Graphics Generation

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3/25/2018

```
# library
library(stargazer)
```

```
##
## Please cite as:
```

```
##  Hlavac, Marek (2015). stargazer: Well-Formatted Regression and Summary Statistics Tables.
```

```
##  R package version 5.2. http://CRAN.R-project.org/package=stargazer
```

```
library(survival)
```

```
## Warning: package 'survival' was built under R version 3.2.5
```

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 3.2.5
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 3.2.5
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

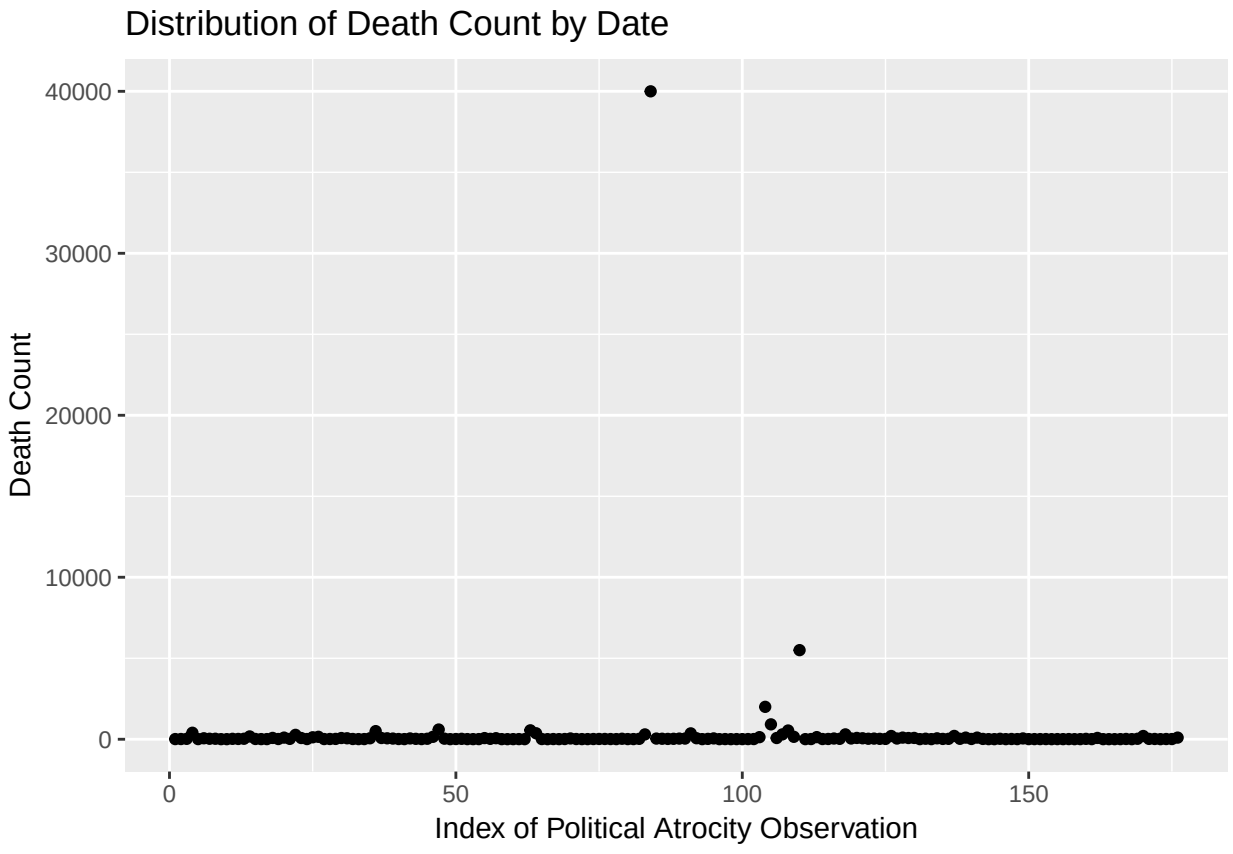
```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(xtable)
# set working directory
setwd("/Users/SriduttN/Desktop/JP Spring Semester")
# reading in the data set
timeVaried.sections <- read.csv("Finalized Compilation_SURV.csv", header = TRUE)
wars.withCovariates <- read.csv("Finalized Compilation.csv", header = TRUE)
finalCOW_intrastateData <- read.csv("Intrastate COW Data Compilation, 1995 to 2007.csv", header = TRUE)
atrocityWars <- finalCOW_intrastateData
atrocityWars <- atrocityWars[-31,]
```

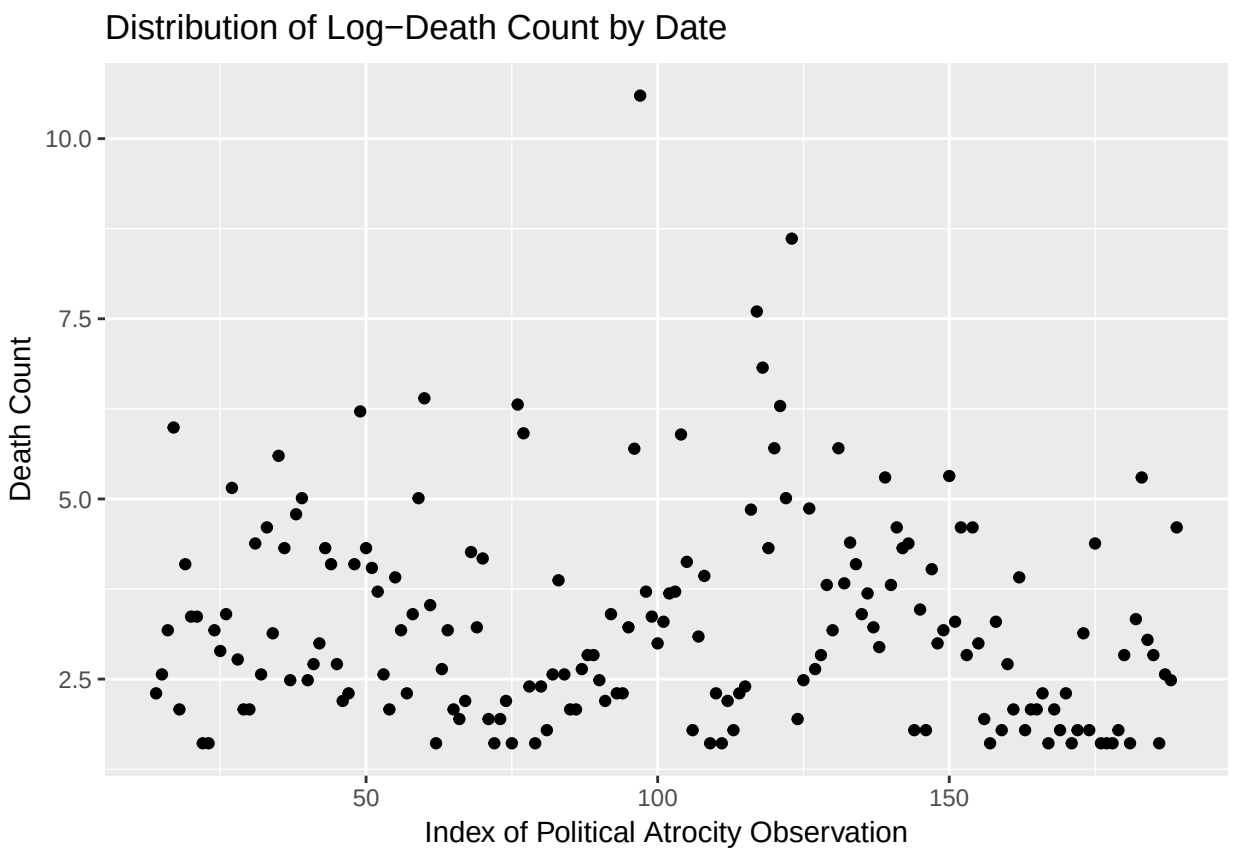
```
atrocityWars <- atrocityWars[-27,]
atrocityWars <- atrocityWars[-10,]
atrocityWars <- atrocityWars[-7,]
atrocityWars <- atrocityWars[-20,]
atrocityWars <- atrocityWars[-17,]
atrocityWars <- atrocityWars[-2,]
atrocityWars <- atrocityWars[-2,]
atrocityWars <- atrocityWars[-18,]
atrocityWars <- atrocityWars[-6,]
atrocityWars <- atrocityWars[-9,]
atrocityWars <- atrocityWars[-4,]
atrocityWars <- atrocityWars[-5,]
# checking length of atrocity wars to corroborate accuracy of dataset
nrow(atrocityWars)
```

```
## [1] 18
```

```
# reading in the nimmagadda.replication set
nimmagadda.replication <- read.csv("Political Atrocities Replication File_Final.csv", header = TRUE)
nimmagadda.replication$X <- 1:nrow(nimmagadda.replication)
ggplot(data = nimmagadda.replication, aes(x = X, y = Deaths.Number)) + geom_point() +
  ggtitle("Distribution of Death Count by Date") + xlab("Index of Political Atrocity Observation") + yla
```



```
ggplot(data = timeVaried.sections[14:189, ], aes(x = X, y = LogDeaths)) + geom_point() +
  ggtitle("Distribution of Log-Death Count by Date") + xlab("Index of Political Atrocity Observation") +
```




```
# intervention organization
intervention <- subset(wars.withCovariates, InternationalOppo == 1)
intervention.atrocities <- subset(timeVaried.sections, DidAtrocityHappen == 1)

cor(wars.withCovariates$DidAtrocityHappen, wars.withCovariates$WarLength)
```

```
## [1] 0.451746
```

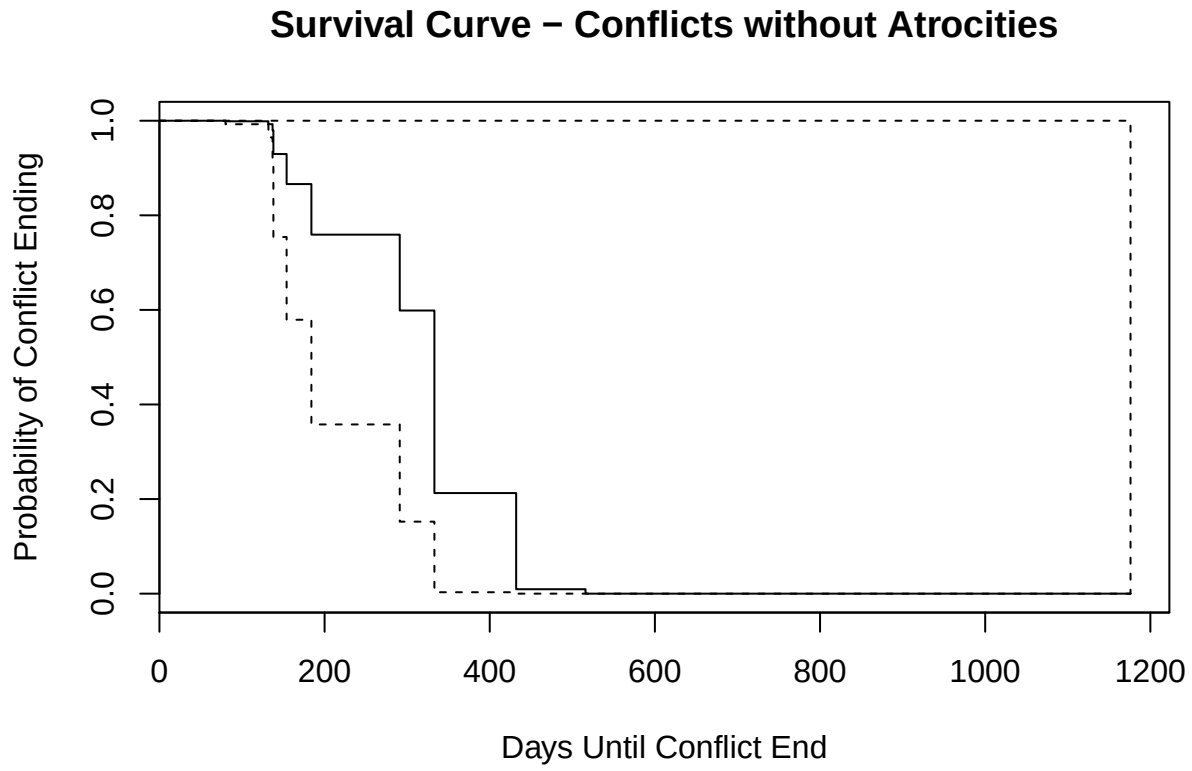
```
# time of first intervention
firstIntervention <- rep(NA, nrow(intervention.atrocities))
intervention.atrocities <- cbind(intervention.atrocities, firstIntervention)
Violation.Dates <- nimmagadda.replication$dated_violations
intervention.atrocities <- cbind(intervention.atrocities, Violation.Dates, nimmagadda.replication$x)

startDates <- c("10/10/1997", "2/6/1998", "1/1/1997", "10/19/2006")
```

```
# dpylr
nimmagadda.replication.violations <- nimmagadda.replication %>%
  group_by(x) %>%
  summarise(sum(Deaths.Number))

totalDeaths <- rep(NA, 31)
```

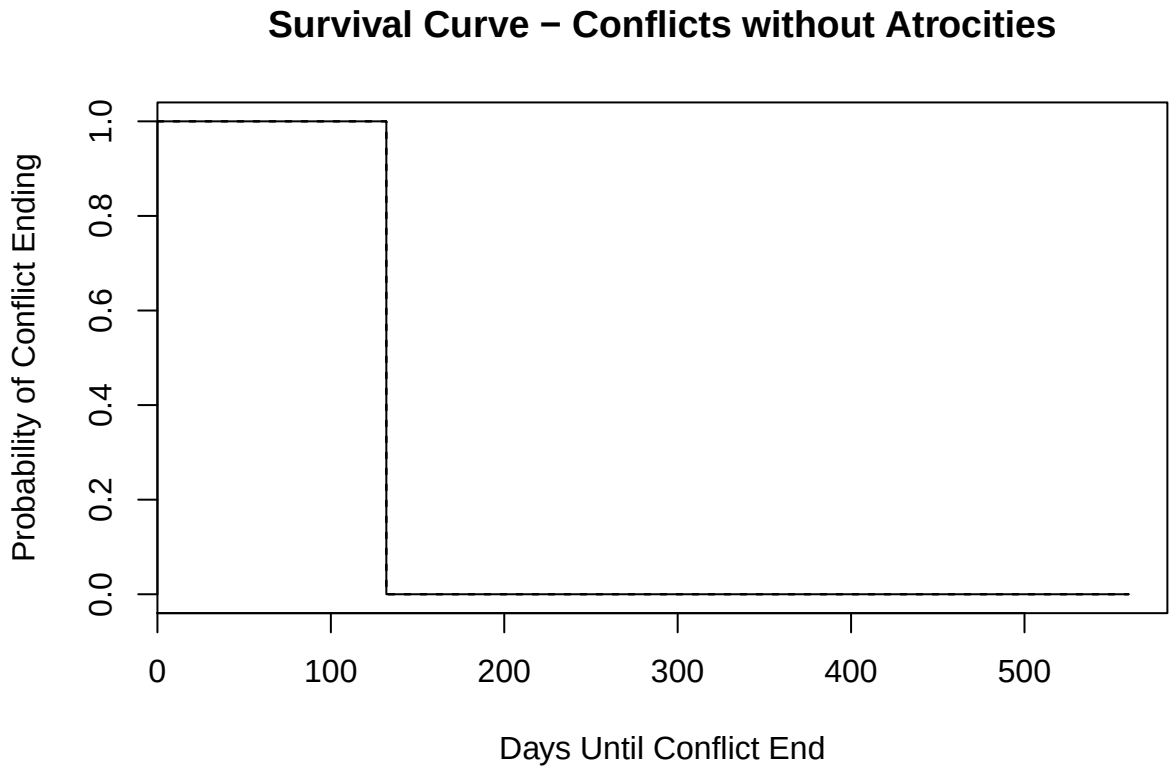
```
for (i in 1:13) {
  totalDeaths[i] <- 0
}
for (i in 14:31) {
  totalDeaths[i] <- nimmagadda.replication.violations$'sum(Deaths.Number)'[i-13]
}

# wars with covariates
wars.withCovariates <- cbind(wars.withCovariates, totalDeaths)
wars.withCovariates$LogDeaths <- log(wars.withCovariates$totalDeaths)
wars.withCovariates$LogDeaths[1:13] <- 0

combinedSurvival <- coxph(data = timeVaried.sections, formula = Surv(WarLength, WarEndStatus) ~
                            DidAtrocityHappen + EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

combinedSurvival.Deaths <- coxph(data = timeVaried.sections[14:189,], formula = Surv(WarLength, WarEndS
                            LogDeaths + EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

combinedSurvival.woAtrocities <- coxph(data = timeVaried.sections[1:13,], formula = Surv(WarLength, War
                            EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

combinedSurvival.full <- coxph(data = wars.withCovariates, formula = Surv(WarLength, WarEndStatus) ~
                            DidAtrocityHappen + EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

combinedSurvival.full.missAngola <- coxph(data = wars.withCovariates[2:31,], formula = Surv(WarLength,
                            DidAtrocityHappen + EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

combinedSurvival.full.missAngola.death <- coxph(data = wars.withCovariates[2:31,], formula = Surv(WarLe
                            LogDeaths + EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

combinedSurvival.full.death <- coxph(data = wars.withCovariates, formula = Surv(WarLength, WarEndStatus
                             LogDeaths + EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)

# removing angola
combinedSurvival.woAtrocities.ang <- coxph(data = timeVaried.sections[2:13,], formula = Surv(WarLength,
                            EthnFrac + RelFrac + InternationalAlly +
                            InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                            LogGDP.perCap)
```

```
## Warning in fitter(X, Y, strats, offset, init, control, weights = weights, :
## Loglik converged before variable 1,2,3,4,5,6,7,8,9 ; beta may be infinite.
```

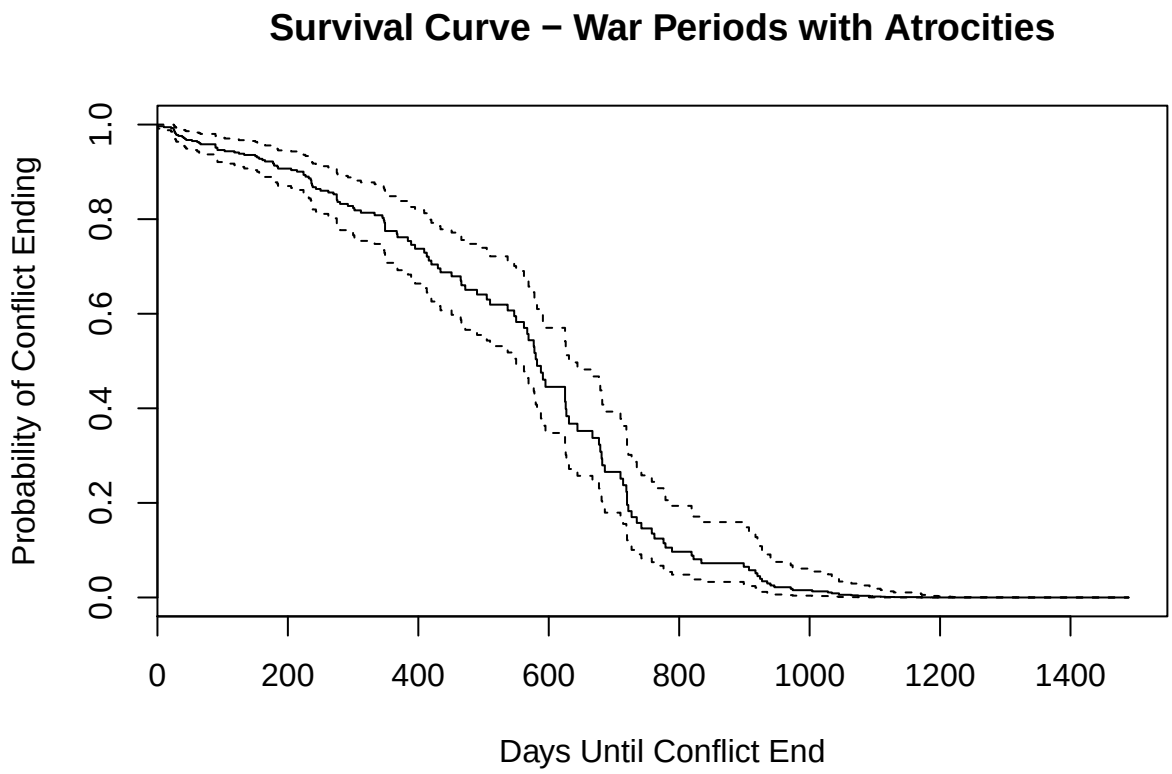
```
combinedSurvival.wAtrocities <- coxph(data = timeVaried.sections[14:189,], formula = Surv(WarLength, Wa
                              EthnFrac + RelFrac + InternationalAlly +
                              InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                              LogGDP.perCap + LogDeaths)

combinedSurvival.wAtrocities.war <- coxph(data = wars.withCovariates[14:31,], formula = Surv(WarLength,
                              EthnFrac + RelFrac + InternationalAlly +
                              InternationalOppo + African + Polity + Log.Mountainous + Log.Population +
                              LogGDP.perCap + LogDeaths)

plot(survfit(combinedSurvival.wAtrocities), xlab = "Days Until Conflict End",
     ylab = "Probability of Conflict Ending", main = "Survival Curve - Conflicts without Atrocities",
     xaxt = "n")
axis(side = 1, at = seq(0,2000,200))
```



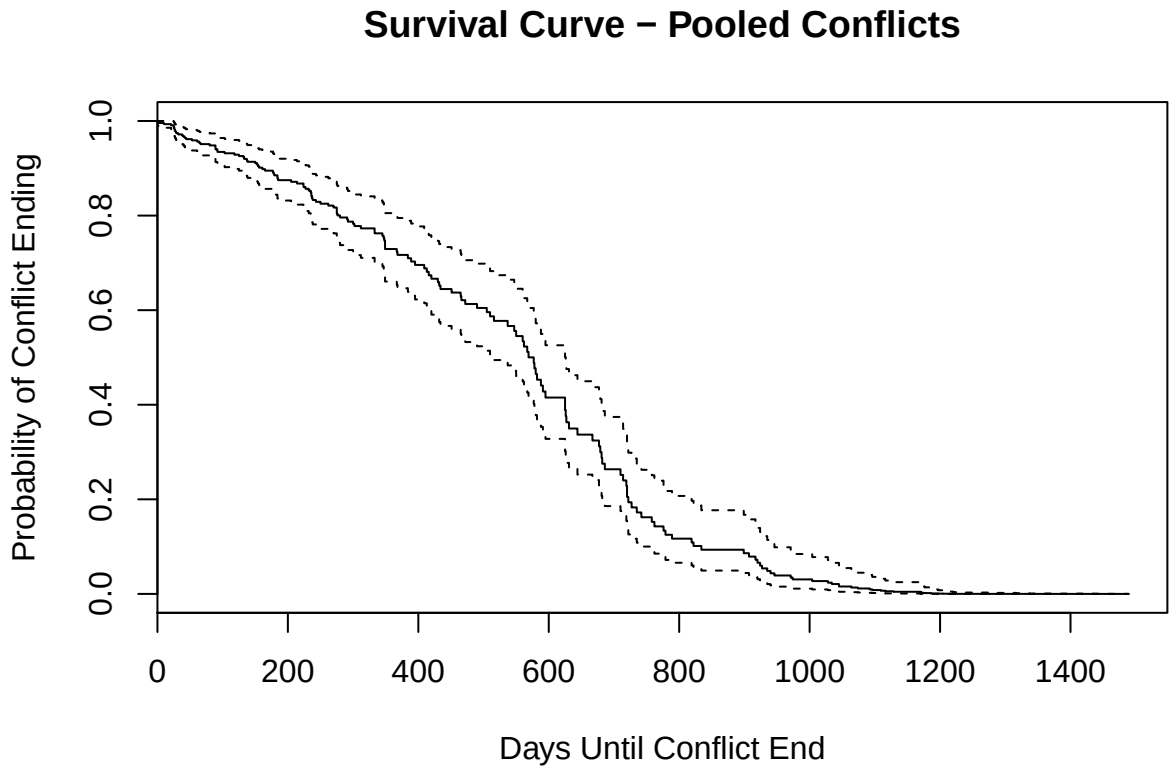

```
# removing angola
plot(survfit(combinedSurvival.woAtrocities.ang), xlab = "Days Until Conflict End",
     ylab = "Probability of Conflict Ending", main = "Survival Curve - Conflicts without Atrocities")
```



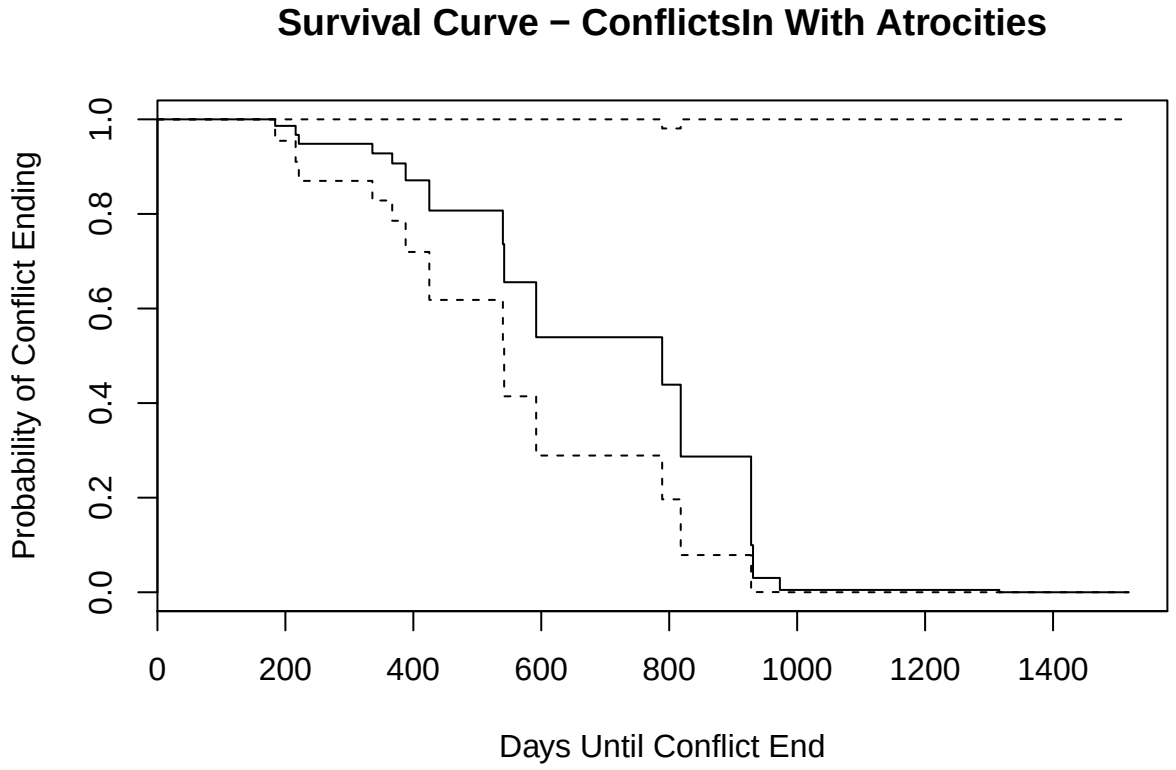

```
plot(survfit(combinedSurvival.wAtrocities), xlab = "Days Until Conflict End",
     ylab = "Probability of Conflict Ending", main = "Survival Curve - War Periods with Atrocities")
```



```
plot(survfit(combinedSurvival), xlab = "Days Until Conflict End",
     ylab = "Probability of Conflict Ending", main = "Survival Curve - Pooled Conflicts")
```




```
plot(survfit(combinedSurvival.wAtrocities.war), xlab = "Days Until Conflict End",
     ylab = "Probability of Conflict Ending", main = "Survival Curve - ConflictsIn With Atrocities",
     xaxt = "n", )
axis(side = 1, at = seq(0,2000,200))
```




```
stargazer(combinedSurvival.full.missAngola, combinedSurvival.full.missAngola.death,
          covariate.labels = c("Did an Atrocity Happen?", "Log-Death Count", "Ethnic Fractionalization"
                               "Religious Fractionalization",
                               "International Ally",
                               "International Opponent",
                               "African Country",
                               "Polity",
                               "Log Mountainous",
                               "Log Population",
                               "Log-GDP Per Capita"),
          column.sep.width = c(".1pt"))
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:10:52

```
stargazer(combinedSurvival.full, combinedSurvival.full.death, combinedSurvival.Deaths,
          covariate.labels = c("Did an Atrocity Happen?", "Log-Death Count", "Ethnic Fractionalization"
                               "Religious Fractionalization",
                               "International Ally",
                               "International Opponent",
                               "African Country",
                               "Polity",
                               "Log Mountainous",
                               "Log Population",
                               "Log-GDP Per Capita"),
          column.sep.width = c(".1pt"), title = "Test")
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:10:53

Table 1:

	Dependent variable:	
	WarLength	
	(1)	(2)
Did an Atrocity Happen?	-1.763^{***}	
	(0.662)	
Log-Death Count		-0.137
		(0.087)
Ethnic Fractionalization	1.481	1.199
	(1.271)	(1.342)
Religious Fractionalization	0.323	0.999
	(1.931)	(1.914)
International Ally	-0.165	-0.149
	(0.848)	(0.837)
International Opponent	0.535	0.723
	(0.805)	(0.791)
African Country	0.332	-0.139
	(0.890)	(0.817)
Polity	0.081	0.098
	(0.065)	(0.061)
Log Mountainous	0.415	0.329
	(0.373)	(0.352)
Log Population	-0.763^{**}	-0.741^{**}
	(0.337)	(0.327)
Log-GDP Per Capita	1.153^{**}	0.609
	(0.527)	(0.436)
Observations	29	29
R^2	0.484	0.390
Max. Possible R^2	0.993	0.993
Log Likelihood	-61.658	-64.088
Wald Test (df = 10)	16.070^{*}	12.360
LR Test (df = 10)	19.199^{**}	14.339
Score (Logrank) Test (df = 10)	20.180^{**}	14.695
Note:	*p<0.1; **p<0.05; ***p<0.01	

