Online Appendix

This appendix provides extra information on the empirical analysis provided in the article '*Nationalization of multilevel party systems. A conceptual and empirical analysis*'. The next two sections provide details on the units of analysis and on the treatment of independents in the measurements. In the third section, I discuss the measurement of regional authority which is the main independent variable of interest. The fourth section discusses the hypotheses of the control variables and provides more details on the measurement of the control variables. The results for the control variables are discussed in the fifth section. Descriptive statistics for the variables are provided in table A1 through A3.

1. Units of analysis

From table 1 one can observe that there are more parties participating in regional than in national elections in every country except for Portugal, Japan and the USA. In the case of Japan and the USA this might be explained by the participation of a large number of independents in regional elections. Vote shares obtained by independents are excluded in the analysis. In the case of Portugal there are only regional elections in Acores and Madeira where a smaller number of parties participate compared to national elections which are also held in the mainland regions.

Another observation in table 1 is that the numbers of regional elections by far exceed the number of national elections. However, horizontal simultaneity is abundant which means that regional elections often occur on the same day. This is the case for regional elections in Denmark, France, Greece, Italy (ordinary regions), Japan, the Netherlands, Norway, Portugal, Spain (non-historic communities), Sweden, the United Kingdom (Scotland and Wales), and the United States. In most of the countries there are more national elections than regional election 'occasions' for the same time period. Therefore the number of cases is lower when regional elections are analyzed.

Regions in Australia, Austria, Canada, Germany, Italy (5 special statute regions), Spain (4 historic communities), and Switzerland hold elections on dates of their own choosing and the regional elections are grouped around the national election closest in time to obtain nationalization scores for regional election vote shares.

In case when national elections are compared with regional elections (i.e. the difference measures) the scores for national elections are matched to the scores obtained for the regional election held closest in time. In some countries we are confronted with regional election asymmetry, i.e. some regions hold elections whereas others do not. The countries and regions involved are: Italy (ordinary regions before 1968), Portugal (mainland regions 1975-2009), Spain (non-historic communities in 1979), and the United Kingdom (English regions 1999-2005). In these cases regional vote shares are obtained by imputing national election vote shares. Robustness analyses indicate that the results do not differ significantly when the imputed vote shares are excluded.

2. Treatment of independents

Nationalization studies differ in the way they treat vote shares obtained by independents. Bochsler (2010) includes independents by treating them as one party. Chhibber and Kollman (2004) treat every individual as a separate party. Caramani (2004) excludes independents. This article excludes independents because most of the arguments linking regional authority to *distributional* and *dynamic* nationalization concern the incentives decentralization produces for parties and not for independents. Independents may also be excluded with respect to *party-linkage* nationalization because the argument is that decentralization should produce incentives for politicians to join regional instead of national party labels but the option for an independent list is not considered. The results presented in this article remain robust when the vote shares for independents (treated as individual parties) are included.

3. Regional authority

This article uses the Regional Authority Index (RAI) to measure regional authority. The RAI varies from 0 to 24 points and is composed of the sum of self rule (0 to 15 points) and shared rule (0 to 9 points). Self rule and shared rule are operationalized according to the following eight dimensions.

Self rule is the sum of the following four dimensions:
- Institutional depth: the extent to which a regional government is autonomous rather than deconcentrated (0-3);
- Policy scope: the range of policies for which a regional government is responsible (0-4);
- Fiscal autonomy: the extent to which a regional government can independently tax its population (0-4);
- Representation: the extent to which a region is endowed with an independent legislature and executive (0-4).

Shared rule is the sum of the following four dimensions:
- Law making: the extent to which regional representatives co-determine national legislation (0-2);
- Executive control: the extent to which a regional government co-determines national policy in intergovernmental meetings (0-2);
- Fiscal control: the extent to which regional representatives co-determine the distribution of national tax revenues;
- Constitutional reform: the extent to which regional representatives co-determine constitutional change (0-3).

