Electoral volatility in Europe: Assessments and potential explanations for estimate differences

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Abstract:

The problem addressed in this paper is how to measure and calculate accurate aggregate electoral volatility scores. This paper relies on two kinds of data sets to make comparisons of different estimates possible; a first one is a collection of electoral data for 31 European countries covering elections from after WWII up till the June 2012 elections in Greece and France, and a second one collects estimates of aggregate electoral volatility as presented in the research literature. For the electoral data the ambition has been to collect data for as many parties participating at elections as possible, and based on this data set scores for aggregate electoral volatility has been estimated for 395 elections. Besides mapping the variation in volatility in space and over time comparisons of different estimates of volatility has been conducted in order to gain an understanding of why estimates tend to differ for certain countries and elections. The findings reported in this paper suggest that disaggregating the group of “other parties” only have a limited impact on volatility estimates; the treatment of “independents” matters more for the estimates for party systems where they are numerous; the Pedersen index is still useful as a measure of aggregate electoral volatility, although other measures like the lsq-index or the 1-cos-index may contribute with complementary information; distinguishing between type A and type B volatility enriches the analysis of electoral volatility, but it is not a solution for achieving more reliable estimates of volatility; what is obvious from this paper is that the treatment of party splits and party mergers and the defining of genuinely new parties are crucial for achieving more reliable volatility estimates. To arrive at better volatility estimates it is necessary to reach agreement about the analytical framework meaning how to define what is meant with genuinely new parties and how to treat party splits and party mergers; to do so there is also a need to consult country expertise and examine a number of critical cases where an analytical framework may be tested and further refined.
“The occurrence of such events [splits and mergers] makes it very difficult to compare electoral volatility over time in at least some of the European nations, most notably France and Italy.” (Pedersen 1979: 5)

“Measuring volatility by means of a single index, such as the Pedersen index, appears to have hardly any meaning.” (Grunberger 1985: 204)

“… comparing Total Volatility in post-communist countries to Total Volatility in established democracies is essentially comparing apples to oranges.” (Powell & Tucker 2012: 27)

1. Introduction

The “earthquake election” of 1973 in Denmark was probably an impetus for Mogens Pedersen to write his paper for the 1978 ISA World Congress in Uppsala, which was published in the European Journal of Political Research 1979 and later republished as a book chapter in 1983. One can say that the article from 1979 was the starting point for the research about electoral volatility in Western Europe to be followed by other areas later on. His conceptualization of volatility as Aggregate Volatility (Vt; Pedersen 1980: 399) has become known as the Pedersen index (Taagepera & Grofman 2003: 662).

Yet, the word volatility and its conceptualization was not unknown to Nordic political scientists in the mid-1970s. When Erik Damgaard (1974: 21) prior to the 1973 election analysed the stability of the Danish party system he characterized the party system of the 1960’s as featuring “increasing mobility and volatility”. In their analysis of the 1973 Norwegian election did Henry Valen and Stein Rokkan (1974: 217) note “increasing volatility within national electorates” in Scandinavia. Commenting on the simultaneous election in Sweden Olof Pettersson (1974: 225) concluded: “Compared with the recent turbulences of the Danish and Norwegian party systems, there were remarkably small changes in the 1973 Swedish election”. In his analysis of the 1976 election he added about the Swedish case: “Aggregate stability is combined with a large and increasing individual volatility” (Pettersson 1978: 113). It is also interesting to note that Carsten Jarlov and Ole P. Kristensen (1978: 62) in a previous issue of Scandinavian Political Studies constructed a measure of aggregate electoral mobility which equalled what Pedersen called Total Net Change (TNCt), but instead of volatility they talked about “electoral fluidity”. It may also be something to note, that according to Damgaard (1974: 108), Mogens Pedersen in his earlier research on legislative recruitment in Denmark had employed the concept volatility then measuring “the extent of change in the personal composition of the elite over time”. It was thus primarily in a Danish/Scandinavian context where Pedersen’s theorizing and conceptualization of electoral volatility took place, something that may be worth to remember.

