

(Analytical Review, Planning and Budgeting, Interim Tests of Tesla, Inc.)

QUESTION 1: Financial Ratios

Financial ratios of Tesla:

date <chr>	ReturnOnEquity <dbl>	OperatingMargin <dbl>	CurrentRatio <dbl>	QuickRatio <dbl>	InventoryTurnRatio <dbl>	DebtToEquity <dbl>	AccountsReceivableTurnover <dbl>	WorkingCapital <dbl>
2011-12-31	-1.1355353	-1.23132363	1.9485730	1.6868281	4.078152	1.330376	36.98606	181499000
2012-12-31	-3.1773296	-0.95408899	0.9734005	0.4753482	1.539106	3.611724	29.76511	-14340000
2013-12-31	-0.1109456	-0.03043612	1.8750207	1.3709106	5.915870	1.610880	81.68120	590779000
2014-12-31	-0.3225148	-0.05837030	1.5179900	1.0654035	3.353717	3.040637	28.20373	1091491000
2015-12-31	-0.8160778	-0.17711927	0.9912274	0.5374939	3.166305	3.806621	46.08646	-24706000
2016-12-31	0.0000000	-0.09533249	1.0742733	0.7194677	3.385871	2.298205	36.05538	432791000
2017-12-31	0.0000000	-0.13879756	0.8561306	0.5611946	5.194857	3.622241	53.76991	-1104150000

7 rows

Financial ratios of Ford:

date <chr>	DebtToEquity <dbl>	ARTurnover <dbl>	QuickRatio <dbl>	InventoryTurnover <dbl>	OperatingMargin <dbl>	PERatio <dbl>	EarningsPerShare <dbl>	WorkingCapital <dbl>	ReturnOnEquity <dbl>
2012-12-31	10.854393	Inf	-Inf	15.35439	0.042026370	0	0.8617944	0.00000e+00	0.35191572
2013-12-31	6.643634	Inf	-Inf	16.24222	0.048884744	0	1.1043787	0.00000e+00	0.27195543
2014-12-31	7.521401	Inf	-Inf	15.88628	0.008544042	0	0.4467732	0.00000e+00	0.05033145
2015-12-31	6.849173	0	Inf	14.95925	NaN	Inf	NaN	1.02587e+11	0.25734935
2016-12-31	7.153514	0	Inf	14.22612	NaN	Inf	NaN	1.08461e+11	0.15793624
2017-12-31	6.385555	0	Inf	12.77922	NaN	Inf	NaN	1.15902e+11	0.21862998

6 rows

Financial ratios of General Motors:

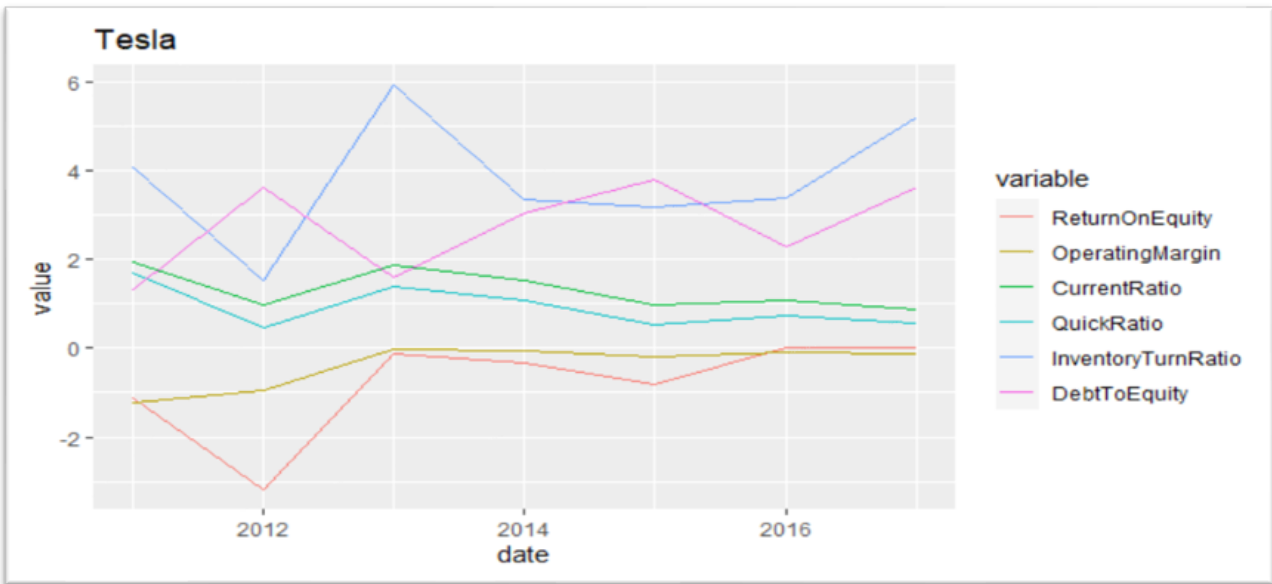
date <chr>	ReturnOnEquity <dbl>	OperatingMargin <dbl>	CurrentRatio <dbl>	QuickRatio <dbl>	InventoryTurnRatio <dbl>	DebtToEquity <dbl>	AccountsReceivableTurnover <dbl>	WorkingCapital <dbl>
2011-12-31	0.2410808	0.037637414	1.2197610	0.9506444	10.49120	1.374239	14.94039	11697000000
2012-12-31	0.1707317	-0.199420712	1.2964143	1.0238924	10.34770	1.612129	14.45839	16004000000
2013-12-31	0.1254723	0.033012282	1.3058546	1.0809139	11.07109	1.426010	17.81980	19089000000
2014-12-31	0.1113743	0.009812158	1.2734966	1.0658590	11.43007	2.142088	16.64375	17969000000
2015-12-31	0.2429585	0.032141826	0.9745988	0.7813303	11.06917	2.076647	17.50294	-1809000000
2016-12-31	0.2150516	0.057368674	0.8946009	0.7327338	12.06701	2.108632	16.27402	-8978000000
2017-12-31	-0.1103968	0.068796879	0.8940564	0.7553778	13.65357	2.839690	16.34603	-8146000000

7 rows

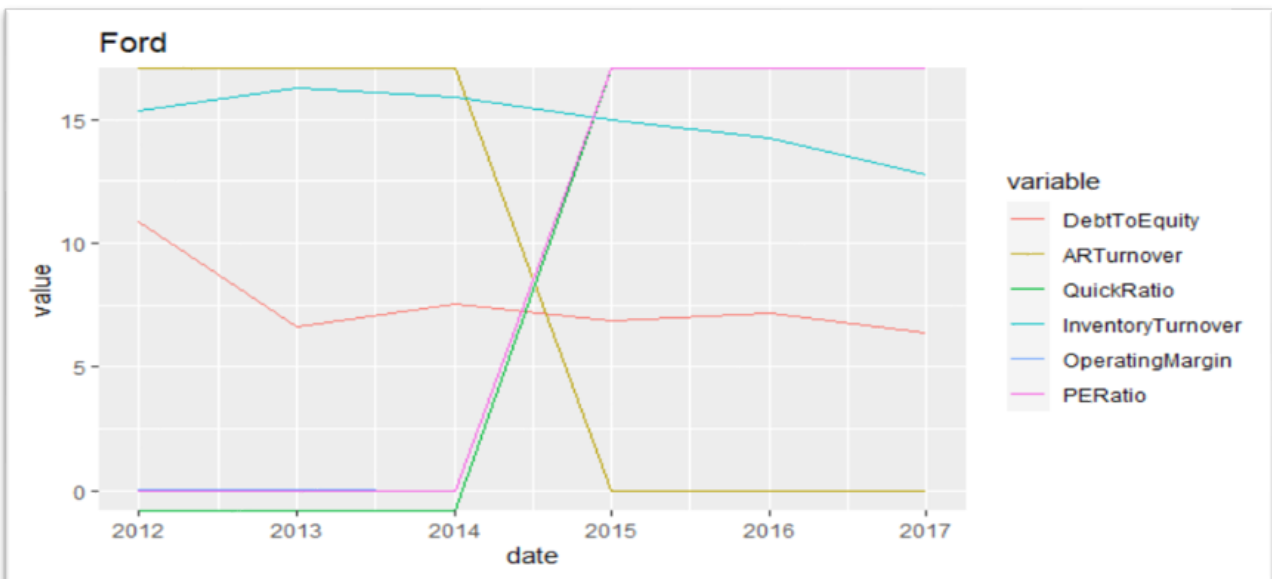
Overall, Tesla's inventory turnover is increasing which is a good sign in the market. Apart from that the debt-to-equity ratio decreased which is also a good sign for Tesla. ROE is increasing which indicates that the company is generating profit without requiring as much investment. Overall, it can be said that Tesla is slowly and steadily gaining its foot on the market.

