

Demo Project

Data Transactions: 3678
 Vendors Records: 504
 Payroll Records: 307
 QuickBooks Logs: 0

Statistics

- High **135988.3**
- Low **1.27**
- Average **2734.35**
- Standard Deviation **6826.63**
- Median **674.14**
- Variance **46602920.55**
- Skewness **6.37**

the data distribution is highly skewed (6.37). It means the degree of distortion from the symmetrical bell curve or the normal distribution (the lack of symmetry in data distribution) is high. In other words, there are transactions of very extreme amounts/Outliers which need to be investigated. The spread of data (amounts) around the mean in percentage (Relative Standard Deviation) is 2734.35 +/- 249.66 .

Z-Score

A **Z-score** is a numerical measurement used in statistics of a value's relationship to the mean (average) of a group of values, measured in terms of standard deviations from the mean. Actually the Z-Score statistical calculation standardizes the data and its distribution regardless of the amounts and variance within the data set. If a Z-score is 0, it indicates that the data point's score is identical to the mean score. The Z-Score tells the user how far the data exceeds the norm. Statistical theory states that in 99.7 percent of the time, the Z-Score will be between -3 and +3.



Normal: 96.38% (ZScore <= 2 or ZScore >= -2) |
 Critical: 1.31% (ZScore >= 2 or ZScore <= -2) |
 Severe: 2.31% (ZScore >= 3 or ZScore <= -3)

Z Score (Top 10 results)

TransactionID	Paid To/ Received From	Amount	Z-Score	Modified Z-Score
R0507	LUCKY FOODS COMPANY	14130.19	1.6693204084448	1.32951419647404
R0507	LUCKY FOODS COMPANY	4977.1	0.328529163243154	0.425150501585526
R0507	LUCKY FOODS COMPANY	1857.47	-0.12845012924369	0.11691796880315
R0507	LUCKY FOODS COMPANY	5388.76	0.388831216866544	0.465824236754502
R0507	LUCKY FOODS COMPANY	5280.08	0.372911216896204	0.455086196774508
R0507	LUCKY FOODS COMPANY	3034.24	0.0439291343291512	0.233187782083031
R0507	LUCKY FOODS COMPANY	15079.88	1.80843583696736	1.4233475530125
R0507	LUCKY FOODS COMPANY	1912.18	-0.120435929773896	0.122323546345526
R0507	LUCKY FOODS COMPANY	4318.75	0.232090701884367	0.360102759399024
R0507	LUCKY FOODS COMPANY	3680.84	0.138646395838367	0.297074574970997

Benford's Law Analysis

First Digit Law is an observation about Percentage of time digits **1 through 9** are expected to occur in the first position in a genuine data set of numbers. Although the obtained results below can not be considered definitive and do not decidedly prove the absence or presence of fraud; however, additional investigation work is warranted for the predictions (difference between the expected and observed values) that do not hold true for the data. Following steps are advised:

- Analyse data to ensure it's validation.
- Investigate whether specific unusual transactions/events, accounting/ business changes, random fluctuations, or misstatements may have impacted the data set.
- Examine the Z Scores report for the set of transactions starting with the particular first digit where predictions do not hold true.

Benford's First Digit Law (Top 10 results)

Digit	Count	Actual Value	Ideal Value	Difference	Percentage
1	1034	0.2811	0.301	0.02	
2	660	0.1794	0.1761	0.003	
3	453	0.1232	0.1249	0.002	
4	381	0.1036	0.0969	0.007	
5	314	0.0854	0.0792	0.006	
6	246	0.0669	0.0669	0	
7	221	0.0601	0.058	0.002	
8	194	0.0527	0.0512	0.001	
9	175	0.0476	0.0458	0.002	

Duplicate Payments Same Vendor No of total flagged transactions **1254**

34.0946 % Flagged Transactions



Duplicate Payments Same Date No of total flagged transactions **227**

6.1718 % Flagged Transactions



Non-Business Day Transactions No of total flagged transactions **102**

2.7732 % Flagged Transactions



Similar Vendors (Addresses) No of total flagged transactions **145**

28.7698 % Flagged Transactions



Similar Vendors (Names) No of total flagged transactions **37**

7.3413 % Flagged Transactions



Vendor Containing Fictitious Keywords No of total flagged transactions **27**

5.36 % Flagged Transactions



At/Under Approval Cut-Off Level No of total flagged transactions **155**

4.21 % Flagged Transactions



Just Under Approval Cut-Off Level No of total flagged transactions **6**

1 % Flagged Transactions



Amounts Exactly Twice as much as the other:

47 No of Occurrences

When an amount is paid to a vendor and it's exactly double a previous amount paid there is a chance the employee is expensing the double amount, voiding the check, then issuing the correct amount to the vendor and writing a check to themselves for the other half.

Amounts 5% +/- the other:

41 No of Occurrences

Some employee's that commit fraud get accustomed to the same amount every month that they steal. If they do for six months stealing 10K a month, they will either become more bold and increase the amount, to hold steady at our around the same amount. We provide a list of all amounts that are 5% or less in any data set. This will give us a quick look to see if it's the same vendor or many vendors. If it's the same vendor around, but not exactly the same amount, it's something that required further investigation.

Employee Cross-Check possible matches:

228 No of Occurrences

Employees that use fictitious invoices will sometimes use their own address. Employees may also alter a certain paycheck amount for only one pay period then return their paycheck amount back to normal amount.

Amounts Start with the Same **First Four Digits**:

50 No of Occurrences

Amounts starting with same first four digits, i.e. \$117.53 and \$1,175.38, This could well be an error or a legit transaction but there is a chance the employee is expensing the double amount, voiding the check, then issuing the correct amount to the vendor and writing a check to themselves for the rest.

Relative Size Factor Distribution

Relative Size Factor test compares large amounts to a benchmark to see how large they are relative to some norm. The test identifies subsets where the largest amount is out of line with the other amounts for that subset. Outliers may not be the largest amounts in the entire data set but are large in relation to particular members of the subset. Large differences might be attributed to errors such as the record belonging to another subset or the amount being posted incorrectly (e.g., shifted decimal point). Large differences may also be an indication of fraudulent activity.



Normal: 16.761363636363636%(RSF <= 1) | **Low Severity:** 63.35%(RSF > 1 & RSFValue <= 2) | **Medium Severity:** 10.23%(RSF b/w 2 & 3) | **High Severity:** 2.27%(RSF b/w 3 & 4) | **Very High Severity:** 7.39%(RSF > 4)

Payroll Analysis

Below results are based on **Current Pay Period=6** and **Total Pay Periods=26.0**

Year to date payroll is divided by pay periods then multiplied by total pay periods in a year. The annualized year to date amount is compared to the annual salary or annualized hourly rate to find outliers. Employees who have access to payroll and commit fraud will have amounts in excess of expected annualized amounts.

When year to date actual amounts are annualized and compared to expected annual wage costs, the overtime wages are also annualized showing the impact of overtime in a full year.



Normal: 3.09%(RSF <= 1) | **Low Severity:** 24.4%(RSF > 1 & RSFValue <= 2) | **Medium Severity:** 9.97%(RSF b/w 2 & 3) | **High Severity:** 12.37%(RSF b/w 3 & 4) | **Very High Severity:** 50.17%(RSF > 4)