

# EMPIRICAL WORK

Econometrics 1

Semester 1

Session: 2023-24

Submitted by Avanish Mishra [MSC 1<sup>ST</sup> YEAR]

\*All interpretations are made at 5% level of significance

1. Please refer to the variable definition in the manual and run the following regression command in STATA and produce the regression table:

*regress any\_prio gdp\_g gdp\_g\_l (equation 1)*

Interpret the regression result including the magnitude and statistical significance of the coefficients.

. reg any_prio gdp_g gdp_g_l						
Source	SS	df	MS	Number of obs	=	743
Model	.380872821	2	.19043641	F(2, 740)	=	0.97
Residual	145.320338	740	.196378836	Prob > F	=	0.3797
				R-squared	=	0.0026
				Adj R-squared	=	-0.0001
Total	145.701211	742	.196362818	Root MSE	=	.44315
any_prio	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gdp_g	-.3094018	.2302228	-1.34	0.179	-.7613695	.1425658
gdp_g_l	-.0726641	.2248388	-0.32	0.747	-.5140619	.3687338
_cons	.2659587	.0163394	16.28	0.000	.2338815	.2980358

According to the data manual, the variable definitions are as follows:

- any\_prio: Any Internal War or Any Internationalized Internal War.
- gdp\_g: GDP Growth. (GDPEN - GDPENL) / (GDPENL) where, GDPEN: per capita GDP, GDPENL: per capita GDP lagged one year, with 0 for start of country series.
- gdp\_g\_l: gdp\_g lagged one year

Interpretation: Let our estimated regression equation be

$$E[\text{any\_prio}|X] = b_0 + b_1 * \text{gdp\_g} + b_2 * \text{gdp\_g\_l}$$

The p-value for both the independent variables is more than 0.05. So, both the estimates of the coefficient of these variables are statistically insignificant at 5% level of significance and cannot be used to interpret the change in the probability of conflict.

2. Now run the following regression equation:

*regress any\_prio gdp\_g gdp\_g\_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year (equation 2)*

Explain how and why the coefficients and standard errors have changed now in comparison to the earlier regression result.

<b>. reg any_prio gdp_g gdp_g_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year</b>						
Source	SS	df	MS	Number of obs	=	743
Model	17.5364185	9	1.94849094	F(9, 733)	=	11.14
Residual	128.164793	733	.174849649	Prob > F	=	0.0000
				R-squared	=	0.1204
				Adj R-squared	=	0.1096
Total	145.701211	742	.196362818	Root MSE	=	.41815

  

any_prio	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gdp_g	-.3258443	.2177767	-1.50	0.135	-.7533847	.1016961
gdp_g_l	-.0784348	.2125758	-0.37	0.712	-.4957649	.3388952
polity2l	.0000237	.003009	0.01	0.994	-.0058835	.005931
ethfrac	.2190961	.0856298	2.56	0.011	.0509872	.387205
relfrac	-.2263156	.0974633	-2.32	0.021	-.4176561	-.0349752
Oil	.0046091	.0487878	0.09	0.925	-.0911714	.1003895
lpopl1	.0776922	.0156791	4.96	0.000	.046911	.1084735
lmtnest	.0754583	.0140744	5.36	0.000	.0478274	.1030891
year	.0022108	.0030562	0.72	0.470	-.0037891	.0082107
_cons	-4.965938	6.070872	-0.82	0.414	-16.88431	6.952432

According to the data manual, the variable definitions are as follows:

- any\_prio: Any Internal War or Any Internationalized Internal War.
- gdp\_g: GDP Growth.  $(\text{GDPEN} - \text{GDPENL}) / (\text{GDPENL})$  where, GDPEN: per capita GDP, GDPENL: per capita GDP lagged one year, with 0 for start of country series.
- gdp\_g\_l: gdp\_g lagged one year
- polity2l: Polity2 lagged one year, with 0 for start of country series where Polity2 is Revised polity score.
- ethfrac: Ethnic-linguistic fractionalization
- relfrac: Religious Fractionalization
- Oil: Oil Exporters
- lpopl1: Log of population lagged one year, with 0 for start of country series