1 Geographically the first studies of electoral volatility dealt with Western Europe, but the areas covered were extended to Latin America (Coppedge 1998, Roberts and Wibbels, 1999) as well as Central and Eastern Europe (Birch 2001, 2003; Sikk 2001, 2006; Tavits 2005, 2008a) and recently the focus is all-European (Dassonneville & Hooghe 2011); among recent contributions one may cite: Shair-Rosenfield (2008), Mainwaring et al. (2010), Epperly (2011), Bischoff (2012), Gherghina (2012), Jones (2012), Robbins & Hunter (2012).

2 This index was named an “index of dissimilarity” by Duncan & Duncan (1955) and an “index of distortion” by Loosemore & Hanby (1971) (Taagepera & Grofman 2003: 662).
Pedersen’s focus was on electoral volatility measuring changes in party votes at the aggregate level; the key concept employed in 1979 (p. 4) “volatility” was in 1980 (p. 399) and 1983 (p. 33) extended to “aggregate volatility” thus implicitly opening up for measurement of volatility at the individual level (1980: 402). Crewe in 1985 (p. 8) added the analysis of seats to the analysis of votes and he also introduced the distinction between net (aggregate level) volatility and gross (individual level) volatility. A further step was taken by Bartolini & Mair (1990: 22-23) when they broke down total (aggregate) volatility into block volatility and within-block volatility. The problems associated with mergers and splits among parties have been addressed in various ways; Birch (2003: 122-23; see also Janda & Kwak 2009:10) introduced the concept party replacement which implied the exclusion of parties that did not contest two consecutive elections; Mainwaring & Zocco (2007:123) established a few calculating rules to accommodate for changes due to mergers and party splits; recently Powell & Tucker (2012: 6-12) have distinguished between Type A (A new party) volatility between nonstable parties and Type B (Between existing parties) volatility between stable parties3.

The aim of this paper is mainly empirical with a focus on measuring and calculating aggregate electoral volatility among 31 European countries4 covering the period from after the Second World War up till today. To be somewhat more precise the aims are5:
- to collect electoral data and compute new own estimates; the ambition is, for most elections, to reduce the number of votes for other parties; make an effort to trace splits and mergers of parties between the elections among the party systems; employ different measurement formulas to capture aggregate electoral volatility;
- to map the variation in aggregate electoral volatility over time and in space based on the new own estimates;
- to retrieve existing volatility scores/estimates for a reasonable number of elections reported in the research literature;
- to detect deviating estimates in order to locate a number of critical elections to draw lessons from;
- to draw conclusions from these enquiries with regard to how to improve the precision and validity in measuring volatility scores.

2. Measuring aggregate volatility

In this section I will first present the aggregate volatility measures that I will employ; I will then further discuss some of the rules I will apply for estimating these measures; the third step involves discussing data employed, while the final step of this section will be a brief presentation of the data sets constructed.

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3 Type A volatility comes close to what Rose & Munro label demand volatility and type B volatility is similar to what they name supply volatility (Rose & Munro 2009: 52; 2003: 77-86; see also Stískala 2012).
4 27 current EU-member countries plus Croatia, Iceland, Norway and Switzerland.
5 Among issues not dealt with in this paper I may name volatility in votes vs. seats and net volatility vs. gross volatility. Neither will I contribute to an analysis of the causes behind the variation in volatility; before that there is a need to establish reliable and valid scores of aggregate volatility in Europe.
a) Aggregate volatility measures

The focus of this paper is on the Pedersen index as presented in his article from 1980 (p. 399);
(1) Total Aggregate Volatility ($v$) =

$$\text{Total Net Change (TNC}_t\text{)} = \sum_{i=1}^{n} |\Delta p_{i,t}|;$$

$$0 \leq \text{TNC}_t \leq 200$$

$$\text{Aggregate Volatility (V}_t\text{)} = \frac{1}{2} \cdot \text{TNC}_t;$$

$$0 \leq \text{V}_t \leq 100$$

Two alternative measures have been suggested by Koppel & Diskin (2009: 282 & 284) here labelled the lsq-index (or the Gallagher index) and 1-cosines index:

