Stakeholder Management Plan Updates

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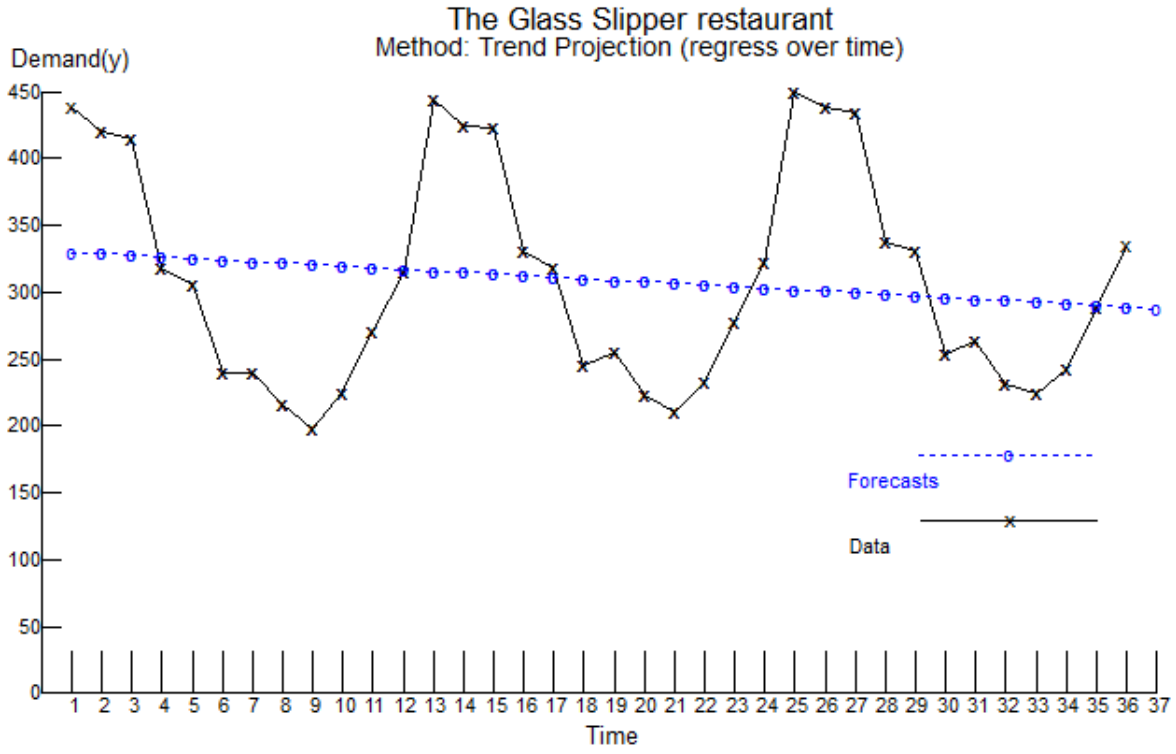
Example of Regression Analysis from MGMT 524 Management Science:

2- A) Use regression to develop a trend line that could be used to forecast monthly sales for the next year.



Demand function:

DEMAND2 (Y) = 330,889 – 1.162 x TIME

B) Is the slope of this line consistent with what you observed in question 1? If not, discuss a possible explanation.

Future Period	Forecast
37	287,889
38	286,727
39	285,565
40	284,402
41	283,24
42	282,078
43	280,916
44	279,754
45	278,592
46	277,429
47	276,267
48	275,105

The slope is not consistent from what we observed on question No. 1. This is due to the negative gradient of the slope. This tells us there is a negative correlation between the forecasted sales each month and the future periods of sales. This is further reinforced by the negative correlation coefficient of -.15. (Render, 2012, Pg. 121) Since sales are not decreasing through years, a negative trend arise due to the high seasonal index in January and February. This particular values causes the trend line on the unadjusted data to have a negative slope.

