

**A MEASURE OF THE IMPACT OF BCOM314 CLASSES ON THE TUCSON JEWISH  
COMMUNITY CENTER**

**By**

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**A Thesis Submitted to The Honors College  
In Partial Fulfillment of the Bachelors degree  
With Honors in**

**Business Economics**

**THE UNIVERSITY OF ARIZONA**

**MAY 2018**

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## **Abstract**

The purpose of this thesis is to quantify the impact of Eller BCOM314 student groups on The Tucson Jewish Community Center (The J), where the groups offer strategic plans for various program and operational improvements at The J, as requested by management. I created a logarithmic regression model to test how membership level was impacted by each of the recommendations upon implementation. The overall impact of the implementation of BCOM314 groups' recommendations was estimated to be positive. This was due to the implied positive effect of the recommendations on new membership and lack of effect on cancellations. Because this study was observational, the regression model could not distill the effect of each recommendation and the small sample size caused large standard errors, both of which mitigate the conclusiveness of the results. However, this methodology can be applied to other Eller initiatives to measure their impact in the community.

## **Introduction**

The Eller College of Management is heavily involved in the Tucson Community, from Eller Make a Difference Day to the numerous management and consultative classes that seek to advise local organizations. In addition to contributions organized by the College, Eller clubs independently support the community by donating time, funds, and other resources through acts of philanthropy and community service. I became particularly interested in understanding exactly how much the college and its organizations impact the Tucson community and sought to measure the "impact" through my thesis research.

Impact is a verb that means to "have a strong effect on someone or something". For the purpose of the study, I initially sought to measure Eller's impact by quantifying the number of hours and dollars donated to community organizations and projects. It was quickly apparent that there was poor documentation, if any, of hours donated across the college and organizations and fundraising for the community was not a major objective for most organizations. This prompted me to narrow the scope of the study to one specific Eller initiative that is intended to affect change.

The initiative upon which this thesis is focused is the Tucson Jewish Community Center's (The J) retention of BCOM314 classes to develop strategic plans for improving elements of The J. BCOM314 is a business communications course that all Eller students are required to take in their first semester of admission into the college. About 75% of each cohort enrolls in the "corporate track" while the remaining 25% enrolls in the "consulting track" of the course. Students in the consulting track form several teams, all of which are tasked with creating a strategic plan to improve a facet of a local community organization. At The J, groups were tasked with developing strategies to build a social media presence, increase membership of the organization, etc. The organizations with which BCOM314 classes work are selected by the BCOM teaching team.

BCOM314 classes have offered strategic plans for The J each semester since Spring 2014. In the first several semesters that the BCOM314 classes collaborated with The J, each group within the

class was tasked with developing a solution for the same challenge presented by The J. Under this format, multiple groups often developed similar solutions with some variability across the groups. Solutions from Spring 2014 – Spring 2016 are assessed in this report.

## **Research Question**

What effect does implementing BCOM314 recommendations have on membership at The J?

## **Methodology**

This study uses information available from The J to create regressions that quantify the effect of implementing the BCOM314 groups' recommendations. A regression is a linear model that measures the degree of the relationship between independent variables (in this case the implemented recommendations) and a dependent variable (in this case membership, new memberships, or cancellations).

To create a regression, it was necessary to obtain the following data from The J:

- A comprehensive list of recommendations made by the BCOM314 groups and the time of their implementation.
- Quarterly membership data beginning prior to the implementation of any recommendations through the present.

A comprehensive list of recommendations and their implementation timeframe was not readily available. Instead, I read each report generated by BCOM314 groups from Spring 2014-Fall 2016 to compile a list of all of the recommendations made. Then I met with the CEO of The J, Todd Rockoff, to gather information regarding if and when recommendations were implemented. Using the information gleaned from my meeting with Todd, I created a timeline to depict when each recommendation was proposed and when it was implemented. See the timeline in Appendix A.