(2) Isq index = 

$$G(x, y) = \left( \frac{1}{2} \times \sum (x_i - y_i)^2 \right)^{1/2}$$

(3) 1- cosines index (=1 – cos) =

$$\cos(x, y) = (\sum (x_i \times y_i))/((\sum x_i^2 \times \sum y_i^2)^{1/2})$$

To construct the type A and the type B volatility indexes Powell & Tucker (2012: 10) by convention employ a 2%-threshold; “we defined all parties that received at least 2% of the vote share in either the first or the second election to ‘count’ as a party. All other parties were considered not to have been part of the party system …”. To compute these measures all parties receiving less than 2% of the votes are deleted. Type A volatility captures volatility from parties entering or exiting the party system:

(4) Type A volatility index (Powell & Tucker 2012: 6) =

$$\text{Type A Volatility} = \frac{\left| \sum_{i=1}^{n} p_{ot} + \sum_{i=1}^{n} p_{o(t+1)} \right|}{2}$$

Type B volatility captures volatility among stable parties which are contesting both elections:

(5) Type B volatility index (Powell & Tucker 2012: 7) =

$$\text{Type B Volatility} = \frac{\sum_{i=1}^{n} |p_{i2} - p_{i(t+1)}|}{2}, \text{ among all stable parties.}$$

To be able to compute these indexes decisions has to be taken about mergers and splits among the parties in the party system, which will be discussed in the next section. Suffice here to say that when computing these two indexes (type A and type B) I will follow the procedures employed for computing the total aggregate volatility index ($v$).

b) Estimating aggregate electoral volatility: rules applied

For a pair of elections there may be changes among the parties participating at these two elections. First, in the literature there are suggestions as how to classify the participating

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6 The formulas listed below are copied from the articles/papers discussed in this section; later on in section 2.d)(iii)-2.d)(vii) I make an effort to explain in words how the formulas have been applied.
parties. Bartolini & Mair (1990:311) basically distinguishes between three types of new parties, namely mergers, splits and truly new parties; Mair (1999: 216-17) makes a similar distinction calling mergers for marriage, splits for divorce and “new” new parties for birth, i.e. parties that “cannot be adequately regarded as having derived from either a merger among, or a split from, pre-existing parties.” Hug (2001: 13) maintains these distinctions and adds the category electoral alliances; to him genuinely new parties are those “which emerge without the help from members of existing parties.” Sikk (2006: 57) also stick to these distinctions but focussing on the genuinely new parties he defines them as parties that are “not successors of any previous parliamentary parties, have a novel name as well as structure, and do not have any important figures from past democratic politics among its major members.” Krouwel & Lucardie (2008: 279) introduces a category “transformations” but otherwise keep with the distinctions introduced by Bartolini & Mair. A more narrow and precise definition of a new party, here I take it to refer to what is called genuinely new parties, is formulated by Barnea & Rahat (2010: 311) to be a “party that has a new label and that no more than half of its top candidates (top of candidate list or safe districts) originate from a single former party.”

Second, these distinctions are relevant when calculating the volatility scores, and in particular this is so for the parties classified as mergers or splinter parties. Sikk (2005:393) identifies three approaches for dealing with these categories of parties, namely: a) for a pair of elections combined votes are calculated for split or merged parties; b) for the split or merged parties a larger and a smaller party is identified, and the smaller party is classified as the new party; c) for the split or merged parties no predecessors are recognized, meaning that they will be classified as new parties. I agree with Sikk that the first option a) is the least troublesome one, and I will try to follow that approach when calculating the volatility scores. Third, choosing this approach makes it extremely important to distinguish the genuinely new parties from the split or merged parties. The definitions of Hug, Sikk and Barnea and Rahat gives some advice for handling the complicated cases faced when calculating the volatility scores.

Based on the deliberations discussed in the research literature there are some rules, or criteria, that may be applied and which may facilitate the process of calculating the volatility scores; the criteria I will follow are briefly commented upon here:

i. Continuous parties:
These are parties which are stable over at least one pair of elections, but often over a number of pairs of elections. They are recognised as continuous parties in the literature, but in most cases also in the election data; when a party has changed name but they still display an obvious continuity with a previous party, they are counted as continuous parties (Mainwaring & Zoco 2007: 173). Typical examples would be the Nordic Social Democratic Parties, but only the Swedish SAP remains stable in a strict sense over the period studied. The scores for these parties are generally easy to compute.