4. Control variables

Nationalization might be explained as a consequence of the territorial structure of social or socio-economic divisions. Caramani (2004: 15) relates low levels of nationalization to territorial divisions arising from centre-periphery and urban-rural cleavages. Territorial heterogeneity is captured by three variables. In the analysis of nationalization scores for parties and party systems, which vary at the country level, a fragmentation index is introduced. Ethnolinguistic fragmentation is operationalized as the probability that two randomly selected individuals belong to a different ethnolinguistic group (Alesina et al. 2003).

Two region specific indices are included in the models which analyze dissimilarity scores. Regions with a distinct history and/or language are measured by a regional language and history index (Fitjar 2010). The language index is made up of the following items, with one point awarded for each item: there is an indigenous regional language that is different from the dominant (plurality) language in the state; the regional language is spoken by at least half the region's population; the language is not the dominant language of any state.

The history index captures the extent to which the region itself or other states than the current sovereign have governed the territory. The index is made up of the following three criteria, with one point awarded for each: the region has not been part of the current state since its formation; the region was not part of the current state for the entire twentieth century; the region has been an independent state. Data for regions within Europe are taken from Fitjar (2010) and is extended to Australia, Canada, Japan, Switzerland, and the United States (Schakel 2011).

There are two electoral institutions which may affect nationalization scores. The first is the electoral system. The second is derived from second-order election theory and concerns electoral cycles. The electoral system may have two different effects. On the one hand, coordination between party candidates is more difficult in single member district systems than in proportional member systems because the former tend to have many more districts than the latter (Morgenstern et al. 2009: 1327-1328). On the other hand, majoritarian and plurality electoral systems tend to produce small party systems but with large parties, and larger parties tend to have a more homogeneous territorial distribution of the vote (Caramani 2004). Hence, the literature is divided on the specific effects of electoral systems on nationalization but authors agree that the type of electoral system should matter. An electoral system variable is introduced whereby majoritarian/plurality systems score 0, proportional systems 1, and mixed systems 0.5. In case of the party system and party models, which require that regional scores are aggregated, the score for the regional electoral system which is most frequent is used. When regional elections are compared with national elections a difference variable is employed which is constructed by subtracting the regional electoral system score from the national electoral system score.

The extent to which regional elections can be considered second-order depends on the timing of the regional election vis-à-vis the national (vertical simultaneity) and other regional elections (horizontal simultaneity). Dissimilarity between national and regional elections tends to decrease under horizontal and vertical simultaneity (Hough & Jeffery 2006; Schakel 2011). Vertical simultaneity is measured by including the number of days between a regional and national election (divided by 100). Horizontal simultaneity is

obtained by the number of regions which hold their elections simultaneously divided by the total number of regions in the country. In case of the party and party system models these variables are measured by a dummy variable which scores one when a majority of the regions hold their elections simultaneously with the national, respectively with other regional elections.

Presidentialism is often associated with smaller party systems whereby vote shares are aggregated in a small number of parties, which may subsequently lead to smaller differences between regional and national vote shares. Presidentialism reduce the effective number of parties because presidential systems encourage the formation of national alliances between parties in order to obtain control over the presidential office which is generally awarded in a single national district (Harbers 2010). The models include a dummy variable to account for the presidential office in France (since 1958) and the United States.

Finally, in most countries, large regions elect more representatives in parliaments than small regions and exhibit less dissimilarity as a result (Schakel 2011). Therefore, the region nationalization models include a size variable which is operationalized as the number of regional valid votes relative to the total, statewide number of valid votes. Similarly, large parties tend to have a more homogeneous territorial distribution of the vote than small parties (Caramani 2004). Therefore, the party nationalization models include party vote shares (aggregated) at the statewide level.

