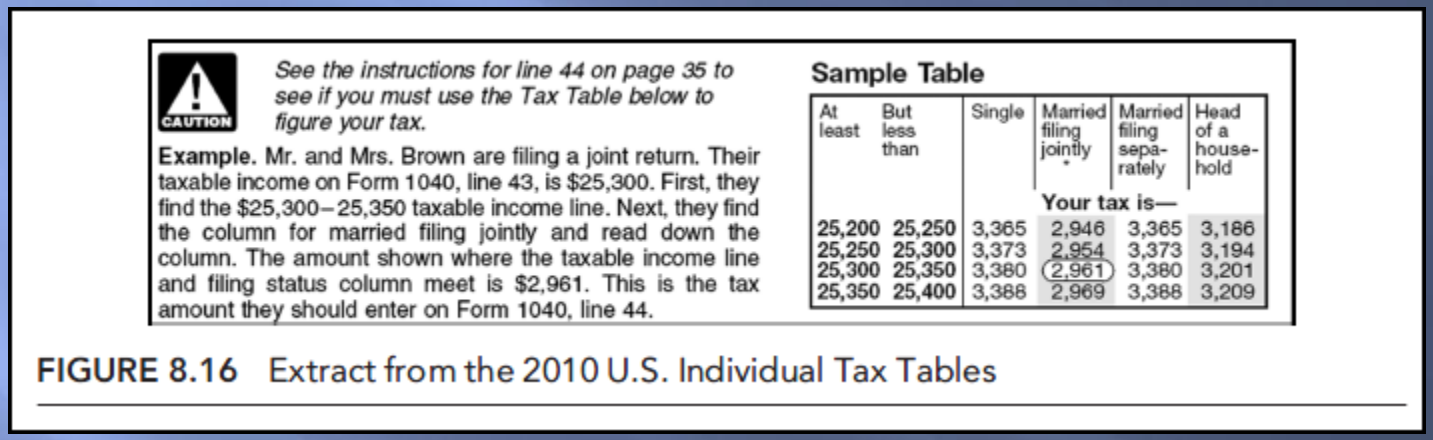


FIGURE 3.12 First Digits of the Base 8 Town and City Populations

RECENT APPLICATIONS



See the instructions for line 44 on page 35 to see if you must use the Tax Table below to figure your tax.

Example. Mr. and Mrs. Brown are filing a joint return. Their taxable income on Form 1040, line 43, is $25,300. First, they find the $25,300–25,350 taxable income line. Next, they find the column for married filing jointly and read down the column. The amount shown where the taxable income line and filing status column meet is $2,961. This is the tax amount they should enter on Form 1040, line 44.

Sample Table

At least	But less than	Single	Married filing jointly *	Married filing separately	Head of a household
		Your tax is—			
25,200	25,250	3,365	2,946	3,365	3,186
25,250	25,300	3,373	2,954	3,373	3,194
25,300	25,350	3,380	2,961	3,380	3,201
25,350	25,400	3,388	2,969	3,388	3,209