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7 This means that I have made no effort to cover changes in turnout which may be captured through the use of survey data.
8 Tavits (2008a: 122) closely follows the classification of Hug; Mustillo (2009: 317-18), however, differ somewhat when applying the discussion of new parties to Latin America identifying five categories of new parties.
9 Combined votes means that the comparison between the two elections refers to the vote for the parties in question at election t0 and the same set of parties at election t1.
10 Birch (2003: Appendix C pp. 185-186) discusses criteria for differentiating various types of parties although not specifically addressing what constitutes a genuinely new party.
11 This means that neither “Nya Partiet” in 1979 nor “Junilistan” in 2006 are considered as splinter parties.
ii. Alliances:
For a particular election two or more parties may agree upon forming an electoral alliance; such an alliance is recognised in the literature as well as noted in the election data. Examples of such alliances are to be found in Finland (Kesk and Liberals 1983), Sweden (CP and KDS in 1985) and the Czech Republic (Koalice 2002). The scores are based on comparisons of the combined vote of the alliance partners at the election preceding the alliance (election t0) and the elections following the end of a temporary alliance (election t+2) with the election when the alliance is formed (election t+1).

iii. Mergers:
New parties are formed when two or more parties merge; these mergers are recognised in the literature. Typical examples of mergers are to be found in the Netherlands (CDA formed by KVP, ARP and CHU in 1977), Denmark (EL formed by DKP and VS in 1991) and the United Kingdom (the Alliance, later Liberal Democrats formed by SDP and Liberals in 1983). The scores are based on comparisons of the vote for the new party (at election t+1) with the combined vote for the “merging parties in the election immediately preceding the merger” (election t0) (Bartolini & Mair 1990: 311).

iv. Splits:
New parties are formed when a party splits into two or more parties; these splits are recognised in the literature. Examples of splits are quite numerous also in the Nordic countries as in Denmark (DKP split into DKP and SF in 1959), Norway (DNA split into DNA and SF in 1960), Finland (PS split into PS and TPSL in 1959) but also in Austria (FPÖ split into FPÖ and LF 1993, and later FPÖ into FPÖ and BZÖ 2003). The scores are based on comparisons of the combined vote of the new parties (at election t+1) with that “of the original party in the election immediately preceding the split” (election t0) (Bartolini & Mair 1990: 311).

v. Genuinely new parties:
Genuinely new parties are parties formed which are not merged or split up ones; these new parties are often recognised in the literature. Genuinely new parties are in particular to be found among party families like the green parties or populist parties of various shades. Examples of such genuinely new parties may be localised to Sweden (KDS in 1964, MP in 1981, ND in 1990 and SD in 1986; see Bolin 2012a), Austria (Greens in 1983), Germany (Greens in 1983), Estonia (RP in 2003) and Bulgaria (NSDV in 2001) (Hug 2001b, Sikk 2005b, Tavits 2008b). The score for a genuinely new party is computed from scratch meaning that the volatility score will be based on the election figure received at the first election when it participated (at election t0) to be compared with the preceding election (election t+1) where it did not take part. It is no doubt that a major problem when computing the volatility scores is to distinguish new parties formed as splits and mergers (where combined votes is applied) from the genuinely new parties (where no combined votes is applied). A few critical cases will be discussed later in the paper – section 4.c).

vi. Death of parties:
Parties for which there are no further electoral results, unless they have not merged with other parties or entered an electoral coalition, are considered dead parties, which have exited the party system. The score for the dead party is calculated by comparing the result for the latest election (election t0) where it participated with the following election (election t+n+1) where it did not participate.
c) Data employed
There are two sets of data employed in this paper. First, we have the electoral data which forms the basis for the computation of the scores measuring alternative operationalisations of total (net) aggregate electoral volatility (see section 2.a) above). Second, we have a set of estimates of aggregate volatility for European countries reported in the research literature; a reasonable number of estimates have been collected for the 31 European countries to make it possible to identify critical cases where the classification of parties and the calculation of volatility scores diverge.

i. Electoral data
One need not go that many years back to recognise that electoral data for comparative research was not easily available (cf. Lijphart 2005). The first edition of Mackie & Rose (1974) covering the Western world simplified this task, and it was made easier by later editions (3rd edition from 1991) and an update (from 1997); Central and Eastern Europe is covered first by Rose, Munro & Mackie (1998), and then by Rose & Munro in a first (2003) and a second edition (2009). These data handbooks have been complemented by Nohlen & Stöver (2010) as well as the yearly reporting of the Political Data Yearbook published by the European Journal of Political Research.