5. Results for the control variables

The results for the control variables with respect to party systems nationalization scores (see table 3) are in line with the hypotheses. Territorial cleavages and proportional electoral systems lead to denationalization and presidentialism leads to nationalization, but electoral cycles do not seem to matter much.

A 0.1 increase in the probability that two randomly selected persons from a country belong to a different ethnolinguistic group leads to a –0.03 decline in the PNSSw-scores for regional elections and about a 0.001 increase in the difference between national and regional elections. Turning to the DISw-scores, which measure *dynamic* and *distributional* nationalization for regions, we observe that ethnolinguistic fragmentation affects distributional nationalization scores for national and regional elections. A 0.1 increase in the probability that two randomly selected persons from a country belong to a different ethnolinguistic group leads to a 1.5% to 2.8% increase in dissimilarity between regions.

Presidential systems seem to have a larger impact on parties than on regions. Presidentialism is associated with nationalization. Nationalization scores are about 0.13 and 0.28 higher in national and regional elections and the difference between regional and national elections is about 0.06 lower in presidential systems. Turning to the regions scores, we observe that dissimilarity is between 7% and 13% lower for regional elections held in countries with a strong presidential office.

Proportional systems lead to denationalization as evidenced by the lower PNSSw-scores for national elections and the smaller differences between PNSSw-scores for regional and national elections. In countries with a proportional electoral system PNSS-

scores are about 0.06 lower and the difference between PNSSw-scores in regional and national elections is about 0.14 smaller.

Vertical and horizontal simultaneity does not seem to matter for party system nationalization except for the difference between national and regional elections for the PNSSw-scores which decline by 0.04 per hundred days between the regional and national election.

An analysis on the control variables is also provided in table 4 which presents results on nationalization scores for parties and regions. Denationalized parties can be found in countries with territorial cleavages, large parties are relatively more nationalized and parties tend to obtain similar vote shares in regional and national elections when these elections are held simultaneously. The effect of territorial cleavages is relatively strong, for every 0.1 increase in the probability that two randomly drawn persons belong to a different ethnolinguistic group, party nationalization declines by –0.07 for national elections and –0.06 for regional elections. The effect of vertical simultaneity is small, the difference in PNSS party scores between regional and national elections declines with –0.03 for every 100 days between the regional and national election. The party size variable is very weak, a 10% increase in size leads to a 0.08-0.17 increase in party nationalization score. The control variables presidentialism, electoral system and horizontal simultaneity do not seem to have an influence on party nationalization.

Turning to the results for regions we observe that territorial heterogeneity is associated with denationalization. A one point increase on the regional history or language index leads to a 1.4% to 1.9% increase in dissimilarity score in national and regional elections. A comparison between the results of table 3 and 4 shows that the variable electoral system significantly affects party system nationalization based on party scores and nationalization of regions. This result might point towards a differentiated effect of the type of electoral system on different units of analysis. Dissimilarity between regional vote shares for national elections declines with 5% in countries with a proportional electoral system. Dissimilarity declines with 7.4% when a majoritarian system is used at the national level and a more proportional system is used at the regional level (e.g. Scotland and Wales in the UK). An explanation for this result might be that the smaller national party system spills over into the regional electoral arena. In other words, the party supply offered via national elections supersedes party demands by voters in the regional electoral arena. *Vice versa*, dissimilarity increases with 7.4% when proportional system is used at the national level but a majoritarian system at the regional level (e.g. some Swiss cantons).

Vertical non-simultaneity has an impact on *dynamic* nationalization or *party system integration*: the difference between regional and national vote shares increases with 0.26% per 100 days difference between the dates of regional and national elections. Horizontal simultaneity seems to significantly affect *distributional* nationalization. Dissimilarity scores between regions decline with 6.8% when regional elections are held at the same date. Finally, the size of the region also matters significantly and an increase of 0.1 (10%) in relative size leads to a decline of about 3% in the dissimilarity score in national and regional elections and about 1.8% decline in the vote share difference between regional and national elections.