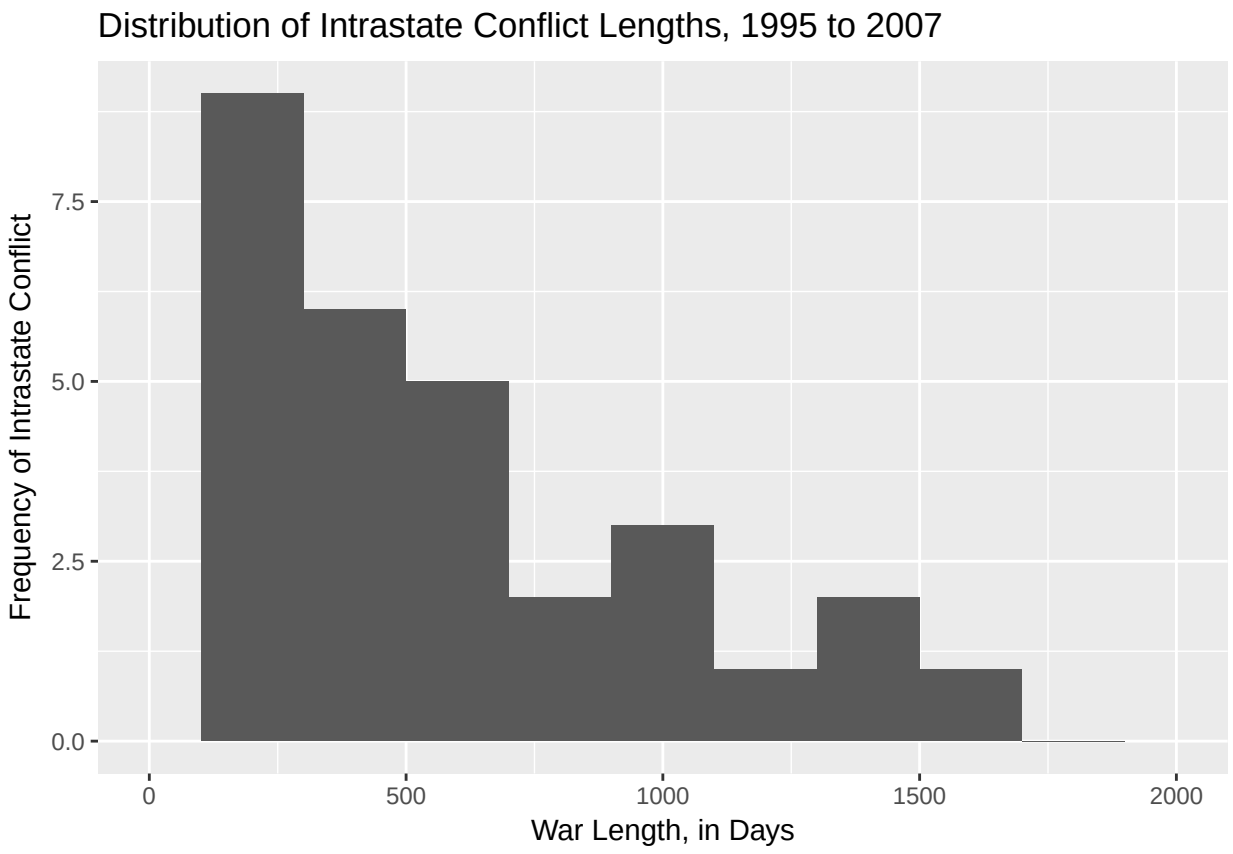
Table 2: Test

	Dependent variable:		
	WarLength		
	(1)	(2)	(3)
Did an Atrocity Happen?	−0.789		
	(0.539)		
Log-Death Count		−0.074	−0.102
		(0.084)	(0.065)
Ethnic Fractionalization	0.588	0.706	7.201***
	(1.239)	(1.344)	(0.740)
Religious Fractionalization	0.066	0.523	1.628**
	(1.935)	(1.918)	(0.793)
International Ally	−0.303	−0.223	0.939***
	(0.851)	(0.850)	(0.278)
International Opponent	0.619	0.754	4.020***
	(0.797)	(0.805)	(0.560)
African Country	−0.960	−0.911	0.023
	(0.749)	(0.749)	(0.485)
Polity	0.067	0.080	0.200***
	(0.067)	(0.063)	(0.031)
Log Mountainous	0.070	0.127	1.833***
	(0.346)	(0.339)	(0.236)
Log Population	−0.738**	−0.747**	−2.094***
	(0.333)	(0.330)	(0.191)
Log-GDP Per Capita	0.379	0.281	1.413***
	(0.392)	(0.396)	(0.263)
Observations	30	30	176
R^2	0.365	0.335	0.694
Max. Possible R^2	0.993	0.993	1.000
Log Likelihood	−67.852	−68.529	−633.289
Wald Test (df = 10)	12.680	11.510	166.230***
LR Test (df = 10)	13.612	12.259	208.442***
Score (Logrank) Test (df = 10)	14.402	13.068	222.767***
Note:			*p<0.1; **p<0.05; ***p<0.01

```
stargazer(combinedSurvival.full, combinedSurvival.full.death, combinedSurvival.Deaths, combinedSurvival
          covariate.labels = c("Did an Atrocity Happen?", "Log-Death Count", "Ethnic Fractionalization"
                               "Religious Fractionalization",
                               "International Ally",
                               "International Opponent",
                               "African Country",
                               "Polity",
                               "Log Mountainous",
                               "Log Population",
                               "Log-GDP Per Capita"),
          column.sep.width = c(".1pt"), title = "Test")
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:10:53

```
vector1 <- data.frame(combinedSurvival.full[1])
vector1$HR <- exp(vector1)

# distribution of conflict lengths
ggplot(data = finalCOW_intrastateData, aes(x = warTime)) + geom_histogram(binwidth = 200) + xlab("War L
```

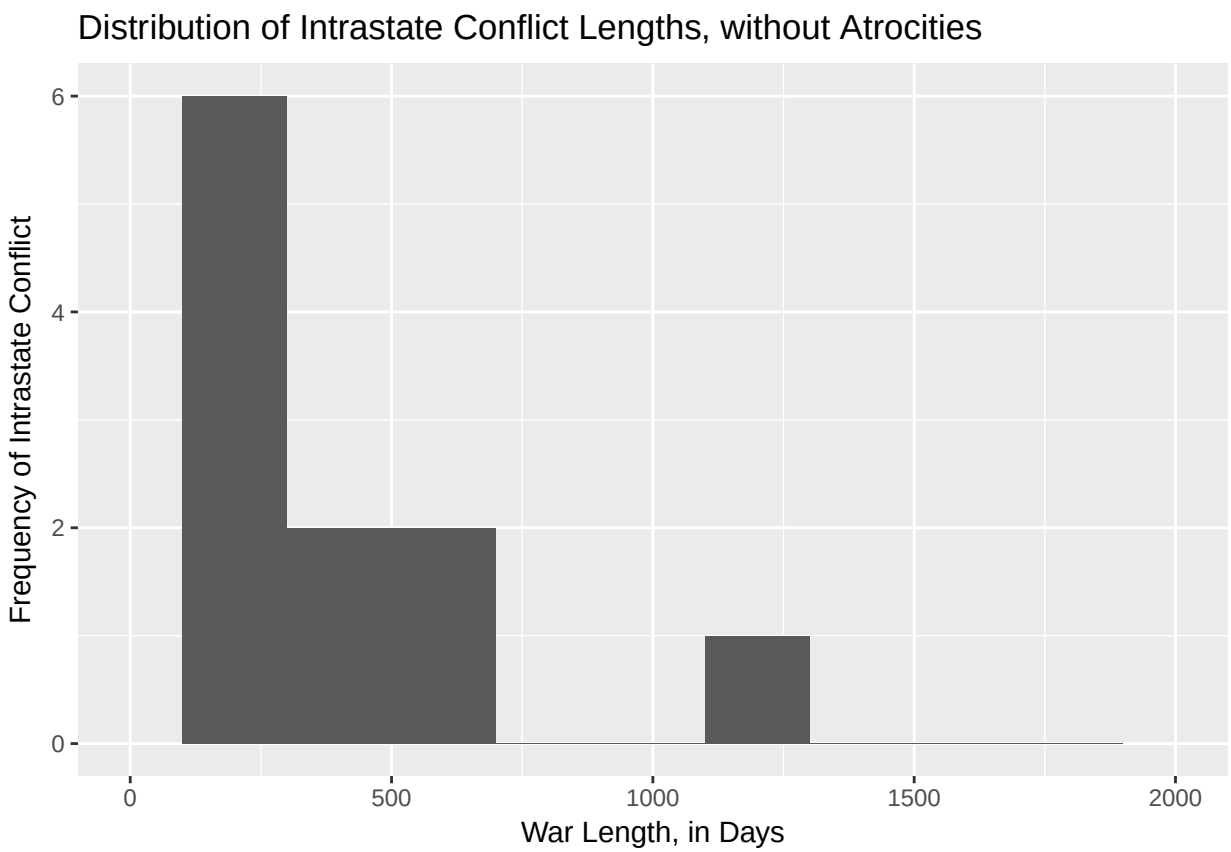



```
ggplot(data = timeVaried.sections[1:13, ], aes(x = WarLength)) + geom_histogram(binwidth = 200) + xlab(
```

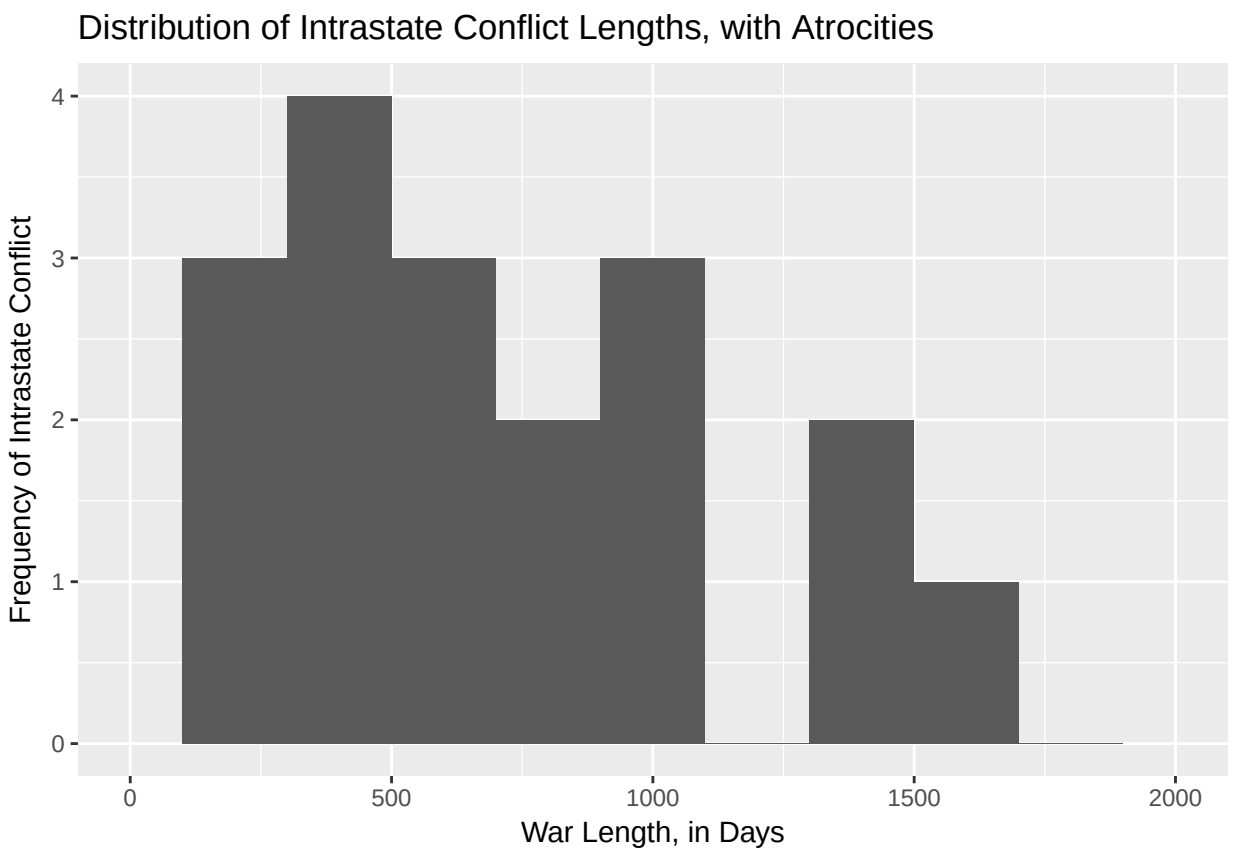
Table 3: Test

	Dependent variable:				
	WarLength				
	(1)	(2)	(3)	(4)	(5)
Did an Atrocity Happen?	−0.789			−1.763***	
	(0.539)			(0.662)	
Log-Death Count		−0.074	−0.102		−0.137
		(0.084)	(0.065)		(0.087)
Ethnic Fractionalization	0.588	0.706	7.201***	1.481	1.199
	(1.239)	(1.344)	(0.740)	(1.271)	(1.342)
Religious Fractionalization	0.066	0.523	1.628**	0.323	0.999
	(1.935)	(1.918)	(0.793)	(1.931)	(1.914)
International Ally	−0.303	−0.223	0.939***	−0.165	−0.149
	(0.851)	(0.850)	(0.278)	(0.848)	(0.837)
International Opponent	0.619	0.754	4.020***	0.535	0.723
	(0.797)	(0.805)	(0.560)	(0.805)	(0.791)
African Country	−0.960	−0.911	0.023	0.332	−0.139
	(0.749)	(0.749)	(0.485)	(0.890)	(0.817)
Polity	0.067	0.080	0.200***	0.081	0.098
	(0.067)	(0.063)	(0.031)	(0.065)	(0.061)
Log Mountainous	0.070	0.127	1.833***	0.415	0.329
	(0.346)	(0.339)	(0.236)	(0.373)	(0.352)
Log Population	−0.738**	−0.747**	−2.094***	−0.763**	−0.741**
	(0.333)	(0.330)	(0.191)	(0.337)	(0.327)
Log-GDP Per Capita	0.379	0.281	1.413***	1.153**	0.609
	(0.392)	(0.396)	(0.263)	(0.527)	(0.436)
Observations	30	30	176	29	29
R^2	0.365	0.335	0.694	0.484	0.390
Max. Possible R^2	0.993	0.993	1.000	0.993	0.993
Log Likelihood	−67.852	−68.529	−633.289	−61.658	−64.088
Wald Test (df = 10)	12.680	11.510	166.230***	16.070*	12.360
LR Test (df = 10)	13.612	12.259	208.442***	19.199**	14.339
Score (Logrank) Test (df = 10)	14.402	13.068	222.767***	20.180**	14.695

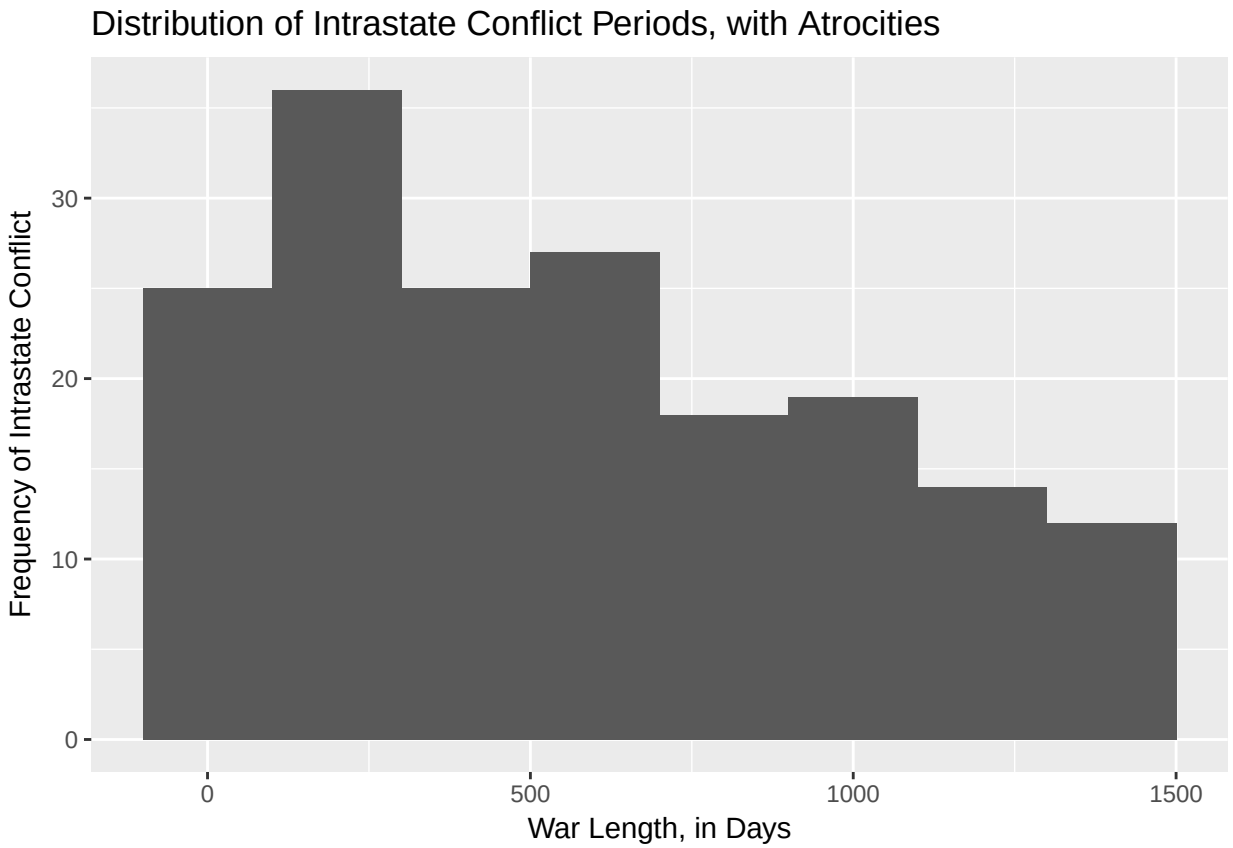
Note: *p<0.1; **p<0.05; ***p<0.01




```
ggplot(data = atrocityWars, aes(x = warTime)) + geom_histogram(binwidth = 200) + xlab("War Length, in Da
```




```
ggplot(data = timeVaried.sections[14:189, ], aes(x = WarLength)) + geom_histogram(binwidth = 200) + xlab
```




```
# hypothesis test for difference in mean war length, confidence intervals
se.noAtrocity.Length <- sqrt(var(timeVaried.sections$WarLength[1:13])/13)
mean.noAtrocity.Length <- mean(timeVaried.sections$WarLength[1:13])

# confidence interval for war periods of atrocities
se.AtrocityPeriod.Length <- sqrt(var(timeVaried.sections$WarLength[14:189])/176)
mean.AtrocityPeriod.Length <- mean(timeVaried.sections$WarLength[14:189])

# confidence interval for conflict duration of wars without atrocities
se.Atrocity.Length <- sqrt(var(atrocityWars$warTime)/18)
mean.Atrocity.Length <- mean(atrocityWars$warTime)

# creating a table of the results
X1 <- rbind(se.noAtrocity.Length, se.Atrocity.Length, se.AtrocityPeriod.Length)
X2 <- rbind(mean.noAtrocity.Length, mean.Atrocity.Length, mean.AtrocityPeriod.Length)
C1_table <- cbind(X1, X2)
row.names(C1_table) <- c("Length of Wars with No Atrocities",
                         "Length of Wars with Atrocities", "Length of War Periods (with Atrocities)")

C1_table <- data.frame(C1_table)

SE <- C1_table$X1
Mean <- C1_table$X2

UpperBound <- 1.96*SE+Mean
LowerBound <- Mean-1.96*SE
```

```
C1_table <- cbind(SE, Mean, UpperBound, LowerBound)
row.names(C1_table) <- c("Length of Wars with No Atrocities",
                         "Length of Wars with Atrocities", "Length of War Periods (with Atrocities)")


stargazer(C1_table, title = "Intrastate Conflict Length and Confidence Intervals, 1995 to 2007")
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:10:54

Table 4: Intrastate Conflict Length and Confidence Intervals, 1995 to 2007

	SE	Mean	UpperBound	LowerBound
Length of Wars with No Atrocities	84.700	322	488.012	155.988
Length of Wars with Atrocities	97.781	692.667	884.318	501.015
Length of War Periods (with Atrocities)	31.610	574.335	636.291	512.379

```
# correlation tests, for wars with atrocities
cor(atrocityWars$internationalizedAlly, atrocityWars$warTime)
```

[1] 0.1689778

```
cor(atrocityWars$internationalizedOpponent, atrocityWars$warTime)
```

[1] -0.1518585

```
# for wars without atrocities
cor(timeVaried.sections$InternationalAlly[1:13], timeVaried.sections$WarLength[1:13])
```

[1] 0.01082254

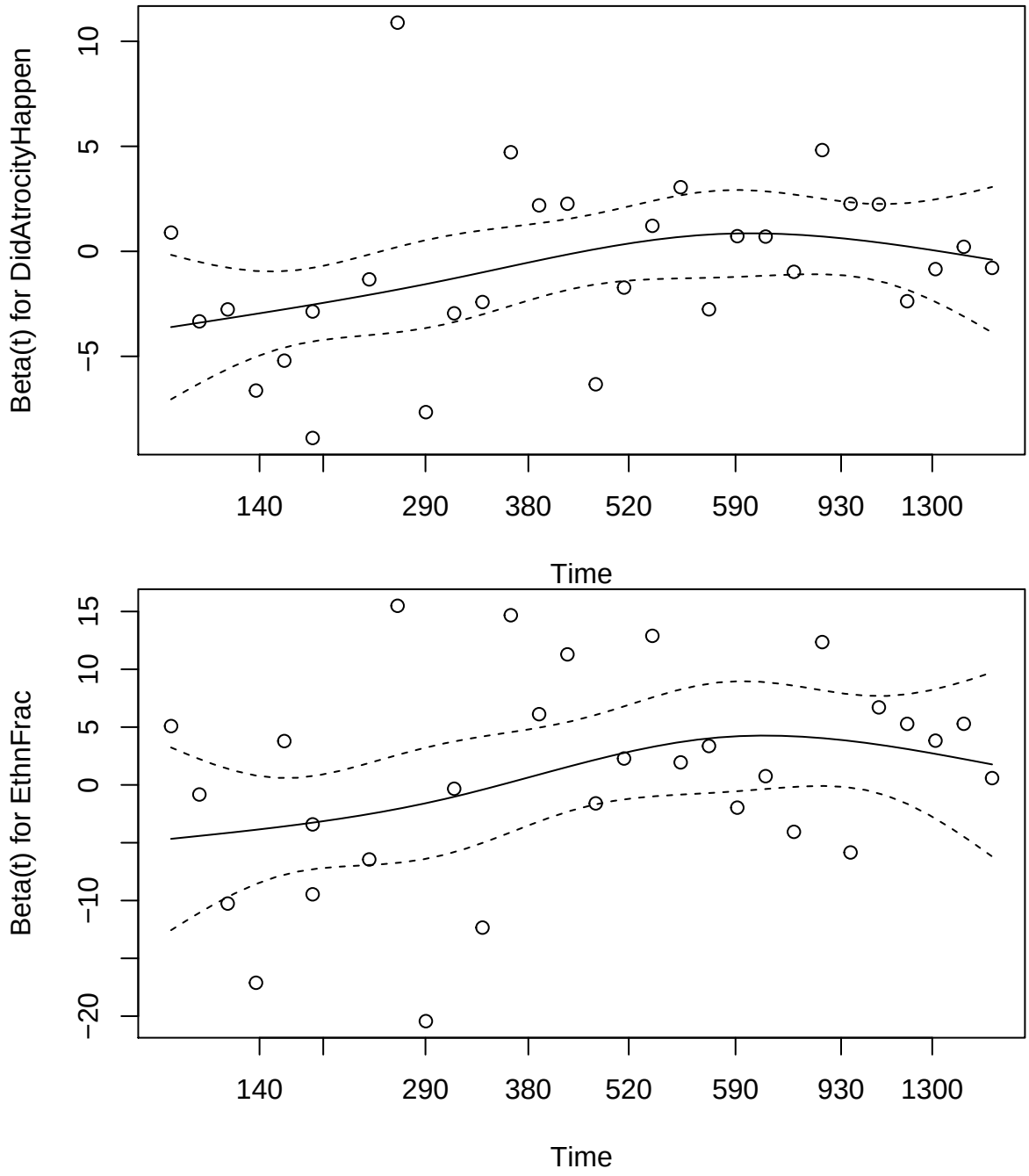
```
cor(timeVaried.sections$InternationalOppo[1:13], timeVaried.sections$WarLength[1:13])
```

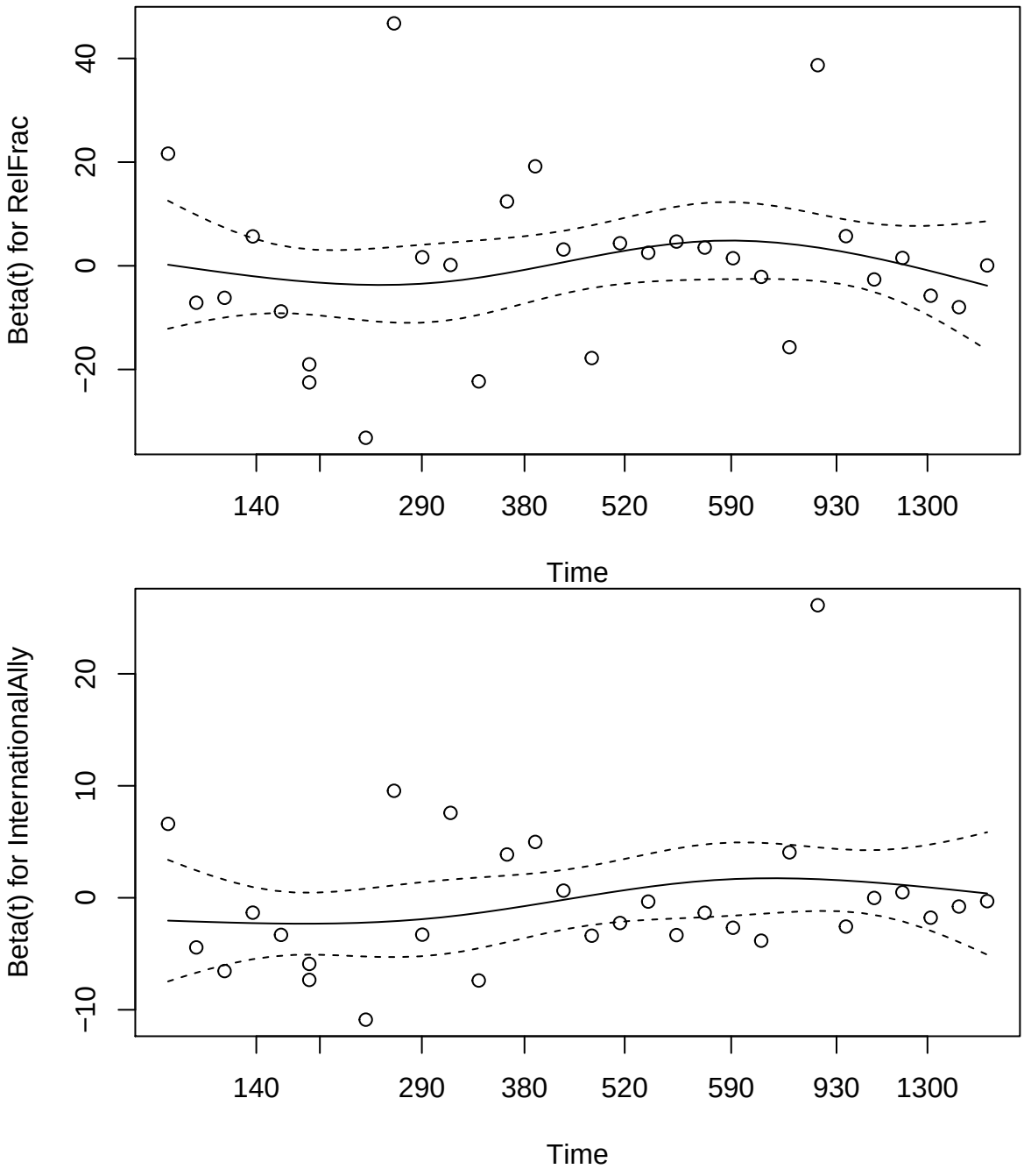
[1] 0.002906537

```
# hypothesis test for difference in means between war periods
hypothesisTestSE <- sqrt((var(atrocityWars$warTime)/18) + var(timeVaried.sections$WarLength[1:13])/13)
meanDiff <- mean.Atrocity.Length - mean.noAtrocity.Length

# number of standard errors, significant at alpha levels of both .05 and .01
test1 <- meanDiff/hypothesisTestSE

# hypothesis test for difference between periods
hypothesisTestSE.2 <- sqrt(se.noAtrocity.Length^2+se.AtrocityPeriod.Length^2)
meanDiff.2 <- mean.AtrocityPeriod.Length - mean.noAtrocity.Length
test2 <- meanDiff.2/hypothesisTestSE.2

cor(timeVaried.sections$WarLength[14:189], timeVaried.sections$Log.Mountainous[14:189])
```

