Midterm

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```
## Error in eval(expr, envir, enclos):  could not find function "amelia"
## Error in ols(formula = form, data = dataMiss, impute = TRUE): could not find function
"amelia"
## Error in data.frame(modelAmelia$coefficients):  object 'modelAmelia' not found
```

1 Comparison of Coefficient Estimates Between models

Table 1: Coefficients of Original Data

	Estimate	Std..Error	T.Statistic	P.Value	Lower.95..CI	Upper.95..CI
intercept	-0.22	0.37	-0.60	0.55	-0.94	0.50
ELF_ethnic	2.01	0.27	7.37	0.00	1.48	2.54
polity2	-0.10	0.03	-2.79	0.01	-0.16	-0.03

Table 2: Coefficients of Listwise Deletion Data

	Estimate	Std..Error	T.Statistic	P.Value	Lower.95..CI	Upper.95..CI
intercept	0.67	0.50	1.33	0.19	-0.31	1.65
ELF_ethnic	0.81	0.39	2.06	0.05	0.04	1.57
polity2	-0.16	0.05	-3.58	0.00	-0.25	-0.07

Table 3: Coefficients of Imputed Data

	Estimate	Std..Error	T.Statistic	P.Value	Lower.95..CI	Upper.95..CI
intercept	1.94	0.34	5.68	0.00	1.27	2.61
ELF_ethnic	0.33	0.34	1.00	0.33	-0.32	0.99
polity2	-0.29	0.03	-10.09	0.00	-0.34	-0.23

2 Plot of Coefficients

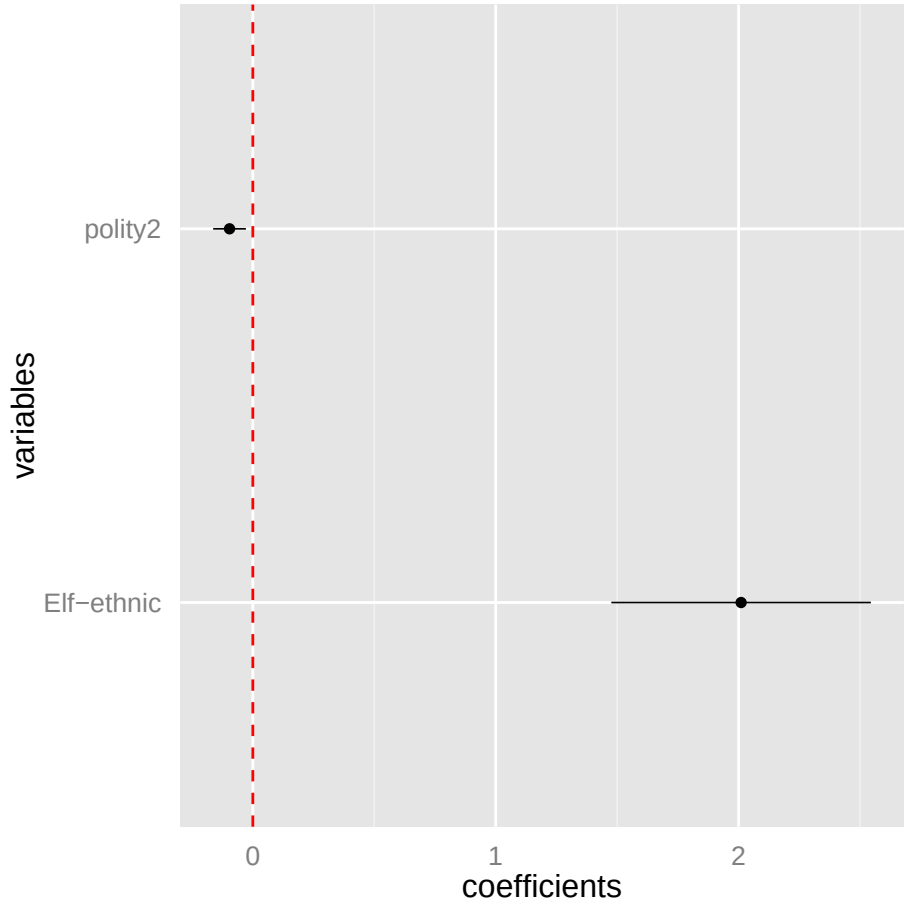

Figure 1: Coefficients Plotting of Model

```
## Loading required package:  Rcpp
## ##
## ## Amelia II: Multiple Imputation
## ## (Version 1.7.3, built:  2014-11-14)
## ## Copyright (C) 2005-2015 James Honaker, Gary King and Matthew Blackwell
## ## Refer to http://gking.harvard.edu/amelia/ for more information
## ##
```

3 Interpretation

The tables address diffrent treatment of missing data result in discrepancy in coefficient estimate. Since Listwise deletion does not discard data randomly, the estimate for coefficients is essentially biased . We notice in Listwise deletion model the distance between upper and lower bond of both coefficients are wider compared with original model, and the standard error is also higher in Listwise deletion model.

