Putting Electoral Competition Where It Belongs

Comparing Vote-Based Measures of Electoral Competition

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Session and Variable Information

sessionInfo()

R version 4.0.2 (2020-06-22)

Platform: x86_64-apple-darwin19.5.0 (64-bit)

Running under: macOS Catalina 10.15.6

attached base packages:

[1] stats graphics grDevices utils datasets methods base

other attached packages:

[1] xtable_1.8-4 ggplot2_3.3.0 magrittr_1.5 dplyr_1.0.2

Variable Description

Core Data (pecwib_wagner_krause.Rdata)

Country: Country Name

wave_year: Wave of European Election Study (EES)

vol_ess: Volatility based on EES

agg_switch: Share of Respondents Switching Vote Choice

agg_avail: Mean Availability of Respondents

diff: Time Difference between Survey and Last National Election (in years)

diff2: Squared Time Difference between Survey and Last National Election (in years)

agg_avail_median: Median Availability of Voters

agg_avail_nv: Mean Availability without Non-Voters

agg_switch_nv: Share of Respondents Switching Vote Choice without Non-Voters

CSES Data (pecwib_cses_wagner_krause.Rdata)

country: Country Name

year: Year of Survey/Election

agg_switch: Share of Respondents Switching Vote Choice

agg_avail: Mean Availability of Respondents

Article: Tables and Figures

```
library( dplyr )
library( magrittr )
library( ggplot2 )

load( 'pecwib_wagner_krause.Rdata' )
load( 'pecwib_cses_wagner_krause.Rdata' )
```

Figure 2

```
d %>%
  ggplot( aes( agg_switch , vol_ees )) +
  geom_point( ) +
  geom_smooth( method = 'lm' )
```

Figure 2: Scatter Plot of Volatility and Vote switching, 1989-2014

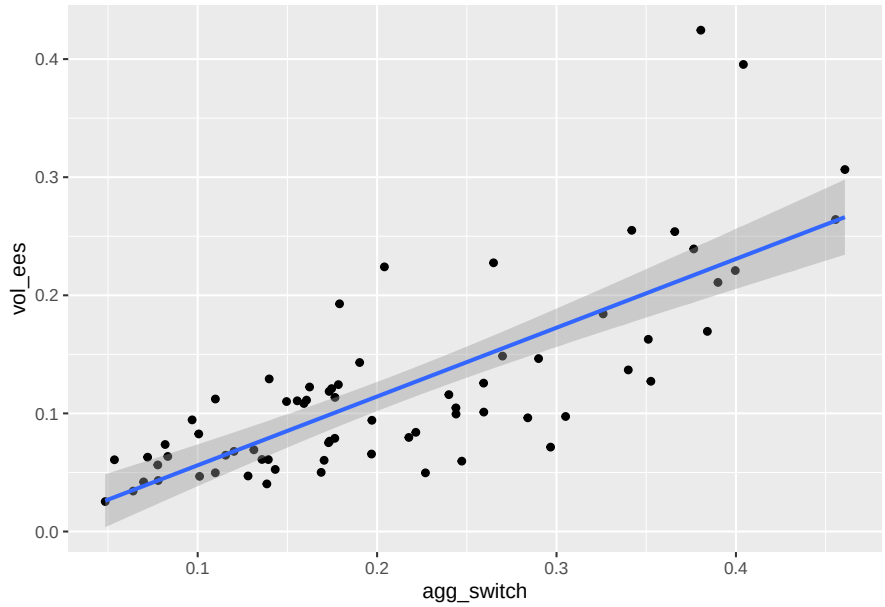

Table 1

```
m1 <- lm( vol_ees ~ agg_switch + Country , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_switch , . )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd < 4 / nrow( m1$model )) %>%
  lm( vol_ees ~ agg_switch + Country , . )

se1b <- lmtest::coeftest( m1 , vcov = sandwich::vcovHC( m1 , "HC1"))
```

Table 1: Testing hypothesis 1 – Vote switching as a necessary but insufficient condition of electoral volatility

	vol_ees	residuals	w/o outliers	robust s.e.
	(1)	(2)	(3)	(4)
agg_switch	0.605***	0.012***	0.511***	0.605***
	(0.060)	(0.004)	(0.048)	(0.080)
Constant	−0.017	−0.0004	−0.002	−0.017
	(0.025)	(0.001)	(0.018)	(0.021)
Observations	71	71	67	71
Adjusted R^2	0.600	0.103	0.665	0.600

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
First-step models (models 1, 1a, and 1b) include country dummies.