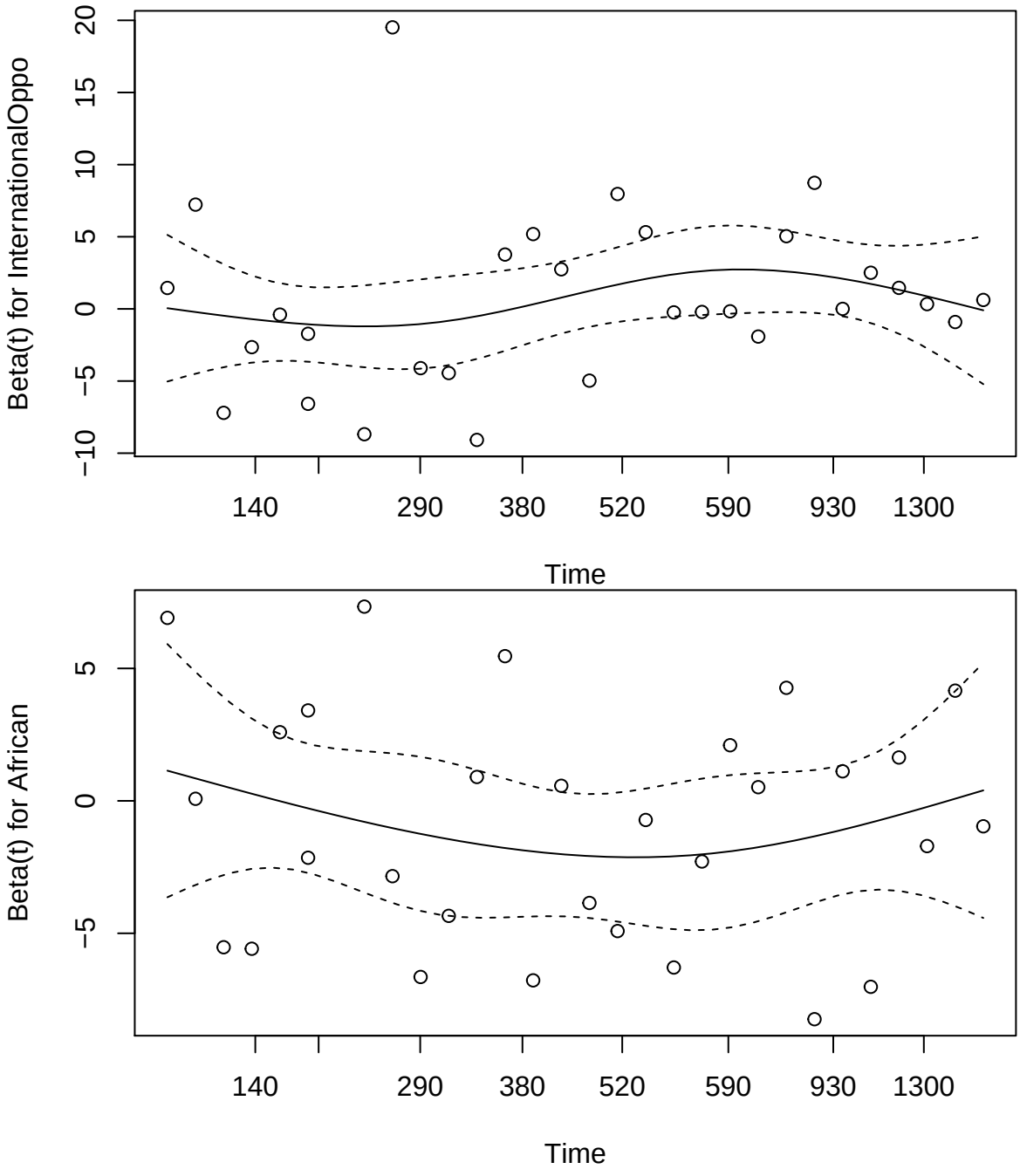
[1] -0.05259557

```
# checking proportional hazards
plot(cox.zph(combinedSurvival.full))
```

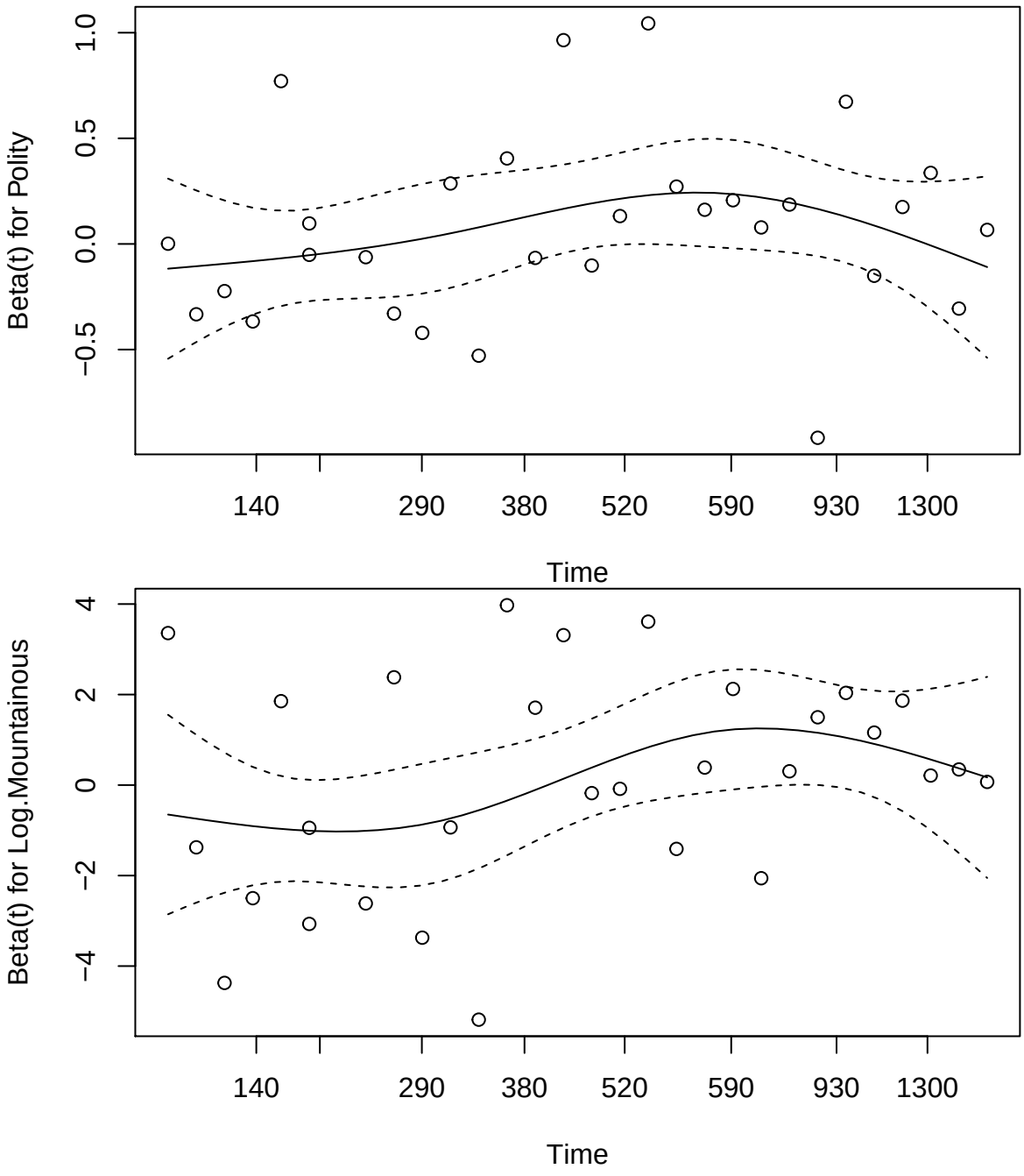


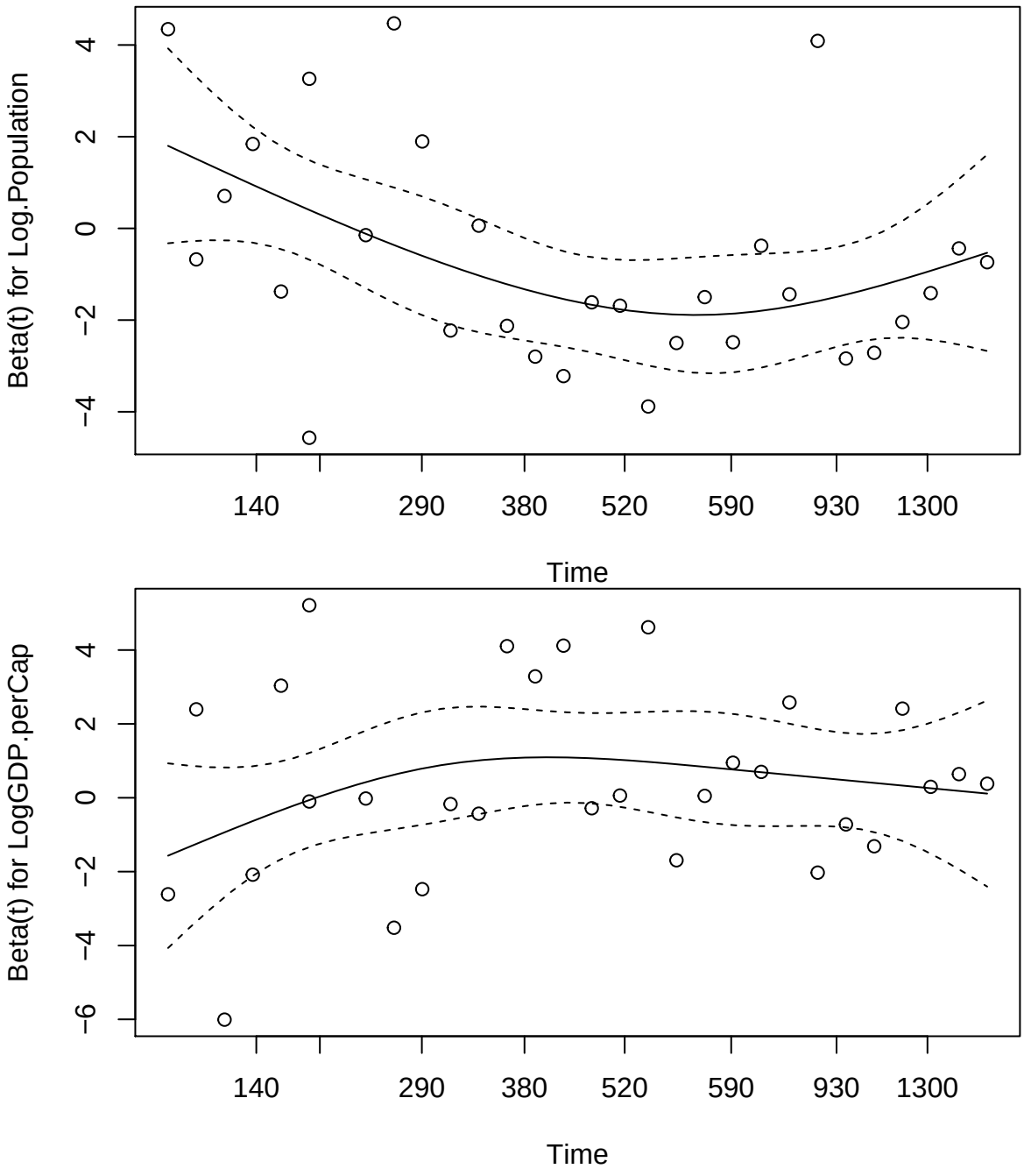

Beta(t) for RelFrac
40
20
0
−20
140
290
380
520
590
930
1300
Time

Beta(t) for InternationalAlly
20
10
0
−10
140
290
380
520
590
930
1300
Time

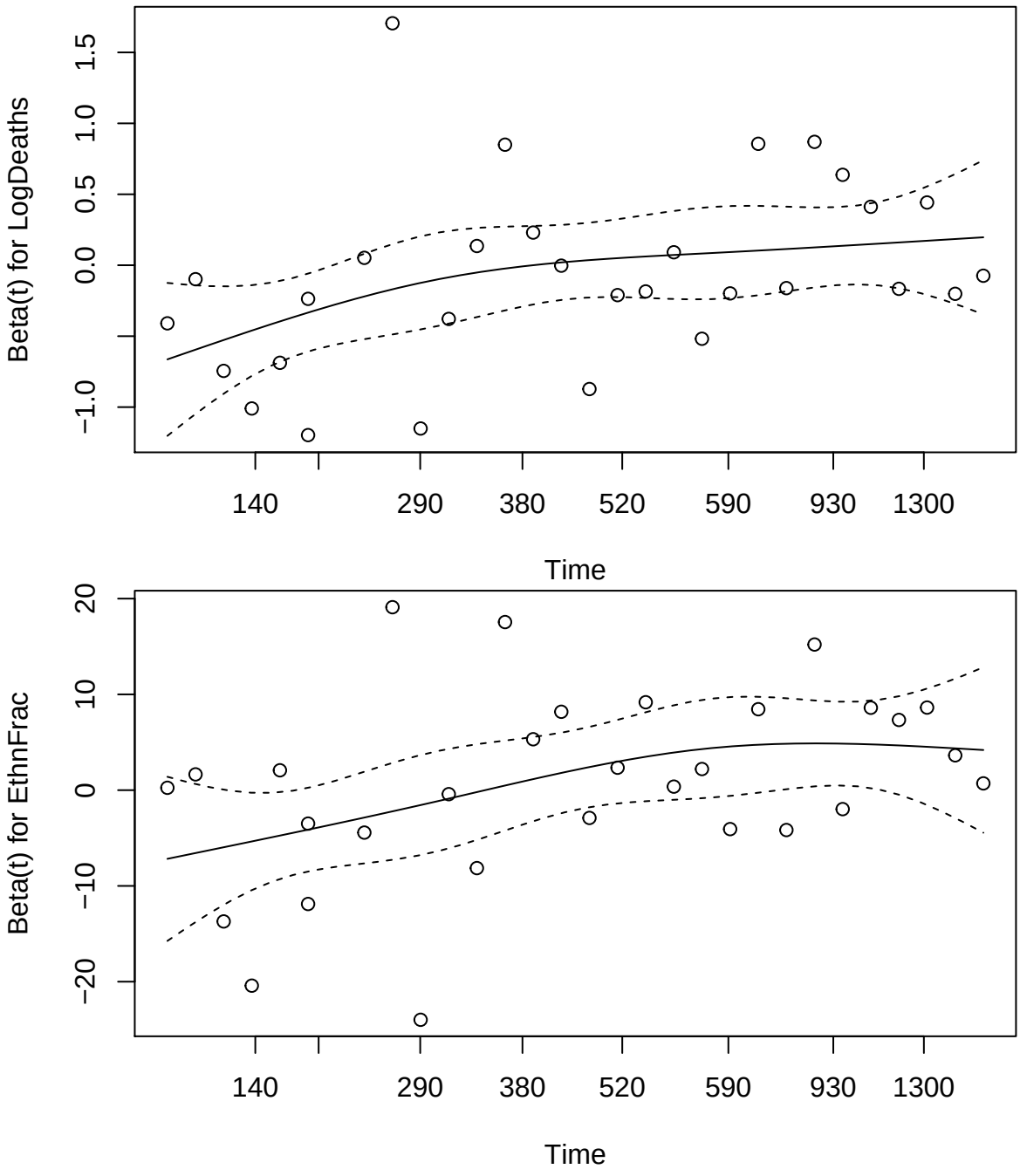

Beta(t) for InternationalOppo
20
15
10
5
0
−5
−10
140
290
380
520
590
930
1300
Time

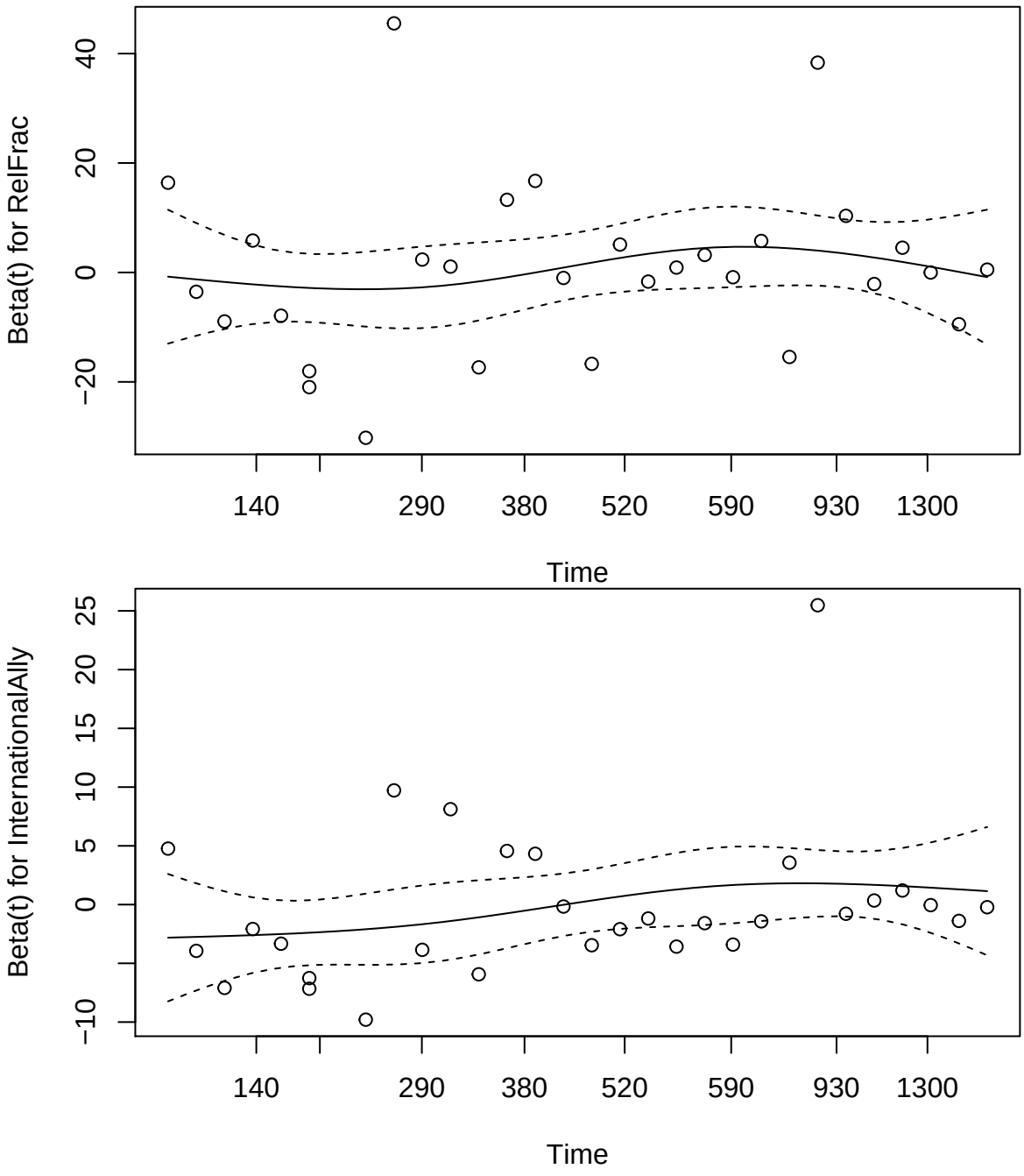
Beta(t) for African
5
0
−5
140
290
380
520
590
930
1300
Time


Beta(t) for Polity
1.0
0.5
0.0
−0.5
140
290
380
520
590
930
1300
Time
Beta(t) for Log.Mountainous
4
2
0
−2
−4
140
290
380
520
590
930
1300
Time

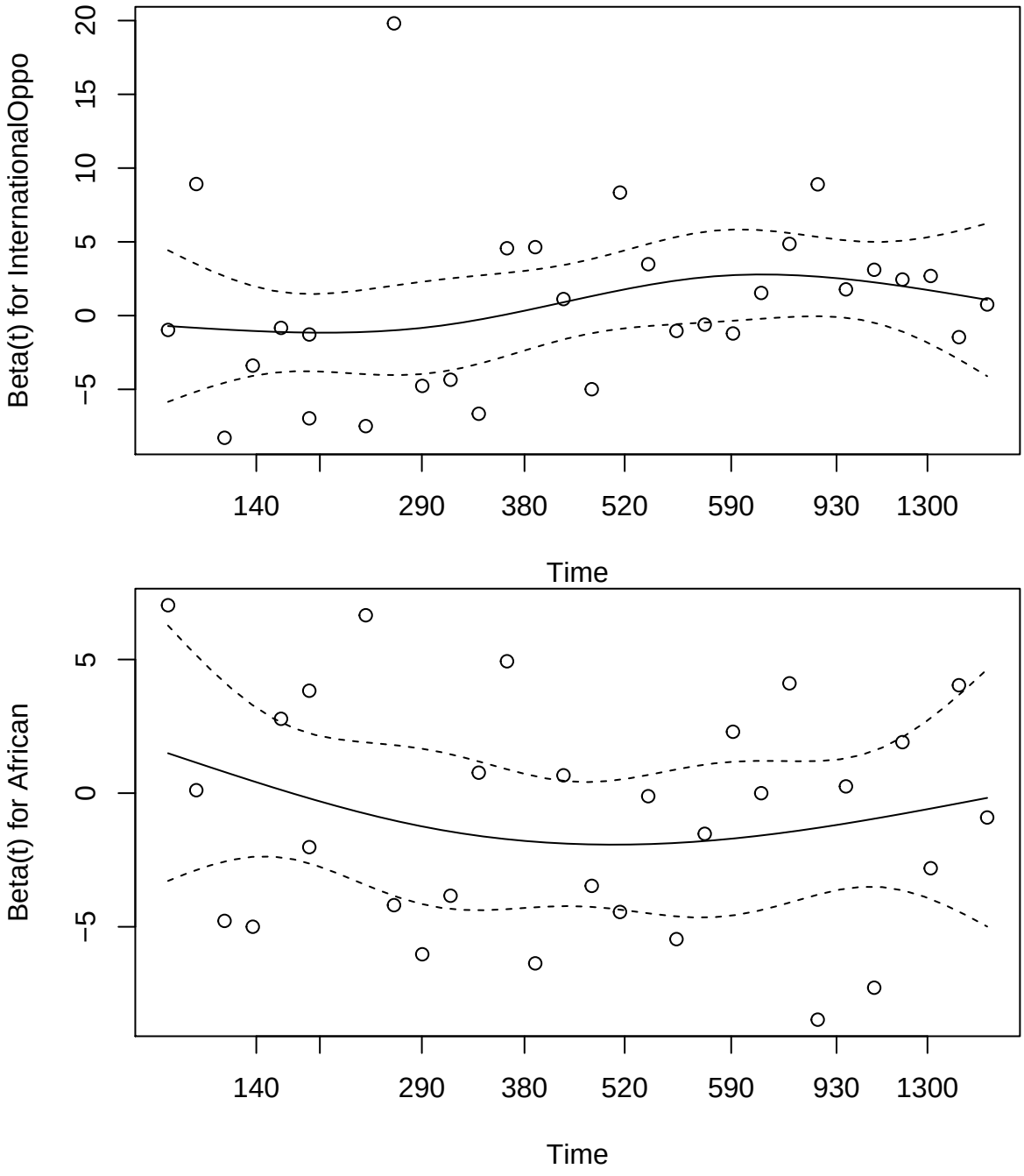



```
plot(cox.zph(combinedSurvival.full.death))
```

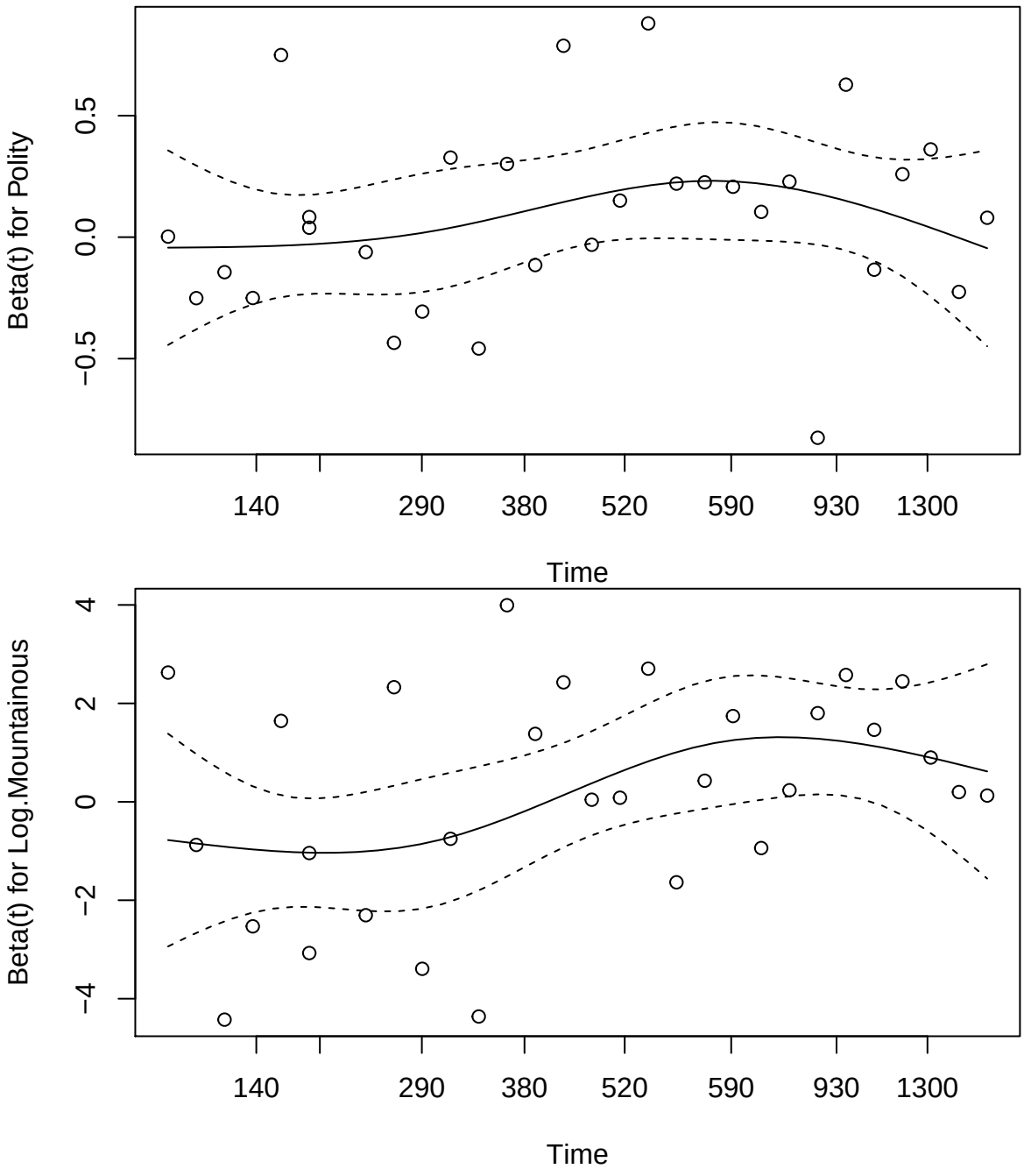

Beta(t) for LogDeaths
1.5
1.0
0.5
0.0
−1.0
140
290
380
520
590
930
1300
Time
Beta(t) for EthnFrac
20
10
0
−10
−20
140
290
380
520
590
930
1300
Time


Beta(t) for RelFrac
40
20
0
−20
140
290
380
520
590
930
1300
Time

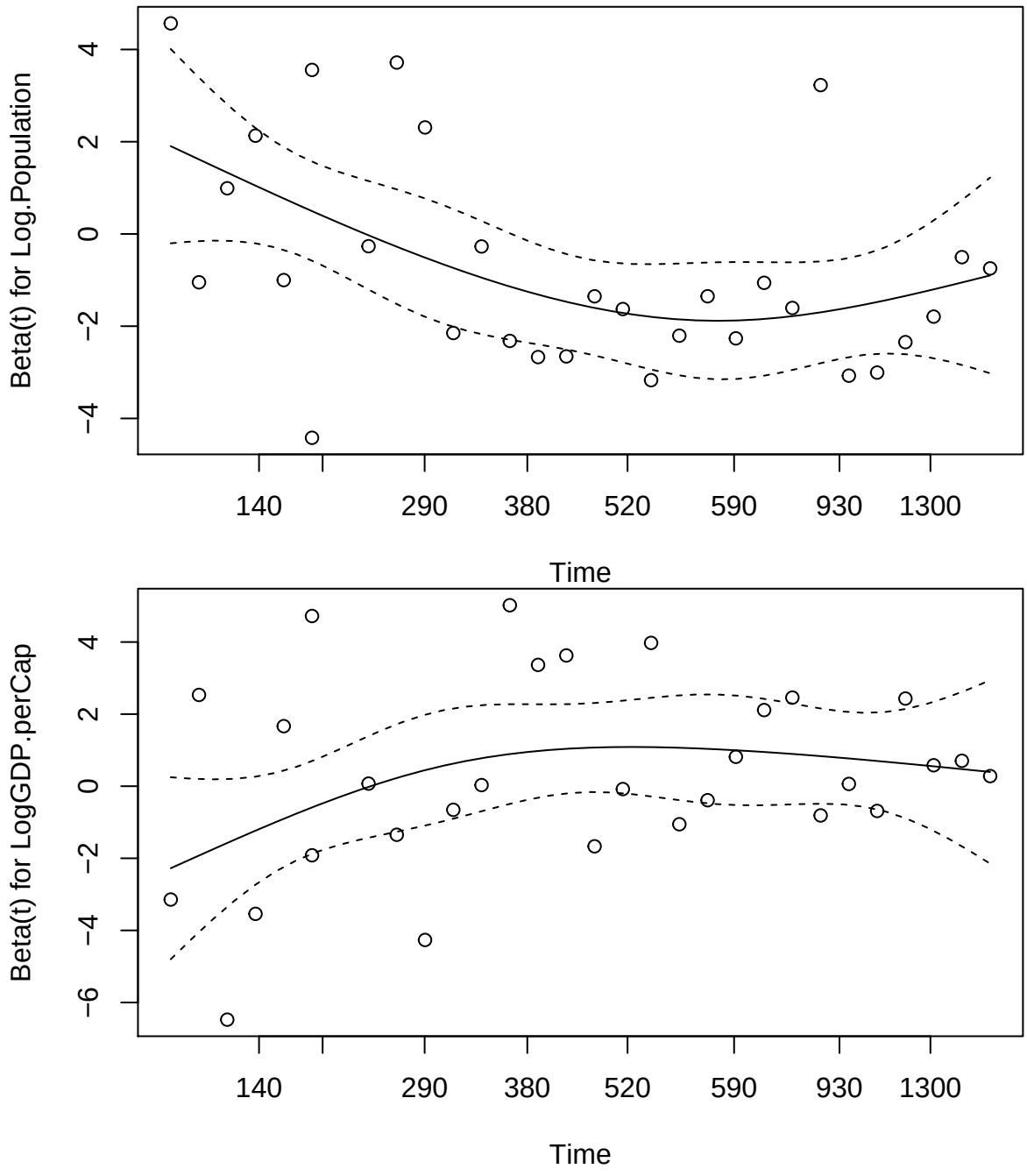
Beta(t) for InternationalAlly
25
20
15
10
5
0
−10
140
290
380
520
590
930
1300
Time