The regression analyzes recommendations proposed by BCOM314 groups in the semesters Spring 2014 - Spring 2016 because, per the timeline described above, no recommendations made in Fall 2016 and beyond were implemented at the time the thesis was initiated. A logarithmic regression model is used for this analysis because the logarithmic model shows the proportional change of the dependent variable associated with the independent variables. The following steps outline the process for setting up the regressions used for analysis:

- A time variable was created to indicate the progression of time by quarter.
- All the recommendations appeared in the regression by grouping. Recommendations that were implemented in the same period and continued to be used for the same duration were grouped together as a single variable. For all quarters in which a variable was implemented, it was assigned a value of 1; for all quarters in which a variable was not in effect, it was assigned a value of 0. See Appendix B for a description of the variables.
- To control for seasonal effects, quarter dummy variables were created. Quarter dummy variables were assigned a value of 1 in that quarter and a value of 0 in all other quarters.
- Multicollinearity was found between some variables after running an initial regression. To uncover which variables were collinear, additional regressions were run where each of the variables flagged for multicollinearity was the dependent variable. This operation revealed the source of multicollinearity; the variables causing it were then eliminated from the final

regression. The effect (coefficient) of each of the remaining variables with which the eliminated variables were collinear represents the combined effect of the remaining variable and the eliminated variable. Multicollinearity occurs in observational studies when multiple variables take effect in the same period and a linear relationship between the variables arises. It is impossible to avoid multicollinearity because the timing of the onset of each variable is not controlled.

- To determine the effect of each of the independent variables on new memberships and on cancellations separately, I created several more regressions. First, I created a membership variable that represents the quarterly change in membership, rather than the overall membership level, and ran a regression of this new dependent variable with all of the non-collinear independent variables. Then I created a variable for new memberships that represents the percentage of members that are new each quarter and a variable for cancellations to represent the percentage of members who cancel their memberships each quarter. I ran regressions with new membership percentage and cancellation percentage as the dependent variables, respectively, with all non-collinear independent variables.

## Results

For complete regression output, see Appendix C.

Regression output provides information about the relationship of the dependent variable with each independent variable. First, it shows the 95% confidence interval of each independent variable, which reveals whether there is a definitive relationship between that independent variable and the dependent variable. A confidence interval that includes 0 indicates that the independent variable does not have a statistically significant relationship with the dependent variable, which means there is not evidence that the independent variable has a non-zero effect on the dependent variable. Secondly, a regression outputs the coefficient of each independent variable. The coefficient measures the degree of the effect of the independent variable on the dependent variable. The verbiage typically used to describe a coefficient is “for every one unit change in the independent variable, there is a change in the dependent variable equal to the value of the coefficient”. The variables are binary in this study, only taking on the values of 1 and 0. Therefore, the appropriate conclusion is that if a variable is in effect (equal to 1), its effect is quantified by the magnitude of its coefficient; otherwise its effect is 0. A negative coefficient indicates that the independent variable has a negative effect on (decreases) the dependent variable, while a positive coefficient indicates that the independent variable has a positive effect on (increases) the dependent variable. However, a coefficient’s effect is only considered if the variable is statistically significant, as determined by the confidence interval. Given that the dependent variable in this case is the natural log of membership, the effect of each coefficient on membership change is equal to  $e^{\text{coefficient}} - 1$ .

Based on the output from the regression for this study:

- The Time variable has a coefficient of -.0099566 and a 95% confidence interval of [-.012646, -.0072672]. Therefore, there is evidence that time has a non-zero, negative effect on membership of -.0099, which translates to an estimated 0.99% decrease in membership quarterly.