The claim of this article that nationalization measures should be sensitive to the dimension of nationalization of interest to the researcher is further illustrated by the results for electoral systems and territorial cleavages. A comparison between the results

of table 3 (models 7 and 9) and 4 (models 4 and 6) shows teaches that the variable electoral system significantly affects party system nationalization based on party scores and nationalization of regions. This result might point towards a differentiated effect of the type of electoral system on different units of analysis. The results for the models applied to nationalization scores based on regional or national vote shares show that parties and regions (models 1, 2, 4, and 5 in table 4) denationalize in response to territorial cleavages. The models analyzing differences between regional and national election vote shares (models 3 and 6 in table 4), however, show no significant effect on nationalization scores for regions and parties. This seems to suggest that territorial cleavages induce regional voters to express their heterogeneous policy preferences in both regional and national elections.

Table A1. Descriptive statistics for the *party system* nationalization dataset

	Average	St. dev.	Min	Max
PNSSw national elections	0.779	0.112	0.194	0.925
PNSSw regional elections	0.710	0.148	0.151	0.929
PNSSw difference elections	0.069	0.088	–0.090	0.444
DISw national elections	13.266	7.158	5.010	42.080
DISw regional elections	17.444	9.962	4.230	44.390
DISw difference elections	17.922	8.384	3.970	44.070
Regional authority	13.967	6.088	0.324	21.000
Ethnolinguistic fragmentation	0.270	0.241	0.010	0.770
Presidential system	0.100	0.298	0.000	1.000
Electoral system national elections	0.596	0.458	0.000	1.000
Electoral system regional elections	0.609	0.461	0.000	1.000
Electoral system difference elections	0.012	0.143	–0.500	1.000
Vertical simultaneity	0.230	0.425	0.000	1.000
Horizontal simultaneity	0.600	0.492	0.000	1.000

Note: N = 244.

Table A2. Descriptive statistics for the *party* nationalization dataset

	Average	St. dev.	Min	Max
PNSS national elections	0.618	0.315	0.000	0.976
PNSS regional elections	0.602	0.304	0.000	0.974
PNSS difference elections	0.059	0.123	–0.407	0.755
Regional authority	11.561	6.913	0.000	21.000
Ethnolinguistic fragmentation	0.273	0.226	0.010	0.770
Presidential system	0.109	0.311	0.000	1.000
Electoral system national elections	0.632	0.450	0.000	1.000
Electoral system regional elections	0.644	0.455	0.000	1.000
Electoral system difference elections	0.015	0.155	–0.500	1.000
Vertical simultaneity	0.231	0.421	0.000	1.000
Horizontal simultaneity	0.668	0.471	0.000	1.000
Party size national elections	15.154	15.091	0.001	58.078
Party size regional elections	16.751	15.391	0.010	58.741

Note: N = 2247 (listwise deletion per variable).

Table A3. Descriptive statistics for the *region* nationalization dataset

	Average	St. dev.	Min	Max
DIS national elections	14.732	12.188	0.477	87.175
DIS regional elections	16.962	12.653	0.270	93.630
DIS difference elections	18.029	11.942	0.569	76.648
Regional authority	14.198	5.096	0.000	21.000
Regional history index	0.312	0.616	0.000	3.000
Regional language index	0.195	0.613	0.000	3.000
Presidential system	0.229	0.420	0.000	1.000
Electoral system national elections	0.487	0.453	0.000	1.000
Electoral system regional elections	0.690	1.413	0.000	1.000
Electoral system difference elections	–0.154	0.354	–1.000	1.000
Vertical simultaneity (100 days)	4.900	2.868	0.000	15.890
Horizontal simultaneity	0.674	0.432	0.000	1.000
Region size national elections	0.050	0.064	0.000	0.566
Region size regional elections	0.050	0.065	0.000	0.623

Note: N = 4441 (listwise deletion per variable).