Risk of electoral defeat and heterogeneous decentralisation

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# ONLINE APPENDIX

# Descriptive Statistics

The sample includes regions in Norway, Sweden, Austria, Belgium, Germany, Czech Republic, Estonia, Finland, France, Greece, Hungary, Netherlands, Slovakia, Spain and the UK. Table 1 presents descriptive statistics of the variables used in the analysis. Variables measured at regional level include regional share of taxes less subsidies, sub-national support for the party in government, percentage of votes obtained by the regional winner of the national election, proportion of votes for regional parties, lag of regional taxes (*loge*), government vote share in regional elections, stability of the regional strength of the party in national government population and unemployment. Measured at national level are risk of losing, district magnitude, electoral participation and GDP (*loge*).

Table 1: Descriptive statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Statistic | N | Mean | St. Dev. | Min | Max |
| Share of takes less subsidies | 1,417 | 0.113 | 0.113 | 0.001 | 0.611 |
| GDP | 1,417 | 2.005 | 1.166 | −1.349 | 3.493 |
| Lag of regional tax | 1,417 | 0.799 | 0.977 | 0.009 | 6.457 |
| Winner of regional election is PM | 1,417 | 0.421 | 0.494 | 0 | 1 |
| Risk of Losing 3 | 1,417 | 0.345 | 0.248 | 0.004 | 0.996 |
| Percentage of votes obtained by the winner of regional election | 1,417 | 0.390 | 0.130 | 0.162 | 1.000 |
| Vote share of regionalist parties | 1,417 | 0.591 | 3.573 | 0.001 | 49.900 |
| Regional population | 1,417 | 0.004 | 0.010 | 0.00003 | 0.068 |
| Regional unemployment | 1,417 | 0.090 | 0.059 | 0.004 | 0.532 |
| District magnitude | 1,417 | 0.109 | 0.243 | 0.010 | 1.500 |
| Turnout | 1,417 | 0.549 | 0.071 | 0.353 | 0.690 |
| Strength of support for the party of PM | 1,417 | 0.170 | 0.209 | 0.000 | 0.674 |
| Stability of government stronghold | 1,417 | 2.523 | 3.550 | 0 | 15 |

# Outcome Variable

The argument in this article is that parties in government decentralize differently in order to protect themselves against the risk of electoral defeat. When the risk of losing the national government increases, they transfer resources to their sub-national enclaves, for it to be available in case of defeat in the next national election. Accordingly, the outcome variable needs to operationalize informal government-manipulated decentralization while at the same time, differentiating between regions.

Unfortunately, there is no information available on government transfers at the level of the individual region that are directly comparable between regions. However, the OECD releases regional data on Gross Domestic Product (GDP) and Gross Value Added (GVA) at the sub-national level (regional and local). This data is collected every year using a questionnaire sent to the delegates of each country, and through access to the websites of National Statistical Offices and Eurostat. The data collection is undertaken by the Directorate of Public Governance and Territorial Development (GOV). This information is reliable as it is later used to compute national values.

Regional tax revenue can be calculated using GDP and GVA collected at the regional level.

This is because the regional GDP (R.GDP) reported is composed of the regional GVA (R.GVA), plus any taxes (RT) less subsidies (RS) [[1]](#footnote-1). Thus, if R.GVA and R.GDP are known, we can calculate for taxes less subsidies.

## RT − RS = R.GDP − R.GV A (1)

This calculation of taxes collected at the regional level is positive and significantly correlated with the national measure of fiscal decentralization published by the Comparative Political Data. Nevertheless, the absolute amount of tax revenue depends on many things other than centralized decisions to transfer resources. To tap into government manipulations and measure fiscal decentralization, it is possible to use the regional share of taxes (RT) less subsidies (RS) of the total national taxes (TT) less subsidies (TS).

The resulting variable is always positive, ranges between 0 and 1 and is very skewed. This particular distribution is common when dealing with economic time-series data and it is often analyzed after computing the logarithms. Moreover, it is useful to transform the variable so that the results of the model can be interpreted as percentage changes in regional share of national taxes less subsidies. More importantly, using the dependent variable in its original form resulted in problems of heteroskedastic residuals in the model that were solved once I transformed the variable using its natural logarithm (*loge*). Figure 1 shows the distribution of regional share of taxes less subsidies before and after the logarithmic transformation.