- The WebDesign variable had a coefficient of .0247387 and a 95% confidence interval of [-.0513384, .1007957]. Therefore, there is not evidence that the combination of reformatting the website and allowing members to freeze their membership has a non-zero effect on membership levels.
- The ReferralsNotes variable represents the combined effect of ReferralsNotes and CommEvents due to multicollinearity. It has a coefficient of 0.1365981 and a 95% confidence interval of [.0396312, .2335649]. Therefore, there is evidence that the combined effect of an incentivized referral program, sending notes to long time members, and sending representatives of The J to community events has a non-zero, positive effect on membership estimated at 14.63% quarterly.
- The GrandOpening variable represents the combined effect of GrandOpening and CommEvents due to multicollinearity. It has a coefficient of .1220965 and a 95% confidence interval of [.0619602, .1822328]. Therefore, there is evidence that the combination of the grand opening of the fitness center and sending representatives of The J to community events has a non-zero, positive estimated effect on membership of 12.99% quarterly.
- The OpenHouses variable has a coefficient of -.0136141 and a 95% confidence interval of [-.0896811, .062453]. Therefore, there is not evidence that the implementation of open houses has a non-zero effect on membership levels.
- The AdsMediaEmail variable has a coefficient of .0300589 and a 95% confidence interval of [-.0827669, .1428846]. Therefore, there is not evidence that the implementation of additional advertising and communication tools has non-zero effect on membership level.
- The Website variable represents the combined effect of Website and Videos due to multicollinearity. It has a coefficient of .0755165 and a 95% confidence interval of [-.0013075, .1523405]. Therefore, there is not evidence that the combined effect of redesigning the website and implementing a YouTube channel has a non-zero effect on membership level.
- The EmpNews variable represents the combined effect of EmpNews and Videos due to multicollinearity. It has a coefficient of .0407125 and a 95% confidence interval of [-.0361114, .1175365]. Therefore, there is not evidence that the combined effect of instituting an employee newsletter and implementing a YouTube channel has a non-zero effect on membership level.
- The Convo variable has a coefficient of .0573766 and a 95% confidence interval of [-.0186905, .1334437]. Therefore, there is not evidence that training employees on informal conversation tactics has a non-zero effect on membership level.
- The Q2 variable has a coefficient of .0467035 and a 95% confidence interval of [.0125791, .0808279]. Therefore, there is evidence that quarter 2 has a non-zero, positive estimated effect on membership level of 4.78% versus membership in quarter 1.
- The Q3 variable has a coefficient of .0417858 and a 95% confidence interval of [.0073449, .0762266]. Therefore, there is evidence that quarter 3 has a non-zero, positive estimated effect on membership level of 4.26% versus membership in quarter 1.
- The Q4 variable has a coefficient of .0264777 and a 95% confidence interval of [-.0084842, .0614397]. Therefore, there is not evidence that quarter 4 has a non-zero effect on membership level versus quarter 1 membership.

The effect of each of the variables on membership can be disaggregated into the variable's effect on new membership enrollment and its effect on cancellations. Additional regressions were run where the dependent variables were new memberships as a percentage of total membership and cancellations as a percentage of total membership, respectively. The following outcomes were a result of these regressions:

- There is evidence that Time has a non-zero, positive effect on new membership of 0.17% quarterly, which means that new members as a percentage of total membership increases over time.
- There is evidence that GrandOpening has a non-zero, positive effect on new membership of 4.8% quarterly, which means that new membership as a percentage of total membership increased 4.8% due to the grand opening of the fitness center in Q1 2015 and the presence of representatives from The J at community events.
- There is evidence that AdsMediaEmail has a non-zero, positive effect on new membership of 7.47% quarterly, which means that publishing print ads for Early Childhood Education, using Twitter, and sending monthly email blasts to members increase new membership as a percentage of total membership.
- There is evidence that Convo has a non-zero, negative effect on new membership of 4.24%, which means that training employees to use informal conversation tactics decreases new membership as a percentage of total membership.
- There is evidence that Q4 has a non-zero, negative effect on new membership of 2.2%, which means that new membership as a percentage of total membership is lower in quarter 4 than in quarter 1. It is possible that this outcome is due to the fact that people tend to sign up for fitness memberships in Q1 after making exercise related new year's resolutions and typically do not start new memberships for activities in Q4 because they are busy with numerous holidays.

There is not evidence that any other variables have a non-zero effect on new membership.

There is evidence that Q2 has a non-zero, negative effect on cancellations relative to Q1 of 3.1%; Q3 has a non-zero, negative effect on cancellations relative to Q1 of 1.4%; and Q4 has a non-zero, negative effect on cancellations relative to Q1 of 1.76%. A negative effect on cancellations means that there were fewer cancellations as a percentage of total membership in each Q2, Q3, and Q4 relative to Q1. One reason that Q1 has more cancellations than the other quarters is that many members of The J are winter visitors who leave in February or March and cancel their memberships as a result. There was not evidence that any other variables had a non-zero effect on cancellations.

One way to confirm the magnitude of the effect of each variable on new memberships and cancellations is to subtract the cancellation model from the new membership model; it should yield the model for change in  $\log(\text{membership})$ , or  $\delta\log(\text{membership})$ . Appendix C shows the output for new memberships, cancellations, and  $\delta\log(\text{membership})$ . We see that the coefficients of the variables in the  $\delta\log(\text{membership})$  equation are equal to the difference in coefficients of the corresponding variables in the new membership and cancellation models, thereby confirming that the outputs are consistent across models.