While comparing these ratios, it can be clearly seen that Ford and GM have higher working capital, inventory turnovers, but this is because most of them have been in the market for a very long time.

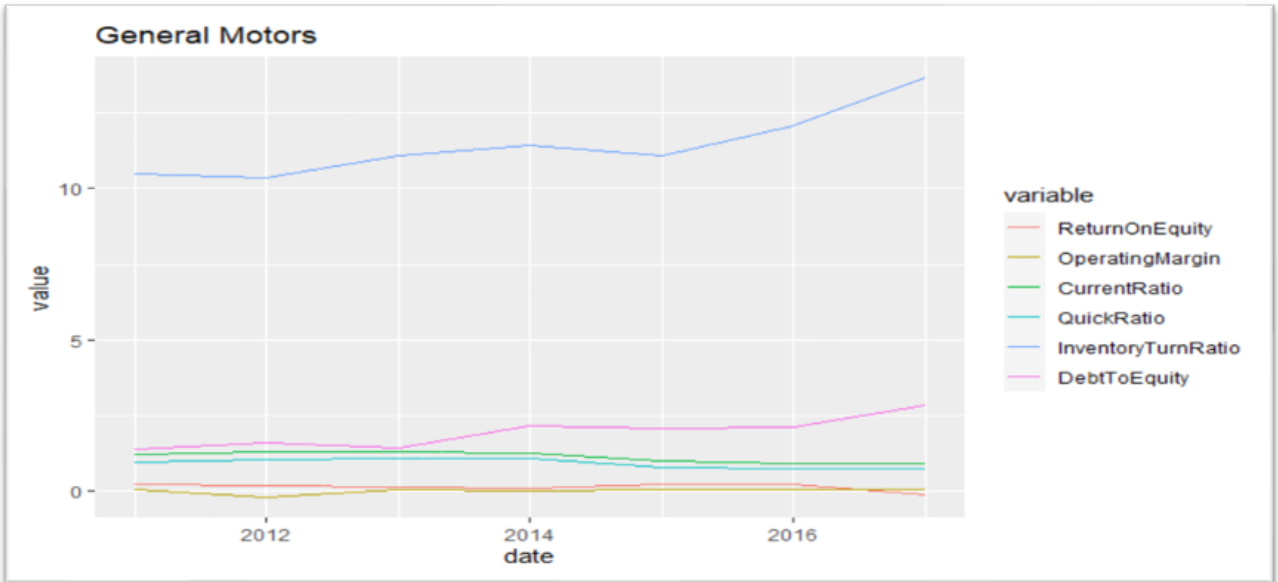
QUESTION 2: Visualization of Technical Metrics



Tesla: Tesla has high debt to equity ratio and high quick ratio which is normal for a new company in any industry. Their ratios seem to be good on closer observation when compared to others.

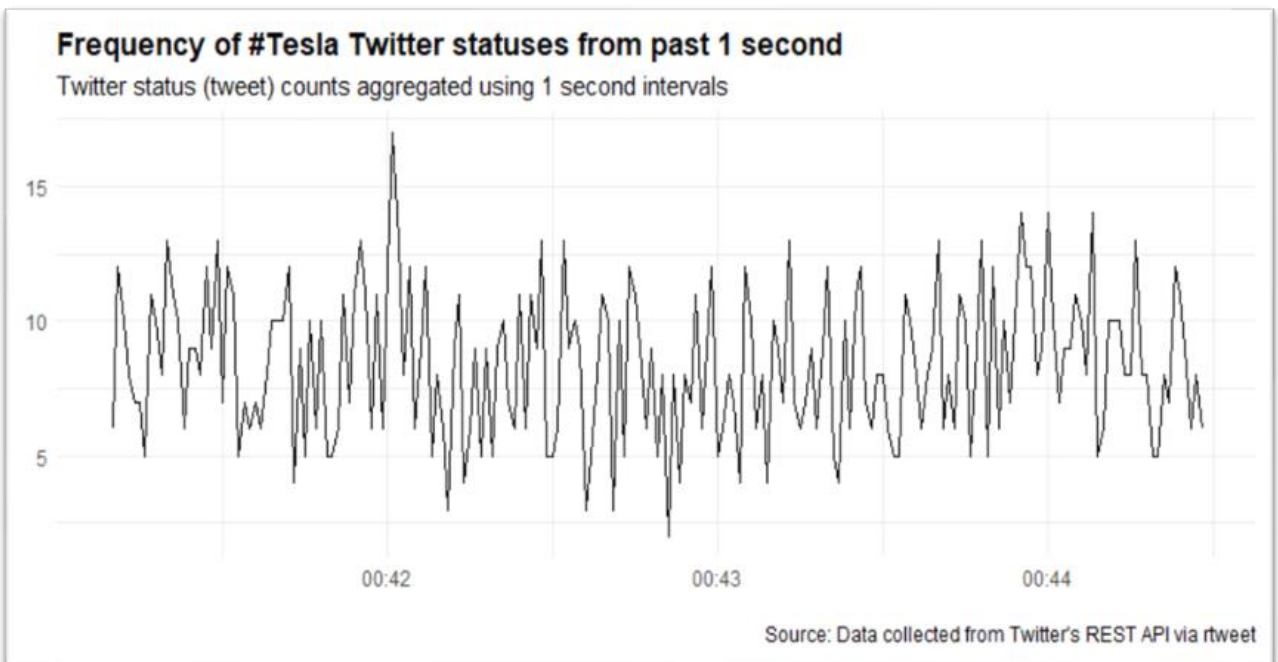


Ford: Their ratios are looking around all over the place. they have infinite and -infinite values which suggest that some key components are not listed in the statements.