Beta(t) for InternationalOppo
20
15
10
5
0
−5
140
290
380
520
590
930
1300
Time

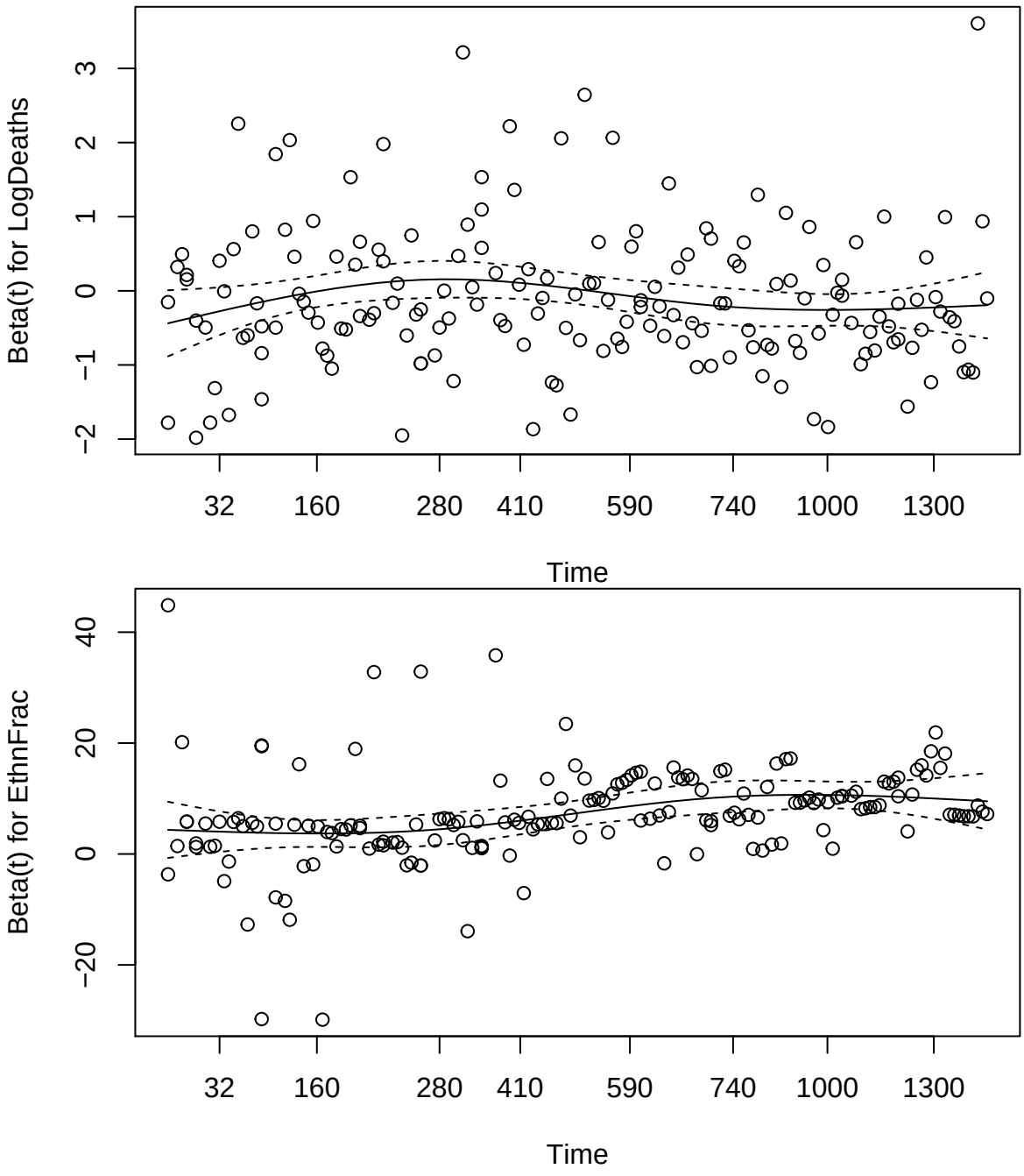
Beta(t) for African
5
0
−5
140
290
380
520
590
930
1300
Time

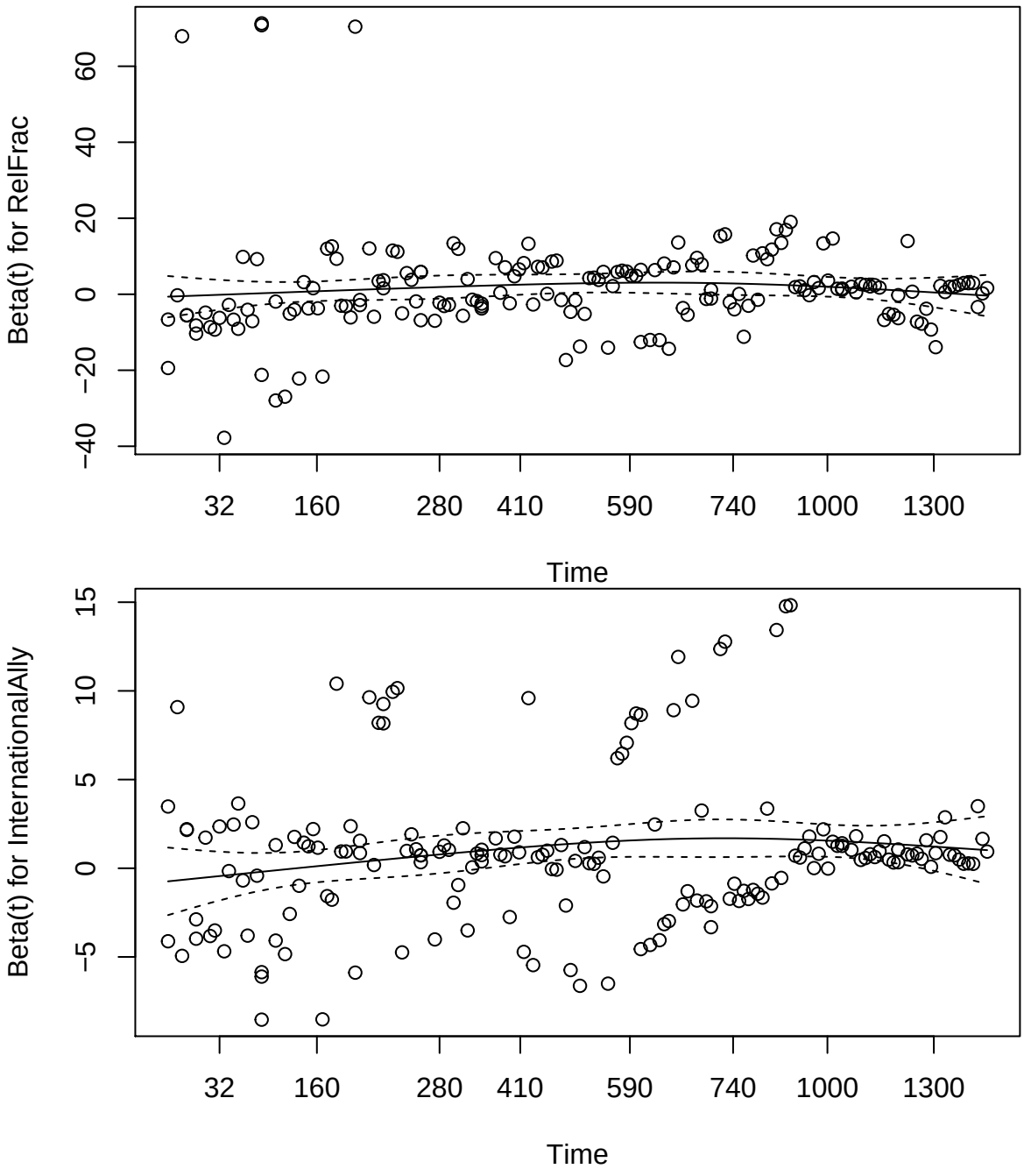

Beta(t) for Polity
0.5
0.0
−0.5
140
290
380
520
590
930
1300
Time

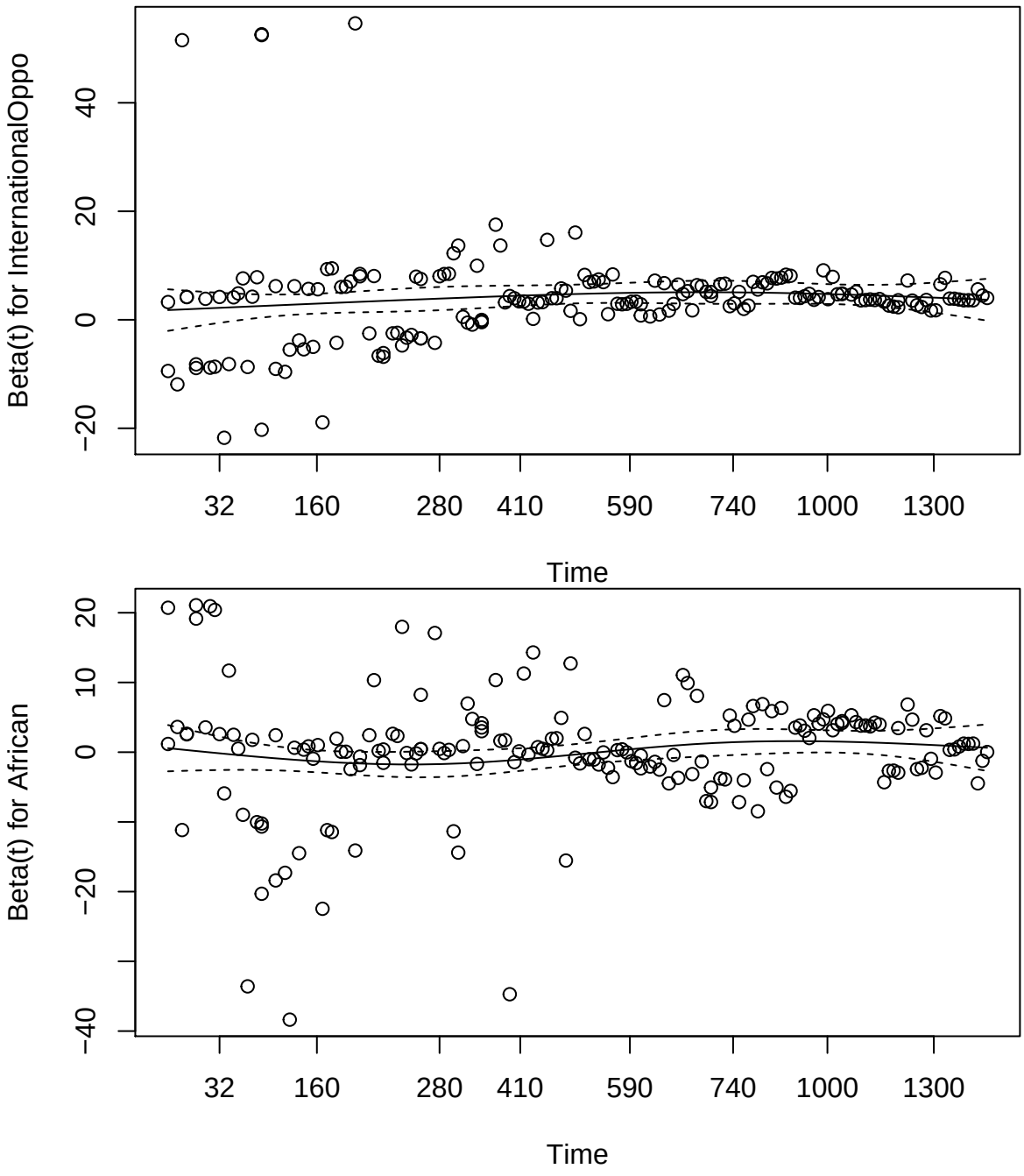
Beta(t) for Log.Mountainous
4
2
0
−2
−4
140
290
380
520
590
930
1300
Time

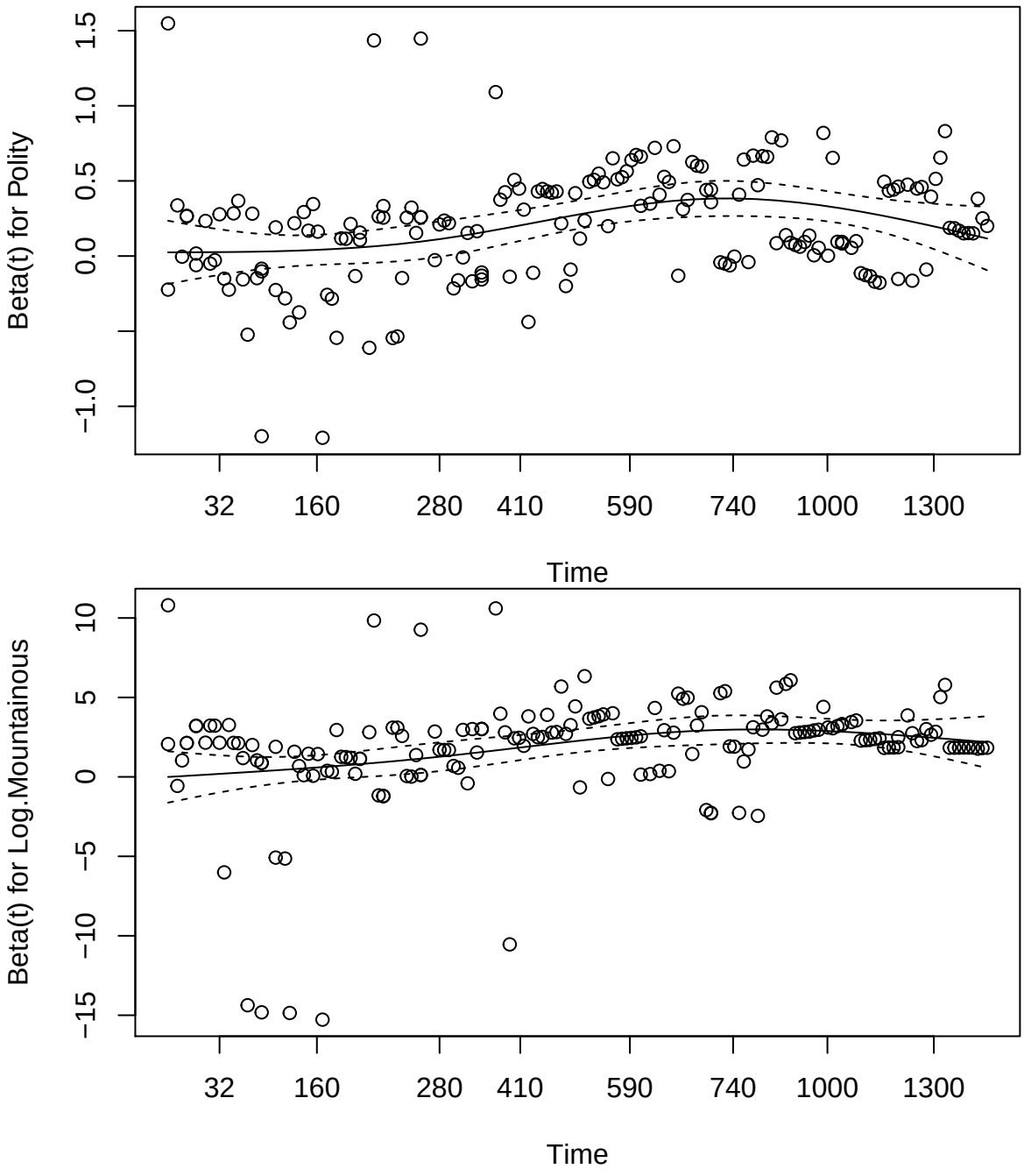


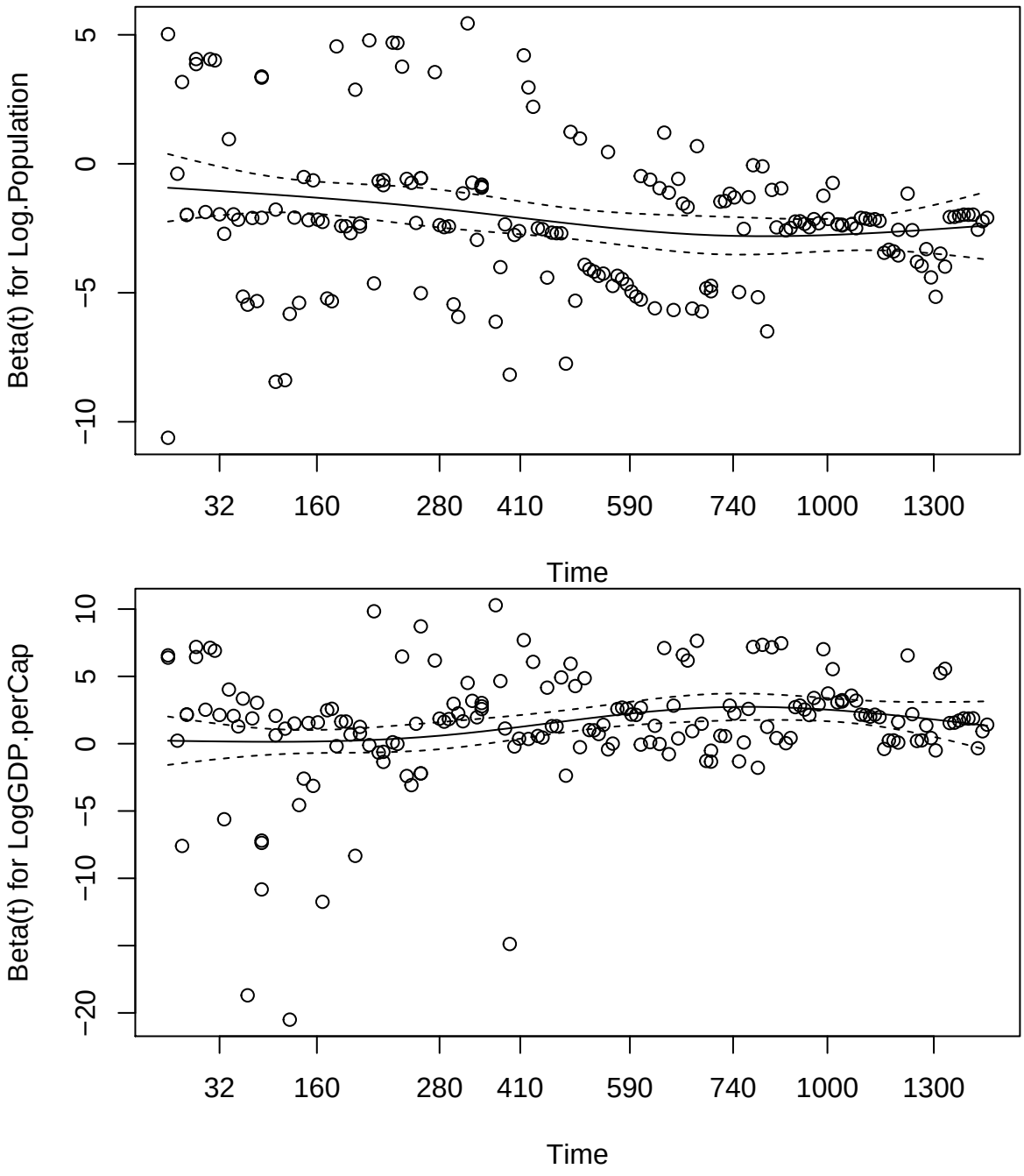

```
plot(cox.zph(combinedSurvival.Deaths))
```


Beta(t) for LogDeaths
3
2
1
0
−1
−2
32
160
280
410
590
740
1000
1300
Time
Beta(t) for EthnFrac
40
20
0
−20
32
160
280
410
590
740
1000
1300
Time

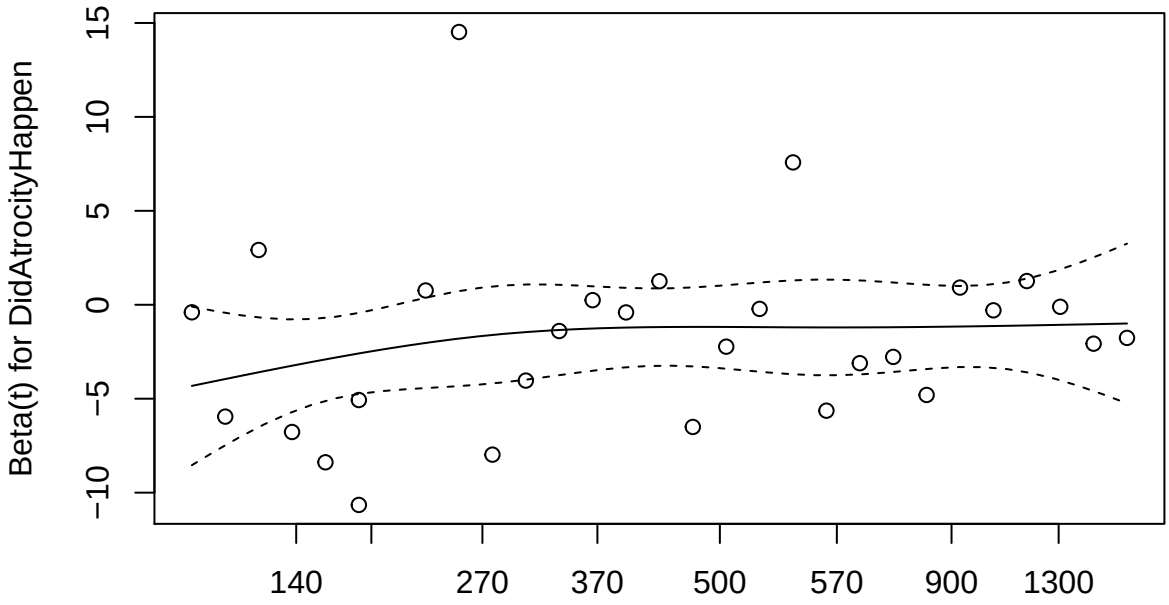

Beta(t) for RelFrac
60
40
20
0
−20
−40
32
160
280
410
590
740
1000
1300
Time
Beta(t) for InternationalAlly
15
10
5
0
−5
32
160
280
410
590
740
1000
1300
Time

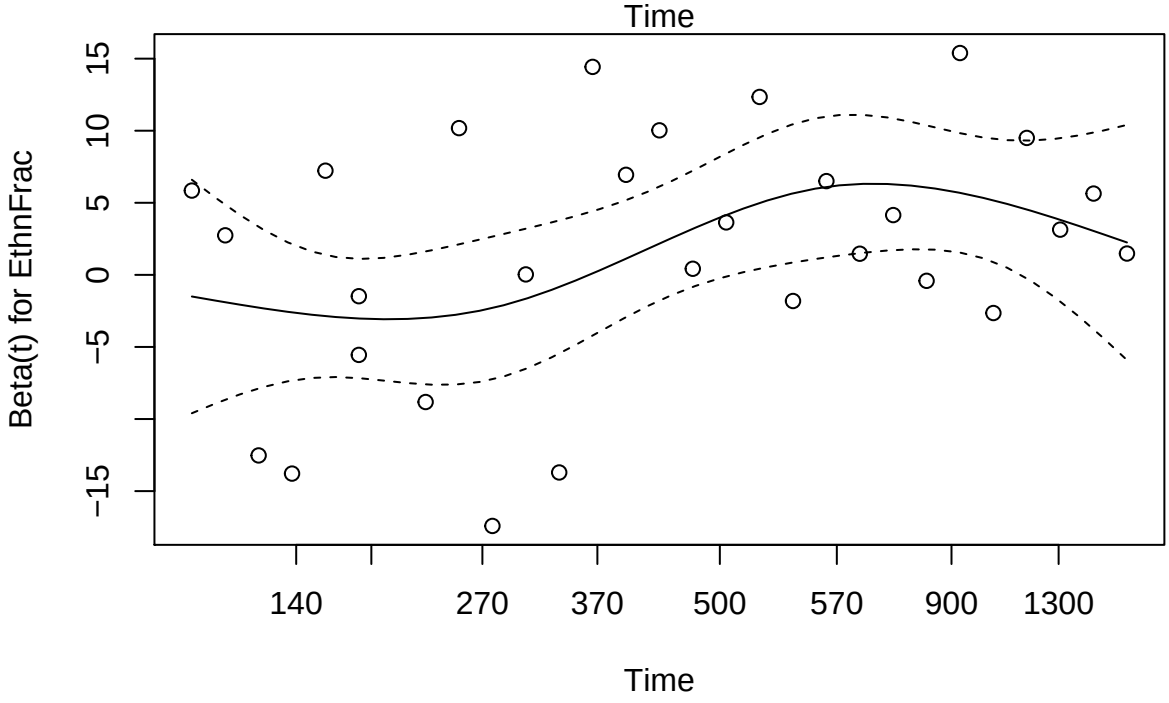

Beta(t) for InternationalOppo
−20
0
20
40
32
160
280
410
590
740
1000
1300
Time
Beta(t) for African
−40
−20
0
10
20
32
160
280
410
590
740
1000
1300
Time

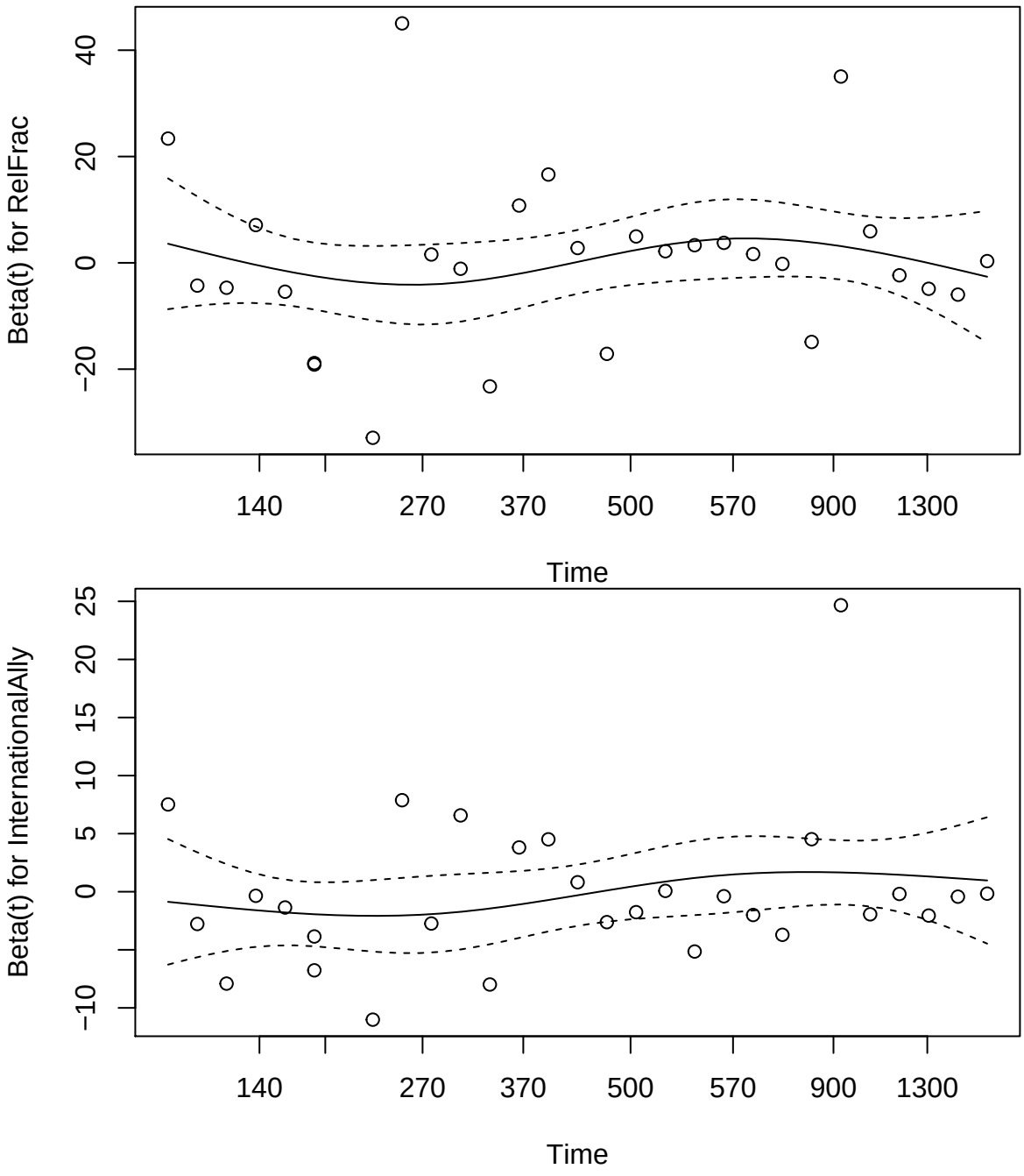

Beta(t) for Polity
1.5
1.0
0.5
0.0
−1.0
32
160
280
410
590
740
1000
1300
Time
Beta(t) for Log.Mountainous
10
5
0
−5
−10
−15
32
160
280
410
590
740
1000
1300
Time