After a complete analysis of the data, there are several key takeaways:

- The majority of recommendations had an inconclusive effect on membership. The variables that did evidence an effect on membership had a positive net effect on membership level.
- The variables that evidenced an effect on new membership had a positive net effect on new membership as a percentage of total membership.
- The only variables that evidenced effect on cancellations were the quarter dummy variables, which is to say there is not evidence that the recommendations made by BCOM314 groups effected cancellations. The entire effect of the recommendations on membership results from improving new membership enrollment.
- The evidence supporting that BCOM314 recommendations had positive effects on membership and new membership enrollment is offset by the large standard errors of each variable's coefficient. A large standard error indicates low accuracy of the results. In this case, the standard errors are large, in part, because of the small dataset resultant from such a short-term study.

### **Conclusion**

This case study investigating the impact of BCOM314 consulting recommendations on the Tucson Jewish Community Center is a microcosm of the greater focus on Eller groups' and organizations' impact on the Tucson community. The case study measures impact as the effect of BCOM314 recommendations on membership level, new membership enrollment, and membership cancellations at The J. It was conducted by compiling a complete list of the recommendations made from 2014-2016, creating variables to represent recommendations implemented and carried through the same periods, and completing regression analysis to determine the evident quantitative effect, if any, of each of the variables. Upon analysis, it was found that the BCOM314 recommendations have a positive net effect on membership and new membership enrollment, but no effect on membership cancellations. However, the small data set and large standard errors paired with the observational nature of the study weaken the conclusiveness of these results.

## **Bibliography**

Rockoff, Todd. Personal interview. 15 Mar. 2017.

\*All other sources are unpublished reports by Eller BCOM314 students.

## Appendices

### Appendix A: Recommendation & Implementation Timeline

	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	
1	<p>R = period recommended            X = period where recommendation is not implemented            I = period in which recommendation is initially implemented            Arrows represent subsequent periods in which recommendation is implemented</p>												
2	Online Strategy: Search Engine Optimization	R	X	X	X	X	X	X	X	X	X	X	
3	Online Strategy: Design Reformat	R						I	→				
4	Online Strategy: Add videos, photos	R						I	→				
5	Member Recruitment + Retention: Allow Membership Freeze				R			I	→				
6	Member Recruitment + Retention: Longer Hours on Saturday				R	X	X	X	X	X	X	X	
7	Member Recruitment + Retention: Proactive facility upkeep				R	X	X	X	X	X	X	X	
8	Member Recruitment + Retention: Award prizes based on membership length				R	X	X	X	X	X	X	X	
9	Member Recruitment + Retention: Offer reward for referrals				R		I	→					
10	Member Recruitment + Retention: Send notes to long-term members				R		I	→					
11	Member Recruitment + Retention: Hold grand opening after renovations				R	I	X	X	X	X	X	X	
12	Member Recruitment + Retention: Have volunteer teams out at community events				R	I	→						
13	Member Recruitment + Retention: Hold open houses for potential members				R	X	I	X	X	X	X	I	X

	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
1												
14				R	X	X	X	X	X	X	X	X
15				R	I new brochure - not separate brochures							
16				R	X	X	X	X	X	X	X	X
17						R	X	X	X	X	X	X
18						R	X	X	X	X	X	X
19						R	I	→				
20						R	X	X	X	X	X	X
21						R			I	→		
22						R	X	X	X	X	X	X
23						R	I	→				
24						R			I	→		
1	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
25						R	X	X	X	X	X	X
26						R	I	→				
27								R	X	X	X	X
28								R		I	→	
29								R	I	Stopped Use		
30								R	X	X	X	X
31										R		





## **Appendix B: Description of Variables**

Time: Represented by positive integers to denote equal periods over the course of the study. This variable begins at the start of 2011, so Time at Q1, 2011 equals 1, and increases with each subsequent quarter.

Membership: Represents the total number of memberships existing in each respective quarter.

NewMem: Represents the number of new memberships purchased in a respective quarter.

Cancellation: Represents the number of cancellations that occurred in a respective quarter.

NewMemPercent: Represents new memberships purchased as a percentage of total memberships in the previous quarter. This variable is meant to show the percentage of growth in each quarter.

CancellationPercent: Represents cancellations as a percentage of total memberships in the previous quarter. This variable is meant to show the percentage of shrinkage in each quarter.

NetMembership: Represents the difference between new memberships purchased and cancellations made in a respective quarter.

WebDesign: Represents the implementation of reformatting on the website, including the addition of photos, and allowing members to “freeze” their memberships when they are not able to use the membership for extended periods of time due to personal circumstances such as travel plans or prevailing health issues.