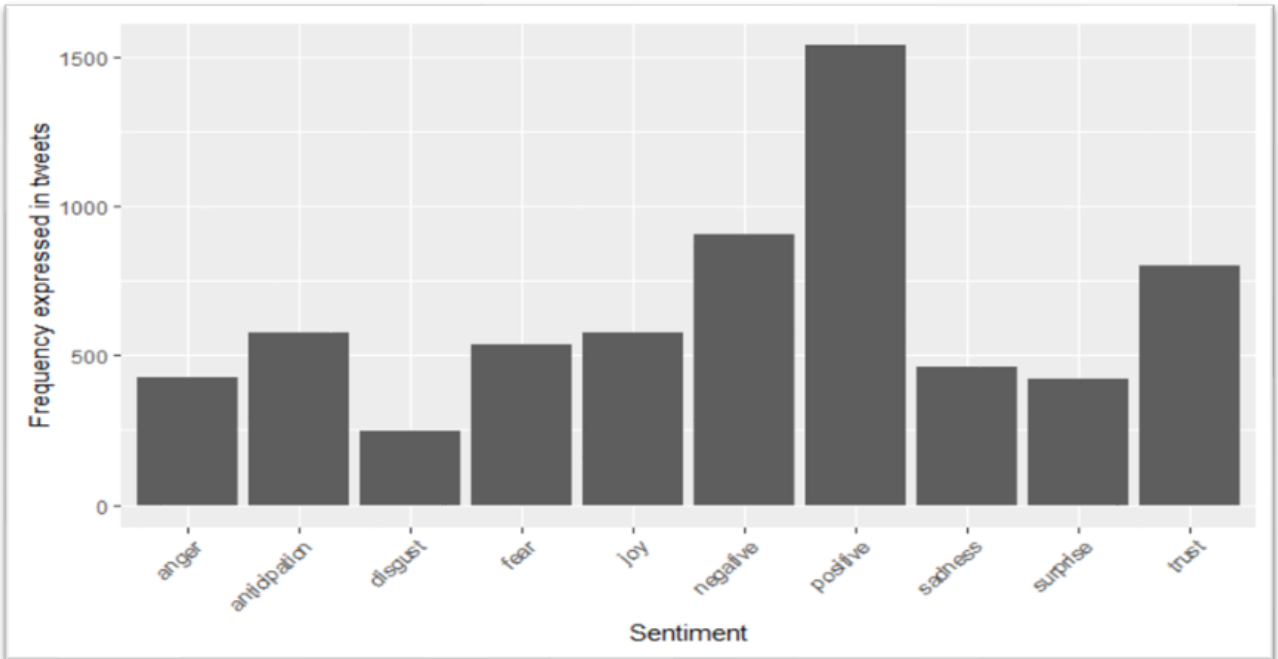


GM: They have a high working capital which overshadows all the other ratios, the high working capital seems to be normal since GM is almost a 100 years old company.

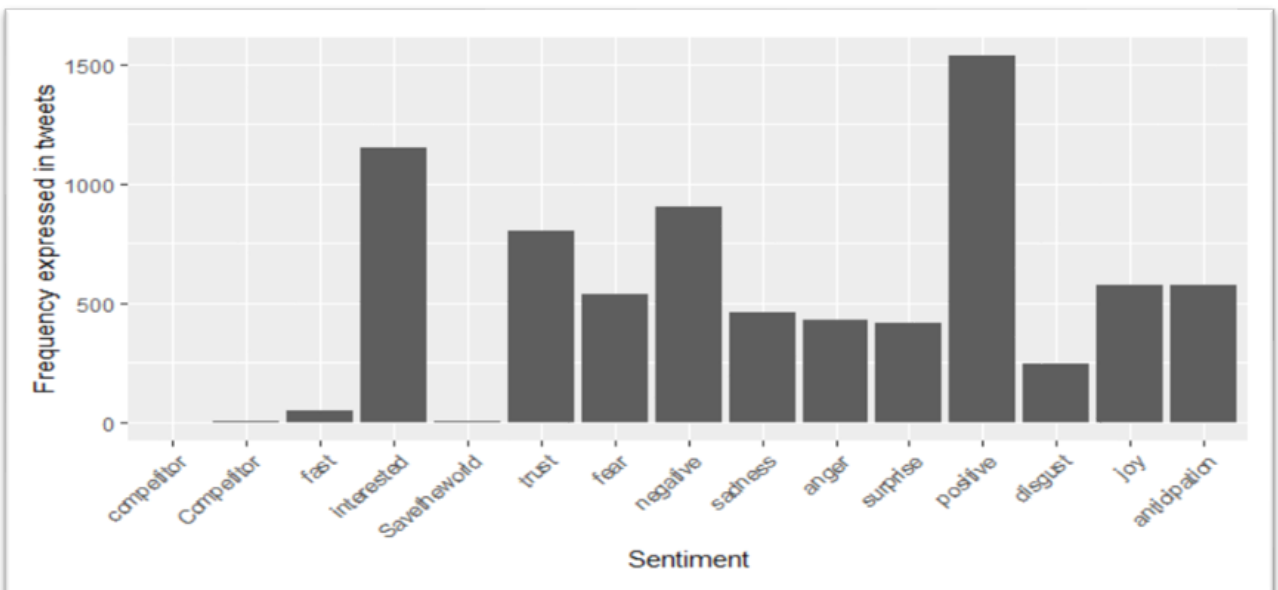
QUESTION 3: Intelligence Scanning with Twitter



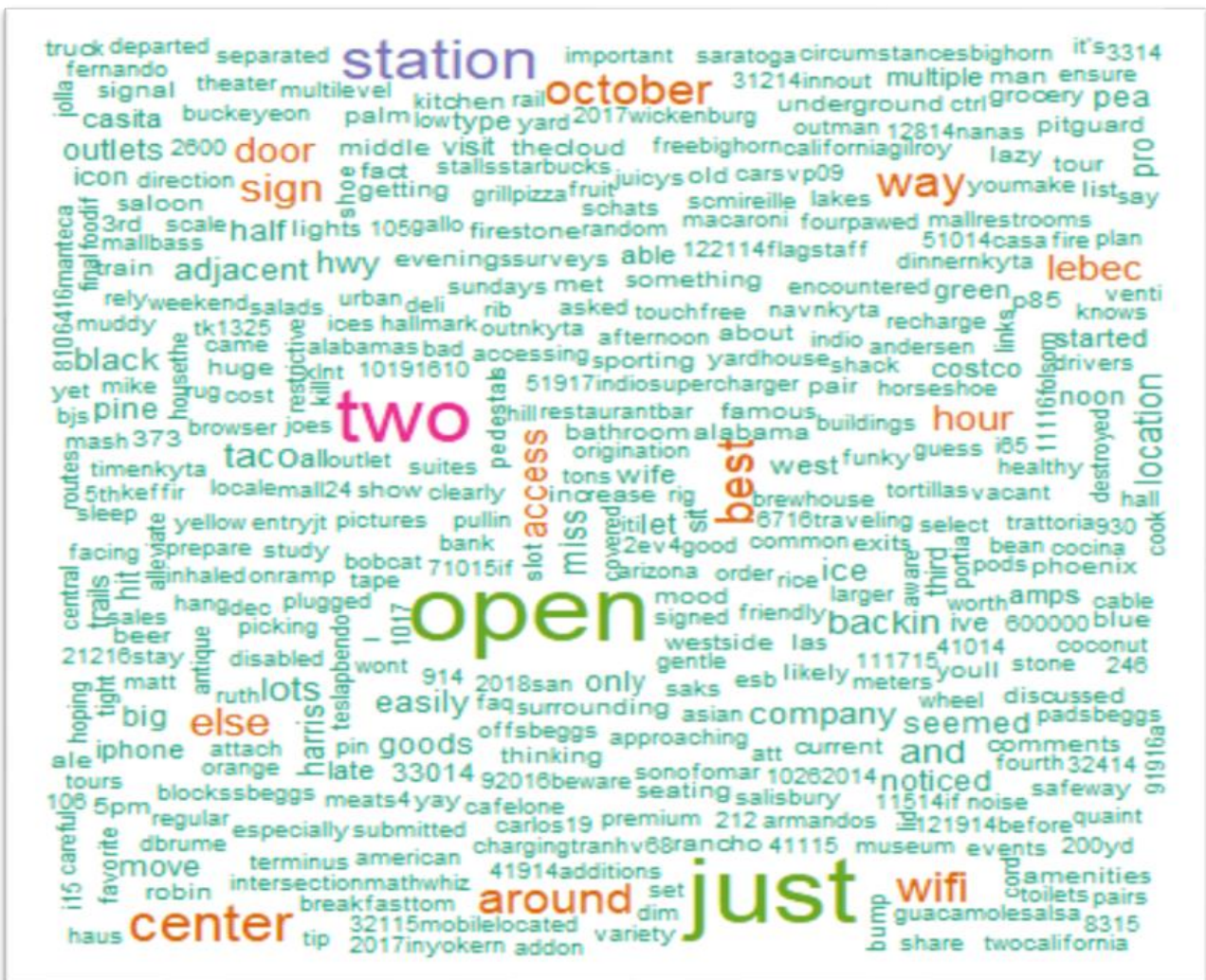
This plot shows the number of tweets that were parsed in one second. The graph shows that there are 10 tweets per second on an average and it peaked at 17 tweets per second.



