Political Networks of Companies - AOM Conference Paper

Notes on Regression/Method

Source: http://www.stat.rice.edu/~dobelman/download/NotesMethod.doc

OLS/Parsimony

We performed a basic ordinary least squares multiple regression fit of a parsimonious model subset of our 26 predictors on the 4 response variables. Missing data were excluded by observation, resulting in about 50 out of 81 observations being used in the full model. Larger degrees of freedom were obtained by regressing certain predictor classes by themselves, but the resulting model fit errors were of course larger.

To obtain an appropriate subset of predictors, we used both the modern stepwise modified-forward inclusion, and exhaustive search techniques. Appropriate in our context is finding smaller number of predictors which minimize regression error and which are as significant as possible. This reduction is necessary in view of our small sample size but nevertheless unique dataset (see data discussion). The stepwise technique is widely discussed; see Agostinelli (2002), Breaux (1968), or Efroymson (1960)

The matrix of coefficients (response intercept and predictor coefficients) was estimated along with their standard errors. The t value is the estimate divided by its standard error. This would be an appropriate test statistic to test the null hypothesis that the value of the corresponding regression parameter is 0. The reported p-value indicates evidence against a null hypothesis that the parameter is zero, which is known as significance.

For the model itself, the RSE is the mean regression residual sum of square error, or $\Sigma(\text{Yhat-Ybar})^2$, allowing a hypothesis (*F*) test of the model coefficients being significantly different than zero, and reported p-value on the *F*-test is reported. An insignificant *p*-value and low R^2 indicates the fitted model does not explain the response.

All Predictors

The regression coefficients were first estimated for the full-rank predictors; very few were significant. Tomorrow I'll have the reduced variable set as outlined on the website. The significant ones roughly match the non-excluded predictors; we'll see how much improvement we get when we just use the selected variable, especially since the useable dataset for ALL variables is just 54 companies, due to miscellaneous missing data.

Reduced Predictors - See Notes on Conclusions

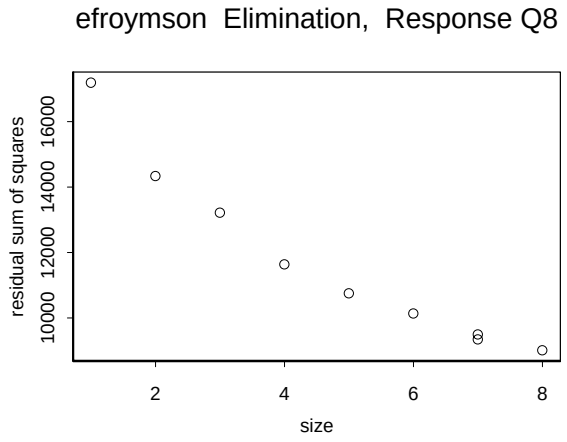
The following are the included variables for the multivariate regressions:

Predictor Inclusion Table for Each Response Variable

	Size of Network		Private meetings		
	Senate	House	Senate	House	
	# Met With		# Private Meetings		
Controls					
Predictor Variable	Q8	Q17	Q11c	Q20c	Predictor Variable
Q1	**YES**	**YES**			Q1
Q2			**YES**	**YES**	Q2
Q61	**YES**		**YES**	**YES**	Q61
Rev02	**YES**		**YES**	**YES**	Rev02
Financial Incentives					
	Q8	Q17	Q11c	Q20c	
Q67					Q67
Q69	**YES**				Q69
Q78	**YES**	**YES**			Q78
Allgive02			**YES**		Allgive02
Largess02					Largess02
Information					
	Q8	Q17	Q11c	Q20c	
Q34					Q34
Q62				**YES**	Q62
Q63					Q63
Q64					Q64
Q72	**YES**		**YES**	**YES**	Q72
Q73	**YES**	**YES**	**YES**	**YES**	Q73
Q74					Q74
Constituency building					
	Q8	Q17	Q11c	Q20c	
Q39					Q39
Q44			**YES**		Q44
Q52		**YES**			Q52
Q57		**YES**		**YES**	Q57
Q81					Q81
Q82					Q82
Q83				**YES**	Q83
Q84					Q84

Table x. Regression variables selected for inclusion via forward/Efroymson and Exhaustive stepwise regression. Variable not noted as "YES" are to be excluded. The included variables from all predictors on each response substantially matches those included when each class of predictor variables was considered separately.

Residual SS Improvement


efroymson Elimination, Response Q8
residual sum of squares
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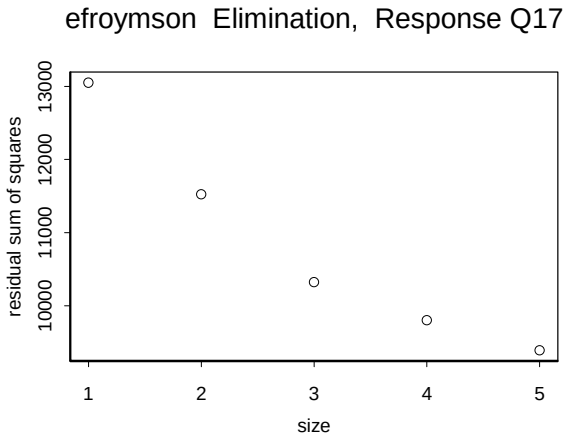
2 4 6 8
size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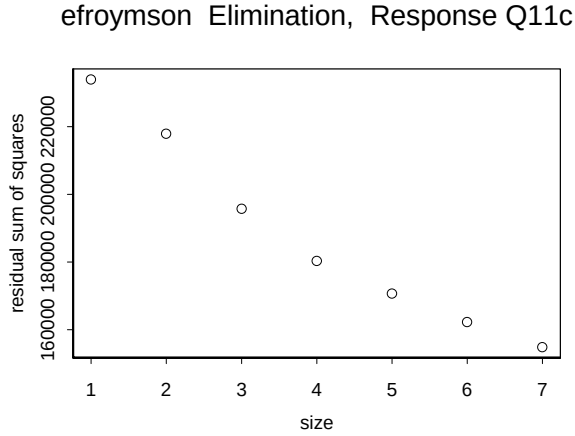
size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residual sum of squares
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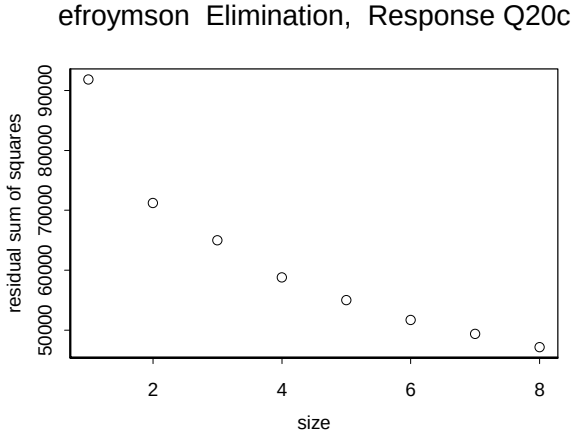
size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residual sum of squares
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2 4 6 8
size