- lmtnest: log of percent mountainous terrain

Interpretation: Let our estimated regression equation be

$$E[\text{any\_prio}|X] = b_0 + b_1 * \text{gdp\_g} + b_2 * \text{gdp\_g\_l} + b_3 * \text{polity2l} + b_4 * \text{ethfrac} + b_5 * \text{relfrac} + b_6 * \text{Oil} + b_7 * \text{lpopl1} + b_8 * \text{lmtnest} + b_9 * \text{year}$$

Since the p-value for the variables ethfrac, relfrac, lppopl1 and lmtnest are less than 0.05, there estimated coefficients are statistically significant. These coefficients can then be interpreted as following:

- $\partial E[\text{any\_prio}|X] / \partial \text{ethfrac} = .2191$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .2191 whenever the ethnic fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X] / \partial \text{relfrac} = -.2263$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .2263 whenever the religious fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X] / \partial \text{lpopl1} = .0777$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0777 whenever the log of population in the previous year had changed by 1 unit.
- $\partial E[\text{any\_prio}|X] / \partial \text{lmtnest} = .0755$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0755 whenever the log of mountainous terrain changes by 1 unit.

3. How would your interpretation change when in addition to gdp\_g you also add square of gdp\_g as the independent variable in equation 2.

Adding the square of gdp\_g, we have the regression equation as

*regress any\_prio gdp\_g sq\_gdp\_g gdp\_g\_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year*

```
. gen sq_gdp_g = gdp_g^2
```

```
. reg any_prio gdp_g sq_gdp_g gdp_g_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year
```

Source	SS	df	MS	Number of obs	=	743
Model	20.0986137	10	2.00986137	F(10, 732)	=	11.71
Residual	125.602598	732	.171588248	Prob > F	=	0.0000
				R-squared	=	0.1379
				Adj R-squared	=	0.1262
Total	145.701211	742	.196362818	Root MSE	=	.41423

any_prio	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gdp_g	-.4326527	.2174995	-1.99	0.047	-.8596499	-.0056554
sq_gdp_g	2.822088	.7303116	3.86	0.000	1.388333	4.255843
gdp_g_l	-.016606	.2111909	-0.08	0.937	-.4312181	.3980062
polity2l	-.0012143	.002998	-0.41	0.686	-.0070999	.0046714
ethfrac	.2061768	.0848933	2.43	0.015	.0395135	.3728402
relfrac	-.2466786	.0966937	-2.55	0.011	-.4365088	-.0568485
Oil	.004586	.0483306	0.09	0.924	-.0902972	.0994691
lpopl1	.0814465	.0155625	5.23	0.000	.050894	.111999
lmtnest	.0717742	.013975	5.14	0.000	.0443383	.0992102
year	.0037487	.0030536	1.23	0.220	-.0022461	.0097435
_cons	-8.053619	6.066837	-1.33	0.185	-19.96409	3.856855

Interpretation: Using the square of gdp\_g in the regression, the statistical significance of some of the independent variables changed.

Earlier we had ethfrac, relfrac, lpopl1 and lmtnest as statistically significant in the model.

Now we have gdp\_g, ethfrac, relfrac, lpopl1 and lmtnest are statistically significant.

In addition to these sq\_gdp\_g is also statistically significant.

From here we can conclude that adding square of gdp\_g in the model makes gdp\_g statistically significant.

These statistically significant estimates can then be interpreted as following:

- $\partial E[\text{any\_prio}|X]/\partial \text{gdp\_g} = -.4327$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .4327 whenever the gdp grows by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{sq\_gdp\_g} = 2.8221$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by 2.8221 whenever the square of gdp grows by 1 unit.

- $\partial E[\text{any\_prio}|X]/\partial \text{ethfrac} = .2062$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .2062 whenever the ethnic fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{relfrac} = -.2467$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .2467 whenever the religious fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{popl1} = .0814$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0814 whenever the log of population in the previous year had changed by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{mtnest} = .0718$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0718 whenever the log of mountainous terrain changes by 1 unit.