The general perception of Tesla seems to be positive according to the sentiments followed by negative sentiments which is closely trailed by trustworthiness in people's minds. So we can say that the overall perception of Tesla amongst the general population is good.



QUESTION 4: Extract Intelligence from Product User Forums and Visualize using Wordcloud



The article on tesla forum was based on supercharger tips and reviews: The wordcloud generated pops out the word "open" being the most frequently occurring word. People are concerned about what is "around" the supercharger; how much time ("hour") does it take to fill up batteries; if there are "restrooms" near the "stations" amongst other concerns.

QUESTION 5: Planning and Risk Assessment

Initial Risk intel for Sales is 2 because sales is a high value account.

Initial Risk intel for Returns is 1 because returns is a low value account.

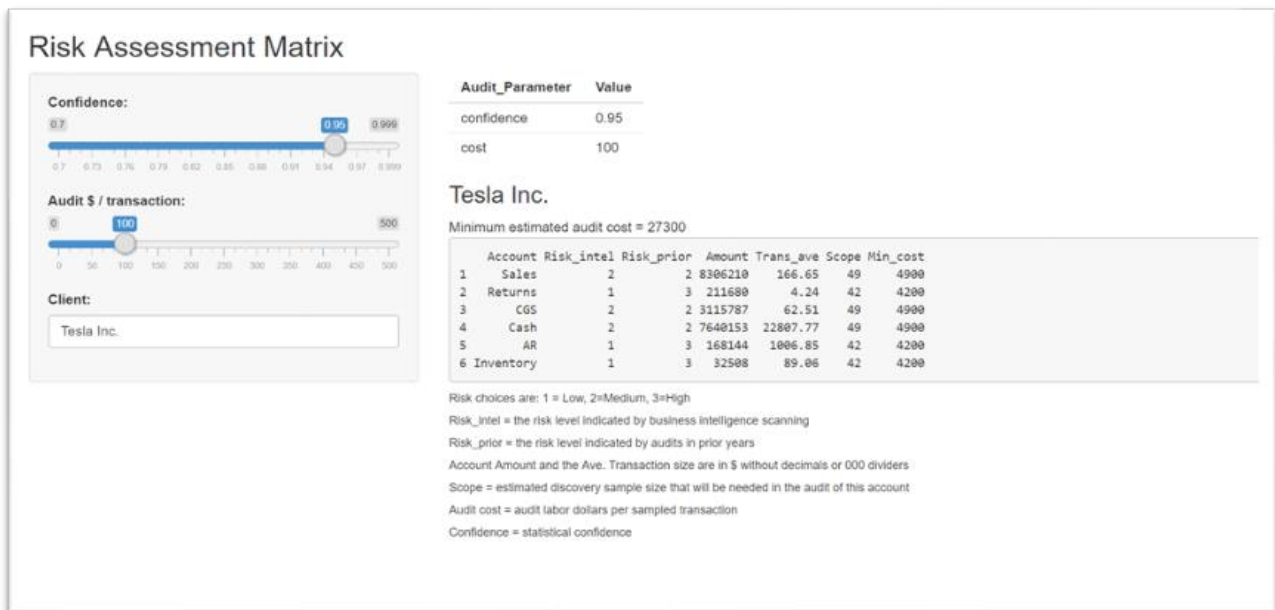
Initial Risk intel for CGS is 2 because CGS is a high value account.

Initial Risk intel for Cash is 2 because Cash is a high value account.

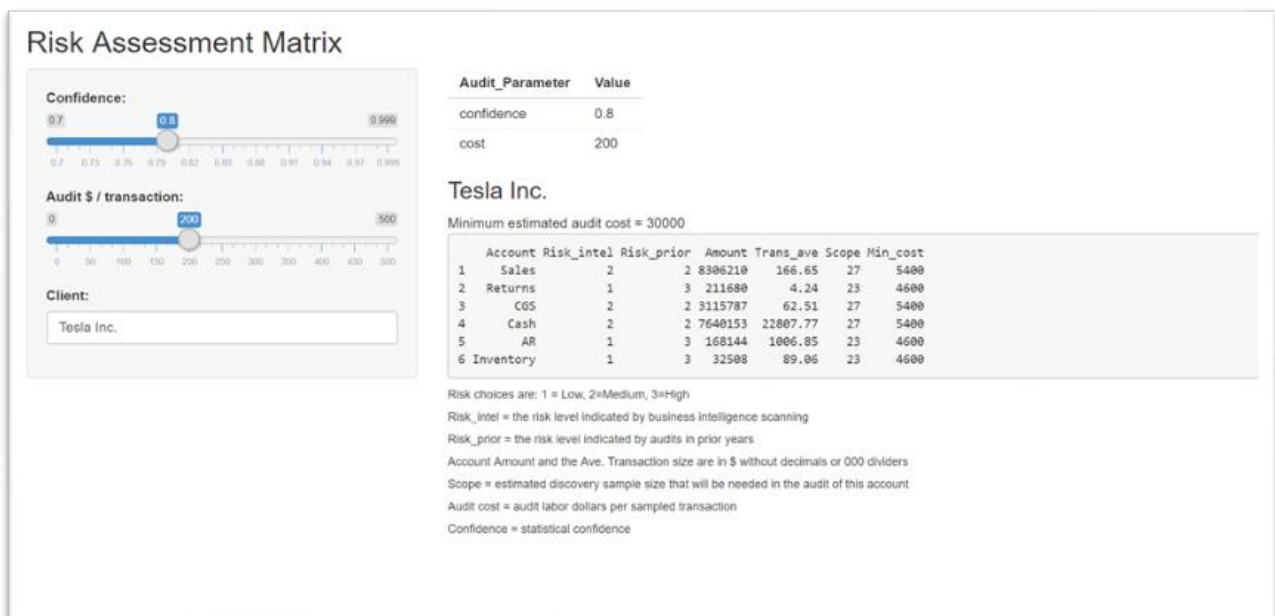
Initial Risk intel for AR is 1 because AR is a low value account.

Initial Risk intel for Inventory is 1 because Inventory is a low value account.

The risk assessment matrix shiny app for calculating the minimum audit costs at 95% CI - \$100 and 80% CI - \$200 have been shown below:



Minimum cost of the audit came out to be \$27300 at 95% Confidence and \$100 per transaction.



Minimum cost of the audit came out to be \$30000 at 80% Confidence and \$200 per transaction.