FIGURE 8.16 Extract from the 2010 U.S. Individual Tax Tables

RECENT APPLICATIONS

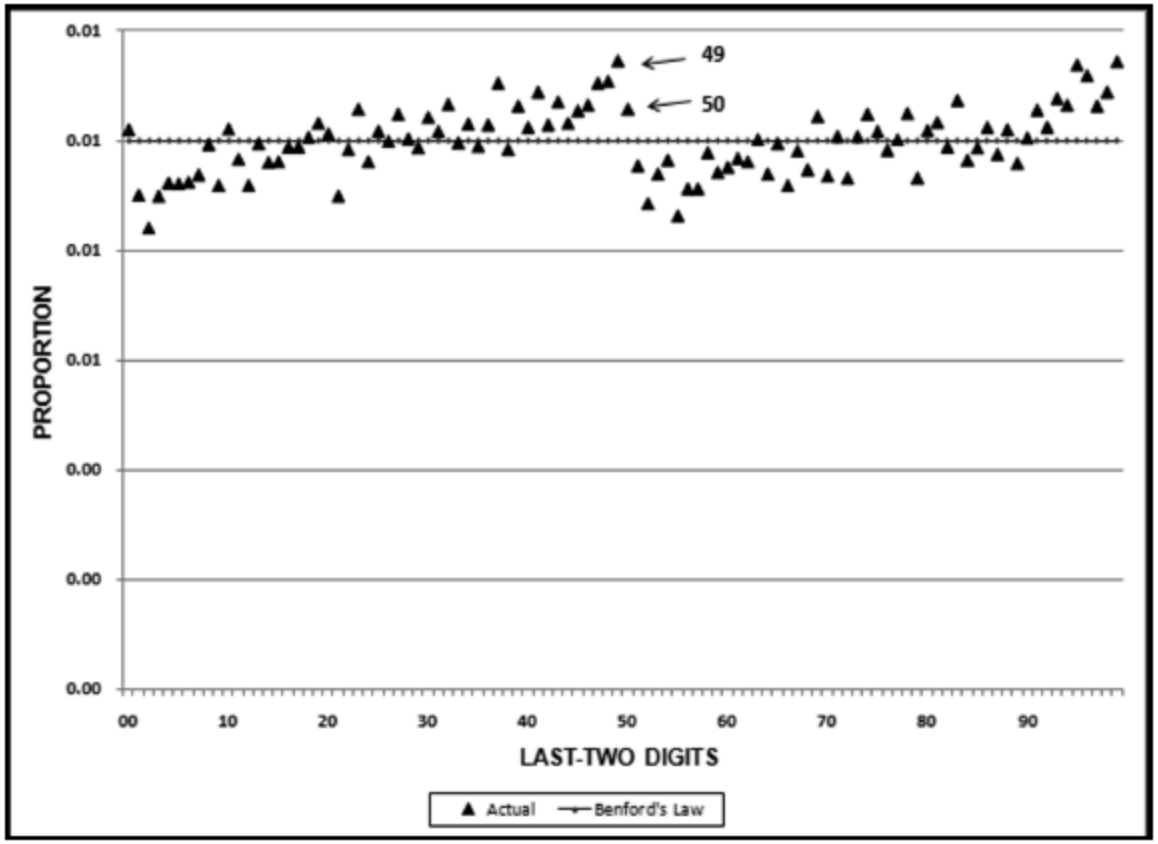


FIGURE 8.17 Last-Two Digits of Taxpayer Taxable Incomes

RECENT APPLICATIONS

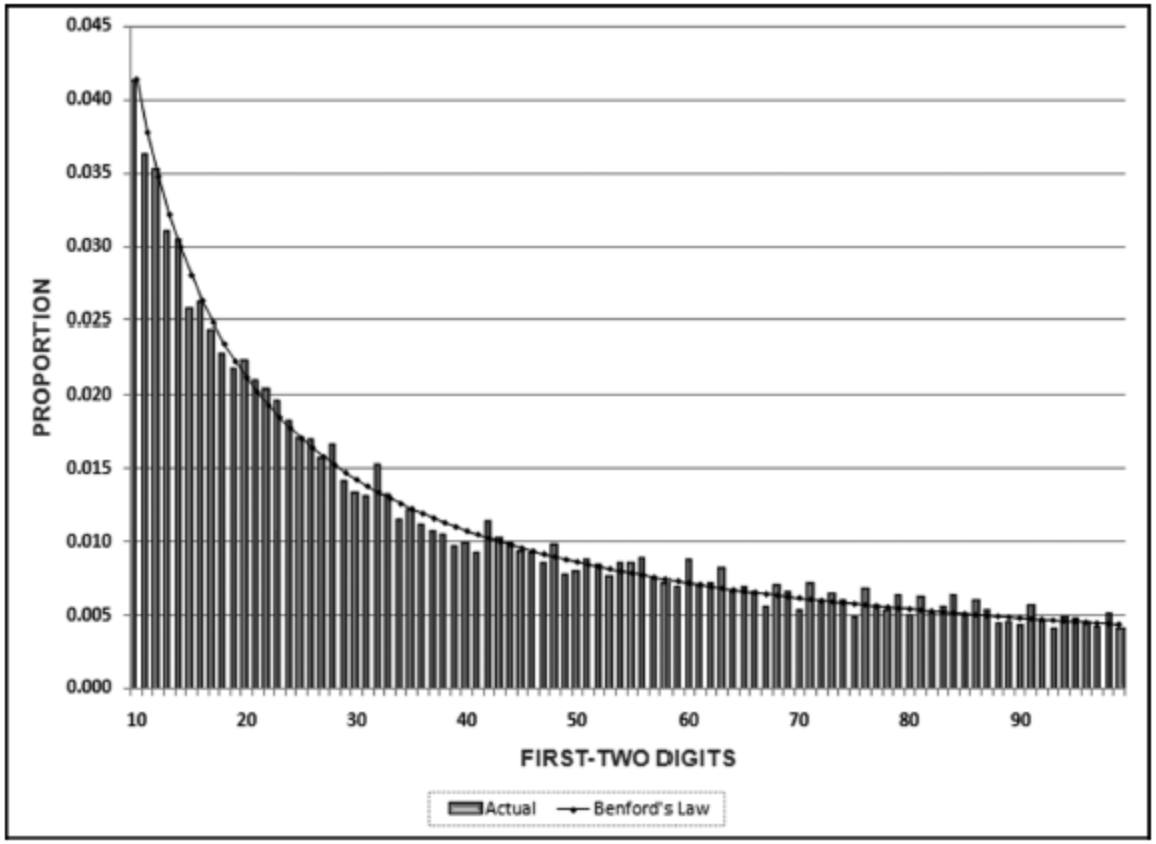


FIGURE 9.2 First-Two Digits of the 2005 Accounting Data

RECENT APPLICATIONS

TABLE 9.4 Numbers Reported by Enron for 1997 to 2000

	2000	1999	1998	1997
Total revenues (in $ millions)	100,789	40,112	31,260	20,273
Net income before cumulative effect of accounting changes (in $ millions)	979	1,024	703	105
Cumulative effect of accounting changes, net of tax (in $ millions)	–	(131)	–	–
Net income (in $ millions)	979	893	703	105
Earnings per share of common stock (diluted and in dollars)	1.12	1.10	1.01	0.16

RECENT APPLICATIONS

Enron
P.O.Box 1188
Houston, TX 77251-1188

News Release

Mark Palmer
(713) 853-4738

ENRON REPORTS RECORD FIRST QUARTER RECURRING EARNINGS OF $0.47 PER DILUTED SHARE; INCREASES EARNINGS EXPECTATIONS FOR 2001

FOR IMMEDIATE RELEASE: Tuesday, April 17, 2001

HOUSTON -- Enron Corp. announced today an 18 percent increase in diluted earnings per share to $0.47 for the first quarter of 2001 from $0.40 a year ago. Results for the quarter include:

- a 281 percent increase in revenues to $50.1 billion;
- a 20 percent increase in net income to $406 million;

RECENT APPLICATIONS

Revenues:	
Premiums and other considerations	$ 83,505
Net investment income	12,222
Net realized capital gains (losses)	(55,484)
Unrealized market valuation losses on AIGFP super senior credit default swap portfolio	(28,602)
Other income (loss)	(537)
Total revenues	11,104
Benefits, claims and expenses:	
Policyholder benefits and claims incurred	63,299
Policy acquisition and other insurance expenses	27,565
Interest expense	17,007
Restructuring expenses and related asset impairment and other expenses	758
Other expenses	11,236
Total benefits, claims and expenses	119,865
Income (loss) before income tax expense (benefit), minority interest and cumulative effect of change in accounting principles	(108,761)
Income tax expense (benefit):	
Current	1,706
Deferred	(10,080)
Total income tax expense (benefit)	(8,374)
Income (loss) before minority interest and cumulative effect of change in accounting principles	(100,387)
Minority interest	1,098
Income (loss) before cumulative effect of change in accounting principles	(99,289)
Cumulative effect of change in accounting principles, net of tax	—
Net income (loss)	$ (99,289)