4. How would your interpretation change when instead of gdp\_g you use log of gdp as the independent variable in equation 2.

Using the log of gdp instead of gdp\_g, we have the regression equation as

*regress any\_prio lgdp gdp\_g\_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year*

**. gen lgdp=log(gdpen)**

**. reg any\_prio lgdp gdp\_g\_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year**

Source	SS	df	MS	Number of obs	=	743
Model	19.7727616	9	2.19697351	F(9, 733)	=	12.79
Residual	125.92845	733	.171798704	Prob > F	=	0.0000
				R-squared	=	0.1357
				Adj R-squared	=	0.1251
Total	145.701211	742	.196362818	Root MSE	=	.41449

any_prio	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lgdp	-.1184297	.0302814	-3.91	0.000	-.1778783	-.0589811
gdp_g_l	.0056689	.2119659	0.03	0.979	-.4104637	.4218016
polity2l	.0023715	.0030446	0.78	0.436	-.0036056	.0083486
ethfrac	.2159197	.0848829	2.54	0.011	.0492771	.3825624
relfrac	-.2561168	.0969162	-2.64	0.008	-.4463831	-.0658504
Oil	.0863311	.0523766	1.65	0.100	-.0164948	.1891571
lpopl1	.060075	.0161967	3.71	0.000	.0282775	.0918725
lmtnest	.0721777	.0139726	5.17	0.000	.0447466	.0996087
year	.0009713	.0030372	0.32	0.749	-.0049913	.0069339
_cons	-2.340925	6.036867	-0.39	0.698	-14.19254	9.510685

Interpretation: Using lgdp instead of gdp\_g, we get a statistically significant independent variable which can be used to interpret the changes in the expected value of any internal conflict.

Let our estimated regression equation be

$$E[\text{any\_prio}|X] = b_0 + b_1 \cdot \text{lgdp} + b_2 \cdot \text{gdp\_g\_l} + b_3 \cdot \text{polity2l} + b_4 \cdot \text{ethfrac} + b_5 \cdot \text{relfrac} + b_6 \cdot \text{Oil} + b_7 \cdot \text{lpopl1} + b_8 \cdot \text{lmtnest} + b_9 \cdot \text{year}$$

Now, the statistically significant variables can be interpreted as below,

- $\partial E[\text{any\_prio}|X] / \partial \text{ethfrac} = .2159$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .2159 whenever the ethnic fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X] / \partial \text{relfrac} = -.2561$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .2561 whenever the religious fragmentation changes by 1 unit.

- $\partial E[\text{any\_prio}|X]/\partial \ln \text{popl1} = .0601$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0601 whenever the log of population in the previous year had changed by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \ln \text{mtnest} = .0722$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0722 whenever the log of mountainous terrain changes by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \ln \text{gdp} = -.1184$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .1184 whenever gdp changes by 1 percent.



5. Suppose you would like to test that economic shocks affect conflict more in countries with low levels of democracy. Write the regression equation to do that and produce the regression table. Also, interpret the results of the new model.

We can use the interactive dummy to account for the increase in the effect of gdp growth on the chances of increase in conflict due to different levels of democracy.

The level of democracy is represented by democ variable which ranges from 0 (least democratic) to 10 (most democratic).

The interactive dummy corresponding to this case is  $inter\_democ = democ * gdp\_g$ .