These published sources may be complemented by a number of websites containing information about electoral data with a comparative scope. The ones I have benefited from are Bochsler, CIAS, Popescu & Hannavy and Nordsieck. In some instances Wikipedia, the English as well as the national ones, may contain useful complementary information.

The main sources used are, however, the websites maintained by the national electoral authorities. In some cases the data is complete and easily accessed (Austria, Germany, Spain, Portugal, Czech Republic, Slovakia, Slovenia and Estonia, to cite some examples), whereas in other cases only a brief period may be covered from these websites (Denmark, United Kingdom, France, Ireland and Luxembourg).

All in all, a quite detailed data set has been assembled where the number of anonymous other parties have been minimised; the data sources employed are listed in Appendix A.

ii. Aggregate volatility estimates in the research literature
Beginning with Crewe & Denver (1985) and followed by Bartolini & Mair (1990) a number of estimates of total aggregate volatility scores for specific elections in various countries have been presented in the research literature, or published online on the Internet. Through different searches I have been able to retrieve volatility scores for 390 elections for the 31 countries covered in this paper; on an average some seven studies have been utilised for each country. Some countries, however, like the Czech republic, Slovakia, Poland and Hungary are covered more intensely, whereas countries like Croatia, Cyprus and Malta more seldom are studied with respect to electoral volatility. In Appendix B the studies made use of are listed.

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12 These and other websites have been accessed over the period from November 2011 to July 2012; a final check of the addresses has been conducted by mid August 2012.
d) Data sets constructed\textsuperscript{13}

To arrive at the different measures of volatility scores employed in this paper a number of data sets have been constructed. Below I will briefly deal with these data sets covering thirty-one European countries:

(i) – election: Election wise from the first to the latest election, for each election, data on valid votes received (sorted from highest to lowest figures) as well as in percent for each party has been assembled; in addition, when completed, information about Mackie & Rose-code or Rose & Munro-code, abbreviation for the party and party name are listed. To make sure of the accuracy of the data, summaries of valid votes and votes in percent (summarizing to 100,00) are added. There are thus eight columns and the number of rows equal number of parties participating at an election (from a low number of 76 in Cyprus to the highest number of 816 in Spain).

(ii) – data: The data from the previous data set (i) is now sorted by party following relevant codes and alphabetic orders; thus each party is located on a row, and on the columns votes received in percent are reported; and for each column is asserted that it summarizes to 100,00. The ambition has been to reduce the number of votes for “other parties” as far as possible. The number of parties listed varies from a low 30 in Denmark to a high 453 in Spain.

(iii) - volatility: The data from data set (ii) is now organised so that it is possible to establish pairs of elections from the first to the latest election, i.e. for the first election a column (designated _fw which stands for forward) is added to match the following election, and for the latest election another column (designated _bw which stands for backward) is added to match the preceding election. Thus for each election for which a volatility score is to be estimated there are two columns to be compared for each party, one _fw and one _bw. These are the columns which are modified to adjust to what is demanded from the occurrences of splits or mergers or the rise of genuinely new parties as well as the death of old parties. As far as possible the necessary computations in these columns are indicated with different colours, and the formulas used may be noted from the excel document (when completed the formulas for the computations will be listed in a separate document). The volatility score, i.e. the Pedersen index, is then arrived at through the following computation: for each pair of columns for the relevant elections (_fw and _bw) the absolute sum is computed and then summarised for all parties, and this sum is then divided by 2. It is this data set that forms the basis for the other volatility measures computed.

(iv) – lsq-measure: Based on the previous data set (iii) the lsq-measure is arrived at through the application of another computational formula; first for each pair of columns for the relevant elections (_fw and _bw) the squared sum is computed and then summarised; the lsq-score is then arrived at by taking the square root from the previous sum divided by 2.

(v) – 1-cos-measure: Based again on the volatility data set (iii) this measure is arrived at through the application of yet another computational formula; for each pair of columns for the relevant elections (_fw and _bw) three sums are computed; first, the product of the pairs are summarised (=sum 1); second, the square root of column fw is computed and then summarised (=sum 2); third, the square root of column bw is computed and then summarised (=sum 3); finally, the score is arrived at using this formula: 1 – (sum 1 / sq rt (sum 2 * sum3)).