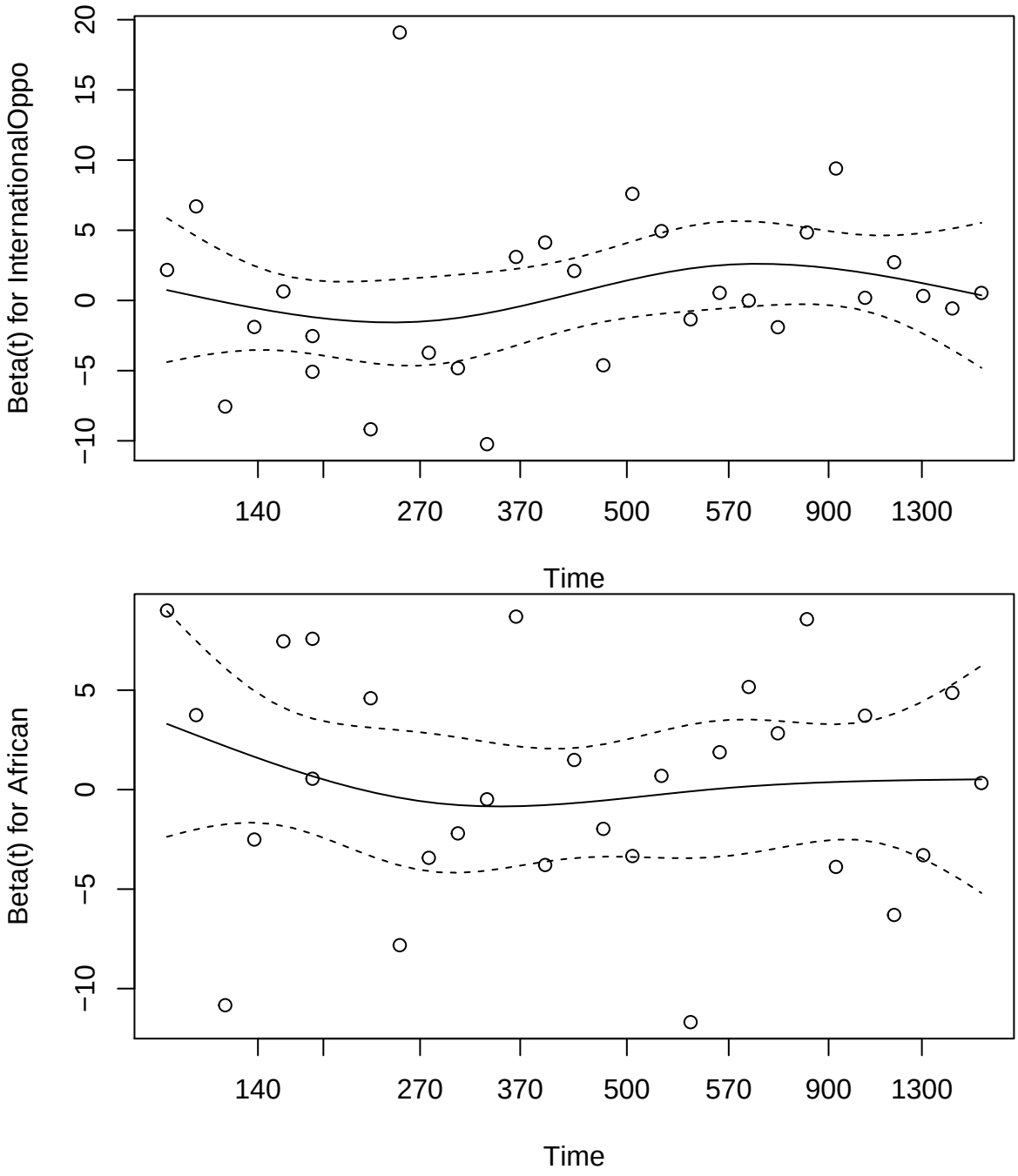

```
plot(cox.zph(combinedSurvival.full.missAngola))
```

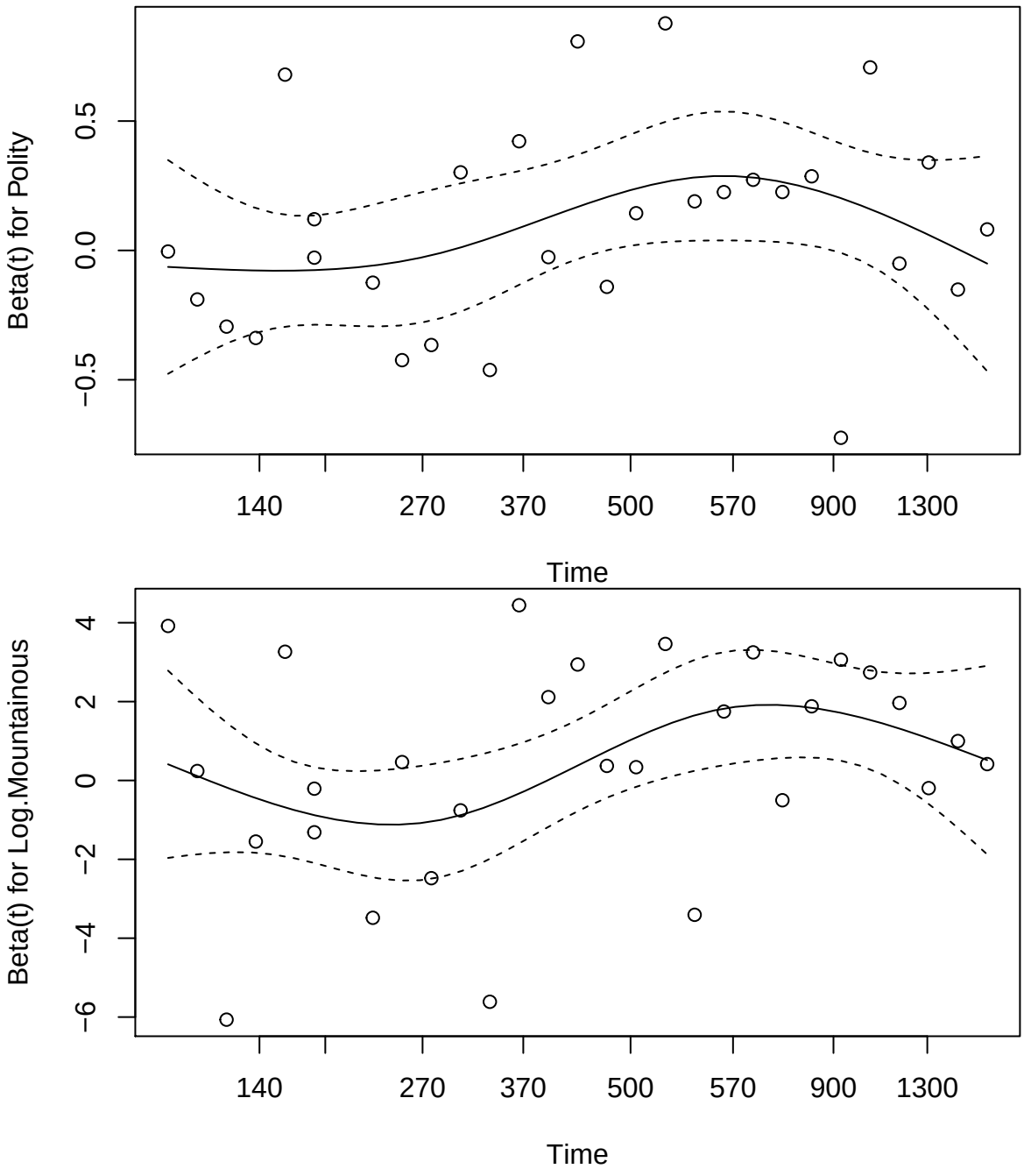

Beta(t) for DidAtrocityHappen
15
10
5
0
−5
−10
140
270
370
500
570
900
1300
Time

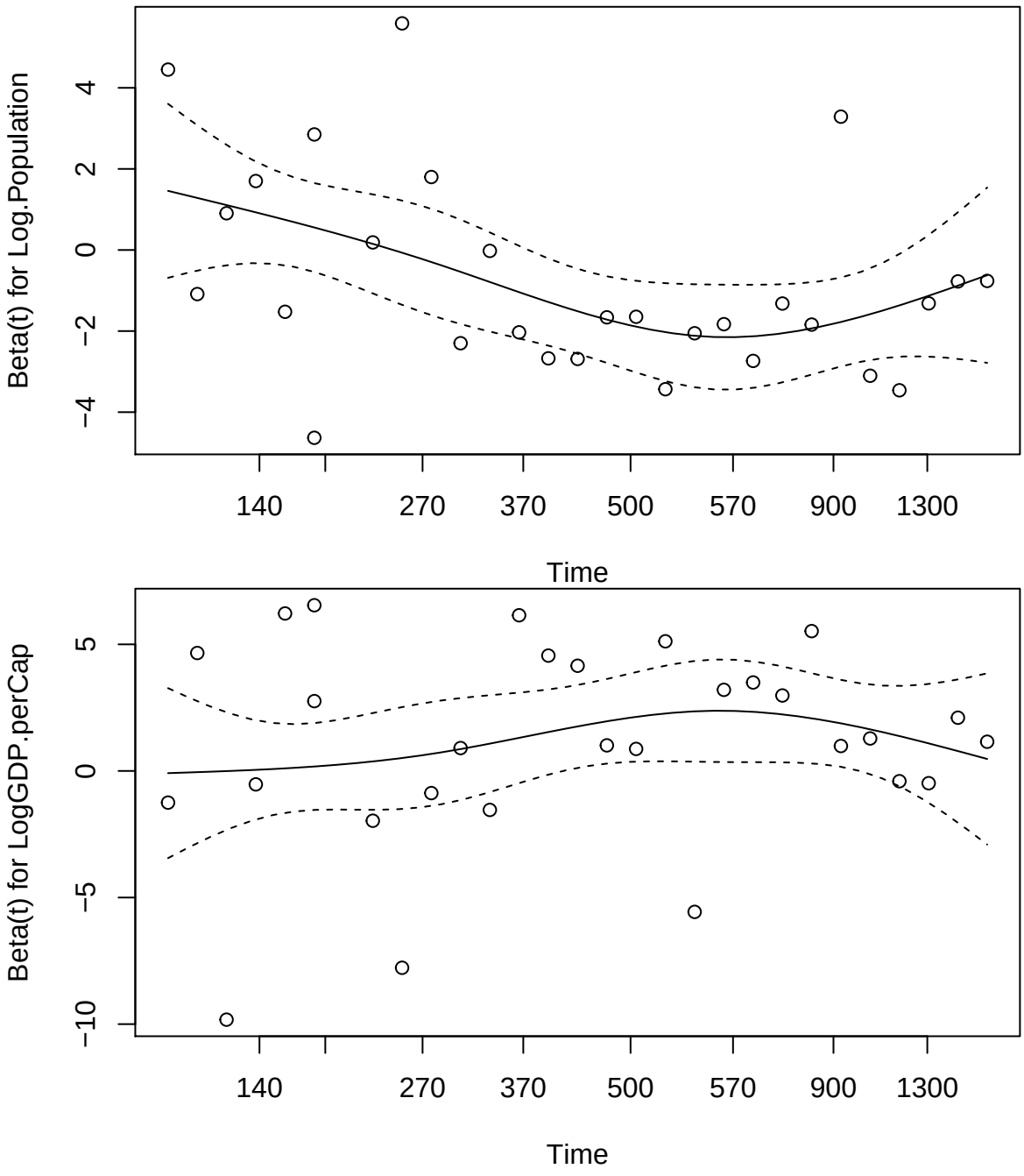

Beta(t) for EthnFrac
15
10
5
0
−5
−15
140
270
370
500
570
900
1300
Time


Beta(t) for RelFrac
40
20
0
−20
140
270
370
500
570
900
1300
Time

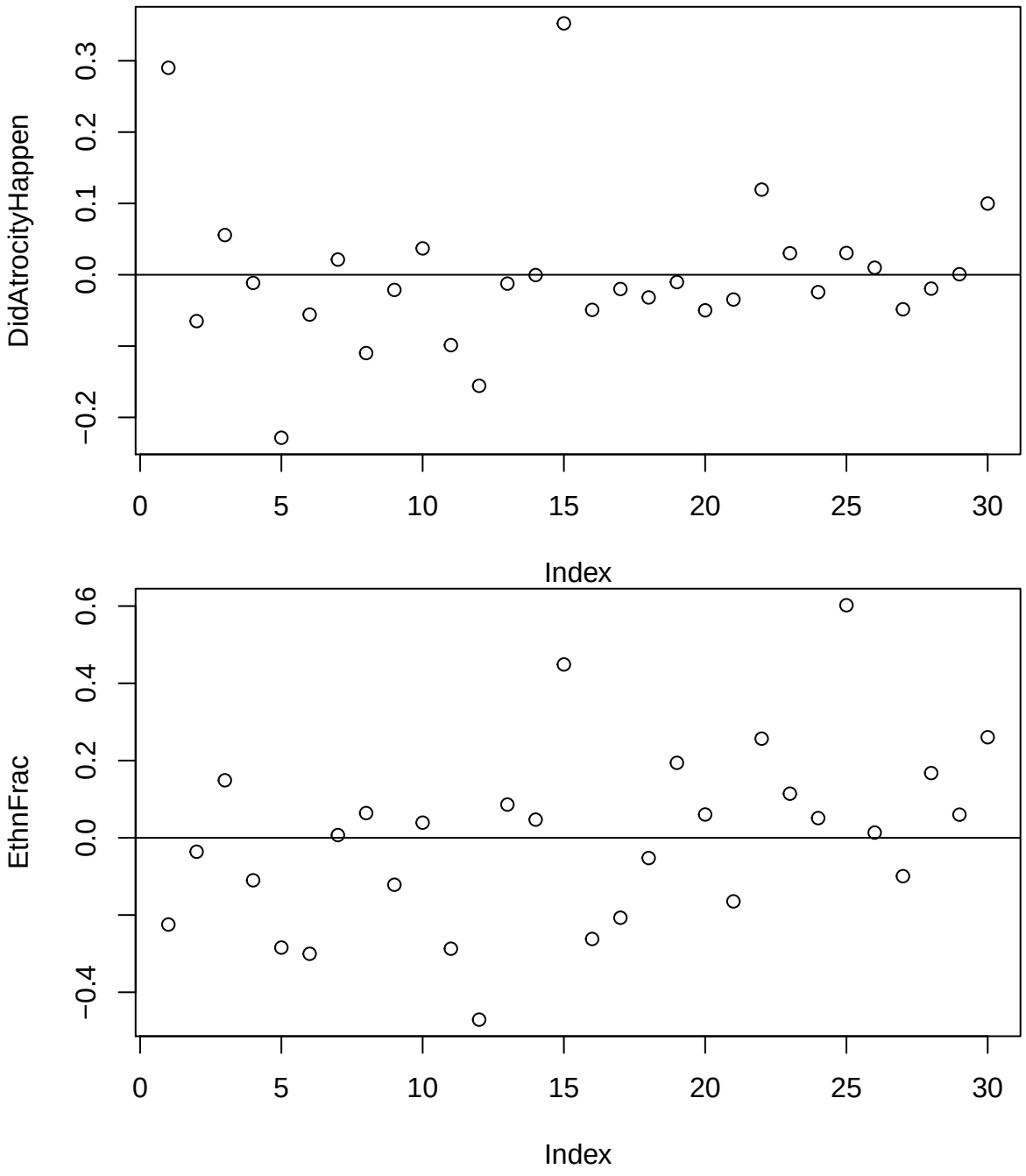
Beta(t) for InternationalAlly
25
20
15
10
5
0
−10
140
270
370
500
570
900
1300
Time

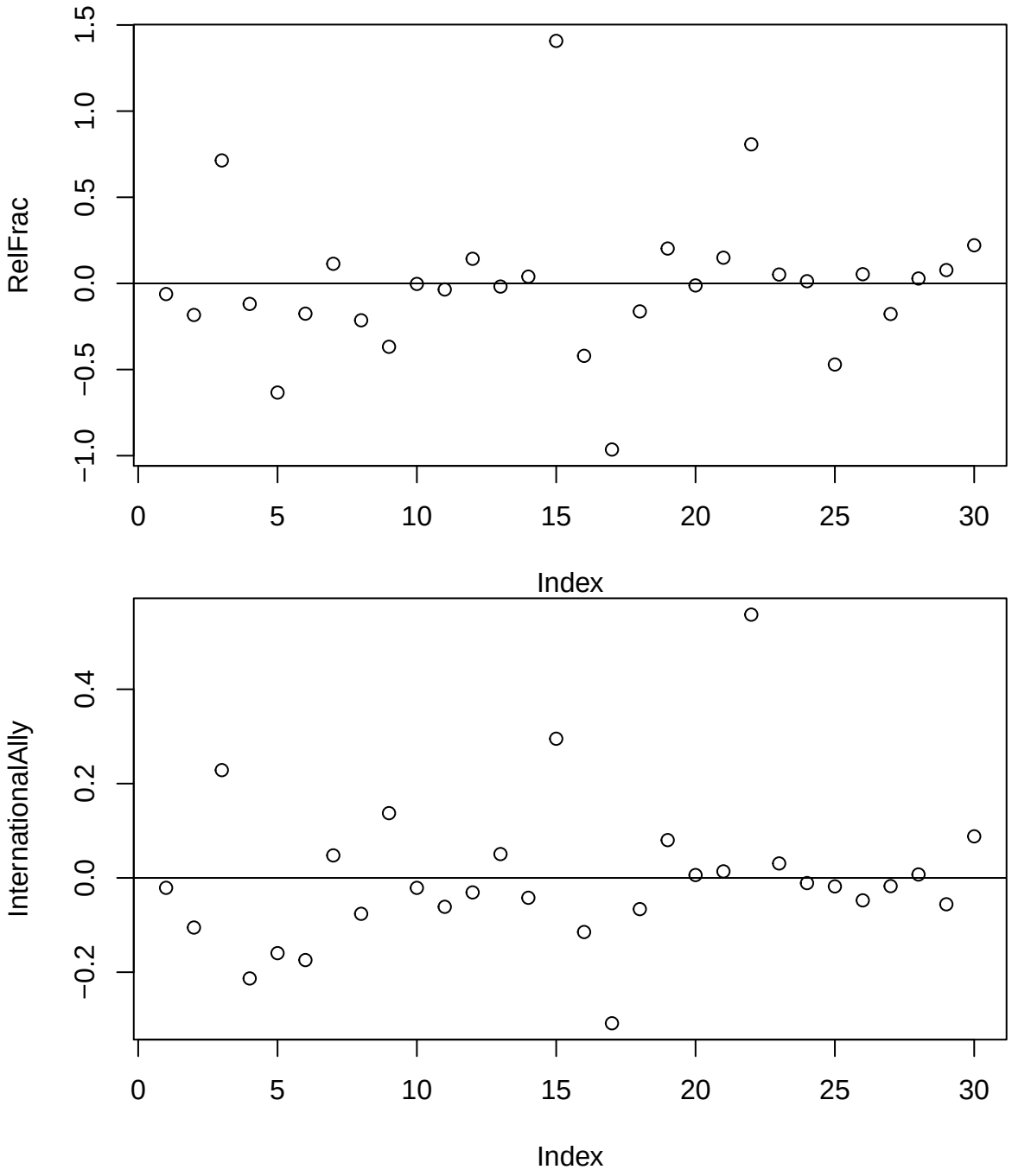

Beta(t) for InternationalOppo
20
15
10
5
0
−5
−10
140
270
370
500
570
900
1300
Time
Beta(t) for African
5
0
−5
−10
140
270
370
500
570
900
1300
Time

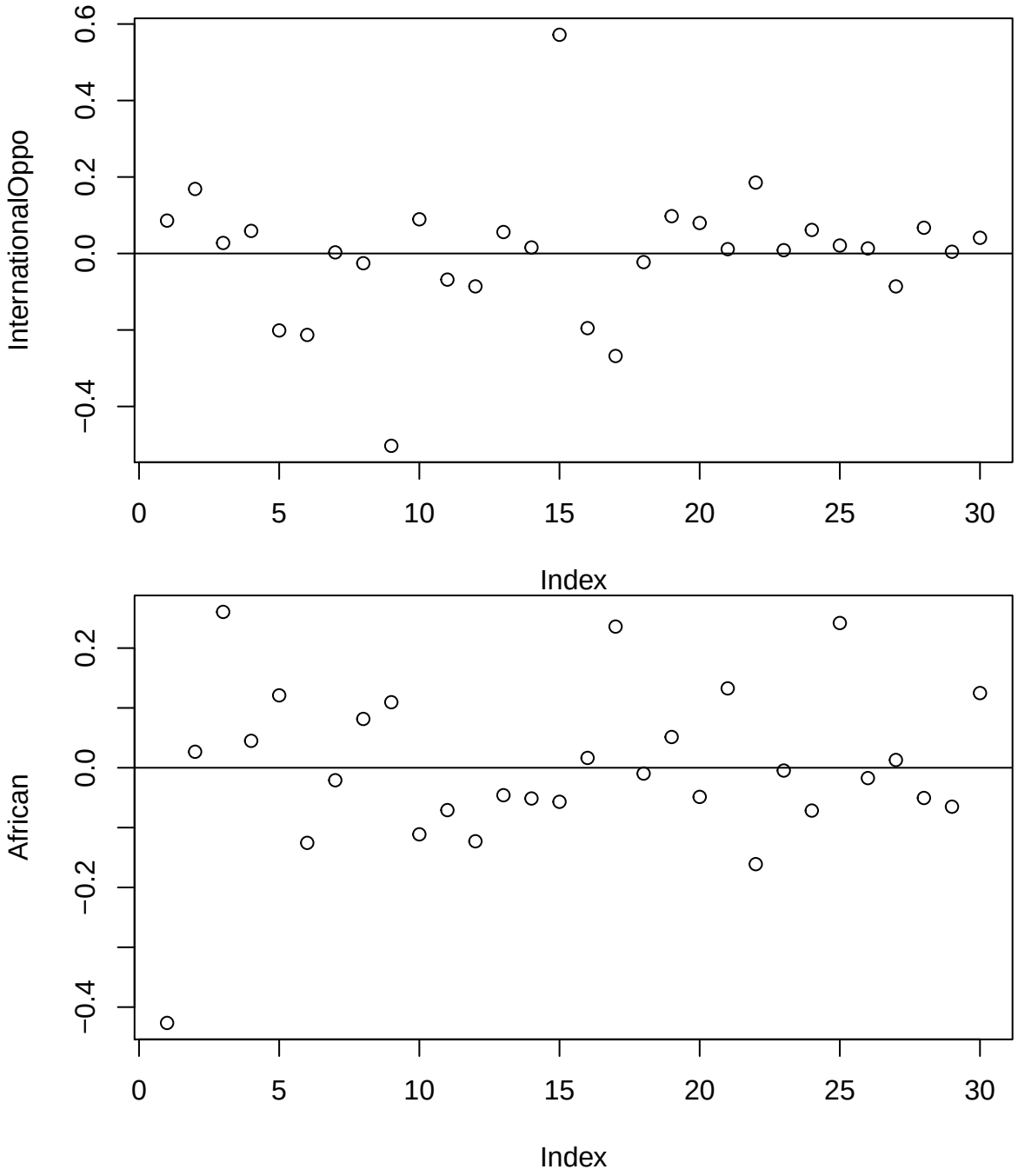

Beta(t) for Polity
0.5
0.0
−0.5
140
270
370
500
570
900
1300
Time
Beta(t) for Log.Mountainous
4
2
0
−2
−4
−6
140
270
370
500
570
900
1300
Time

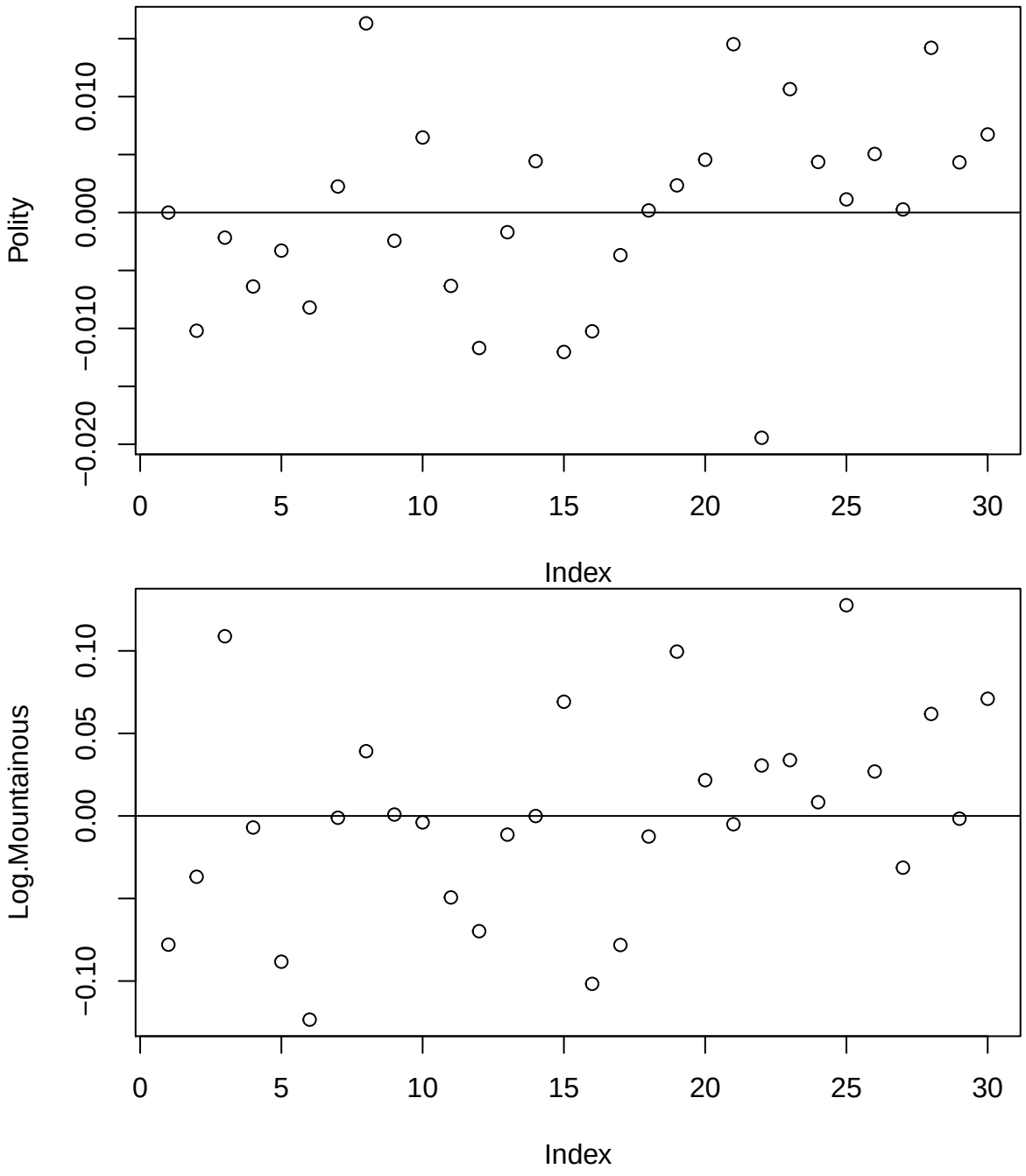


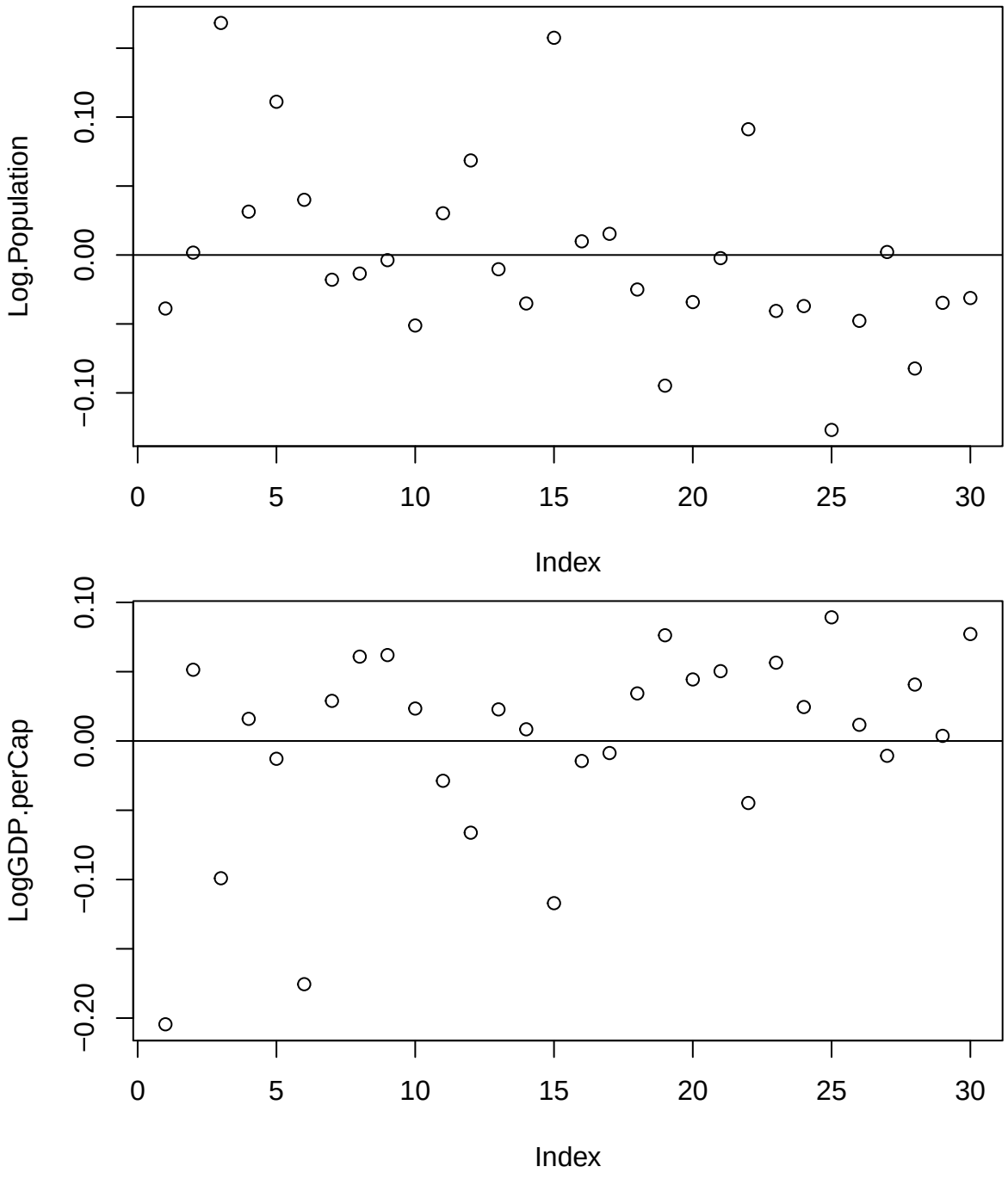

```
# dfbeta, influential observations test
dfbeta <- residuals(combinedSurvival.full, type="dfbeta")
par(mfrow=c(1, 1))
for (j in 1:10) {
  plot(dfbeta[, j], ylab=names(coef(combinedSurvival))[j])
  abline(h = 0)
}
```