FIGURE 9.7 Extract from the AIG 10-K filing for Fiscal 2008

RECENT APPLICATIONS

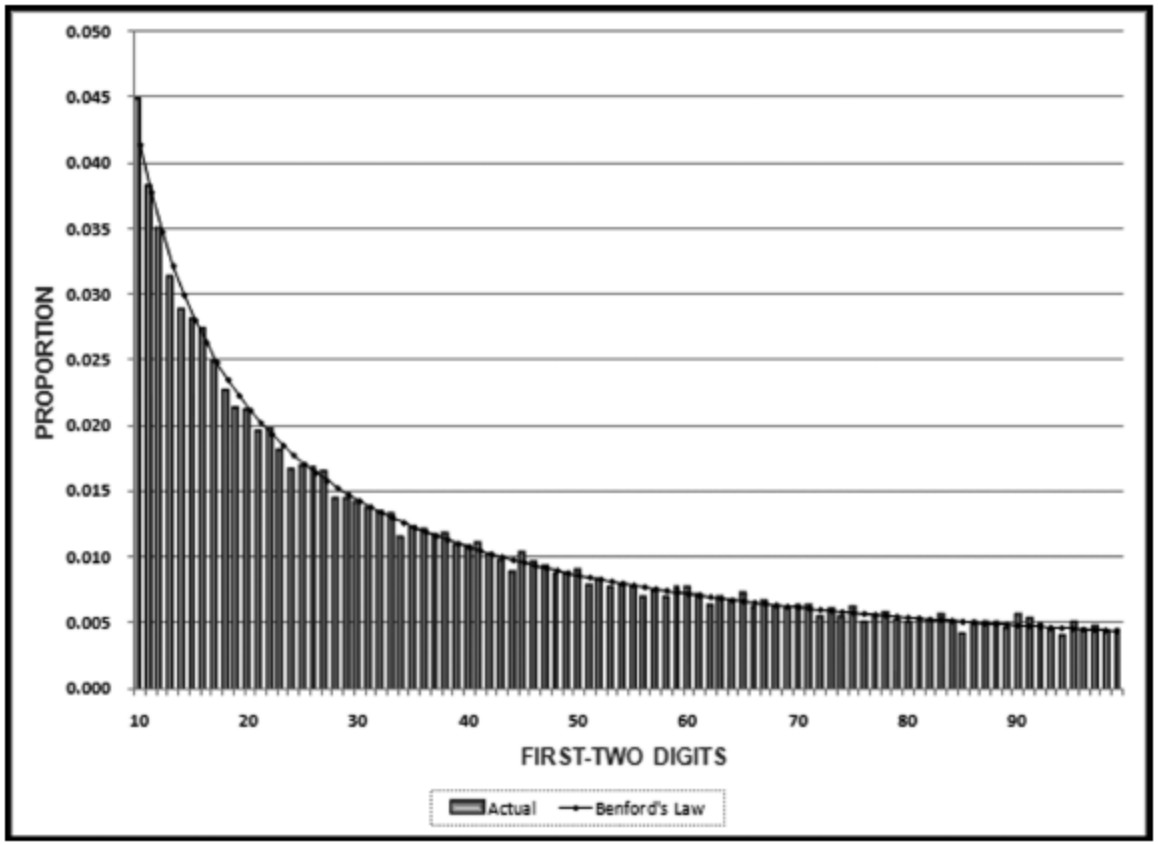


FIGURE 9.8 First-Two Digits of the Ledger Balances

RECENT APPLICATIONS

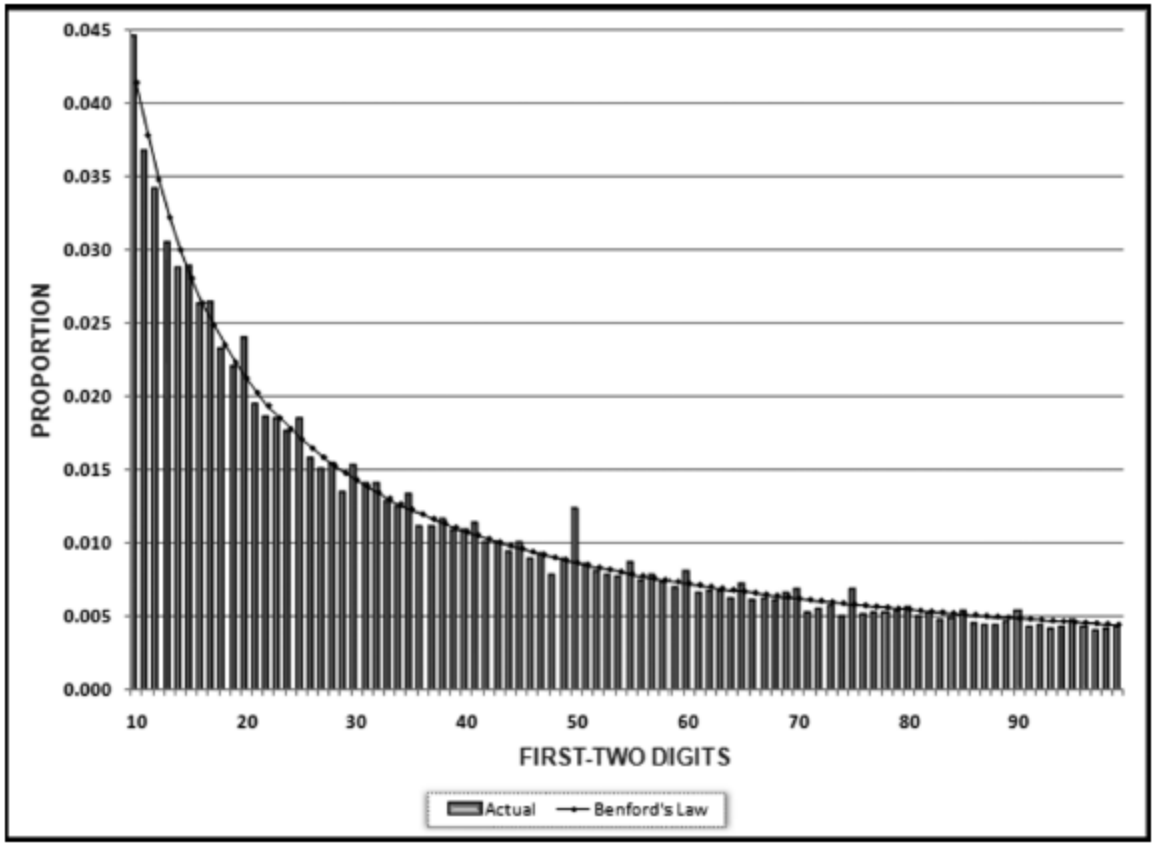


FIGURE 11.8 First-Two Digits of the Chrysler Payments