Figure 3

```
d %>%
  ggplot( aes( agg_avail , agg_switch )) +
  geom_point( ) +
  geom_smooth( method = 'lm' )
```

Figure 3: Scatter Plot of Vote Switching and Availability, 1989–2014

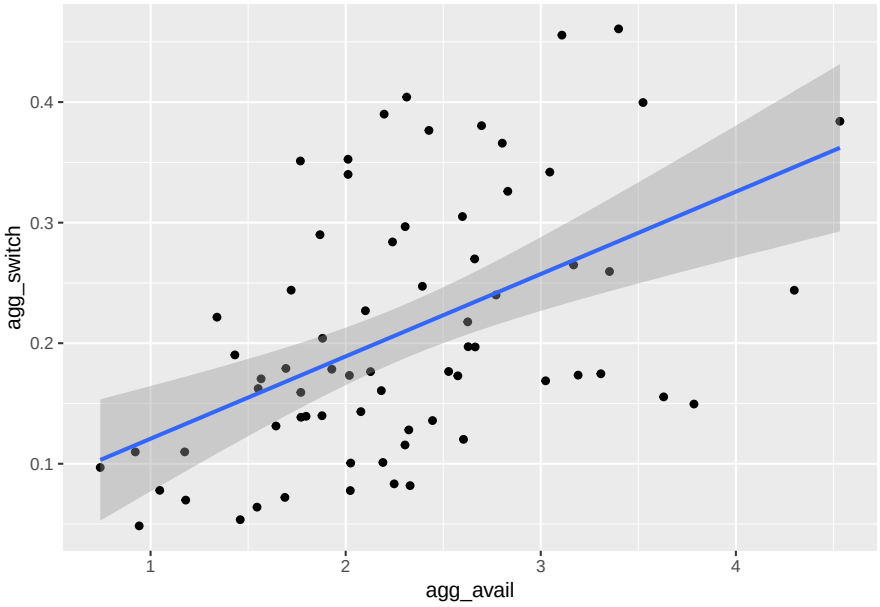

Table 2

```
m1 <- lm( agg_switch ~ agg_avail + Country , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_avail , . )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd < 4 / nrow( m1$model )) %>%
  lm( agg_switch ~ agg_avail + Country , . )

se1b <- lmtest::coeftest( m1 , vcov = sandwich::vcovHC( m1 , "HC1"))
```

Table 2: Testing hypothesis 2 – Availability as a necessary but insufficient condition of vote switching

	Switching	Residuals	w/o outliers	Robust s.e.
	(1)	(2)	(3)	(4)
agg_avail	0.113***	0.004***	0.119***	0.113***
	(0.021)	(0.001)	(0.021)	(0.020)
Constant	−0.111	−0.002	−0.127**	−0.111**
	(0.067)	(0.003)	(0.063)	(0.052)
Observations	70	70	66	70
Adjusted R^2	0.262	0.130	0.302	0.262

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
First-step models (models 1, 1a, and 1b) include country dummies.