\textsuperscript{13} Since this paper is a "work in progress" no data has as yet been posted on the Internet, but anyone interested in receiving the data sets, as they stand, may contact me on my e-mail: svante.ersson@pol.umu.se; I expect to be available on this address till around 2013-06-30.
(vi) - type-A volatility: Following Powell & Tucker (2012) the data set (iii) once again form the basis for the calculation; for each pair of columns for the relevant elections (_fw and _bw) figures lower than 2 are deleted as well as every stable pair with figures of 2 or higher; what remains are pairs where for one of the elections the figure is lower than 2, and for the other election the figure is higher than 2. The figures remaining in the data set forms the basis for calculating type-A volatility in the same way as applied for the Pedersen index (see iii above).

(vii) – type-B volatility: Again following Powell & Tucker (2012) the data set (iii) is once again used as the basis for the calculation; for each pair of columns for the relevant elections (_fw and _bw) figures lower than 2 are deleted as well as pairs where for one of the elections the figure is lower than 2, and for the other election the figure is higher than 2; what remains are every stable pair with figures of 2 or higher. The figures remaining in the data set forms the basis for calculating type-B volatility in the same way as applied for the Pedersen index (see iii above).

(viii) – aggregate volatility estimates reported in the research literature: for each election where volatility estimates are reported in the literature it is possible – in addition to number of studies used (=N) - to compute the following statistical measures: median, mean, standard deviation and coefficient of variability (=cv; computed as standard deviation/mean).

These are thus the data sets to be employed for mapping volatility in space and over time as well as mapping variation in volatility estimates among 31 European countries.

3. Mapping variation in aggregate volatility in space and over time

Based on the data sets presented above the focus in this section is to map the variation in volatility among the European countries in space and over time. But let us first look at how the different measures and the different operationalizations of volatility are related to each other.14

a) Volatility measures: v, lsq and 1-cos

In addition to the commonly employed Pedersen index (v) measuring total aggregate volatility a few alternative measures has been suggested in the literature. Two alternative measures are tested here, namely the least square measure (lsq) and the cosine measure (1-cos). It is obvious that all three of them tend to go together which is indicated by correlations close to .90, and these relations are valid in the set of countries making up Western Europe as well as Central and Eastern Europe – see Table 1 below.

14 An effort has been made to reduce the size of support for “other parties” through the listing of as many parties as possible available in election data. So far I have only conducted a preliminary analysis where I have separated parties that have been classified as “other parties” to find out what impact they may have on the volatility scores. On an average volatility scores for this group of parties summarises to 1.7 which is slightly more than 10% of the total aggregate volatility scores estimated. For some countries like Spain, Czech Republic, Romania and Slovakia this amounts to a certain impact, whereas for other countries like Sweden, Norway and Finland the impact is negligible.
Table 1: Correlation between $v$, $lsq$ and 1-cos by all and WE and CEE

<table>
<thead>
<tr>
<th></th>
<th>All (n=395)</th>
<th>WE (n=334)</th>
<th>CEE (n=61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$lsq$</td>
<td>$r=,960$</td>
<td>$r=,893$</td>
<td>$r=,956$</td>
</tr>
<tr>
<td>$1-cos$</td>
<td>$r=,872$</td>
<td></td>
<td>$r=,872$</td>
</tr>
<tr>
<td>$v$</td>
<td>$r=,919$</td>
<td></td>
<td>$r=,908$</td>
</tr>
</tbody>
</table>

Generally the scores display higher values for $v$ than for $lsq$, and this is also true when comparing $v$ and 1-cos. It is, however, only for a few elections that one may note deviating estimates depending on the measure. In figure 1 the Bulgarian election 2001, the Polish one for 1993, the Slovenian for 1992 and the Cyprus election of 1976 are noted; the Cyprus case is affected by a small number of parties taking part in the election, whereas the opposite is true for the Polish election indicating that the measures are slightly dependent on the number of observations – parties in this case.\(^\text{15}\)

![Figure 1: Relation between measures of volatility: $v$ and $lsq$](image)

Also in Figure 2 do the two measures go quite well together, although here we need to move from a linear to a quadratic relationship. The two Bulgarian elections of 2001 and 2009 are distinguishing themselves through high volatility scores, whereas the $v$-scores are distinctively higher than the 1-cos-scores for the 1947 Maltese election and the 1992 Romanian election; at both of these elections there is a major party losing a substantial part of their vote.