ReferralsNotes: Represents the implementation of a referral program that rewards members for referring friends and recognizes long-term members with personalized notes.

GrandOpening: Represents the grand opening of the updated fitness center. This event was conceived by The J but was also a recommendation from BCOM314 groups. It occurred only once, in 2015.

CommEvents: Represents the implementation of volunteer teams and members’ presence at events in the Tucson community, such as Tucson Meet Yourself, to market The J. This variable was found to be collinear with the variables GrandOpening and ReferralsNotes so its effects are represented in the coefficients of both GrandOpening and ReferralsNotes.

OpenHouses: Represents the implementation of open houses which, in practice, are family-friendly days outdoors at The J that take place over Labor Day Weekend.

AdsMediaEmail: Represents the implementation of several communication tools – print ads for Early Childhood Education programs, use of a Twitter account, and monthly email blasts to members to convey upcoming events.

Videos: Represents implementation of YouTube channel to post videos about the facilities and programming and use of the videos on the Facebook page. This variable was found to be collinear with the variables EmpNews and Website so its effects are represented in the coefficients of both EmpNews and Website.

Website: Represents implementation of another website redesign to allow easier access to sports and recreational information from the homepage.

EmpNews: Represents implementation of an employee newsletter intended to disseminate important center-wide information. Employees did not seem to read the newsletter regularly so the newsletter was amended to have a comprehension quiz; correct responses put employees in a drawing for a gift card. This incentive motivated employees to skim the newsletter for only the information included on the quiz. It was ultimately decided that this weekly newsletter was having little positive effect so it was retired after one quarter.

Convo: Represents the implementation of employee training on informal conversation. Member feedback indicated that many cancellations are the result of not feeling well-connected to the community at The J; training employees on this form of interaction was intended to improve member connectedness with The J.

Q2: Represents a “dummy variable” for the second quarter of each year. This variable equals 1 in the second quarter and 0 in all other quarters of each year. Since Q1 does not have a dummy variable, the coefficient of Q2 represents the quarterly effect of quarter 2 versus quarter 1 on the dependent variable.

Q3: Represents a “dummy variable” for the third quarter of each year. This variable equals 1 in the third quarter and 0 in all other quarters of each year. Since Q1 does not have a dummy variable, the coefficient of Q3 represents the quarterly effect of quarter 3 versus quarter 1 on the dependent variable.

Q4: Represents a “dummy variable” for the fourth quarter of each year. This variable equals 1 in the fourth quarter and 0 in all other quarters of each year. Since Q1 does not have a dummy variable, the coefficient of Q4 represents the quarterly effect of quarter 4 versus quarter 1 on the dependent variable.