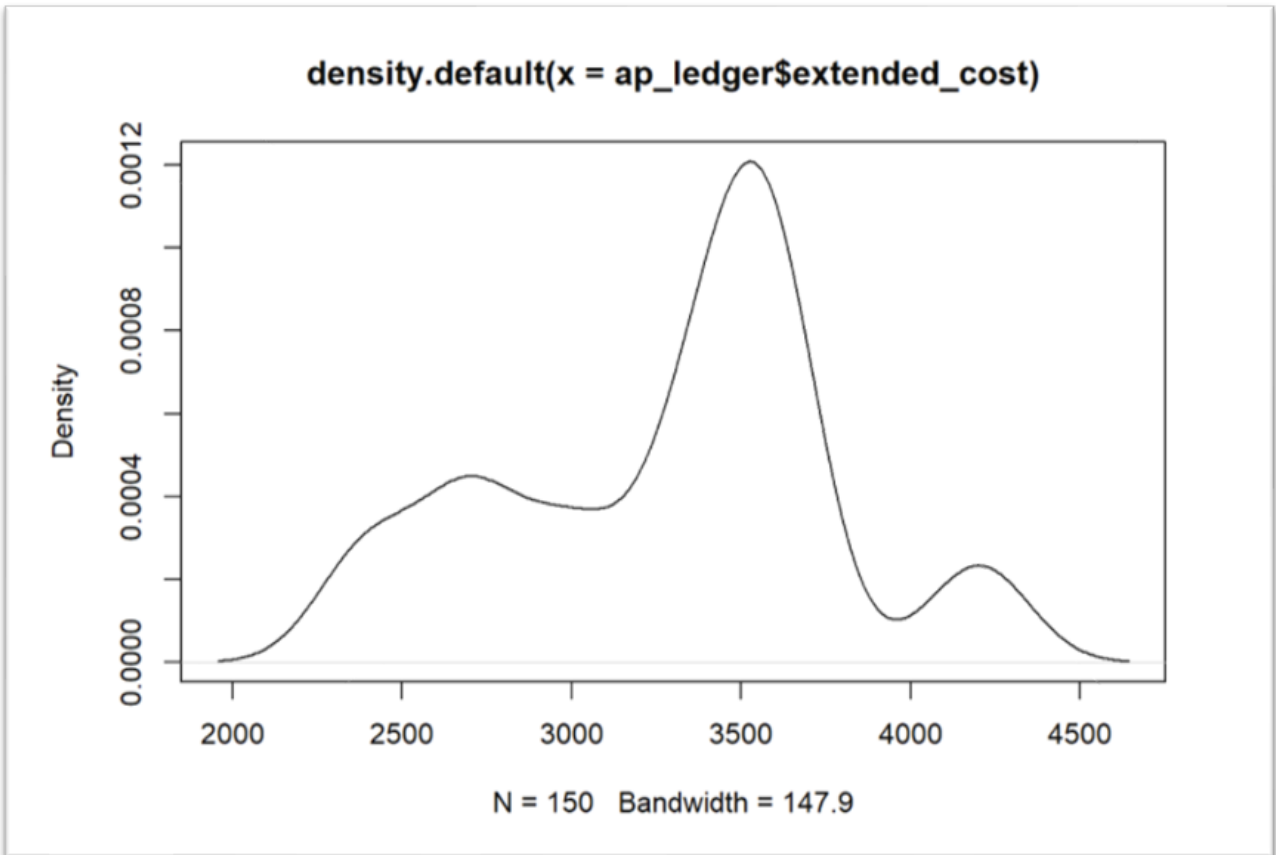
QUESTION 6: Generate the Audit Budget from the Risk Assessment Matrix app

Minimum cost of the audit came out to be \$27300 at 95% Confidence and \$100 per transaction.

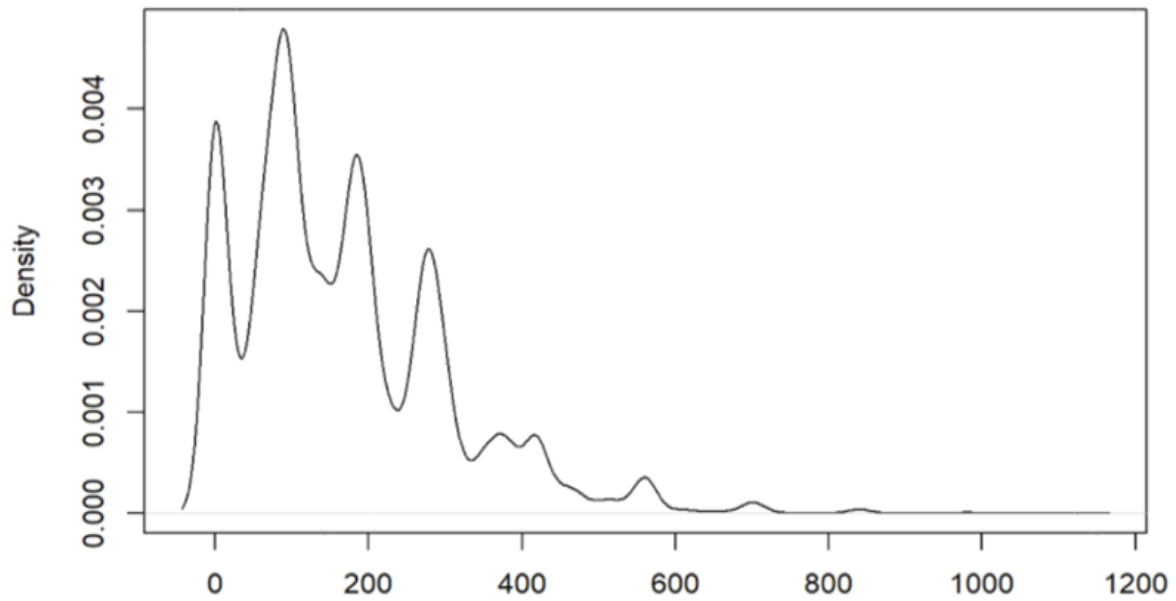
Minimum cost of the audit came out to be \$30000 at 80% Confidence and \$200 per transaction.

QUESTION 7: Preliminary Tests of Transactions Controls

(All inferences have been mentioned after the plots)

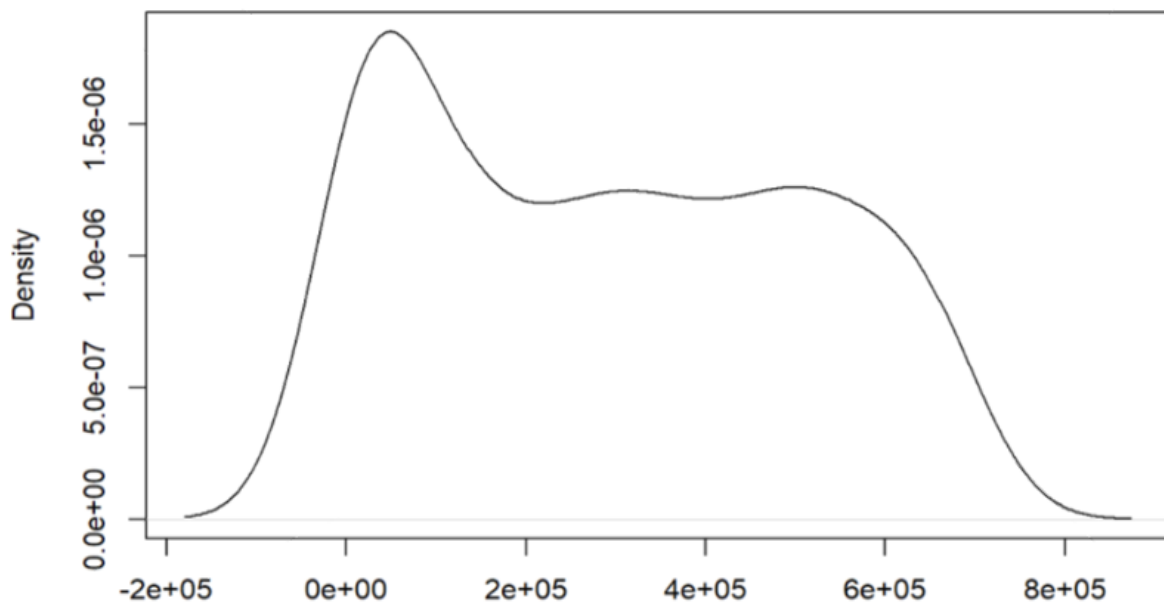


density.default(x = collections_journal\$collection_amount)