DidAtrocityHappen
−0.2
0.0
0.1
0.2
0.3
0
5
10
15
20
25
30
Index
EthnFrac
−0.4
0.0
0.2
0.4
0.6
0
5
10
15
20
25
30
Index

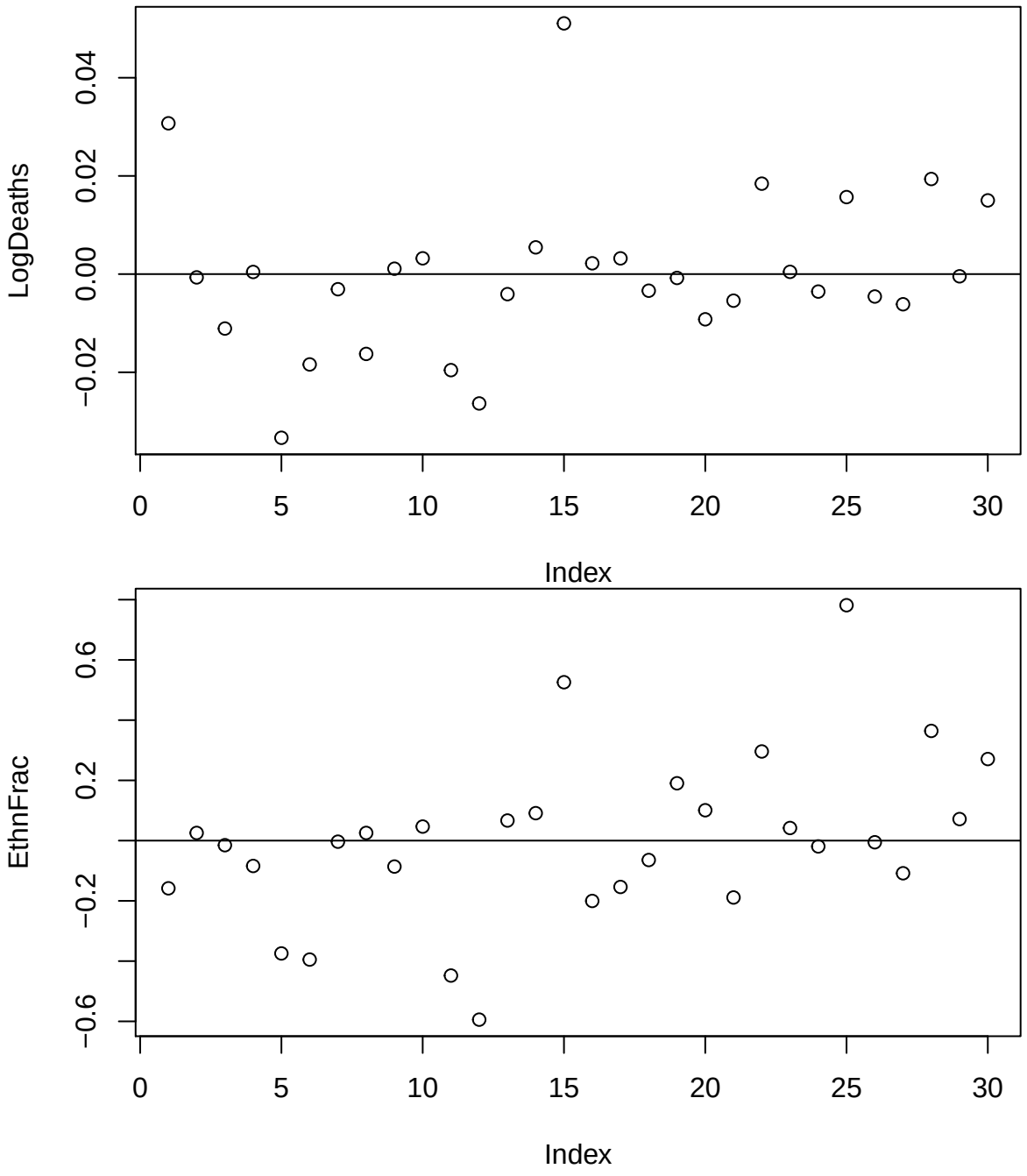

RelFrac
1.5
1.0
0.5
0.0
−0.5
−1.0
0
5
10
15
20
25
30
Index
InternationalAlly
0.4
0.2
0.0
−0.2
0
5
10
15
20
25
30
Index

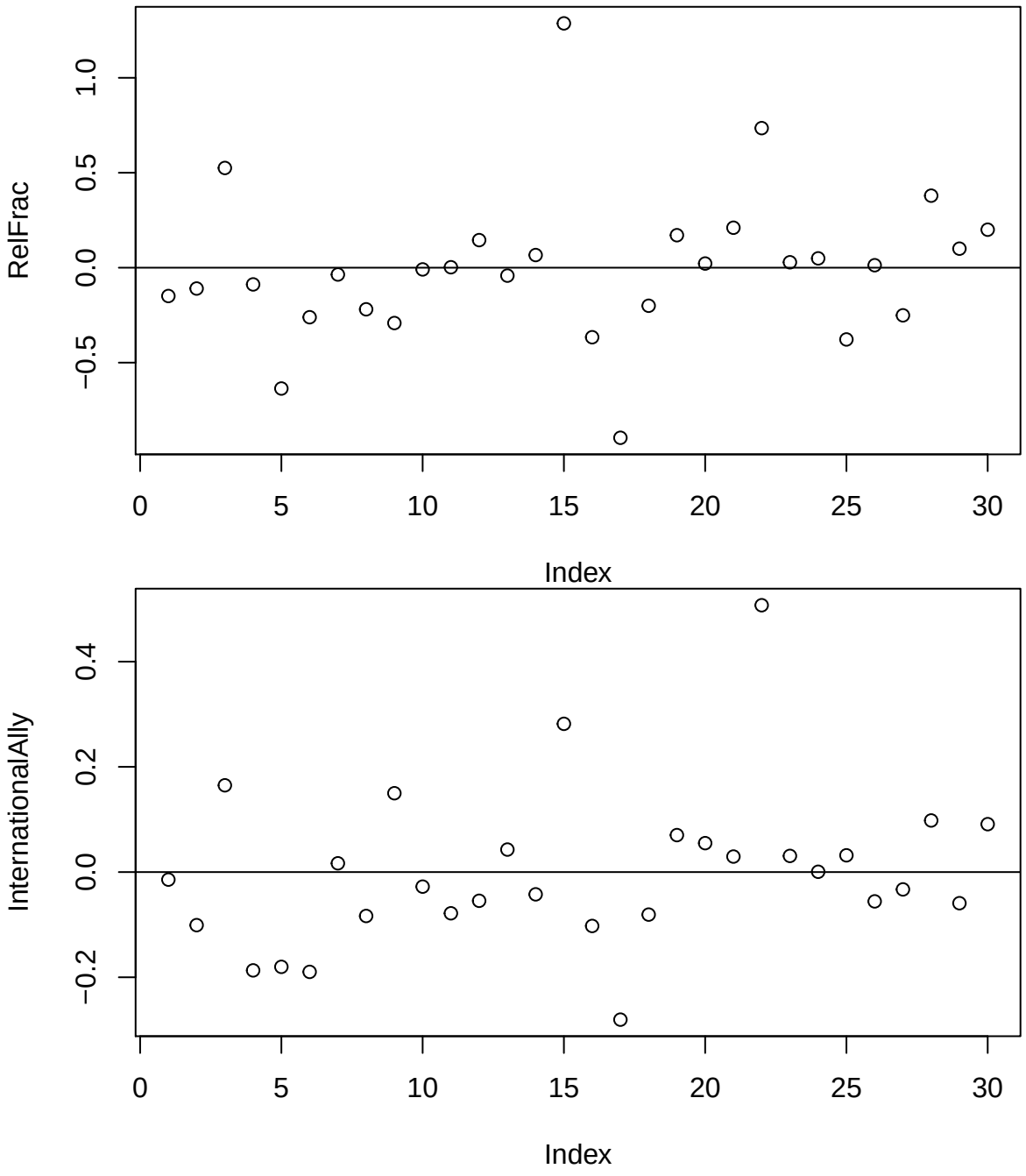

InternationalOppo
0.6
0.4
0.2
0.0
−0.4
0
5
10
15
20
25
30
Index
African
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Index

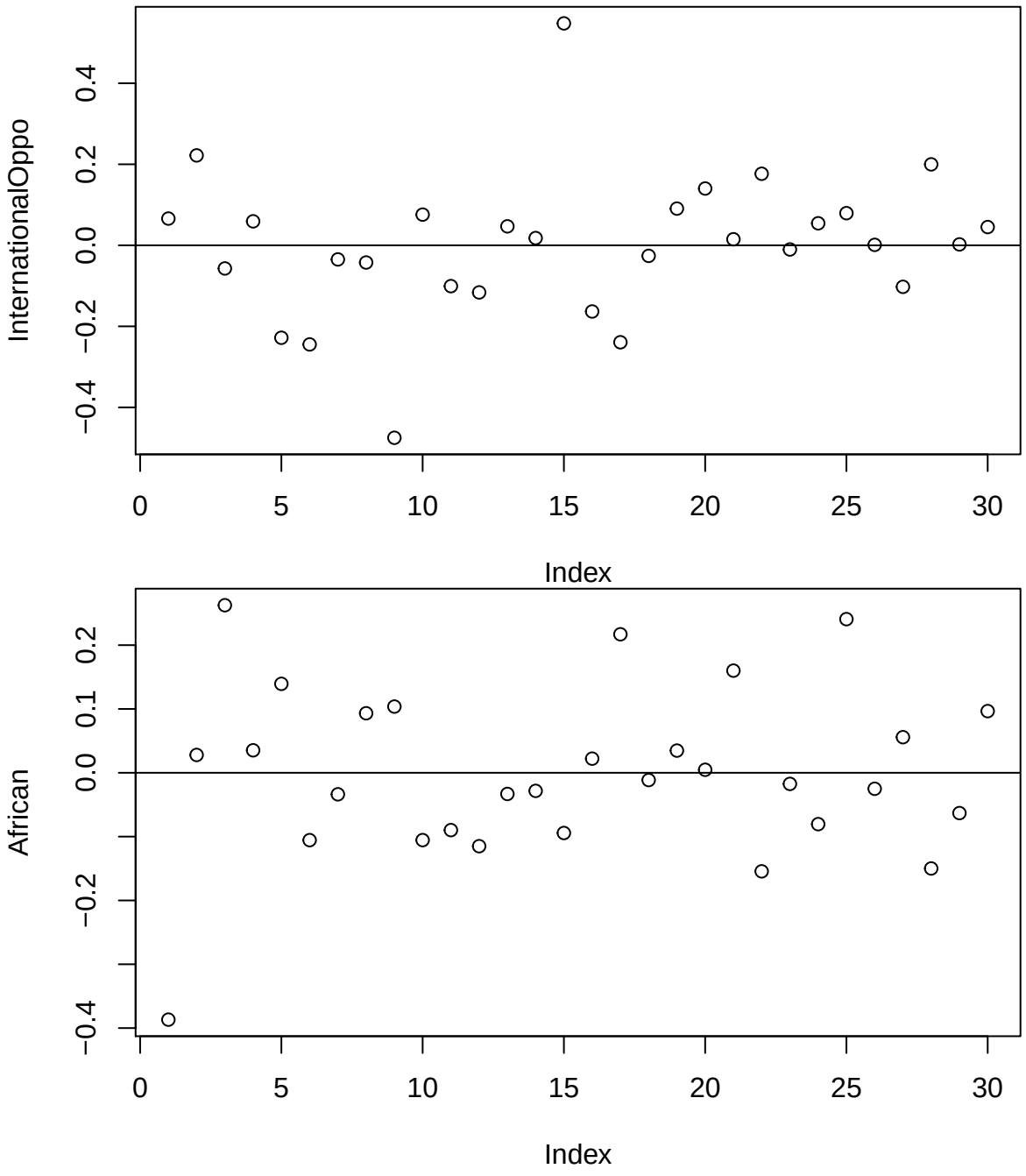

Polity
0.010
0.000
−0.010
−0.020
0
5
10
15
20
25
30
Index
Log.Mountainous
0.10
0.05
0.00
−0.10
0
5
10
15
20
25
30
Index

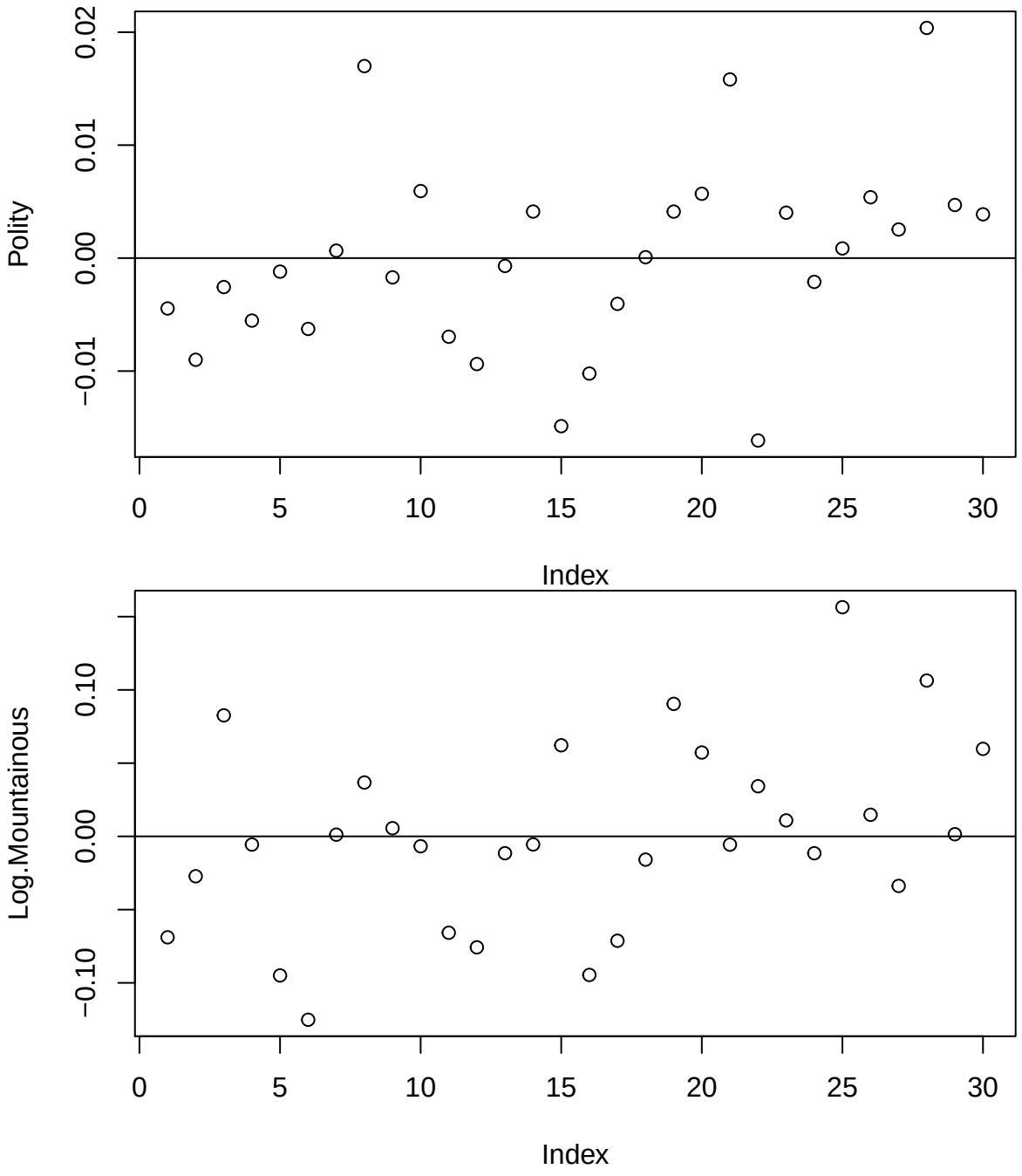


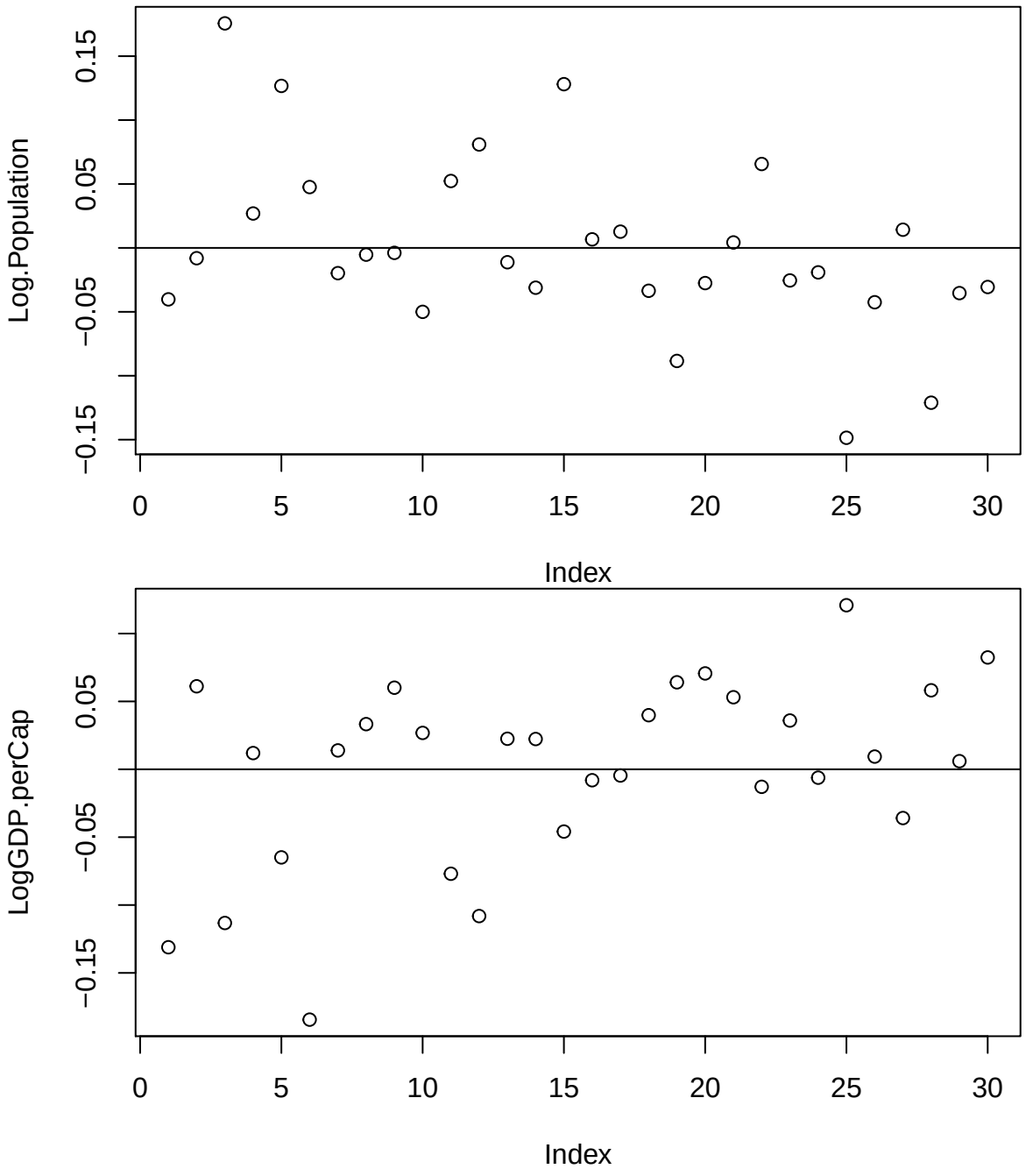

```
dfbeta2 <- residuals(combinedSurvival.full.death, type="dfbeta")
par(mfrow=c(1, 1))
for (j in 1:10) {
  plot(dfbeta2[, j], ylab=names(coef(combinedSurvival.Deaths))[j])
  abline(h = 0)
}
```


LogDeaths
0.04
0.02
0.00
−0.02
0
5
10
15
20
25
30
Index
EthnFrac
0.6
0.2
−0.2
−0.6
0
5
10
15
20
25
30
Index

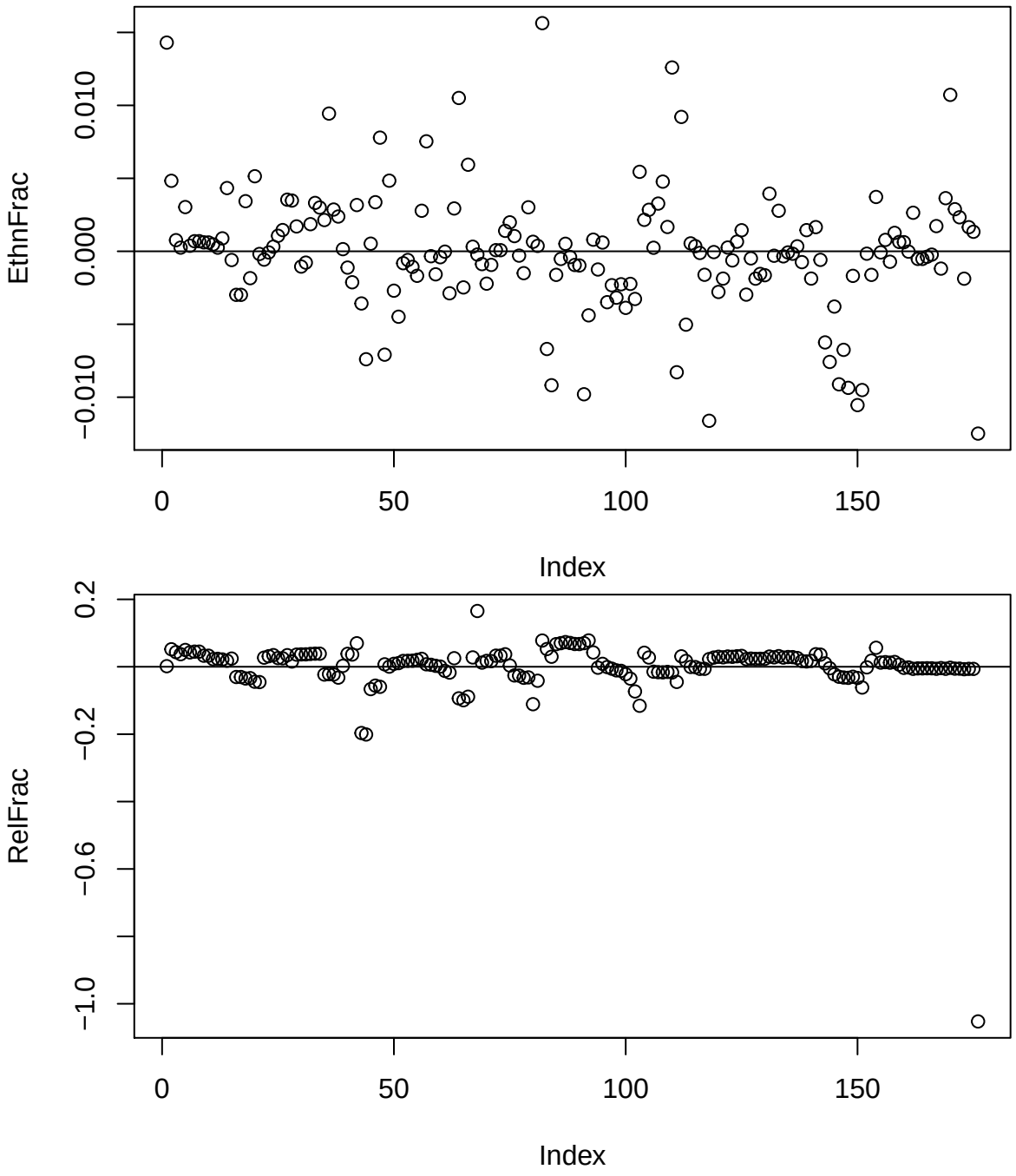

RelFrac
1.0
0.5
0.0
−0.5
0
5
10
15
20
25
30
Index
InternationalAlly
0.4
0.2
0.0
−0.2
0
5
10
15
20
25
30
Index

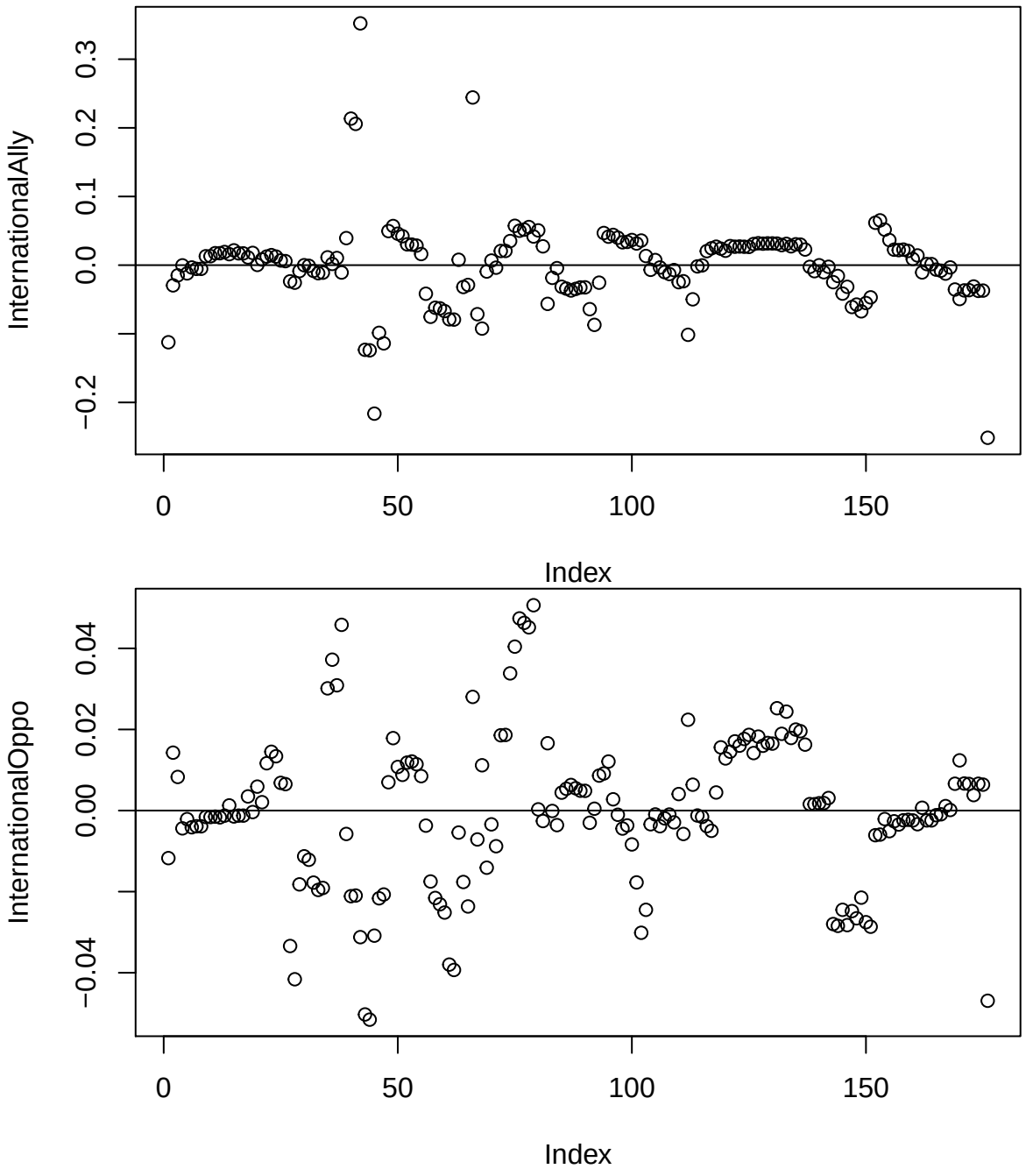

InternationalOppo
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Index
African
0.2
0.1
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Index