RECENT APPLICATIONS

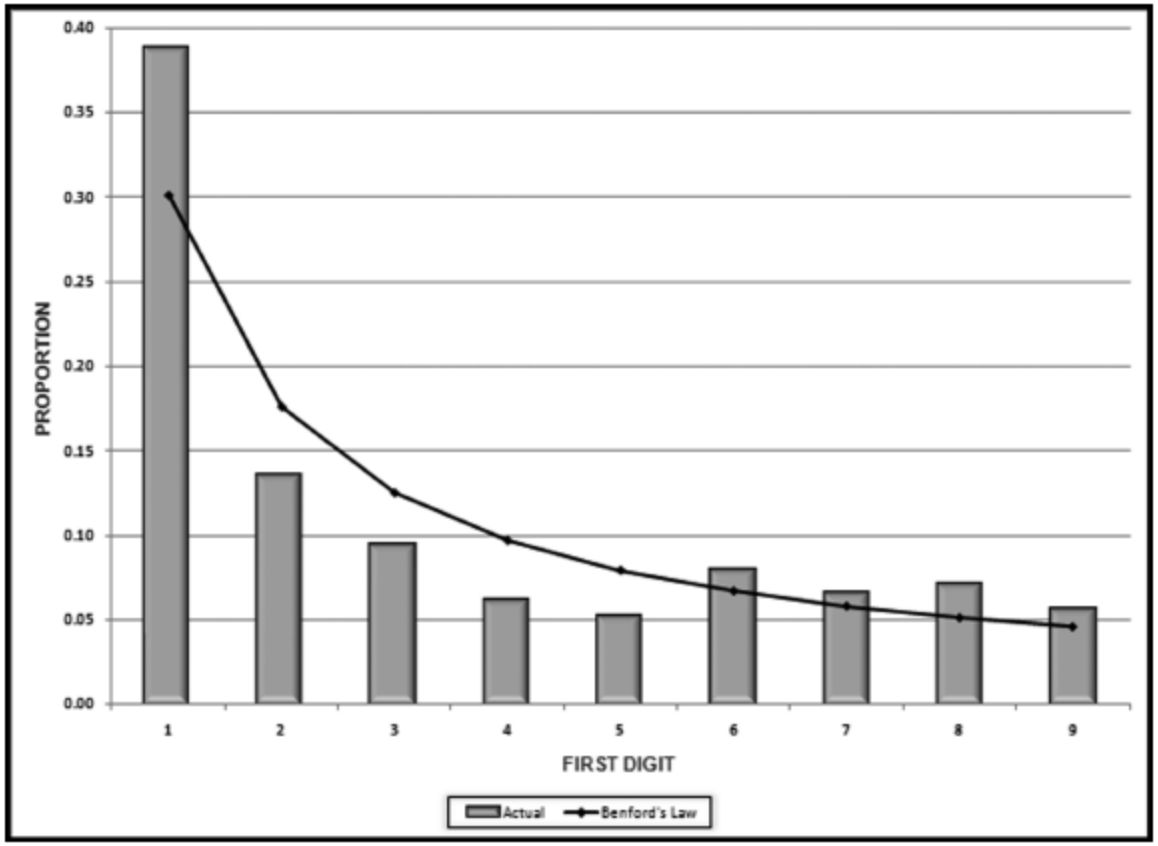


FIGURE 11.13 First Digits of the Fairfield Monthly Returns

RECENT APPLICATIONS

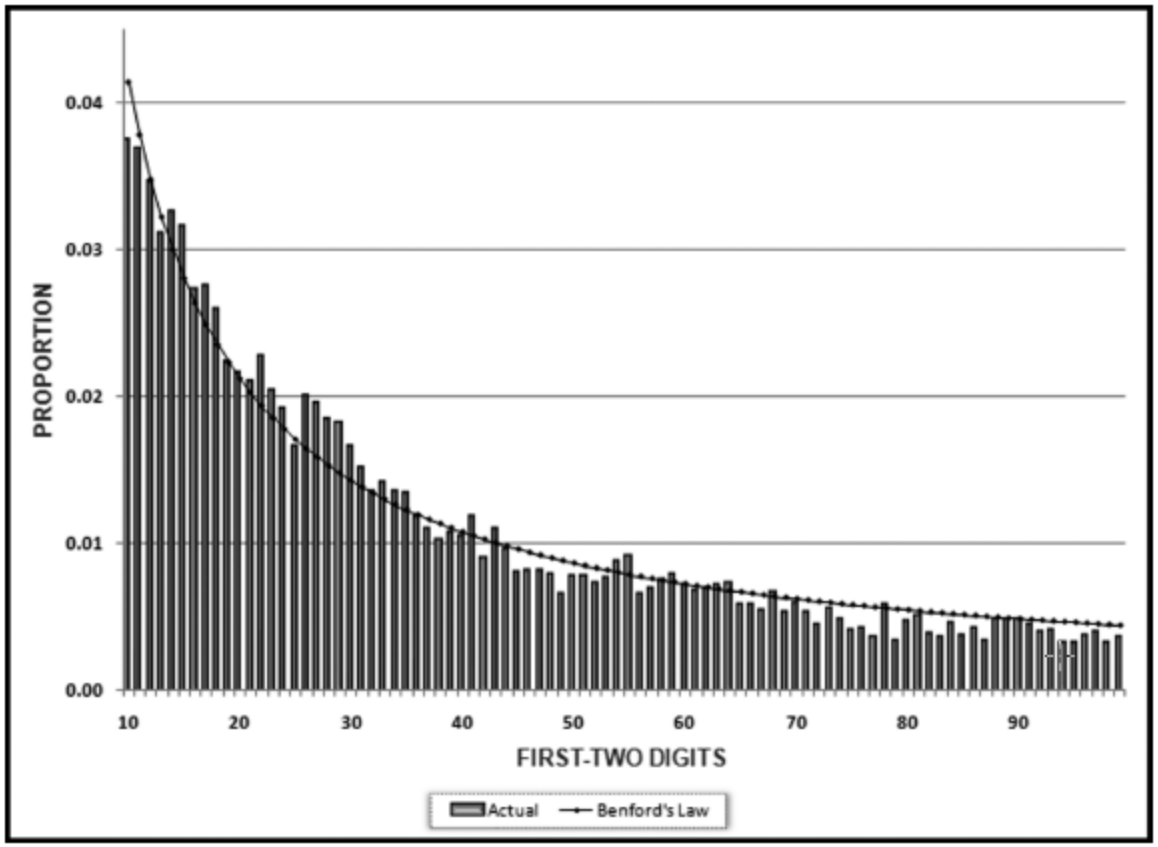


FIGURE 11.19 First-Two Digits of the Daily Apple, Berkshire, and Dell Returns