2) Regression Analysis Table

	Demand(y)	Forecast	Error	Cum error	Cum abs error	Cum Abs	MAD	Track Signal
January	438	329,727	108,273	108,273	108,273	108,273	108,273	1
February	420	328,565	91,435	199,709	91,435	199,709	99,854	2
March	414	327,402	86,598	286,306	86,598	286,306	95,435	3
April	318	326,24	-8,24	278,066	8,24	294,547	73,637	3,776
May	306	325,078	-19,078	258,988	19,078	313,625	62,725	4,129
June	240	323,916	-83,916	175,072	83,916	397,541	66,257	2,642
July	240	322,754	-82,754	92,318	82,754	480,294	68,613	1,345
August	216	321,592	-105,592	-13,273	105,592	585,886	73,236	-,181
September	198	320,429	-122,429	-135,703	122,429	708,315	78,702	-1,724
October	225	319,267	-94,267	-229,97	94,267	802,583	80,258	-2,865
November	270	318,105	-48,105	-278,075	48,105	850,688	77,335	-3,596
December	315	316,943	-1,943	-280,018	1,943	852,631	71,053	-3,941
January	444	315,781	128,219	-151,799	128,219	980,85	75,45	-2,012
February	425	314,619	110,381	-41,417	110,381	1091,231	77,945	-,531
March	423	313,457	109,544	68,126	109,544	1200,775	80,052	,851
April	331	312,294	18,706	86,832	18,706	1219,48	76,218	1,139
May	318	311,132	6,868	93,7	6,868	1226,348	72,138	1,299
June	245	309,97	-64,97	28,73	64,97	1291,318	71,74	,4
July	255	308,808	-53,808	-25,078	53,808	1345,126	70,796	-,354
August	223	307,646	-84,646	-109,724	84,646	1429,772	71,489	-1,535
September	210	306,484	-96,483	-206,207	96,483	1526,255	72,679	-2,837
October	233	305,321	-72,321	-278,529	72,321	1598,577	72,663	-3,833
November	278	304,159	-26,159	-304,688	26,159	1624,736	70,641	-4,313
December	322	302,997	19,003	-285,685	19,003	1643,739	68,489	-4,171
January	450	301,835	148,165	-137,52	148,165	1791,904	71,676	-1,919
February	438	300,673	137,327	-,192	137,327	1929,231	74,201	-,003
March	434	299,511	134,49	134,297	134,49	2063,721	76,434	1,757
April	338	298,348	39,652	173,949	39,652	2103,372	75,12	2,316
May	331	297,186	33,814	207,763	33,814	2137,186	73,696	2,819
June	254	296,024	-42,024	165,739	42,024	2179,21	72,64	2,282
July	264	294,862	-30,862	134,877	30,862	2210,072	71,293	1,892
August	231	293,7	-62,7	72,177	62,7	2272,771	71,024	1,016
September	224	292,538	-68,538	3,639	68,538	2341,309	70,949	,051
October	243	291,375	-48,375	-44,736	48,375	2389,685	70,285	-,636
November	289	290,213	-1,213	-45,949	1,213	2390,898	68,311	-,673
December	335	289,051	45,949	,0	45,949	2436,847	67,69	0

Forecasting Results

Measure	Value	Future Period	Forecast
Error Measures		37	287,889
Bias (Mean Error)	0	38	286,727
MAD (Mean Absolute Deviation)	67,69	39	285,565
MSE (Mean Squared Error)	6320,815	40	284,402
Standard Error (denom=n-2=34)	81,808	41	283,24
MAPE (Mean Absolute Percent	,228	42	282,078
Regression line		43	280,916
Demand(y) = 330,889		44	279,754
-1,162 * Time		45	278,592
Statistics		46	277,429
Correlation coefficient	-,15	47	276,267
Coefficient of determination (r^2)	,023	48	275,105

REFERENCES

Barry Render, Ralph Stair, Michael Hanna (2012). Quantitative Analysis for Management. Upper Saddle River, New Jersey: Prentice Hall, Pearson Education Inc.