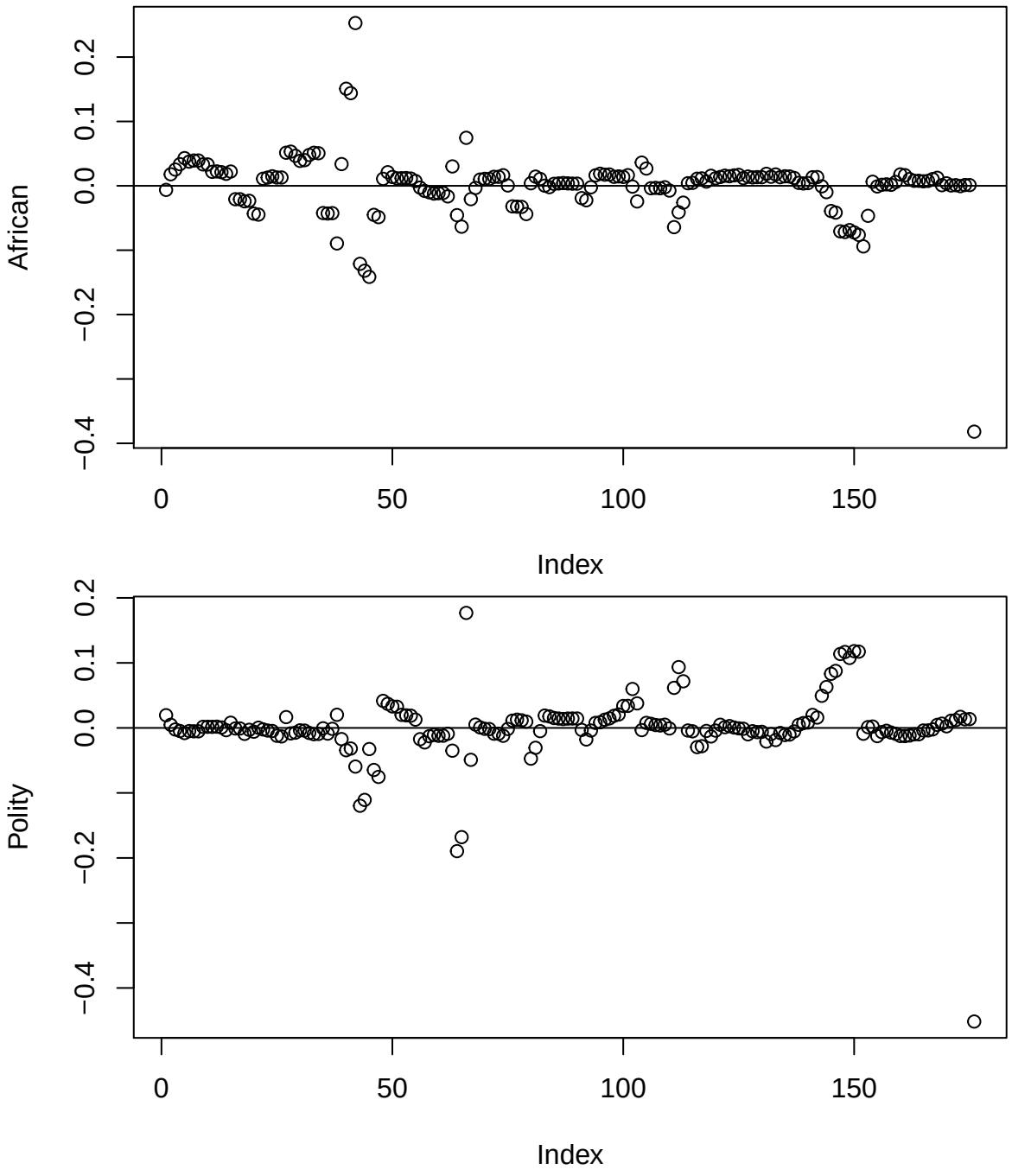

Polity
0.02
0.01
0.00
−0.01
0
5
10
15
20
25
30
Index
Log.Mountainous
0.10
0.00
−0.10
0
5
10
15
20
25
30
Index

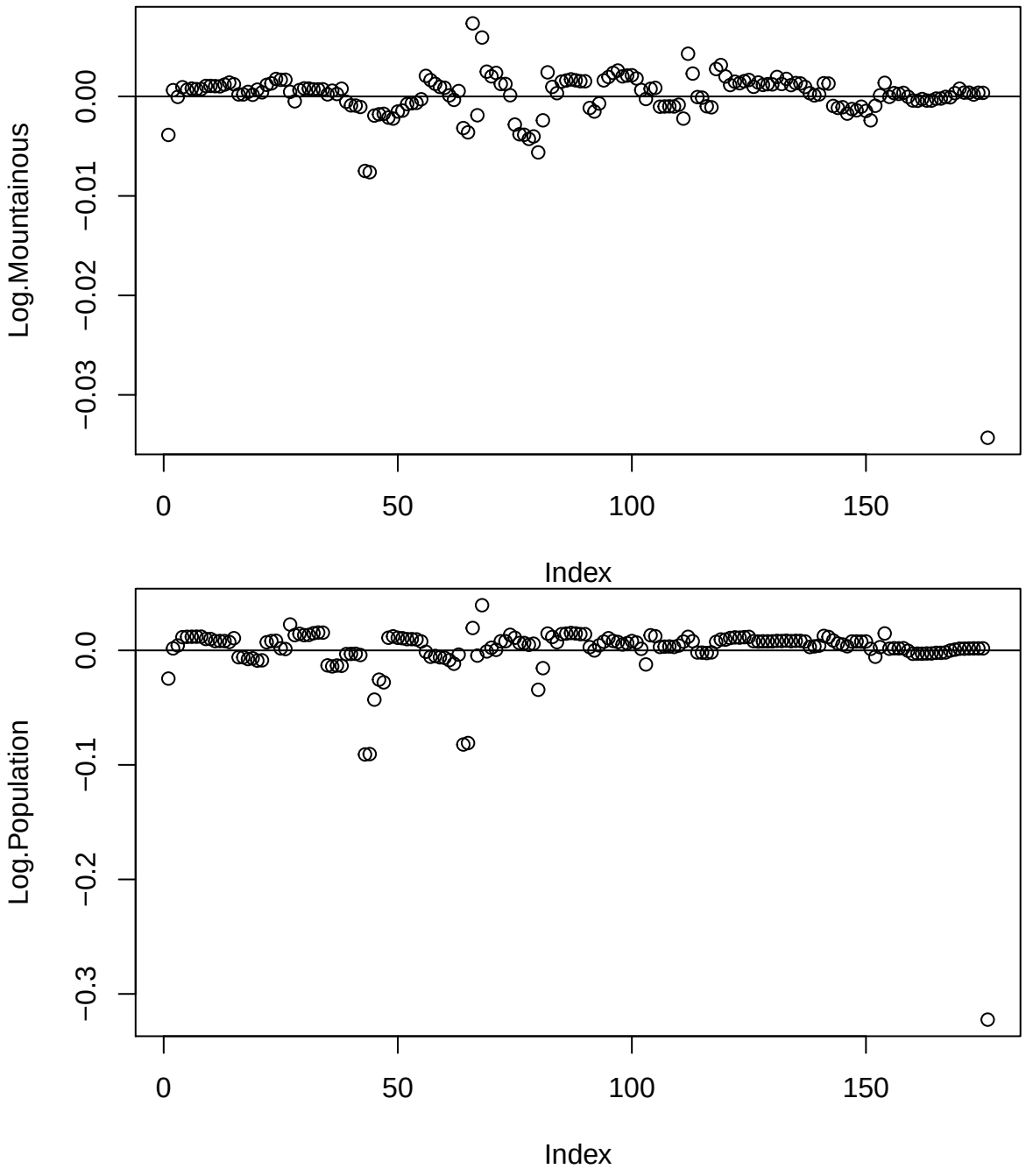


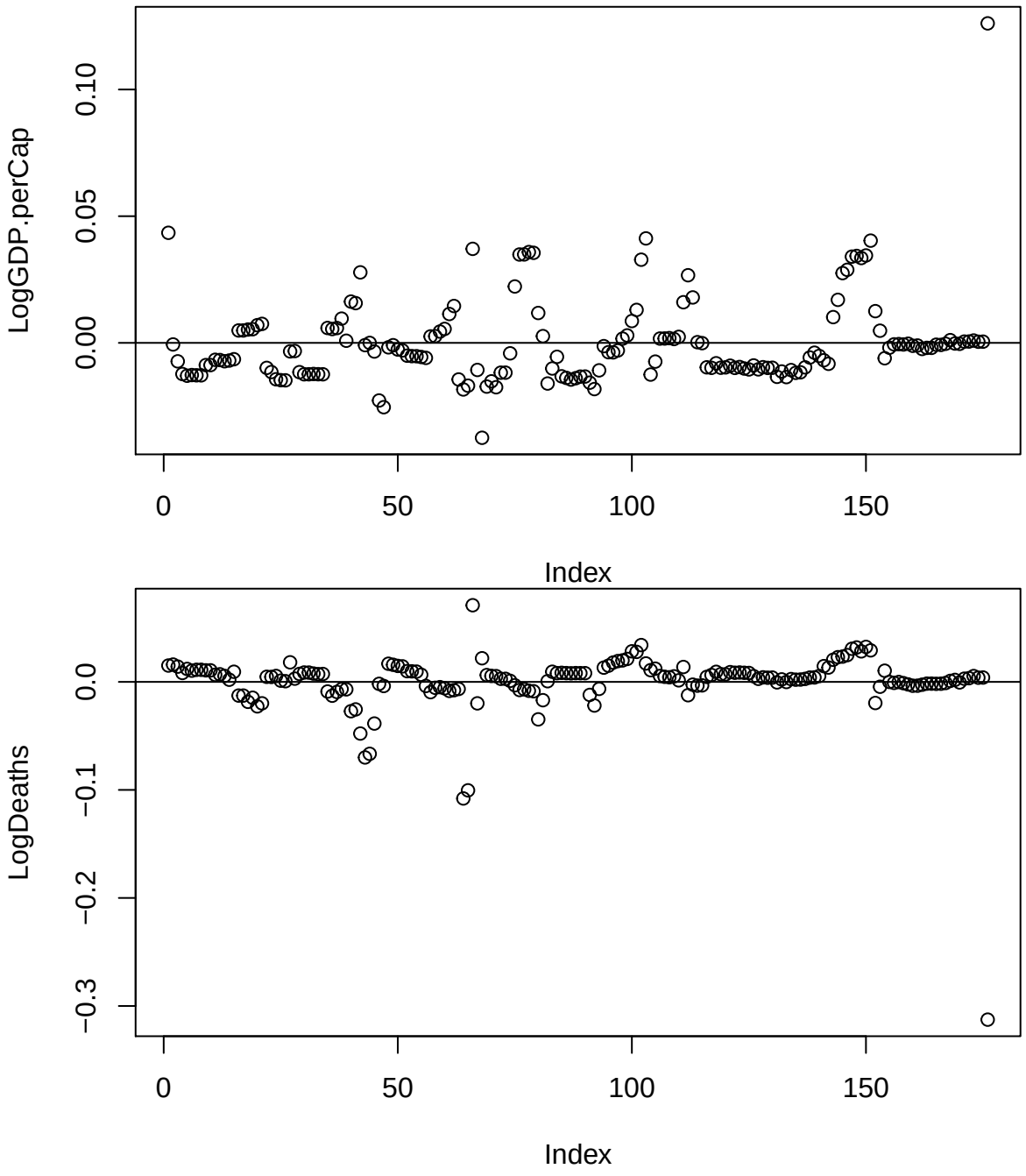

```
dfbeta3 <- residuals(combinedSurvival.Deaths, type="dfbeta")
par(mfrow=c(1, 1))
for (j in 1:10) {
  plot(dfbeta3[, j], ylab=names(coef(combinedSurvival.wAtrocities))[j])
  abline(h = 0)
}
```


EthnFrac
0.010
0.000
−0.010
0
50
100
150
Index
RelFrac
0.2
−0.2
−0.6
−1.0
0
50
100
150
Index

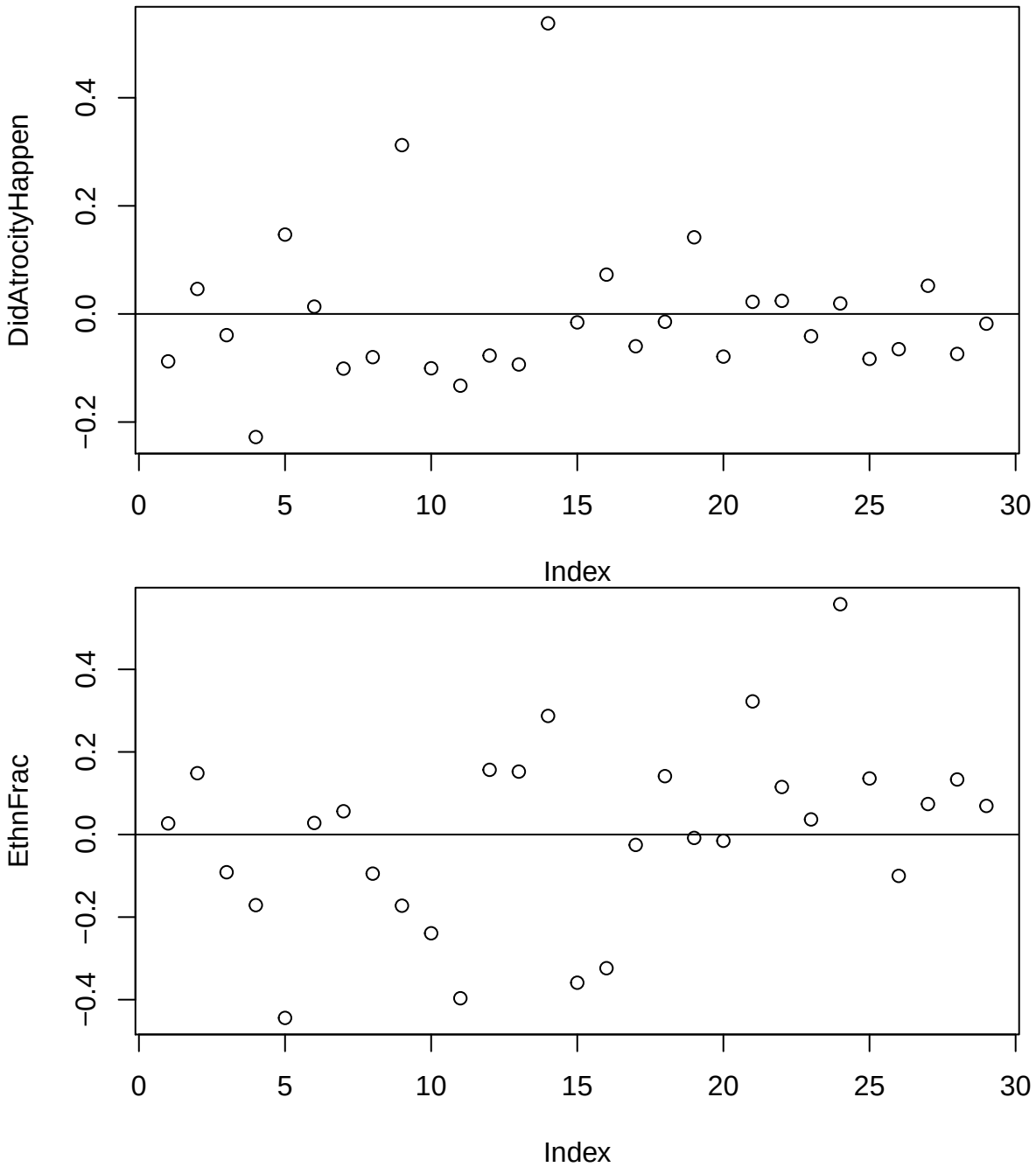

InternationalAlly
0.3
0.2
0.1
0.0
−0.2
0
50
100
150
Index
InternationalOppo
0.04
0.02
0.00
−0.04
0
50
100
150
Index

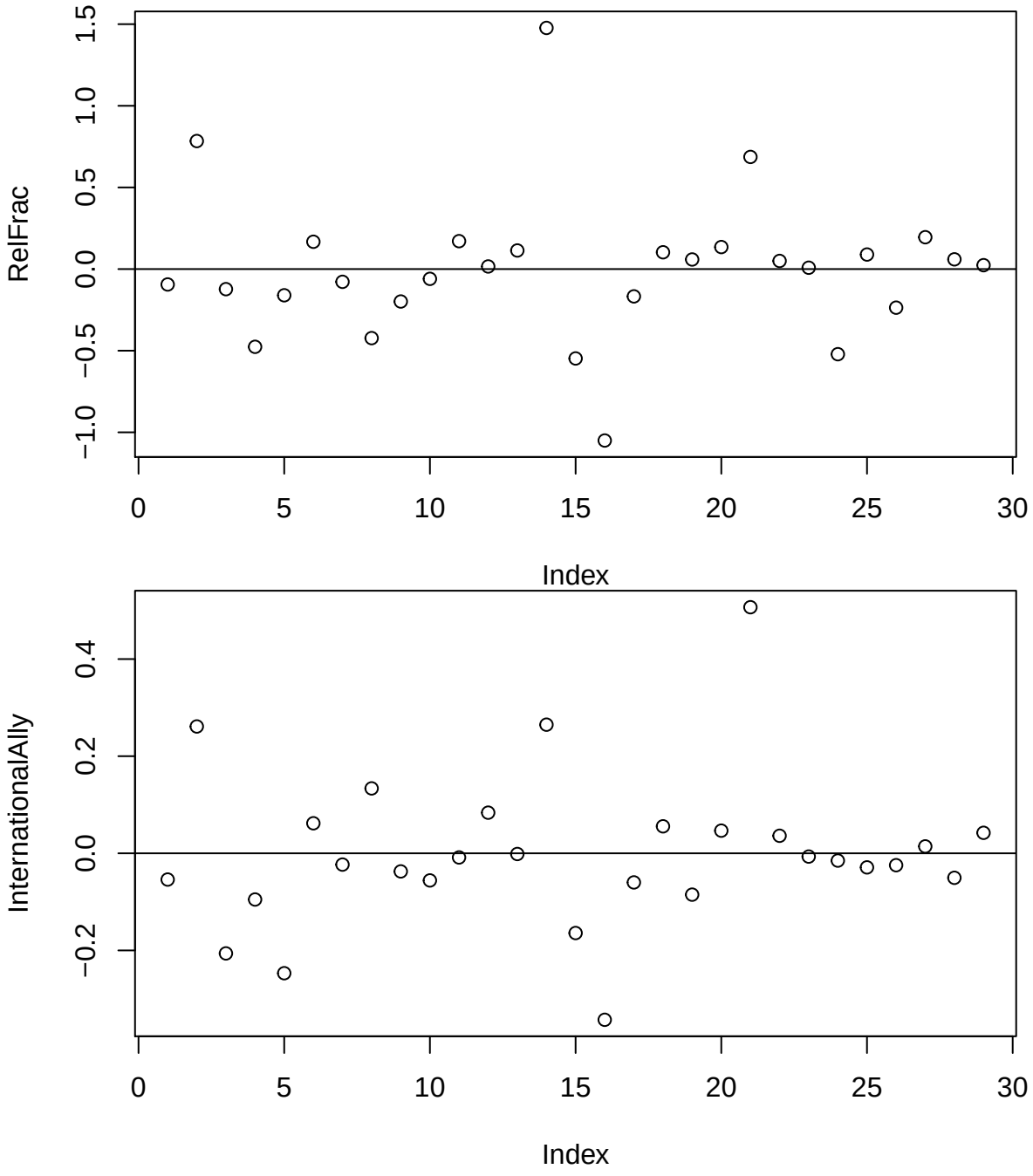

African
0.2
0.1
0.0
−0.2
−0.4
0
50
100
150
Index
Polity
0.2
0.1
0.0
−0.2
−0.4
0
50
100
150
Index

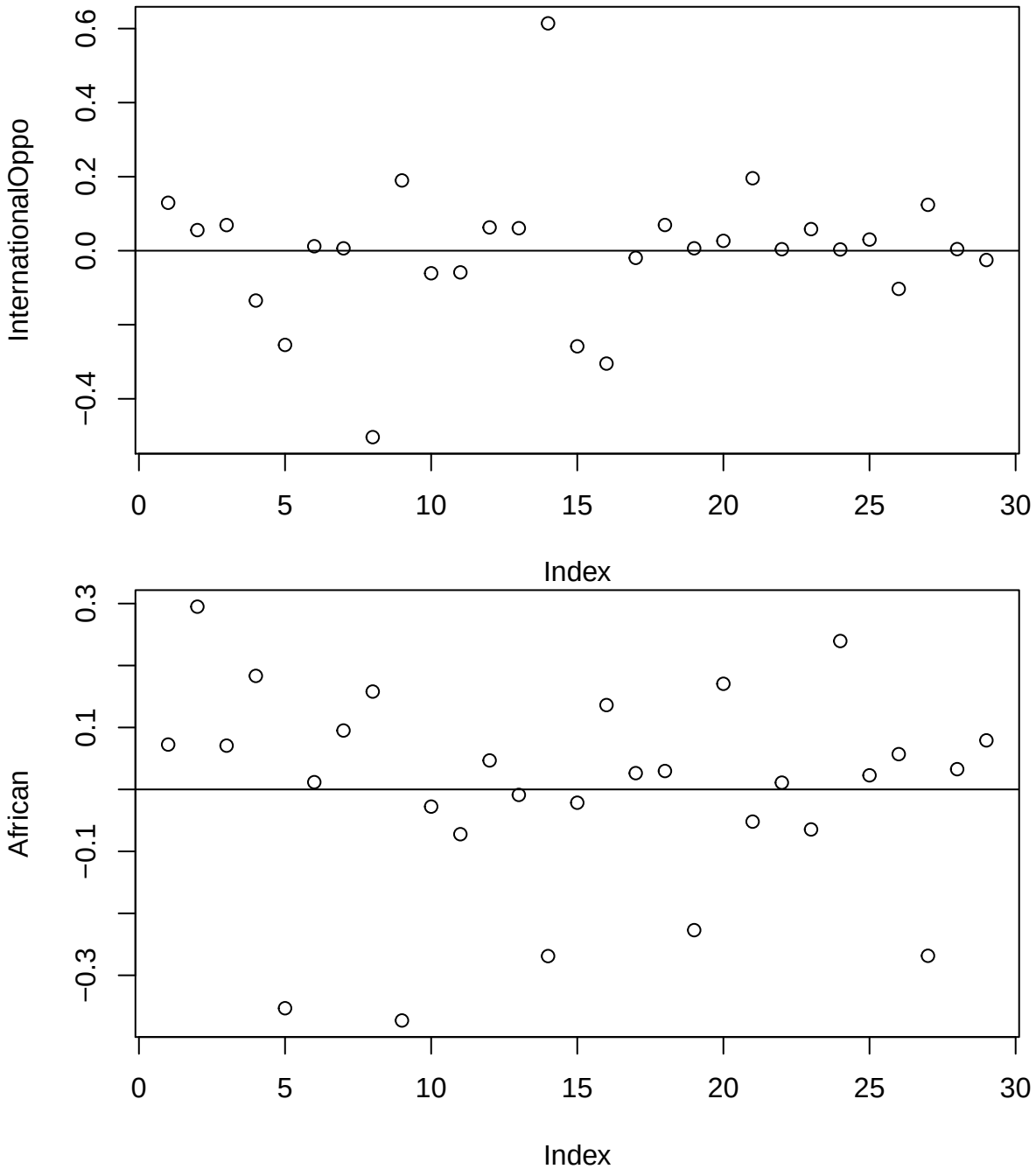

Log.Mountainous
0.00
−0.01
−0.02
−0.03
0
50
100
150
Index
Log.Population
0.0
−0.1
−0.2
−0.3
0
50
100
150
Index

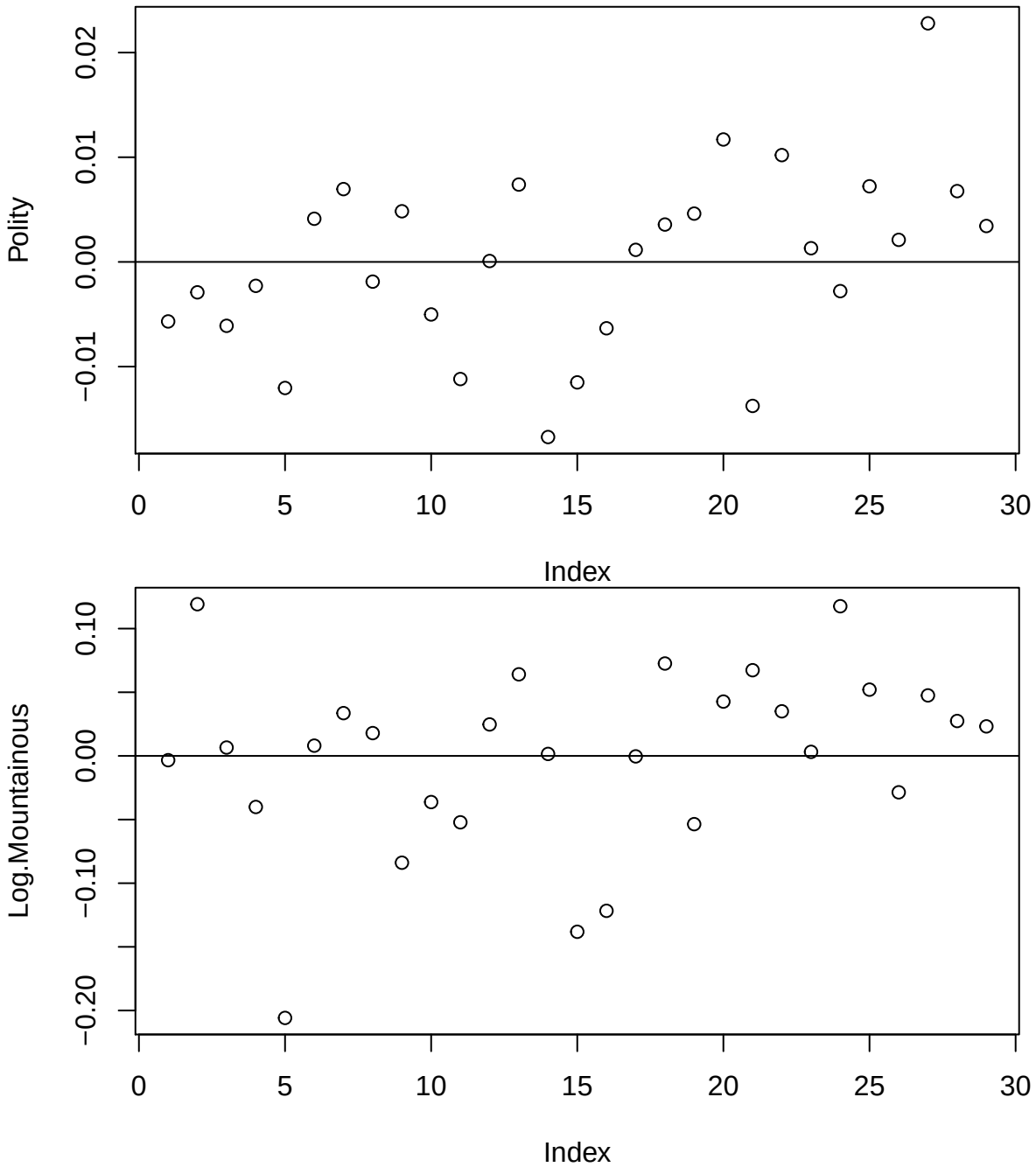


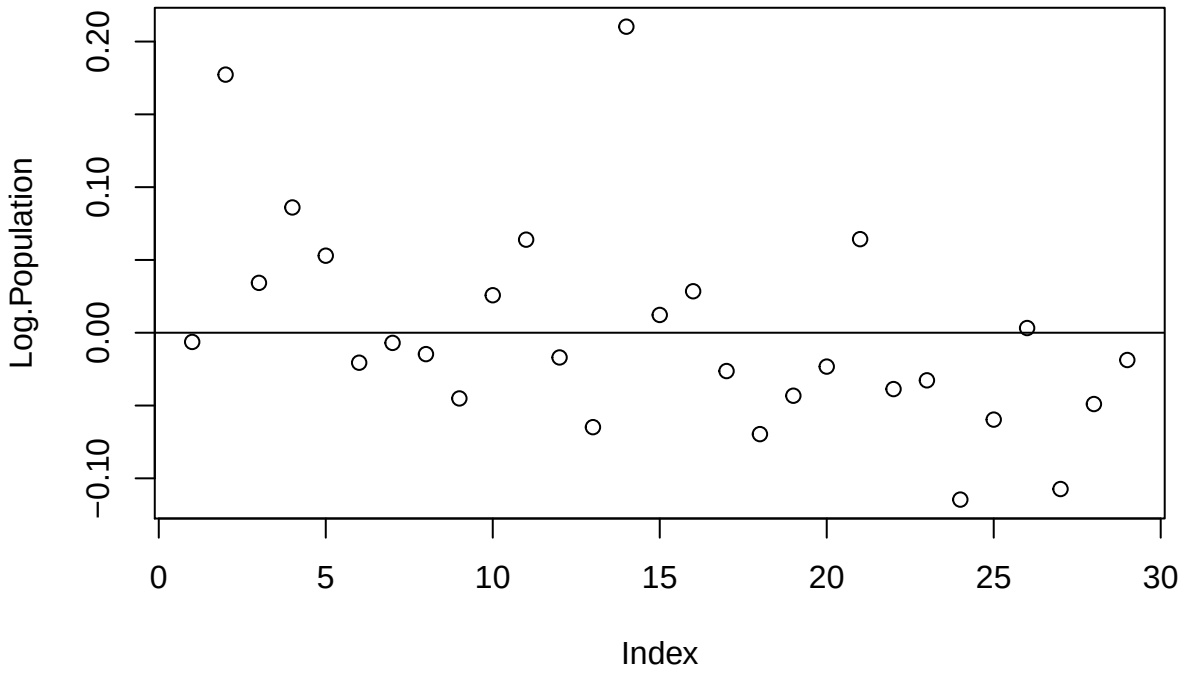

```
dfbeta4 <- residuals(combinedSurvival.full.missAngola, type="dfbeta")
par(mfrow=c(1, 1))
for (j in 1:9) {
  plot(dfbeta4[, j], ylab=names(coef(combinedSurvival))[j])
  abline(h = 0)
}
```


DidAtrocityHappen
0.4
0.2
0.0
−0.2
0
5
10
15
20
25
30
Index
EthnFrac
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Index


RelFrac
1.5
1.0
0.5
0.0
−0.5
−1.0
0
5
10
15
20
25
30
Index
InternationalAlly
0.4
0.2
0.0
−0.2
0
5
10
15
20
25
30
Index


InternationalOppo
0.6
0.4
0.2
0.0
−0.4
0
5
10
15
20
25
30
Index
African
0.3
0.1
−0.1
−0.3
0
5
10
15
20
25
30
Index


Polity
0.02
0.01
0.00
−0.01
0
5
10
15
20
25
30
Index
Log.Mountainous
0.10
0.00
−0.10
−0.20
0
5
10
15
20
25
30
Index




```
cor(atrocityWars$internationalizedOpponent, atrocityWars$warTime)
```