Appendix

Table A.1

```
m1 <- lm( vol_ees ~ agg_switch + diff + diff2 + Country + wave_year , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_switch , . )

m3 <- lm( agg_switch ~ agg_avail + diff + diff2 + Country + wave_year , d )

m4 <- cbind( m3$model , res1 = m3$residuals^2 ) %>%
  lm( res1 ~ agg_avail , . )
```

Table A1: Results for tables 1 and 2 with country and time dummies including time to control for second-order effects

	Volatility	Volatility Residuals	Switching	Switching Residuals
	(1)	(2)	(3)	(4)
agg_switch	0.833***	0.006**		
	(0.105)	(0.003)		
agg_avail			0.039**	0.002*
			(0.016)	(0.001)
diff	−0.002		0.048*	
	(0.020)		(0.025)	
diff2	0.0003		−0.007	
	(0.004)		(0.005)	
Constant	−0.035	0.0002	−0.077	−0.001
	(0.032)	(0.001)	(0.047)	(0.002)
Observations	71	71	70	70
Adjusted R^2	0.676	0.066	0.727	0.034

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
Models 1 and 3 include country and survey year dummies.

Figure A.1

```
d %>%
  ggplot( aes( agg_avail , vol_ees )) +
  geom_point( ) +
  geom_smooth( method = 'lm' )
```

Figure A1: Scatter Plot of Volatility and Availability, 1989-2014

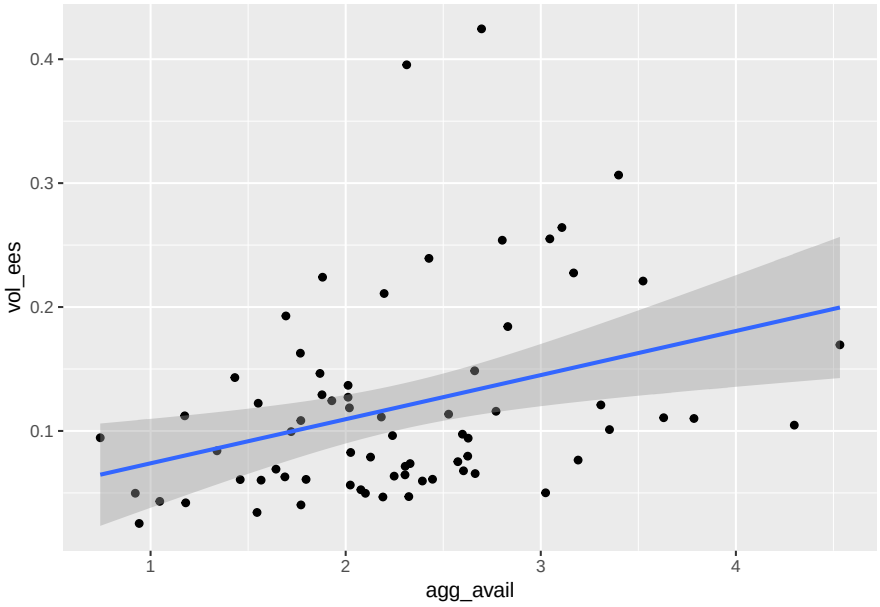

Table A.2

```
m1 <- lm( vol_ees ~ agg_avail + Country , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_avail , . )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd <= 4 / nrow( m1$model ) | is.na( cd )) %>%
  lm( vol_ees ~ agg_avail + Country, . )

se1b <- lmtest::coeftest( m1 , vcov = sandwich::vcovHC( m1 , "HC1"))
```

Table A2: Testing the implication from hypothesese 1 and 2 – Availability as a necessary but insufficient condition of volatility

	(1)	(2)	(3)	(4)
agg_avail	0.077***	0.003**	0.059***	0.077***
	(0.017)	(0.001)	(0.014)	(0.022)
Constant	−0.106*	−0.001	−0.063	−0.106*
	(0.053)	(0.003)	(0.041)	(0.058)
Observations	70	70	65	70
Adjusted R^2	0.192	0.050	0.217	0.192

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
First-step models (models 1, 1a, and 1b) include country dummies.