### Appendix C: Regression Data

	Time	NewMem	Cancellati on	NewMem Percent	Cancellati onPercent	NetMemb ership	Members hip	Web Design	Referrals Notes	GrandOpe ning	Comm Events	Open Houses	AdsMedia Email	Videos	Website	EmpNews	Convo	Q2	Q3	Q4
Q1 2011	1	133	185	0.072	0.100	-52	1,801	0	0	0	0	0	0	0	0	0	0	0	0	0
Q2 2011	2	197	113	0.109384	0.063	84	1,885	0	0	0	0	0	0	0	0	0	0	1	0	0
Q3 2011	3	127	148	0.067374	0.079	-21	1,864	0	0	0	0	0	0	0	0	0	0	0	1	0
Q4 2011	4	126	155	0.067597	0.083	-29	1,835	0	0	0	0	0	0	0	0	0	0	0	0	1
Q1 2012	5	125	171	0.06812	0.093	-46	1,789	0	0	0	0	0	0	0	0	0	0	0	0	0
Q2 2012	6	165	139	0.09223	0.078	26	1,815	0	0	0	0	0	0	0	0	0	0	1	0	0
Q3 2012	7	116	163	0.063912	0.090	-47	1,768	0	0	0	0	0	0	0	0	0	0	0	1	0
Q4 2012	8	85	148	0.048077	0.084	-63	1,705	0	0	0	0	0	0	0	0	0	0	0	0	1
Q1 2013	9	143	177	0.083871	0.104	-34	1,671	0	0	0	0	0	0	0	0	0	0	0	0	0
Q2 2013	10	170	107	0.101735	0.064	63	1,734	0	0	0	0	0	0	0	0	0	0	1	0	0
Q3 2013	11	114	171	0.065744	0.099	-57	1,677	0	0	0	0	0	0	0	0	0	0	0	1	0
Q4 2013	12	96	161	0.057245	0.096	-65	1,612	0	0	0	0	0	0	0	0	0	0	0	0	1
Q1 2014	13	144	175	0.08933	0.109	-31	1,581	0	0	0	0	0	0	0	0	0	0	0	0	0
Q2 2014	14	209	128	0.132195	0.081	81	1,662	0	0	0	0	0	0	0	0	0	0	1	0	0
Q3 2014	15	169	150	0.101685	0.090	19	1,681	0	0	0	0	0	0	0	0	0	0	0	1	0
Q4 2014	16	122	138	0.072576	0.082	-16	1,665	0	0	0	0	0	0	0	0	0	0	0	0	1
Q1 2015	17	239	157	0.143544	0.094	82	1,747	0	0	1	1	0	0	0	0	0	0	0	0	0
Q2 2015	18	201	134	0.115054	0.077	67	1,814	0	1	0	1	1	0	0	0	0	0	1	0	0
Q3 2015	19	218	165	0.120176	0.091	53	1,867	0	1	0	1	0	1	0	0	0	0	0	1	0
Q4 2015	20	157	158	0.084092	0.085	-1	1,866	1	1	0	1	0	1	0	0	0	0	0	0	1
Q1 2016	21	172	164	0.092176	0.088	8	1,874	1	1	0	1	0	1	1	0	1	0	0	0	0
Q2 2016	22	298	159	0.159018	0.085	139	2,013	1	1	0	1	0	1	1	1	0	0	1	0	0
Q3 2016	23	237	178	0.117735	0.088	59	2,072	1	1	0	1	1	1	1	1	0	1	0	1	0
Q4 2016	24	143	167	0.069015	0.081	-24	2,048	1	1	0	1	0	1	1	1	0	1	0	0	1

## Appendix D: Regression Output

### *Logarithmic Membership Regression*

```
. generate mem =log(Membership)

. regress mem Time WebDesign ReferralsNotes GrandOpening OpenHouses AdsMediaEmail Website EmpNews Convo Q2 Q3 Q4
```

Source	SS	df	MS	Number of obs	=	24
Model	.113186701	12	.009432225	F(12, 11)	=	19.74
Residual	.005255476	11	.000477771	Prob > F	=	0.0000
				R-squared	=	0.9556
				Adj R-squared	=	0.9072
Total	.118442177	23	.00514966	Root MSE	=	.02186

mem	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Time	-.0099566	.0012219	-8.15	0.000	-.012646	-.0072672
WebDesign	.0247287	.0345605	0.72	0.489	-.0513384	.1007957
ReferralsNotes	.1365981	.0440561	3.10	0.010	.0396312	.2335649
GrandOpening	.1220965	.0273225	4.47	0.001	.0619602	.1822328
OpenHouses	-.0136141	.0345605	-0.39	0.701	-.0896811	.062453
AdsMediaEmail	.0300589	.0512615	0.59	0.569	-.0827669	.1428846
Website	.0755165	.0349044	2.16	0.053	-.0013075	.1523405
EmpNews	.0407125	.0349044	1.17	0.268	-.0361114	.1175365
Convo	.0573766	.0345605	1.66	0.125	-.0186905	.1334437
Q2	.0467035	.0155041	3.01	0.012	.0125791	.0808279
Q3	.0417858	.0156479	2.67	0.022	.0073449	.0762266
Q4	.0264777	.0158847	1.67	0.124	-.0084842	.0614397
_cons	7.512821	.0138781	541.34	0.000	7.482276	7.543367

## New Membership Regression

```
. regress NewMemPercent Time WebDesign ReferralsNotes GrandOpening OpenHouses AdsMediaEmail Website EmpNews Convo Q2 Q3 Q4
```

Source	SS	df	MS	Number of obs	=	24
Model	.017511179	12	.001459265	F(12, 11)	=	10.29
Residual	.00156064	11	.000141876	Prob > F	=	0.0003
				R-squared	=	0.9182
				Adj R-squared	=	0.8289
Total	.019071818	23	.000829209	Root MSE	=	.01191