Thus, the dependent variable is calculated as:

(2)

**Distribution of regional share of taxes**

Frequency

0.0

0.1

0.2

0.3

0.4

0.5

0.6

0

100

200

300

400

Regional share of total taxes

**Log of regional share of taxes**

Frequency

−7

−6

−5

−4

−3

−2

−1

0

50

100

150

200

Regional share of total taxes

Figure 1: Distribution of dependent variable before and after transformation

# Explanatory variables

Information about the results of national elections and their dis-aggregation by region is obtained from Eurostat. For information on regional elections, the main source is Schakel and Jeffery (2011) and pages of statistical services in several countries. When possible, the results of regional elections were used in the analysis, but in some cases compromises had to be made to ensure the comparability of cases. On the occasions in which results of regional elections were not available, I used regional results of national elections instead:

* In Greece, the administrative units were governed by a centrally-appointed general secretary until 2011.
* In Finland, regional results of parliamentary elections were used as provinces did not have a centrally-appointed governor until 2009.
* In the case of the UK, regional election results are used in the case of Wales, Scotland and Northern Ireland, and regional results of general elections in England.
* In the case of Estonia, the smallest administrative level for which information is available (NUTS 3) does not have elected representatives. This is the same as in Hungary where administrative units do not have elected representatives (RAI score on Tervezsistatisztikai rgik, which are the NUTS 2 and L2 for EU and OCDE).

However, this does not affect results. Table **2** compares the complete model presented in the main body of the article with a model that uses regional results of national elections for all countries to classify regions as government enclaves or not. Results are consistent in both cases.

Table 2: Statistical models

Original

Nationalresultsinregionalelection

Intercept 0*.*10 0*.*11

(0 06) (0 06)

R. taxes (t-1) 0.98\*\*\* 0.99\*\*\*

(0.00) (0.00)

Risk of losing -0.04\*\* -0.04\*\*

(0*.*02) (0*.*02)

Winner of regional election is PM −0.01

(0.01)

Vote share of winner national election −0.05 −0.04

(0.03) (0.03)

Vote share of regionalist parties −0.00 −0.00

(0.00) (0.00)

R. population −0.12 −0.10

(0.32) (0.32)

R. unemployment −0.05 −0.05

(0.07) (0.07)

District magnitude 0.12 0.13∗

(0.06) (0.06)

GDP −0.95∗∗∗ −0.95∗∗∗

(0.02) (0.02)

Stability of stronghold −0.00 0.00

(0.00) (0.00)

Turnout −0.22∗ −0.23∗∗

(0.09) (0.09)

Federal 0.14∗∗ 0.15∗∗

(0.05) (0.05)

Risk of losing: Winner of regional election is PM 0.10∗∗∗

(0.02)

Regional winner of national election is PM -0.01

(0.01)

Risk of losing: Regional winner of national election is PM 0.09\*\*\*

(0.02)

AIC -231.87 -2131.71

BIC -2042.52 -2042.36

Log Likelihood 1082.94 1082.86

Num. obs 1417 1417

Num. groups: year 15 15

Num. groups: country 15 15

Variance: year (Intercept) 0.00 0.00

Variance: country (Intercept) 0.01 0.01

Variance: Residual 0.01 0.01

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

# Model validation

In the main body of the article I showed that after a leave-one-out cross-validation, the coefficient of the interaction term remains positive and significant. Additionally, it was shown that the model is consistent when the sample is trimmed to eliminate cases before 2000, indicating that the results are independent from the international trends towards decentralization that was in fashion during the 1990s.

**Cook's Distance**

2

4

6

8

10

12

14

0.0

0.5

1.0

1.5

2.0

2.5

Obs. number

Cook's distance

Norway

Spain

Slovakia

●

●

●

Figure 2: Cook’s distance to identify high leverage observations

**Significance of interaction after LOOCV**

Norway

Sweden

Austria

Belgium

Czech Republic

Estonia

Finland

France

Germany

Greece

Hungary

Netherlands

Slovakia

Spain

UK

2.5

3.0

3.5

4.0

t−statistic

Figure 3: Results are not driven by a single country

Figure 2 shows through the means of a graph, the Cook’s distance at country level. This measures the influence of all observations belonging to the same country on the model. Spain,

Norway and Slovakia are identified as the countries with the highest influence in results.

This is further investigated with a leave-one-out cross validation grouping by country. This iterative process leaves all observations that belong to each country out and re-calculates the model without them. Figure 3 shows the t-statistic of the interaction term leaving one country out at a time. Results are always positive and significant, thus, not driven by one particular country.

1. See OECD glossary of statistical terms 2003, 2008. [↑](#footnote-ref-1)