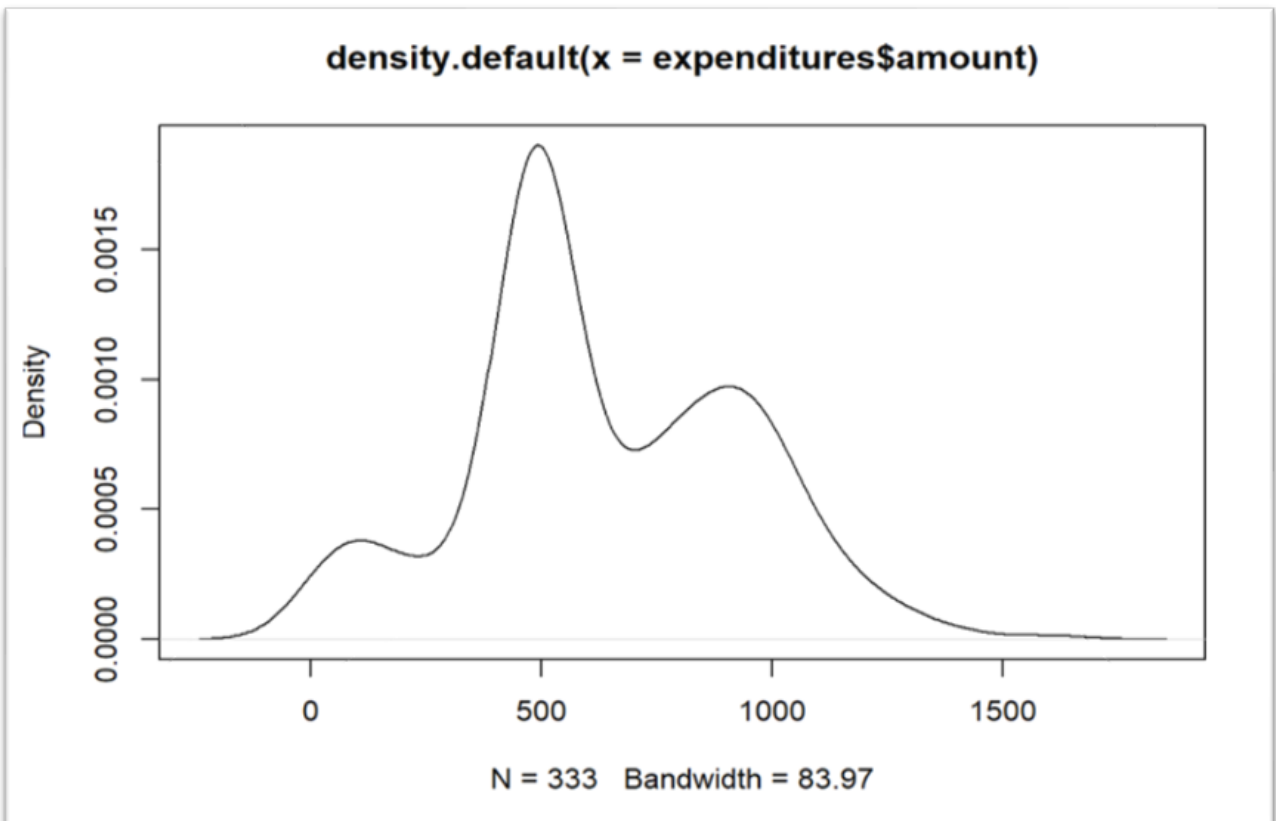
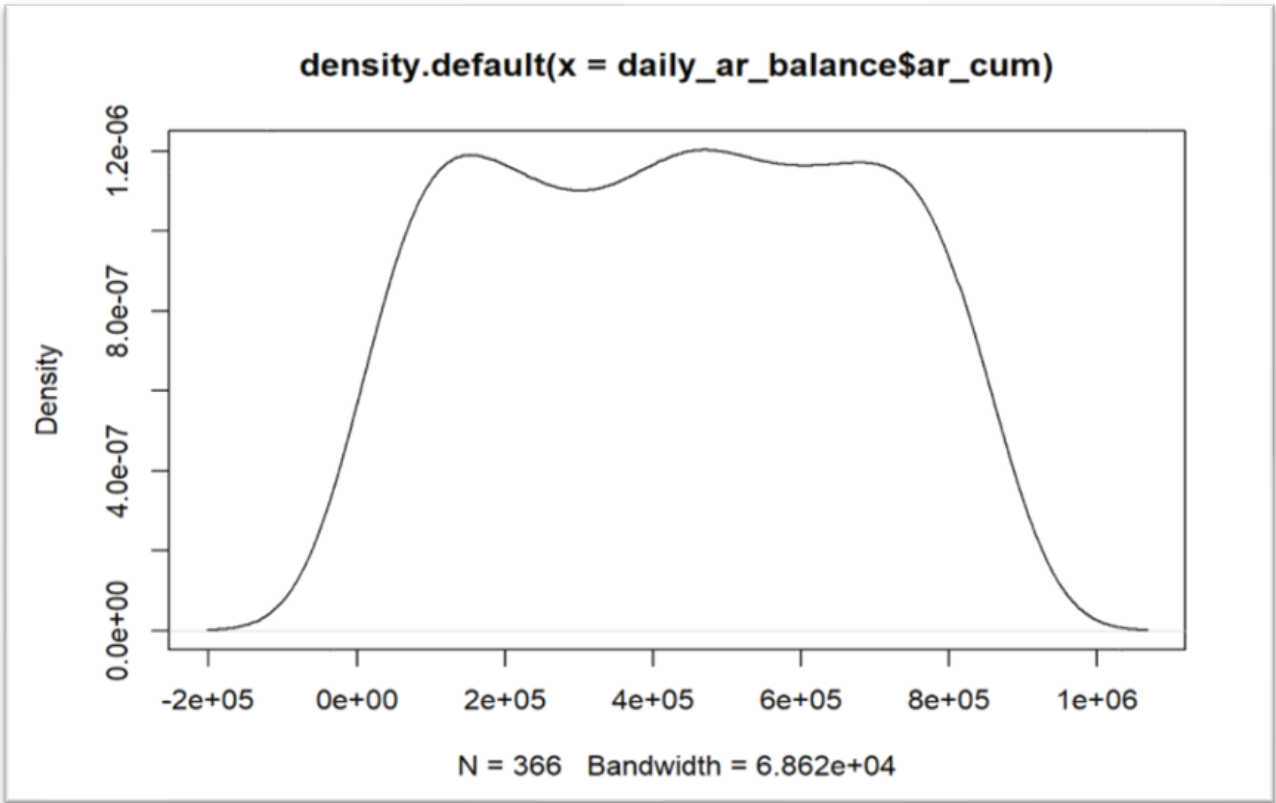