*regress any\_prio gdp\_g inter\_democ gdp\_g\_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year*

**. reg any\_prio gdp\_g inter\_democ gdp\_g\_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year**

Source	SS	df	MS	Number of obs	=	737
Model	19.248408	10	1.9248408	F(10, 726)	=	11.26
Residual	124.157291	726	.171015552	Prob > F	=	0.0000
				R-squared	=	0.1342
				Adj R-squared	=	0.1223
Total	143.405699	736	.194844699	Root MSE	=	.41354

any_prio	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gdp_g	-.042651	.2274778	-0.19	0.851	-.4892439	.4039419
inter_democ	.0303996	.0076494	3.97	0.000	.015382	.0454173
gdp_g_l	.0413489	.2127737	0.19	0.846	-.3763763	.4590741
polity2l	-.0011316	.0029941	-0.38	0.706	-.0070098	.0047466
ethfrac	.2108295	.0848347	2.49	0.013	.0442788	.3773801
relfrac	-.2464842	.0965926	-2.55	0.011	-.4361182	-.0568501
Oil	.0133741	.0483044	0.28	0.782	-.0814588	.108207
lpopl1	.0788902	.015561	5.07	0.000	.0483403	.1094401
lmtnest	.0727433	.014073	5.17	0.000	.0451147	.1003719
year	.0015583	.0030324	0.51	0.608	-.0043951	.0075116
_cons	-3.670948	6.024629	-0.61	0.543	-15.49872	8.156826

Interpretation: The regression equation corresponding to this case will be

$$E[any\_prio|X] = b_0 + b_1 * gdp\_g + b_2 * gdp\_g\_l + b_3 * polity2l + b_4 * ethfrac + b_5 * relfrac + b_6 * Oil + b_7 * lpopl1 + b_8 * lmtnest + b_9 * year + b_{10} * inter\_democ$$

Here the p-value for is less than 0.05 for the independent variables inter\_democ, ethfrac, relfrac, lpopl1 and lmtnest. So these variables are statistically significant and they can be interpreted as follow:

- $\partial E[any\_prio|X] / \partial gdp\_g = -.0427 + .0304 * democ$  which implies that keeping all other variable same, the expected value of any internal conflict changes by  $-.0427 + .0304 * democ$  whenever gdp\_g changes by 1 unit. The interpretation of this effect depend on the value of democ for the particular country.
- $\partial E[any\_prio|X] / \partial relfrac = -.2465$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .2465 whenever the religious fragmentation changes by 1 unit.

- $\partial E[\text{any\_prio}|X]/\partial \ln \text{popl1} = .0789$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0789 whenever the log of population in the previous year had changed by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \ln \text{mtnest} = .0727$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0727 whenever the log of mountainous terrain changes by 1 unit.

6. Do you think the estimation of equation 2 using OLS results in BLUE estimator? If not, state in detail the reason.

No, one possible reason for this could be the presence of heteroscedasticity in the model. Presence of heteroscedasticity implies that the OLS estimates are not the BLUE estimates. This can be tested using the breusch-pagan test for heteroscedasticity in the model.

**. estat hettest, rhs mtest**

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity  
Ho: Constant variance

Variable	chi2	df	p
gdp_g	0.37	1	0.5403 #
gdp_g_l	1.06	1	0.3030 #
polity2l	0.06	1	0.8129 #
ethfrac	5.71	1	0.0168 #
relfrac	8.72	1	0.0031 #
Oil	0.72	1	0.3965 #
lpopl1	58.09	1	0.0000 #
lmtnest	30.91	1	0.0000 #
year	5.53	1	0.0187 #
simultaneous	82.72	9	0.0000

*# unadjusted p-values*

.

Critical chi2 value for 1 degree of freedom is 3.84 and for 9 degree of freedom is 16.92.

Here we have the value of chi2 for ethfrac, relfrac, lpopl1 and lmtnest greater the critical value of chi2 at 1 degree of freedom. There we can reject the null hypothesis that the variances are constant and thus the model can not be estimated using OLS.

7. The file provided also has data on rainfall shocks. Can you use this variable to improve upon OLS? Explain in detail all the steps.

We can use exogenous variation in rainfall as an instrumental variable for income growth in order to estimate the impact of economic growth on civil conflict. Weather shocks are plausible instruments for growth in gross domestic product in economies that largely rely on rain-fed agriculture, that is, neither have extensive irrigation systems nor are heavily industrialized. The instrumental variable method makes it credible to assert that the association between economic conditions and civil war is a causal relationship rather than simply a correlation. Sub-Saharan Africa is the ideal region for this identification strategy as the World Development Indicator database indicates that only 1 percent of cropland is irrigated in the median African country, and the agricultural sector remains large.