NewMemPercent	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Time	.0017201	.0006659	2.58	0.025	.0002546 .0031857
WebDesign	-.0227793	.0188332	-1.21	0.252	-.0642309 .0186724
ReferralsNotes	-.0464474	.0240078	-1.93	0.079	-.0992881 .0063933
GrandOpening	.048068	.014889	3.23	0.008	.0152976 .0808384
OpenHouses	.0354143	.0188332	1.88	0.087	-.0060374 .0768659
AdsMediaEmail	.0747437	.0279342	2.68	0.022	.0132609 .1362265
Website	.020533	.0190206	1.08	0.303	-.0213312 .0623971
EmpNews	-.0156974	.0190206	-0.83	0.427	-.0575616 .0261667
Convo	-.0424902	.0188332	-2.26	0.045	-.0839419 -.0010386
Q2	.0288918	.0084488	3.42	0.006	.0102962 .0474874
Q3	-.0070358	.0085271	-0.83	0.427	-.0258038 .0117323
Q4	-.0220609	.0086561	-2.55	0.027	-.0411129 -.0030089
_cons	.0662331	.0075627	8.76	0.000	.0495878 .0828784

### Cancellation Regression

```
. regress CancellationPercent Time WebDesign ReferralsNotes GrandOpening OpenHouses AdsMediaEmail Website EmpNews Convo Q2 Q3 Q4
```

Source	SS	df	MS	Number of obs	=	24
Model	.002267067	12	.000188922	F(12, 11)	=	4.11
Residual	.000505723	11	.000045975	Prob > F	=	0.0129
				R-squared	=	0.8176
				Adj R-squared	=	0.6186
Total	.00277279	23	.000120556	Root MSE	=	.00678

Cancellation~t	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Time	.0008183	.000379	2.16	0.054	-.000016 .0016525
WebDesign	-.0032748	.0107209	-0.31	0.766	-.0268713 .0203217
ReferralsNotes	-.0076084	.0136665	-0.56	0.589	-.0376882 .0224713
GrandOpening	-.015238	.0084756	-1.80	0.100	-.0338927 .0034166
OpenHouses	.0047701	.0107209	0.44	0.665	-.0188264 .0283666
AdsMediaEmail	.0010875	.0159016	0.07	0.947	-.0339117 .0360868
Website	.0118267	.0108275	1.09	0.298	-.0120046 .035658
EmpNews	-.0151211	.0108275	-1.40	0.190	-.0389524 .0087102
Convo	-.019129	.0107209	-1.78	0.102	-.0427255 .0044675
Q2	-.0308093	.0048095	-6.41	0.000	-.0413949 -.0202237
Q3	-.0136887	.0048541	-2.82	0.017	-.0243725 -.003005
Q4	-.0175636	.0049275	-3.56	0.004	-.028409 -.0067182
_cons	.095622	.0043051	22.21	0.000	.0861467 .1050974

*Δlog(membership) Regression*

```
. regress mem_flow Time WebDesign ReferralsNotes GrandOpening OpenHouses AdsMediaEmail Website EmpNews Convo Q2 Q3 Q4
```

Source	SS	df	MS	Number of obs	=	23
				F(12, 10)	=	7.13
Model	.020416221	12	.001701352	Prob > F	=	0.0020
Residual	.002387331	10	.000238733	R-squared	=	0.8953
				Adj R-squared	=	0.7697
Total	.022803552	22	.001036525	Root MSE	=	.01545

mem_flow	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Time	.0009065	.0009369	0.97	0.356	-.001181 .0029939
WebDesign	-.0189443	.0244302	-0.78	0.456	-.0733781 .0354895
ReferralsNotes	-.0383258	.0313531	-1.22	0.250	-.1081849 .0315333
GrandOpening	.0624724	.0193516	3.23	0.009	.0193544 .1055904
OpenHouses	.0301485	.0244302	1.23	0.245	-.0242853 .0845823
AdsMediaEmail	.0729339	.0362358	2.01	0.072	-.0078044 .1536723
Website	.0064494	.0247159	0.26	0.799	-.048621 .0615199
EmpNews	-.0006139	.0249046	-0.02	0.981	-.0561048 .0548769
Convo	-.0211899	.0244302	-0.87	0.406	-.0756237 .0332439
Q2	.0593029	.011838	5.01	0.001	.0329261 .0856796
Q3	.0067752	.0118009	0.57	0.579	-.0195188 .0330692
Q4	-.0045216	.011838	-0.38	0.710	-.0308983 .0218552
_cons	-.0298078	.0122748	-2.43	0.036	-.0571578 -.0024578