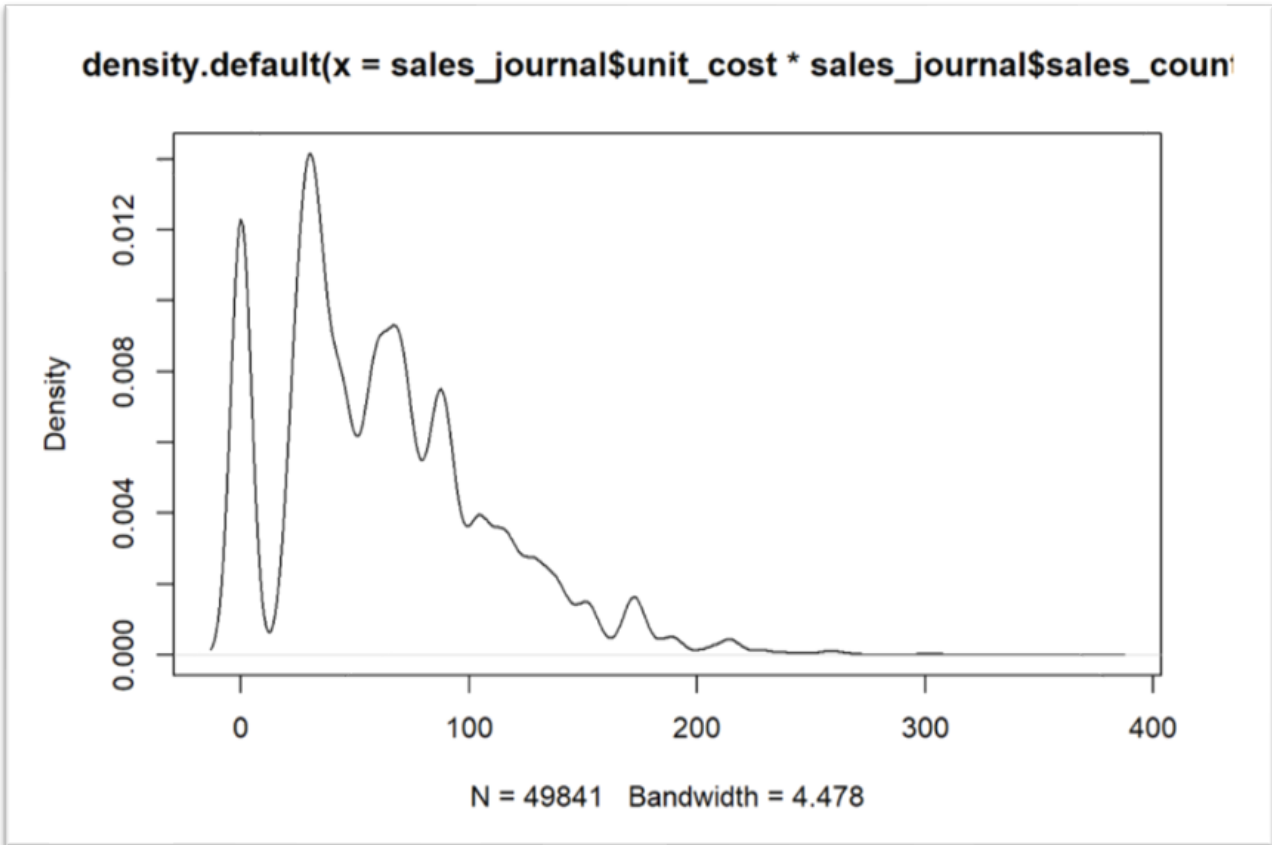
N = 39985 Bandwidth = 14.68

density.default(x = daily_ar_balance\$collect_cum)



N = 366 Bandwidth = 6.019e+04





- ap_ledger seems to have a slight left skewed distribution.
- collections_journal has multi modal long tail going towards right saying that most of the collections are made up by smaller transactions.
- By plotting the densities, we can say that the collections made at any point are less than the accounts receivable at the time.
- Preliminary observation shows a right skewed graph and not normal distribution.
- These plots indicate that the curves of sales, returns, CGS, cash, AR and inventory are not normally distributed and pose a higher risk than expected previously. I would recommend increasing the risk intel by 1 factor for everything.

I have changed the csv file from "risk_asst_matrix_q5.csv" to "risk_asst_matrix_q7.csv" in the file 'server.R' to see the budget changes in the RAM shiny app.

New Audit budget:

Risk Assessment Matrix

Confidence:

0.7 0.73 0.75 0.79 0.82 0.85 0.88 0.91 0.94 0.97 0.999

0.7 0.95 0.999

Audit \$ / transaction:

0 100 500

0 50 100 150 200 250 300 350 400 450 500

Client:

Tesla Inc.

Audit_Parameter	Value
confidence	0.95
cost	100

Tesla Inc.

Minimum estimated audit cost = 44400

	Account	Risk_intel	Risk_prior	Amount	Trans_ave	Scope	Min_cost
1	Sales	3	2	8306210	166.65	74	7400
2	Returns	2	3	211680	4.24	74	7400
3	CGS	3	2	3115787	62.51	74	7400
4	Cash	3	2	7640153	22807.77	74	7400
5	AR	2	3	168144	1006.85	74	7400
6	Inventory	2	3	32508	89.06	74	7400

Risk choices are: 1 = Low, 2=Medium, 3=High

Risk_intel = the risk level indicated by business intelligence scanning

Risk_prior = the risk level indicated by audits in prior years

Account Amount and the Ave. Transaction size are in \$ without decimals or 000 dividers

Scope = estimated discovery sample size that will be needed in the audit of this account

Audit cost = audit labor dollars per sampled transaction

Confidence = statistical confidence

Minimum cost of the audit came out to be \$44400 at 95% Confidence and \$100 per transaction.

Risk Assessment Matrix

Confidence:

0.7 0.73 0.75 0.79 0.82 0.85 0.88 0.91 0.94 0.97 0.999

0.7 0.8 0.999

Audit \$ / transaction:

0 200 500

0 50 100 150 200 250 300 350 400 450 500

Client:

Tesla Inc.

Audit_Parameter	Value
confidence	0.8
cost	200

Tesla Inc.

Minimum estimated audit cost = 48000

	Account	Risk_intel	Risk_prior	Amount	Trans_ave	Scope	Min_cost
1	Sales	3	2	8306210	166.65	40	8000
2	Returns	2	3	211680	4.24	40	8000
3	CGS	3	2	3115787	62.51	40	8000
4	Cash	3	2	7640153	22807.77	40	8000
5	AR	2	3	168144	1006.85	40	8000
6	Inventory	2	3	32508	89.06	40	8000

Risk choices are: 1 = Low, 2=Medium, 3=High

Risk_intel = the risk level indicated by business intelligence scanning

Risk_prior = the risk level indicated by audits in prior years

Account Amount and the Ave. Transaction size are in \$ without decimals or 000 dividers

Scope = estimated discovery sample size that will be needed in the audit of this account

Audit cost = audit labor dollars per sampled transaction

Confidence = statistical confidence

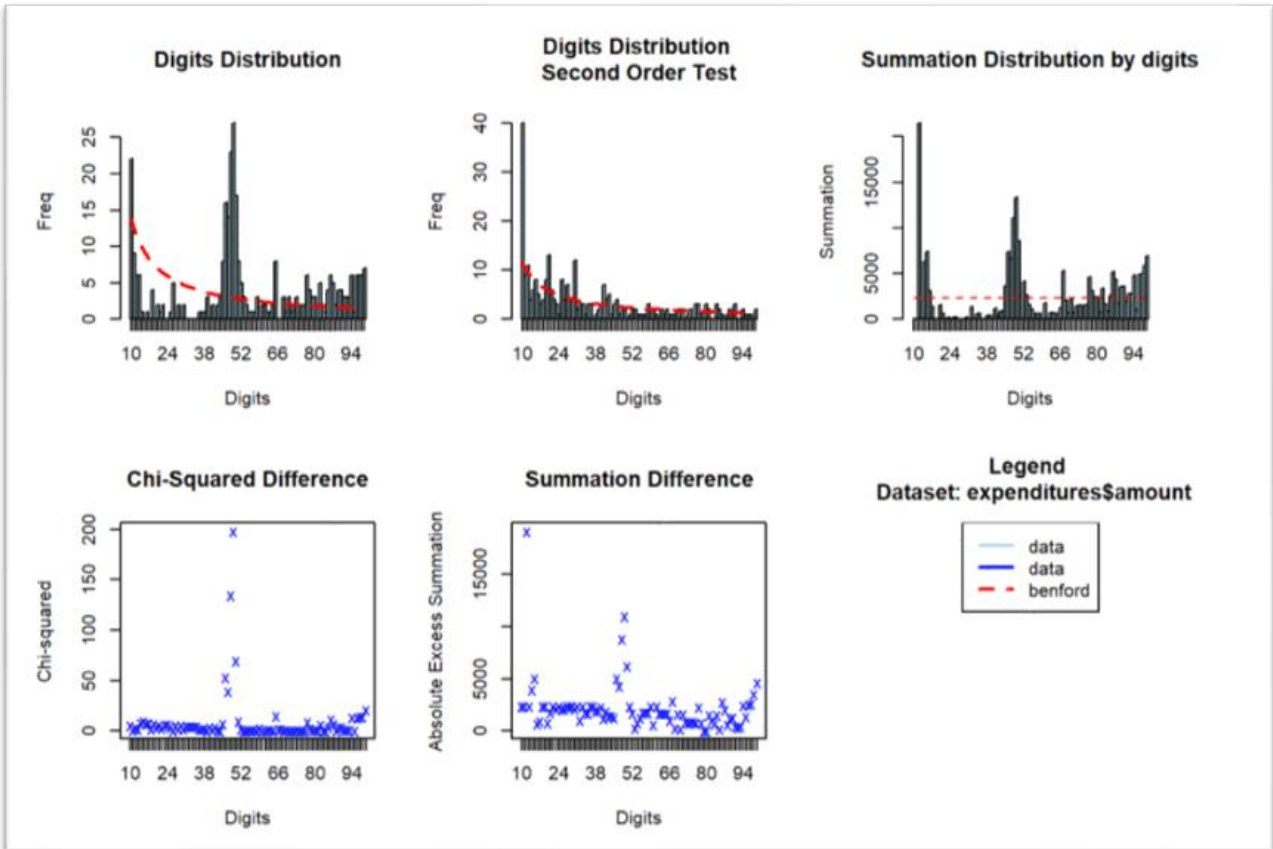
Minimum cost of the audit came out to be \$48000 at 80% Confidence and \$200 per transaction.