[1] -0.1518585

```
desStat1 <-
  rbind(mean(wars.withCovariates$EthnFrac), var(wars.withCovariates$EthnFrac), min(wars.withCovariates$

desStat2 <-
  rbind(mean(wars.withCovariates$RelFrac), var(wars.withCovariates$RelFrac), min(wars.withCovariates$Rel

desStat3 <- rbind(mean(wars.withCovariates$Log.Mountainous), var(wars.withCovariates$Log.Mountainous),
           min(wars.withCovariates$Log.Mountainous), max(wars.withCovariates$Log.Mountainous))

gpa <- wars.withCovariates$LogGDP.perCap[-6]

desStat4 <- rbind(mean(gpa), var(gpa),
           min(gpa), max(gpa))

desStat5 <- rbind(mean(wars.withCovariates$Log.Population), var(wars.withCovariates$Log.Population), mi

desStat6 <- rbind(mean(wars.withCovariates$InternationalAlly), var(wars.withCovariates$InternationalAlly

desStat7 <- rbind(mean(wars.withCovariates$InternationalOppo), var(wars.withCovariates$InternationalOppo

desStat8 <- rbind(mean(wars.withCovariates$Polity), var(wars.withCovariates$Polity), min(wars.withCovari



descriptiveFull <- as.matrix(cbind(desStat1,
                                   desStat2,
                                   desStat3,
                                   desStat4,
```

```
                                    desStat5,
                                    desStat6,
                                    desStat7,
                                    desStat8))


row.names(descriptiveFull) <- c("Mean", "Variance", "Minimum", "Maximum")
colnames(descriptiveFull) <- c("Ethnic Fractionalization", "Religious Fractionalization",
                               "Log-Mountainous %", "Log GDP per Capita", "Log Population",
                               "International Ally Involvement", "International Opponent Involvement",
                               "Polity Score")
desFull <- t(descriptiveFull)


stargazer(desFull, column.sep.width = "2pt")
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:10:54

Table 5:

	Mean	Variance	Minimum	Maximum
Ethnic Fractionalization	0.598	0.076	0.036	0.902
Religious Fractionalization	0.457	0.031	0	0.680
Log-Mountainous %	2.319	1.899	0	4.324
Log GDP per Capita	6.161	0.944	4.287	8.475
Log Population	9.775	2.005	7.099	12.304
International Ally Involvement	0.097	0.090	0	1
International Opponent Involvement	0.129	0.116	0	1
Polity Score	-0.831	21.239	-9	8

```
writeLines(capture.output(stargazer(descriptiveFull)), )
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:10:54

Table 6:

	Ethnic Fractionalization	Religious Fractionalization	Log-Mountainous %	Log GDP per Capita	Lo
Mean	0.598	0.457	2.319	6.161	
Variance	0.076	0.031	1.899	0.944	
Minimum	0.036	0	0	4.287	
Maximum	0.902	0.680	4.324	8.475	

```
# confidence intervals for proportions of wars that are internationalized based on having atrocities
cor(wars.withCovariates$DidAtrocityHappen, wars.withCovariates$InternationalOppo)
```

[1] -0.06290428

```
mean(wars.withCovariates$InternationalOppo)
```

[1] 0.1290323

```
# confidence intervals
international.oppo.peaceMean <- mean(wars.withCovariates$InternationalOppo[1:13])
international.oppo.peaceSE <- sqrt(mean(wars.withCovariates$InternationalOppo[1:13])*(1-mean(wars.withC


international.oppo.atroMean <- mean(wars.withCovariates$InternationalOppo[14:31])
international.oppo.atroSE <- sqrt(mean(wars.withCovariates$InternationalOppo[14:31])*(1-mean(wars.withC

CI_internationalOpponent.max <- international.oppo.peaceMean + 1.96*international.oppo.peaceSE
CI_internationalOpponent.min <- international.oppo.peaceMean - 1.96*international.oppo.peaceSE

CI_internationalOpponent.max.atro <- international.oppo.atroMean + 1.96*international.oppo.atroSE
CI_internationalOpponent.min.atro <- international.oppo.atroMean - 1.96*international.oppo.atroSE

column1 <- rbind(international.oppo.peaceMean, international.oppo.peaceSE, CI_internationalOpponent.max

column2 <- rbind(international.oppo.atroMean, international.oppo.atroMean, CI_internationalOpponent.max

IntOppoTable <- data.frame(cbind(column1, column2))
row.names(IntOppoTable) <- c("Mean", "Median", "95% CI Max", "95% CI Min")
colnames(IntOppoTable) <- c("Internationalization Rate for 'Clean' Wars", "Internationalization Rate fo

xtable(IntOppoTable, digits = 3)
```

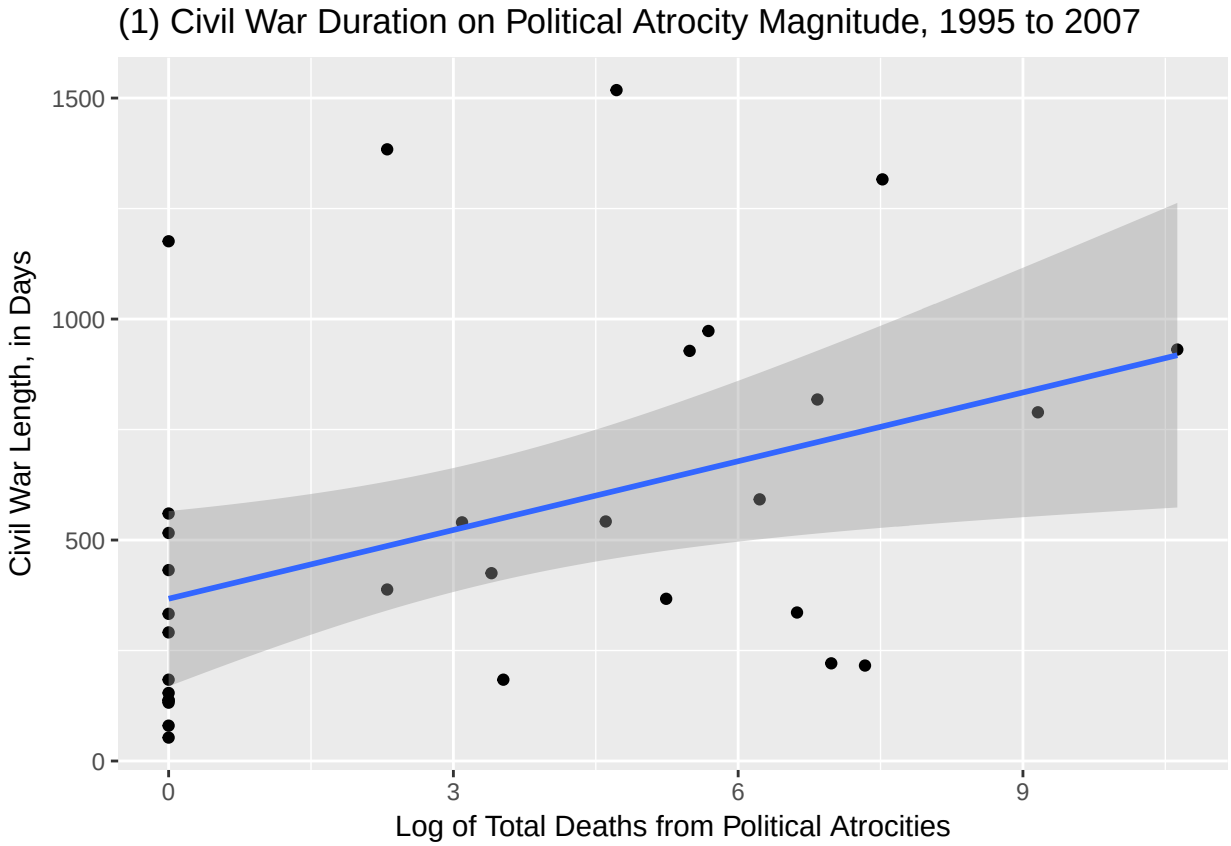
% latex table generated in R 3.2.3 by xtable 1.8-2 package % Mon Apr 2 06:11:21 2018

	Internationalization Rate for 'Clean' Wars	Internationalization Rate for 'Dirty' Wars
Mean	0.154	0.111
Median	0.028	0.111
95% CI Max	0.208	0.145
95% CI Min	0.099	0.077

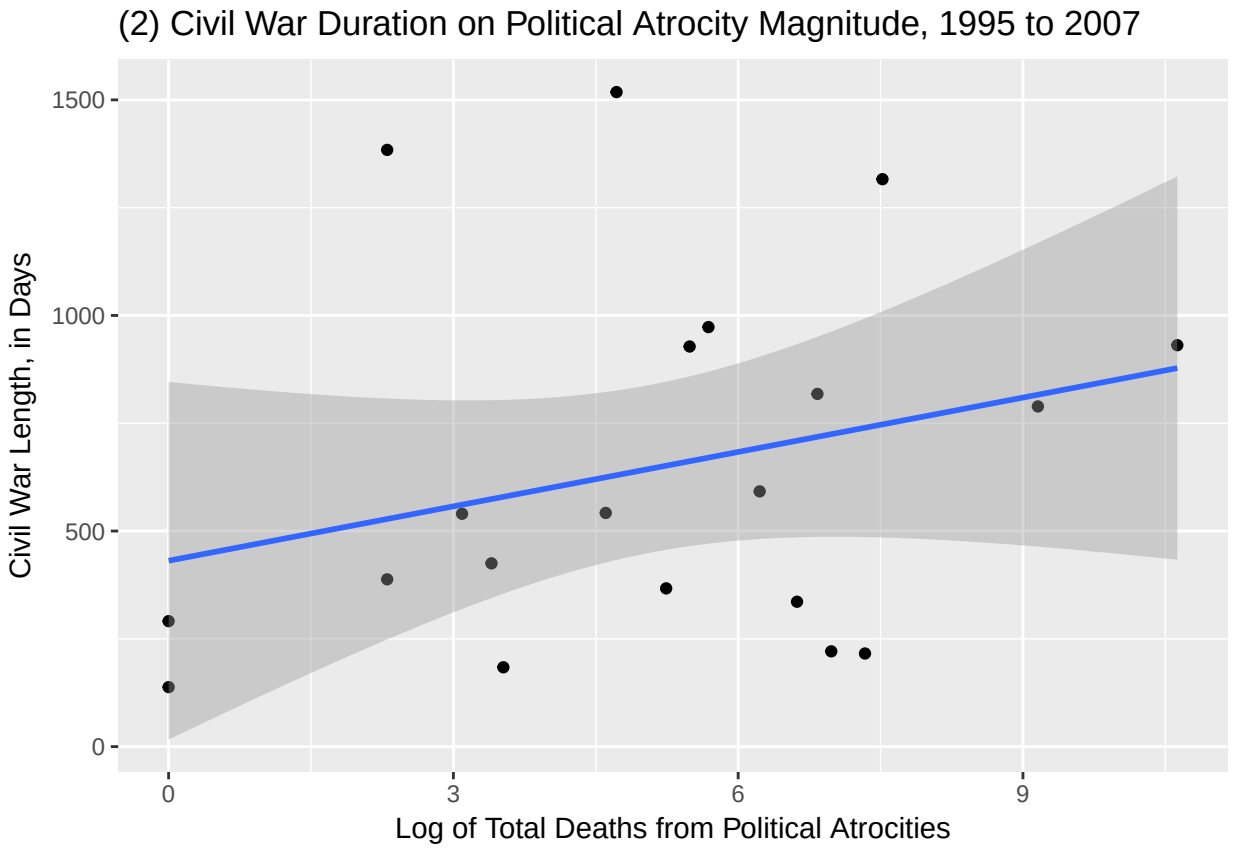
```
# for wars that do feature atrocities, does the magnitude of atrocities influence time before intervent


# hypothesis test for differences
(international.oppo.atroMean - international.oppo.peaceMean)/sqrt(international.oppo.atroSE^2+internati
```

[1] -1.303338

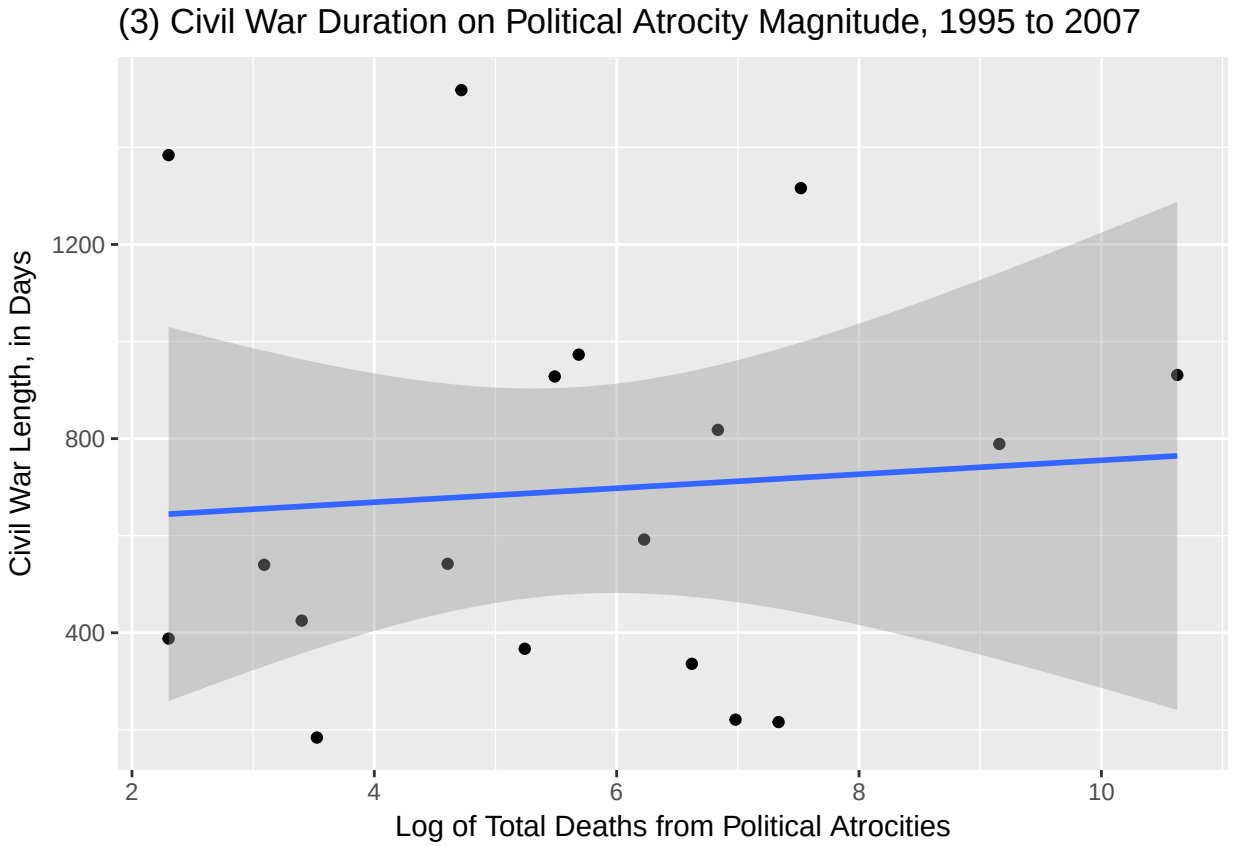
```
# plotting log total deaths as a result of time
ggplot(data = wars.withCovariates, aes(x = LogDeaths, y = WarLength)) + geom_point() +
  ggtitle("(1) Civil War Duration on Political Atrocity Magnitude, 1995 to 2007") + xlab("Log of Total
  ylab("Civil War Length, in Days") + geom_smooth(method = "lm")
```




```
ggplot(data = wars.withCovariates[12:31,], aes(x = LogDeaths, y = WarLength)) + geom_point() +
  ggtitle("(2) Civil War Duration on Political Atrocity Magnitude, 1995 to 2007") + xlab("Log of Total D
  ylab("Civil War Length, in Days") + geom_smooth(method = "lm")
```




```
ggplot(data = wars.withCovariates[14:31,], aes(x = LogDeaths, y = WarLength)) + geom_point() +
  ggtitle("(3) Civil War Duration on Political Atrocity Magnitude, 1995 to 2007") + xlab("Log of Total D
  ylab("Civil War Length, in Days") + geom_smooth(method = "lm")
```




```
COWinternationalized <- read.csv("Intra-StateWarData_v4.1 (All International).csv", header = TRUE)

mean(atrocityWars$warTime)-mean(wars.withCovariates$WarLength[2:13])
```

[1] 441.8333

```
  sqrt((var(wars.withCovariates$WarLength[2:13])/12)+(var(atrocityWars$warTime)/18))
```

[1] 109.791

```
mean(atrocityWars$warTime)
```

[1] 692.6667

```
angolaCheck1 <- rbind(wars.withCovariates$EthnFrac[1],
      wars.withCovariates$RelFrac[1],
      wars.withCovariates$Log.Mountainous[1],
      wars.withCovariates$Log.Population[1],
      wars.withCovariates$African[1])
row.names(angolaCheck1) <- c("Ethnic Fractionalization", "Religious Fractionalization",
                             "Log Mountainous %", "Log Population",
                             "African Status")
colnames(angolaCheck1) <- c("Angola Covariate Measurements")

angolaCheck2 <- rbind(mean(wars.withCovariates$EthnFrac[1:13]),
```

```
      mean(wars.withCovariates$RelFrac[1:13]),
      mean(wars.withCovariates$Log.Mountainous[1:13]),
      mean(wars.withCovariates$Log.Population[1:13]),
      mean(wars.withCovariates$African[1:13]))
row.names(angolaCheck2) <- c("Ethnic Fractionalization", "Religious Fractionalization",
                             "Log Mountainous %", "Log Population",
                             "African Status")
colnames(angolaCheck2) <- c("Mean of 'Clean' Civil Wars ")

angTab1 <- as.matrix(cbind(angolaCheck1, angolaCheck2))

# show the output
stargazer(angTab1)
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:11:21

Table 7:

	Angola Covariate Measurements	Mean of 'Clean' Civil Wars
Ethnic Fractionalization	0.783	0.620
Religious Fractionalization	0.612	0.501
Log Mountainous %	2.370	2.218
Log Population	9.711	9.580
African Status	1	0.538

```
# revisiting initial dataset for sri lankan data
atrocities_1995_2012 <- data.frame(read.csv("Atrocities 1995-2012.csv", header = TRUE))
deleteRows_95_12 <- atrocities_1995_2012[-c(7776:65535), ]
deleteColumns_95_12 <- deleteRows_95_12[, c(1:73)]
lankaAtrocities <- subset(deleteColumns_95_12, Country == "LKA")
lankaAtrocities$index <- 1:nrow(lankaAtrocities)
lankaAtrocities$Deaths.Number <- as.numeric(lankaAtrocities$Deaths.Number)

# condensing to make sure only govenrment committed atrocities
lankaGov <- lankaAtrocities[which(lankaAtrocities$Perp.State.Military != '' |
                                  lankaAtrocities$Perp.State.Police != '' | lankaAtrocities$Perp.State
xtable(angolaCheck1)
```

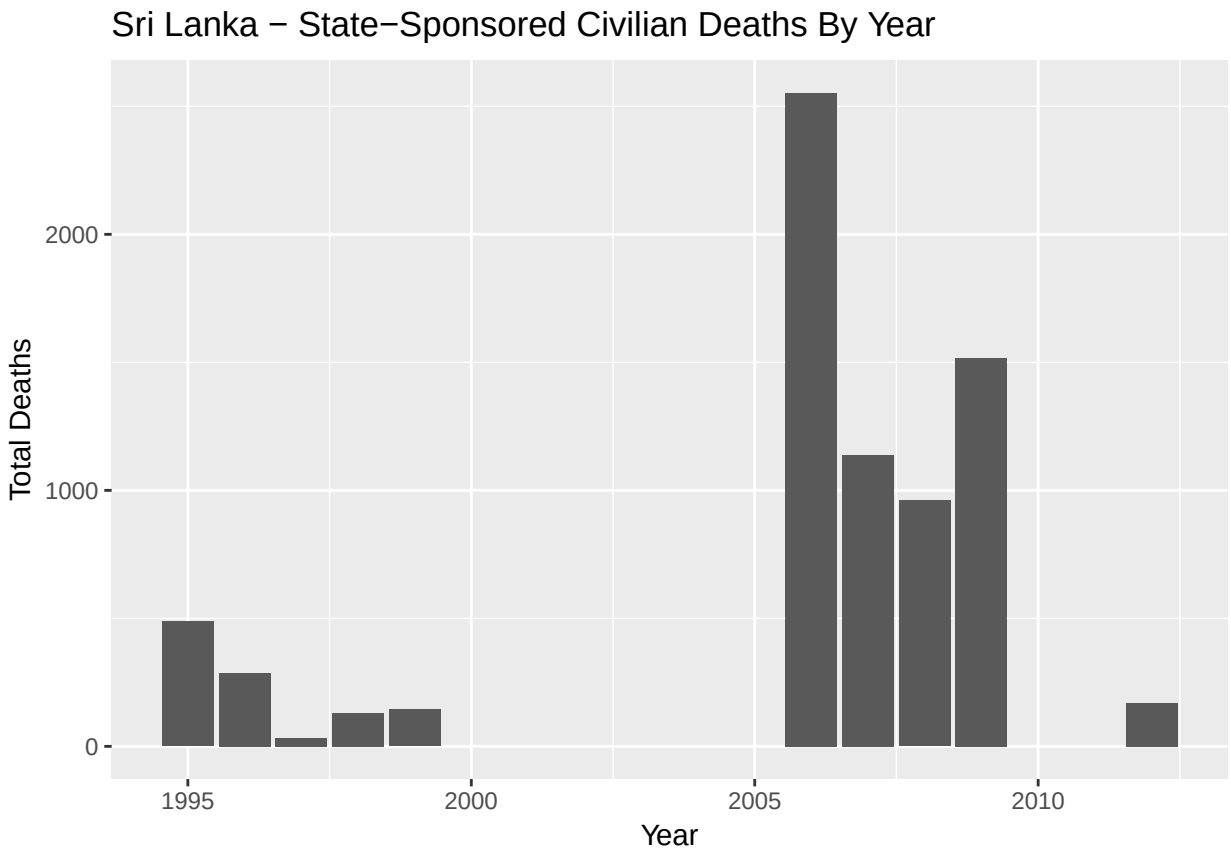
% latex table generated in R 3.2.3 by xtable 1.8-2 package % Mon Apr 2 06:11:31 2018

	Angola Covariate Measurements
Ethnic Fractionalization	0.78
Religious Fractionalization	0.61
Log Mountainous %	2.37
Log Population	9.71
African Status	1.00

```
# dplyr
lankaOrganized <- lankaGov %>%
  group_by(Start.Year) %>%
```

```
  summarise(sumDeaths = sum(Deaths.Number))

ggplot(data = lankaOrganized, aes(x = Start.Year, y = sumDeaths))+geom_histogram(stat='identity') +
  ggtitle("Sri Lanka - State-Sponsored Civilian Deaths By Year") + xlab("Year") + ylab("Total Deaths")
```

```
## Warning: Ignoring unknown parameters: binwidth, bins, pad
```




```
covarNames <- c("Did Atrocity Happen?", "Ethnic Fractionalization", "Religious Fractionalization", "Int

d <- data.frame(timeVaried.sections[14:189,])
d <- d[,-1:-4]
dcor1 <- cor(d)

d2 <- data.frame(wars.withCovariates)
d2 <- d2[,-1:-4]
dcor2 <- cor(d2)


library(rms)
```

```
## Warning: package 'rms' was built under R version 3.2.5

## Loading required package: Hmisc

## Warning: package 'Hmisc' was built under R version 3.2.5
```

```
## Loading required package: lattice

## Loading required package: Formula

## Warning: package 'Formula' was built under R version 3.2.5

##
## Attaching package: 'Hmisc'

## The following objects are masked from 'package:xtable':
##
##     label, label<-

## The following objects are masked from 'package:dplyr':
##
##     src, summarize

## The following objects are masked from 'package:base':
##
##     format.pval, units

## Loading required package: SparseM

## Warning: package 'SparseM' was built under R version 3.2.5

##
## Attaching package: 'SparseM'

## The following object is masked from 'package:base':
##
##     backsolve
```

```
cvif1 <- vif(combinedSurvival.full)
cvif2 <- vif(combinedSurvival.full.death)

vifTests <- cbind(cvif1, cvif2)

stargazer(title = "Correlation Matrix For Covariates in Civil War Level Data", dcor2)
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:11:32

```
stargazer(title = "Correlation Matrix For Covariates in Atrocity Observation Level Data", dcor1)
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:11:32

Table 8: Correlation Matrix For Covariates in Civil War Level Data

	EthnFrac	RelFrac	InternationalAlly	InternationalOppo	Polity	African	Log.Mountai
EthnFrac	1	0.054	-0.108	0.004	0.281	0.237	-0.428
RelFrac	0.054	1	-0.287	-0.048	-0.293	0.418	-0.306
InternationalAlly	-0.108	-0.287	1	0.199	0.012	0.078	-0.045
InternationalOppo	0.004	-0.048	0.199	1	-0.057	0.349	-0.286
Polity	0.281	-0.293	0.012	-0.057	1	-0.195	0.069
African	0.237	0.418	0.078	0.349	-0.195	1	-0.463
Log.Mountainous	-0.428	-0.306	-0.045	-0.286	0.069	-0.463	1
Log.Population	0.064	-0.424	-0.076	-0.188	0.452	-0.614	0.554
LogGDP.perCap							
WarLength	-0.035	-0.223	0.126	-0.110	0.027	-0.0005	0.209
totalDeaths	-0.329	0.099	-0.066	-0.072	0.046	0.209	0.201
LogDeaths	-0.125	-0.187	0.083	0.021	-0.013	0.202	0.049

Table 9: Correlation Matrix For Covariates in Atrocity Observation Level Data

	EthnFrac	RelFrac	InternationalAlly	InternationalOppo	Polity	African	Log.Mountai
EthnFrac	1	0.297	-0.140	-0.399	-0.183	-0.124	-0.662
RelFrac	0.297	1	-0.526	-0.675	-0.181	0.077	-0.109
InternationalAlly	-0.140	-0.526	1	0.580	-0.088	0.143	-0.130
InternationalOppo	-0.399	-0.675	0.580	1	0.054	0.317	-0.031
Polity	-0.183	-0.181	-0.088	0.054	1	-0.378	0.072
African	-0.124	0.077	0.143	0.317	-0.378	1	-0.206
Log.Mountainous	-0.662	-0.109	-0.130	-0.031	0.072	-0.206	1
Log.Population	0.411	-0.135	-0.083	-0.246	0.368	-0.742	-0.015
LogGDP.perCap	0.355	0.003	-0.020	-0.279	0.037	-0.635	-0.386
WarLength	0.225	0.120	-0.324	-0.410	0.173	-0.345	-0.053
Deaths	-0.052	0.036	-0.059	-0.044	0.038	-0.089	0.029
LogDeaths	0.020	0.334	-0.222	-0.240	-0.199	0.105	-0.061

```
polity <- read.csv("polityRawData.csv", header = TRUE)

polityRanks <- c(5,6,6,5,5,5,6,6,6,5)
polityYeas <- c(2000,2001,2002,2003,2004,2005,2006,2007,2008,2009)

tablePolity <- data.frame(cbind(polityYeas, polityRanks))
colnames(tablePolity) <- c("Year", "Polity Score")

xtable(tablePolity)
```

% latex table generated in R 3.2.3 by xtable 1.8-2 package % Mon Apr 2 06:11:32 2018

	Year	Polity Score
1	2000.00	5.00
2	2001.00	6.00
3	2002.00	6.00
4	2003.00	5.00
5	2004.00	5.00
6	2005.00	5.00
7	2006.00	6.00
8	2007.00	6.00
9	2008.00	6.00
10	2009.00	5.00

```
stargazer(vifTests)
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:11:32

Table 10:

	cvif1	cvif2
DidAtrocityHappen	1.833	1.797
EthnFrac	2.875	3.330
RelFrac	3.206	3.103
InternationalAlly	1.840	1.840
InternationalOppo	2.028	2.083
African	3.728	3.770
Polity	2.046	1.930
Log.Mountainous	5.163	4.872
Log.Population	4.681	4.698
LogGDP.perCap	3.243	3.425

```
stargazer(cvif2)
```

% Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Mon, Apr 02, 2018 - 06:11:33

Table 11:

LogDeaths	EthnFrac	RelFrac	InternationalAlly	InternationalOppo	African	Polity	Log.Mountainous
1.797	3.330	3.103	1.840	2.083	3.770	1.930	4.872

```
# creating tables for hazard ratios

# model 1

atom1 <- coef(summary(combinedSurvival.full))
atom2 <- coef(summary(combinedSurvival.full.death))
atom3 <- coef(summary(combinedSurvival.Deaths))
atom4 <- coef(summary(combinedSurvival.full.missAngola))
atom5 <- coef(summary(combinedSurvival.full.missAngola.death))


m1_intl <- mean(wars.withCovariates$InternationalOppo[1:13])
SE1_intl <- sqrt(m1_intl*(1-m1_intl)/13)
m1_upB <- m1_intl + 1.96*SE1_intl
m1_dB <- m1_intl - 1.96*SE1_intl

m2_intl <- mean(wars.withCovariates$InternationalOppo[14:31])
SE2_intl <- sqrt(m2_intl*(1-m2_intl)/18)
m2_upB <- m2_intl + 1.96*SE2_intl
m2_dB <- m2_intl - 1.96*SE2_intl

SE_intl <- rbind(SE1_intl, SE2_intl)
M_intl <- rbind(m1_intl, m2_intl)
upB_intl <- rbind(m1_upB, m2_upB)
dB_intl <- rbind(m1_dB, m2_dB)

prop_intl <- as.matrix(cbind(SE_intl, M_intl, upB_intl, dB_intl))
colnames(prop_intl) <- c("SE", "Mean", "UpperBound", "LowerBound")
row.names(prop_intl) <- c("Proportion Internationalization - Clean Wars", "Proportion Internationalizat

xtable(prop_intl, digits = 3)
```

```
## % latex table generated in R 3.2.3 by xtable 1.8-2 package
## % Mon Apr  2 06:11:33 2018
## \begin{table}[ht]
## \centering
## \begin{tabular}{rrrrr}
##   \hline
##  & SE & Mean & UpperBound & LowerBound \\
##   \hline
## Proportion Internationalization - Clean Wars & 0.100 & 0.154 & 0.350 & -0.042 \\
##   Proportion Internationalization - Dirty Wars & 0.074 & 0.111 & 0.256 & -0.034 \\
##    \hline
## \end{tabular}
## \end{table}
```

```r
(m1_intl - m2_intl)/sqrt(SE1_intl^2+SE2_intl^2)
```

```
## [1] 0.3432492
```