We use the IV(2SLS) method to estimate the regression equation.

Let us denote rainfall shock at period  $t$  by  $R_t$ . Since the GDP growth rate of current year depends upon the GDPs of present year and the past year, we use both the rainfall shock of current year and the previous year i.e.,  $R_t$  and  $R_{t-1}$  as instrumental variables for  $gdp\_g$ . Similarly, the lagged GDP growth rate which is  $gdp\_g\_l$  is also an endogenous variable for which we use the instrumental variables  $R_{t-1}$  and  $R_{t-2}$ .

So, our instrumental variable vector is  $Z = [R_t R_{t-1} R_{t-2} polity2l ethfrac relfrac Oil lpopl1 lmtnest year]$

Step 1: At the 1<sup>st</sup> stage, we estimate both  $gdp\_g$  and  $gdp\_g\_l$  by OLS regression according to the following regression equations.

$$gdp\_g = \alpha_0 + \alpha_1 R_t + \alpha_2 R_{t-1} + \epsilon_1$$

$$gdp\_g\_l = \delta_0 + \delta_1 R_{t-1} + \delta_2 R_{t-2} + \epsilon_2$$

Let the estimated  $gdp\_g$  and  $gdp\_g\_l$  be denoted by  $gd\hat{p}_g$  and  $gd\hat{p}_g\_l$  respectively.

Step 2: Initially our vector of variables was

$$X = [gdp\_g \ gdp\_g\_l \ polity2l \ ethfrac \ relfrac \ Oil \ lpopl1 \ lmtnest \ year]$$

And our regression equation was

$$Y = X\beta + \epsilon$$

At the 2nd stage we use the following vector of variables

$$\tilde{X} = [gd\hat{p}_g \ gd\hat{p}_g\_l \ polity2l \ ethfrac \ relfrac \ Oil \ lpopl1 \ lmtnest \ year]$$

and estimate the coefficients as  $bIV = (\tilde{X}'\tilde{X})^{-1}(\tilde{X}'Y)$ .

Now since  $gd\hat{p}_g$  and  $gd\hat{p}_g\_l$  are linear combinations of  $R_t$ ,  $R_{t-1}$  and  $R_{t-2}$ ,  $\tilde{X}$  is the same as estimated  $X$  in a OLS regression upon instrument variables vector  $Z$ .

So,  $\tilde{X} = (I - MZ)X$ , where  $MZ = I - Z(Z'Z)^{-1}Z'$  is the residual maker.

$$\text{So, } \tilde{X} = Z(Z'Z)^{-1}Z'X$$

$$\begin{aligned} bIV &= (\tilde{X}'\tilde{X})^{-1}(\tilde{X}'Y) = (X'Z(Z'Z)^{-1}Z'X)^{-1}(X'Z(Z'Z)^{-1}Z'Y) = (X'Z(Z'Z)^{-1}Z'X)^{-1}(X'Z(Z'Z)^{-1}Z'[X\beta + \epsilon]) \\ &= \beta + (X'Z(Z'Z)^{-1}Z'X)^{-1}(X'Z(Z'Z)^{-1}Z'\epsilon) \end{aligned}$$

So,  $\text{plim } b_{IV} = \text{plim} [\beta + (X'Z(Z'Z)^{-1}Z'X)^{-1}(X'Z(Z'Z)^{-1}Z'\epsilon)] = \beta + \text{plim}(X'Z(Z'Z)^{-1}Z'X)^{-1}(X'Z(Z'Z)^{-1}Z'\epsilon) = \beta + (\text{plim}(X'Z/n) \text{plim}(Z'Z/n)^{-1} \text{plim}(Z'X/n))^{-1}(\text{plim}(X'Z/n) \text{plim}(Z'Z/n)^{-1} \text{plim}(Z'\epsilon/n)) = \beta$  [Since  $Z$  and  $\epsilon$  are uncorrelated,  $\text{plim}(Z'\epsilon/n) = 0$  and  $\text{plim}(X'Z/n)$ ,  $\text{plim}(Z'Z/n)$  are finite positive definite matrices]

Hence, we get  $\text{plim } b_{IV} = \beta$  i.e.,  $b_{IV}$  is a consistent estimator of  $\beta$ .