QUESTION 8: Employee Expenditures Audit

Overexpense\$employee_no
<chr>
Emp0013
Emp0008
Emp0005
Emp0003
Emp0010
Emp0011
Emp0004
Emp0016
Emp0002
Emp0006
1-10 of 16 rows
Previous 1 2 Next

Overexpense\$employee_no
<chr>
Emp0014
Emp0001
Emp0012
Emp0009
Emp0015
Emp0007
11-16 of 16 rows
Previous 1 2 Next

All employees have at least one spending over \$500 in expenses.



The results of this analysis reveals that the digits 49 were in the data more often than expected.

employee_no	date	amount
<chr>	<date>	<dbl>
Emp0001	2020-05-17	491.0000
Emp0001	2020-07-26	497.0000
Emp0002	2020-08-04	498.0000
Emp0002	2020-08-19	493.0000
Emp0003	2020-09-09	497.0000
Emp0004	2020-01-15	496.4115
Emp0004	2020-05-21	496.0000
Emp0004	2020-06-10	491.0000
Emp0005	2020-06-15	497.0000
Emp0005	2020-07-14	495.0000

1-10 of 27 rows

Previous 1 2 3 Next

employee_no <chr>	date <date>	amount <dbl>
Emp0005	2020-08-08	493.0000
Emp0006	2020-06-27	498.0000
Emp0007	2020-06-28	491.0000
Emp0010	2020-01-10	498.2874
Emp0010	2020-06-22	499.0000
Emp0011	2020-05-13	493.0000
Emp0011	2020-06-01	498.0000
Emp0012	2020-05-03	496.0000
Emp0012	2020-05-28	491.0000
Emp0012	2020-07-19	498.0000

11-20 of 27 rows

Previous 1 2 3 Next

employee_no <chr>	date <date>	amount <dbl>
Emp0013	2020-06-12	490.0000
Emp0013	2020-07-30	495.0000
Emp0013	2020-07-31	499.0000
Emp0014	2020-09-06	490.0000
Emp0015	2020-06-18	499.0000
Emp0016	2020-07-12	490.0000
Emp0016	2020-09-07	492.0000

21-27 of 27 rows

Previous 1 2 3 Next

Line supervisors seem to be abusing this purchase approval system. Any employee submitting bills of nearly \$500 twice within a month duration would be misusing the purchase approval system.

Example: Emp0002, Emp0012, Emp0013.

QUESTION 9: Sales Duplicates and Omissions Error Rates

Summary for duplicate:

##	Transaction Duplicates	Txn_Status
## 1	Invoice 4.7009	Out-of-control
## 2	Shipment 4.7009	Out-of-control
## 3	CollectionReceipt 4.7009	Out-of-control
## 4	CustomerWCredit 0.0150	In-control

Summary for omissions:

##	Transaction Omissions	Txn_Status
## 1	Invoice 5.018	Out-of-control
## 2	Shipment 5.020	Out-of-control
## 3	CollectionReceipt 5.020	Out-of-control
## 4	CustomerWCredit 0.015	In-control

QUESTION 10: Error Rates in Sales Amounts

Tolerable error amount = \$100000

Max tolerable error = 0.01203919 or 1.2%

Sample Size = 247

Difference_sample_amt = -5402

Error in sales amount in sample = -\$5402

This negative cash flow states that the amount that's mentioned in the sales journal is less than what it actually sold for. To get an idea of the materiality we will do the same thing with the complete dataset.

Difference_amt = -\$41434

This amount suggests that Sales was understated in sales journal by \$41434. Now we will check if it is tolerable error or intolerable at 1%.

Saleserror = 0.4988316%

The error comes out to be 0.498% which is under the tolerable error limit of 1%. Therefore, there is no material error in sales which brings us to a conclusion that sales are fairly stated.

QUESTION 11: Inventory Omissions and Duplicates

Summarising for Inventory Duplicates -

##	Transaction Duplicates	Txn_Status
## 1	ReceiverNumbers 0	In-control
## 2	PurchaseOrders 99	Out-of-control

Summary for Inventory Omissions -

##	Transaction Omissions	Txn_Status
## 1	ReceiverNumbers 0.0	In-control
## 2	PurchaseOrders 12.7	Out-of-control

QUESTION 12: Inventory Stock on Hand with a Turnover of less than 5 times

sku <chr>	InterimInventory <dbl>	AnnualInventory <dbl>	TimesFive <dbl>	LowTurnover <chr>
BEDIL	42960	185712	214800	Yes
GDSJN	37672	248064	188360	No
NMQCN	65124	270648	325620	Yes
NSMIY	29430	197964	147150	No
NURMF	57750	302225	288750	No
PDTDG	99036	305382	495180	Yes
RMDNK	16980	185220	84900	No
UFAWH	54288	277920	271440	No
VNWSW	42480	298944	212400	No
XYZGM	50292	274104	251460	No

1-10 of 10 rows

QUESTION 13: Inventory Stock on Hand Lower of Cost or Market

Market and Cost of Inventory by SKU			
sku	ye_cost	ye_market	inv_markdown
BEDIL	4590	1853.4077	2736.592
PDTDG	2064	120.5864	1943.414
<i>Total Markdown for LOCOM rule</i>			
* 4680.01			

QUESTION 14: Write the SAS 115 Letter to Management

In planning and performing our audit of the financial statements of Tesla INC (TSLA) as of and for the year ended December 31, 2020, in accordance with auditing standards generally accepted in the United States of America, we considered the Company's internal control over financial reporting (internal control) as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, we do not express an opinion on the effectiveness of the Company's internal control. Our consideration of internal control was for the limited purpose described in the preceding paragraph and was not designed to identify all deficiencies in internal control that might be significant deficiencies or material weaknesses and therefore, there can be no assurance that all deficiencies, significant deficiencies, or material weaknesses have been identified. However, as discussed below, we identified certain deficiencies in internal control that we consider to be material weaknesses shipment and collection receipt. A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. We consider the following deficiencies in the Company's internal control to be material weaknesses:

- (i) Our primary investigation showed that the major value accounts of the firm are non-normal distributions which pose a higher risk to the audit. This continuation of non-normal distributions will increase the risk of the audit as compared to prior years.

A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance. We consider the following deficiencies in the Company's internal control to be significant deficiencies: shipment and collection receipt. This communication is intended solely for the information and use of management, others within the organization, and is not intended to be and should not be used by anyone other than these specified parties.

- (i) Upon further investigation it was made clear that some employees have not been entirely honest with the expenditure policies of tesla because they have been submitting receipts of more than \$490 and less than \$500 with in a span of 30 days.
- (ii) There were some other irregularities in Duplicates and omissions of Shipment orders and Invoice numbers which was higher than 1%. But since the value was less than 5% we consider it to be material errors and suggest management take steps to reduce it.

This communication is intended solely for the information and use of management, others within the organization, and is not intended to be and should not be used by anyone other than these specified parties.