Amelia imputation shows markedly different result after including the uncertainty of missing data. First of all, ELF is no longer statisticall significant. Compared with listwise deletion method, estimate of coefficient ELF is more than 50 percent lower after applying multiimputation method, which indicate much lower power in predicting income inequality. In terms of polity 2 variable,the

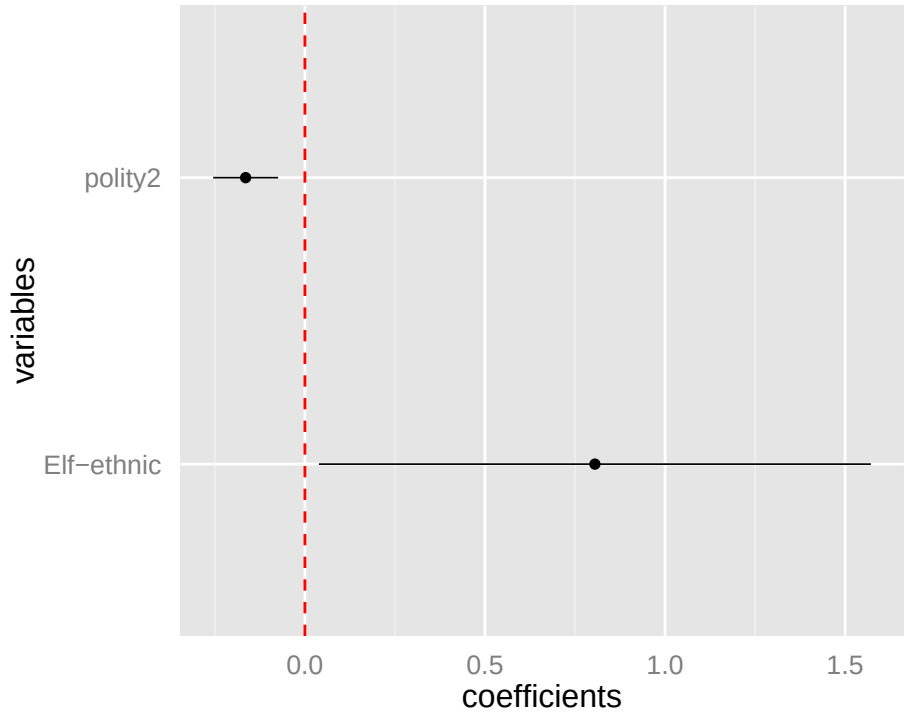

Figure 2: Coefficients Plotting of ModelListDel

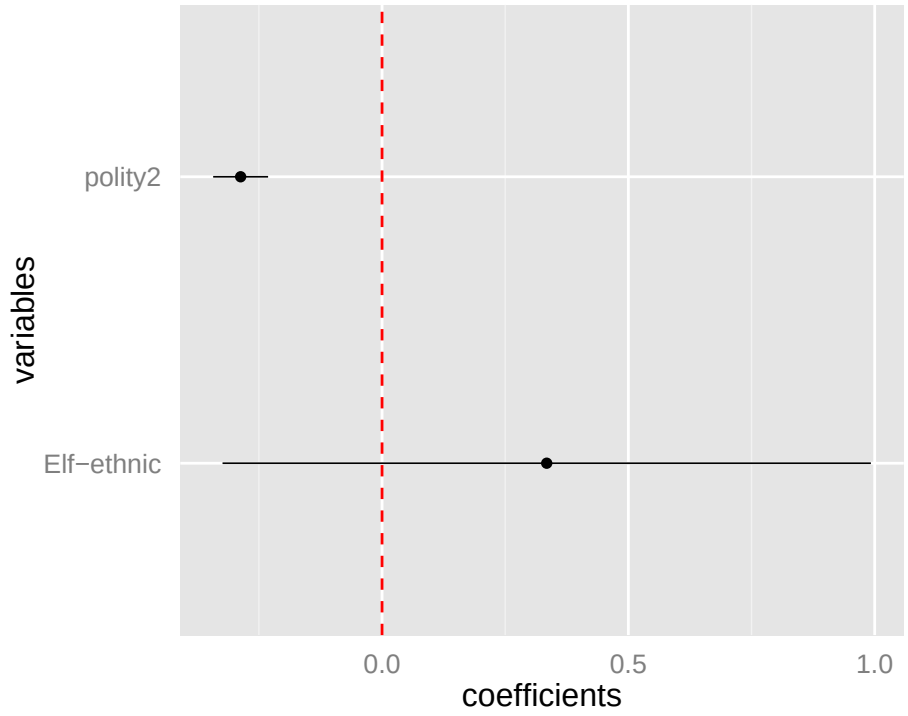

Figure 3: Coefficients Plotting of ModelAmelia

estimate is also lower in multiimputation model. Hence I can conclude the precision is weakened in Listwise deletion model.