Now we have a consistent estimator and it is free from endogeneity. So it is an improvement over the OLS estimator.

8. Estimate regression equation 1 with robust standard errors to account for possible heteroscedasticity in the data. Interpret the change in standard errors with respect to standard errors obtained by estimating equation 2. Run the following command in Stata:

```
regress any_prio gdp_g gdp_g_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year, robust
```

```
. regress any_prio gdp_g gdp_g_l, robust
```

Linear regression	Number of obs	=	<b>743</b>
	F(2, 740)	=	<b>0.58</b>
	Prob > F	=	<b>0.5588</b>
	R-squared	=	<b>0.0026</b>
	Root MSE	=	<b>.44315</b>

any_prio	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
gdp_g	-.3094018	.2969241	-1.04	0.298	-.8923158	.2735122
gdp_g_l	-.0726641	.279152	-0.26	0.795	-.6206883	.4753602
_cons	.2659587	.0163924	16.22	0.000	.2337775	.2981399

```
. regress any_prio gdp_g gdp_g_l polity2l ethfrac relfrac Oil lpopl1 lmtnest year, robust
```

Linear regression	Number of obs	=	<b>743</b>
	F(9, 733)	=	<b>13.38</b>
	Prob > F	=	<b>0.0000</b>
	R-squared	=	<b>0.1204</b>
	Root MSE	=	<b>.41815</b>

any_prio	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
gdp_g	-.3258443	.2791102	-1.17	0.243	-.8737949	.2221063
gdp_g_l	-.0784348	.2618608	-0.30	0.765	-.5925214	.4356517
polity2l	.0000237	.0028078	0.01	0.993	-.0054885	.005536
ethfrac	.2190961	.0886646	2.47	0.014	.0450292	.393163
relfrac	-.2263156	.0916145	-2.47	0.014	-.4061737	-.0464575
Oil	.0046091	.0515001	0.09	0.929	-.0964963	.1057144
lpopl1	.0776922	.0148332	5.24	0.000	.0485716	.1068128
lmtnest	.0754583	.0132024	5.72	0.000	.0495392	.1013773
year	.0022108	.0032873	0.67	0.501	-.0042428	.0086644
_cons	-4.965938	6.518818	-0.76	0.446	-17.76372	7.831843

Interpretation: The use robust standard errors removes the problem of heteroscedasticity in the model but does not have any impact on the values of coefficient estimates and does not influence their statistical significance. So the interpretation of their effects remains the same as earlier for the robust models also.

For equation 1:

Interpretation: The p-value for both the independent variables is more than 0.05. So, both the estimates of the coefficient of these variables are statistically insignificant at 5% level of significance and cannot be used to interpret the change in the probability of conflict.

For equation 2:

Since the p-value for the variables *ethfrac*, *relfrac*, *lppopl1* and *lmtnest* are less than 0.05, there estimated coefficients are statistically significant. These coefficients can then be interpreted as following:

- $\partial E[\text{any\_prio}|X]/\partial \text{ethfrac} = .2191$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .2191 whenever the ethnic fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{relfrac} = -.2263$  which implies that keeping all other variable same, the expected value of any internal conflict decreases by .2263 whenever the religious fragmentation changes by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{lppopl1} = .0777$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0777 whenever the log of population in the previous year had changed by 1 unit.
- $\partial E[\text{any\_prio}|X]/\partial \text{lmtnest} = .0755$  which implies that keeping all other variable same, the expected value of any internal conflict increases by .0755 whenever the log of mountainous terrain changes by 1 unit.