RECENT APPLICATIONS

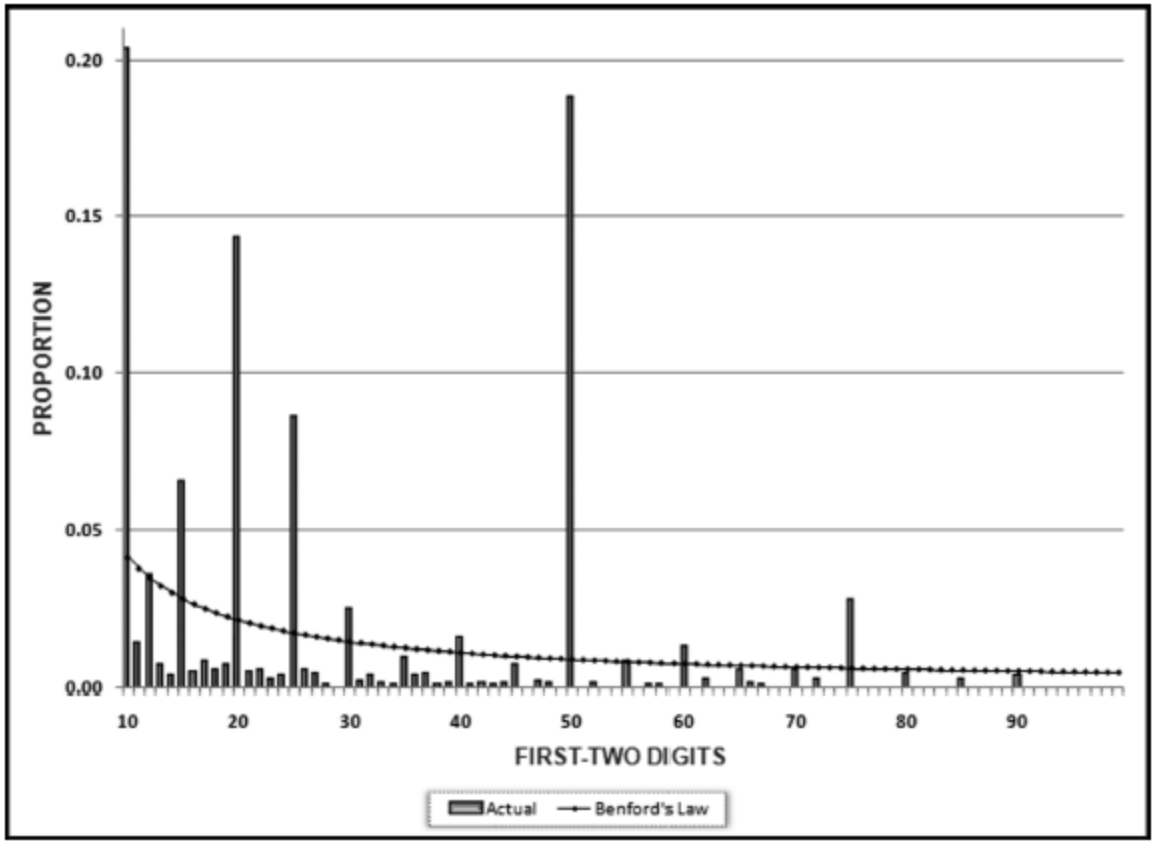


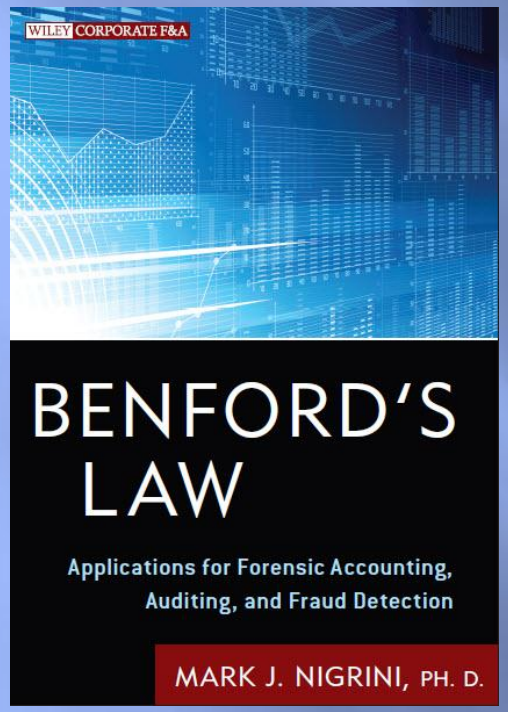
FIGURE 13.11 Digits of the Lehman Gift Amounts

FORENSIC ANALYTICS

1) Access, Excel, and PowerPoint
2) High-level overview and Benford's Law
3) Data interrogation tests
4) Continuous monitoring (correlation and time-series)
5) Fraud risk assessment
6) Financial statement fraud
7) Analytics and purchasing card transactions
8) Concluding comments

FORENSIC ANALYTICS

- Analytics is only one part of the forensic investigations process.
- Collect and analyze data at the start.
- Don't use incomplete or inaccurate data.
- Make use of a subject matter expert.
- Remember the legal environment.
- FA is still an evolving discipline.



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mark_nigrini@msn.com

609-858-3820