Table A.3

```
m1 <- lm( vol_ees ~ agg_avail + diff + diff2 + Country , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_avail , . )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd <= 4 / nrow( m1$model ) | is.na( cd )) %>%
  lm( vol_ees ~ + diff + diff2 + agg_avail + Country, . )

se1b <- lmtest::coeftest( m1 , vcov = sandwich::vcovHC( m1 , "HC1"))
```

Table A3: Results for Table A2 including time to control for second-order effects

	(1)	(2)	(3)	(4)
agg_avail	0.071***	0.003**	0.062***	0.071***
	(0.018)	(0.001)	(0.014)	(0.023)
diff	0.033		0.023	0.033
	(0.032)		(0.023)	(0.022)
diff2	−0.004		−0.002	−0.004
	(0.007)		(0.005)	(0.004)
Constant	−0.144**	−0.002	−0.115**	−0.144**
	(0.057)	(0.003)	(0.045)	(0.064)
Observations	70	70	66	70
Adjusted R^2	0.204	0.054	0.311	0.204

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
Models 1 and 3 include country year dummies.

Table A.4

```
library( xtable )

d.out <- d %>% arrange( Country , wave_year ) %>%
  select( Country , wave_year , agg_avail , agg_switch , vol_ees )

print( xtable( d.out , caption = 'Data base' )
       , tabular.environment = "longtable"
       , include.rownames = F , comment = F )
```

Country	wave_year	agg_avail	agg_switch	vol_ees
Belgium	1989	2.19	0.10	0.05
Belgium	1994	2.18	0.16	0.11
Belgium	1999	2.03	0.10	0.08
Belgium	2004			
Belgium	2009	3.35	0.26	0.10
Belgium	2014	2.63	0.22	0.08
Denmark	1989	2.08	0.14	0.05
Denmark	1994	2.57	0.17	0.08
Denmark	1999	3.31	0.17	0.12
Denmark	2004	2.02	0.17	0.12
Denmark	2009	2.24	0.28	0.10
Denmark	2014	2.60	0.31	0.10
France	1989	3.79	0.15	0.11
France	1994	3.19	0.17	0.08
France	1999	3.63	0.16	0.11
France	2004	2.45	0.14	0.06
France	2009	2.83	0.33	0.18
France	2014	2.80	0.37	0.25
Germany	1989	1.64	0.13	0.07
Germany	1994	1.77	0.16	0.11
Germany	1999	1.43	0.19	0.14
Germany	2004	1.88	0.20	0.22
Germany	2009	2.01	0.35	0.13
Germany	2014	2.10	0.23	0.05
Greece	1989	0.74	0.10	0.09
Greece	1994	1.46	0.05	0.06
Greece	1999	1.88	0.14	0.13
Greece	2004	1.05	0.08	0.04
Greece	2009	2.01	0.34	0.14
Greece	2014	3.05	0.34	0.26
Ireland	1989	2.30	0.12	0.06
Ireland	1994	2.60	0.12	0.07
Ireland	1999	3.02	0.17	0.05
Ireland	2004	2.66	0.27	0.15
Ireland	2009	3.11	0.46	0.26
Ireland	2014	2.43	0.38	0.24
Italy	1989	2.32	0.13	0.05
Italy	1994	2.53	0.18	0.11
Italy	1999	3.40	0.46	0.31
Italy	2004	4.30	0.24	0.10
Italy	2009	2.77	0.24	0.12
Italy	2014	3.17	0.26	0.23

Luxembourg	1989	2.25	0.08	0.06
Luxembourg	1994	2.02	0.08	0.06
Luxembourg	1999	2.33	0.08	0.07
Luxembourg	2004		0.26	0.13
Luxembourg	2009	2.30	0.30	0.07
Luxembourg	2014	2.39	0.25	0.06
Portugal	1989	1.55	0.06	0.03
Portugal	1994	1.69	0.07	0.06
Portugal	1999	1.18	0.07	0.04
Portugal	2004	1.69	0.18	0.19
Portugal	2009	1.87	0.29	0.15
Portugal	2014	2.70	0.38	0.42
Spain	1989	1.34	0.22	0.08
Spain	1994	1.18	0.11	0.11
Spain	1999	0.92	0.11	0.05
Spain	2004	0.94	0.05	0.03
Spain	2009	1.72	0.24	0.10
Spain	2014	2.31	0.40	0.40
The Netherlands	1989	1.77	0.14	0.04
The Netherlands	1994	2.13	0.18	0.08
The Netherlands	1999	2.66	0.20	0.07
The Netherlands	2004	2.63	0.20	0.09
The Netherlands	2009	4.53	0.38	0.17
The Netherlands	2014	3.52	0.40	0.22
United Kingdom	1989	1.80	0.14	0.06
United Kingdom	1994	1.55	0.16	0.12
United Kingdom	1999	1.57	0.17	0.06
United Kingdom	2004	1.93	0.18	0.12
United Kingdom	2009	2.20	0.39	0.21
United Kingdom	2014	1.77	0.35	0.16

Table A4: Data base

```
detach( package:xtable )
```

Table A.5

```
m1 <- lm( agg_switch ~ agg_avail_median + Country , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_avail_median , . )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd < 4 / nrow( m1$model )) %>%
  lm( agg_switch ~ agg_avail_median + Country , . )

se1b <- lmtest::coeftest( m1 , vcov = sandwich::vcovHC( m1 , "HC1"))
```

Table A5: Testing hypothesis 2 – Availability as a necessary but insufficient condition of vote switching: median availability instead of mean availability

	Volatility	Residuals	w/o outliers	Robust s.e.
	(1)	(2)	(3)	(4)
agg_avail_median	0.108***	0.004***	0.117***	0.108***
	(0.021)	(0.001)	(0.018)	(0.019)
Constant	−0.083	−0.001	−0.103*	−0.083*
	(0.063)	(0.003)	(0.055)	(0.046)
Observations	70	70	65	70
Adjusted R^2	0.261	0.111	0.361	0.261

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
First-step models (models 1, 1a, and 1b) include country dummies.

Table A.6

```
m1 <- lm( agg_switch_nv ~ agg_avail_nv + Country , d )

m2 <- cbind( m1$model , res1 = m1$residuals^2 ) %>%
  lm( res1 ~ agg_avail_nv , . )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd < 4 / nrow( m1$model )) %>%
  lm( agg_switch_nv ~ agg_avail_nv + Country , . )

se1b <- lmtest::coeftest( m1 , vcov = sandwich::vcovHC( m1 , "HC1"))
```

Table A6: Testing hypothesis 2 – Availability as a necessary but insufficient condition of vote switching: availability calculated without nonvoters in the last national election

	Volatility	Residuals	w/o outliers	Robust s.e.
	(1)	(2)	(3)	(4)
agg_avail_nv	0.093***	0.003**	0.095***	0.093***
	(0.021)	(0.002)	(0.017)	(0.026)
Constant	0.082	−0.001	0.077	0.082
	(0.066)	(0.004)	(0.049)	(0.068)
Observations	70	70	60	70
Adjusted R^2	0.259	0.044	0.466	0.259

Note: Standard errors in parentheses.
*** p<0.01; ** p<0.05; * p<0.1.
First-step models (models 1, 1a, and 1b) include country dummies.

Table A.7

```
m1 <- lm( agg_switch ~ agg_avail + country , c )

m1a <- cbind( m1$model , cd = cooks.distance( m1 ) ) %>%
  filter( cd < 4 / nrow( m1$model ) | is.na( cd )) %>%
  lm( agg_switch ~ agg_avail + country , . )

m2 <- cbind( m1a$model , res1 = m1a$residuals^2 ) %>%
  lm( res1 ~ agg_avail , . )
```

Table A7: Testing hypothesis 2 – Availability as a necessary but insufficient condition of vote switching: availability and vote switching calculated based on CSES

	Switching	Switching Residuals
	(1)	(2)
agg_avail	0.091**	0.001**
	(0.042)	(0.0004)
Constant	−0.002	−0.002
	(0.131)	(0.001)
Observations	57	57
Adjusted R^2	0.740	0.055
Note:	Standard errors in parentheses.	
	*** p<0.01; ** p<0.05; * p<0.1.	
	Model 1 includes country dummies.	