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\(^{15}\) The impact of number of parties on $v$ and $lsq$ is noted by Sikk (2001: 23).
One conclusion from this exercise is that all three measures go together quite closely. Thus one may infer that it is not a major issue which measure to employ. I thus tend to agree with what Pedersen (1980: 397) maintained already from the beginning, although he was then discussing fragmentation indices, namely that when estimating scores one should stick to the established ones as long as there are no major reasons for abandoning them. Therefore, I would say, it is not meaningful to replace $v$ with any other general measure, not least since most studies within the field employ the $v$ measure when measuring total aggregate volatility.

b) Variation in space: by country and by region

When moving on to the mapping of volatility among the European countries the $v$ measure will be employed. To start with different operationalizations of volatility will be dealt with, namely the relation between $v$ and its subtypes, i.e. type A and type B. How are these three types of volatility related to each other? The correlations displayed in Table 2 below refer to all of Europe as well as to the two regions we have identified (WE and CEE).

Table 2: Correlation between $v$, type A and type B by all and WE and CEE

<table>
<thead>
<tr>
<th></th>
<th>All (n=395)</th>
<th>WE (n=334)</th>
<th>CEE (n=61)</th>
</tr>
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<tbody>
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<td></td>
<td>type A</td>
<td>type B</td>
<td>Type A+B</td>
</tr>
<tr>
<td>$v$</td>
<td>$r=,769$</td>
<td>$r=,876$</td>
<td>$r=,986$</td>
</tr>
<tr>
<td>Type A</td>
<td>$r=,404$</td>
<td>$r=,803$</td>
<td>$r=,701$</td>
</tr>
</tbody>
</table>

It seems to be the case that total volatility ($v$) correlates relatively strongly with type A, type B and type A+B in all three contexts, somewhat stronger for all Europe than for CEE, but in CEE $v$ correlates slightly stronger with type A than with type B. As might be expected type A and type B are not strongly correlated neither in WE nor in CEE. Thus, the volatility due to the entry of new parties is something different from the volatility associated with stable parties. Yet, it is still interesting to note, from this table, that total volatility ($v$) seems to
capture a variation in volatility that is not strongly different from what is captured by type A and type B volatility.

Let us therefore take a closer look at the variation between countries for these different operationalizations of aggregate volatility. The mean values for the four types of volatility are displayed in Table 3 and in each column sorted from the lowest to the highest score. In addition, the table also contains information about what amount of variation in these scores that may be explained by country as it is summarized in the eta-scores.

### Table 3: Variation in v, type A, type B and total A+B by country (sorted by size)

<table>
<thead>
<tr>
<th>country</th>
<th>v</th>
<th>type A</th>
<th>country</th>
<th>type B</th>
<th>country</th>
<th>total A+B</th>
</tr>
</thead>
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<td>6.28</td>
<td>0.36</td>
<td>switzerland</td>
<td>3.76</td>
<td>unitedking</td>
<td>5.45</td>
</tr>
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<td>5.09</td>
<td>switzerland</td>
<td>6.39</td>
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</tr>
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<td>17.45</td>
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<td>17.62</td>
<td>slovenia</td>
<td>24.73</td>
</tr>
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<td>31.71</td>
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<td>bulgaria</td>
<td>18.33</td>
<td>romania</td>
<td>25.99</td>
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<td>latvia</td>
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<td>9.95</td>
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<td>18.63</td>
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<tr>
<td>bulgaria</td>
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<td>romania</td>
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<td>latvia</td>
<td>31.96</td>
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<tr>
<td>lithuania</td>
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<td>17.73</td>
<td>lithuania</td>
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<td>40.11</td>
</tr>
<tr>
<td>Total</td>
<td>13.31</td>
<td>3.20</td>
<td>Total</td>
<td>8.99</td>
<td>Total</td>
<td>12.10</td>
</tr>
<tr>
<td>Eta sq</td>
<td>0.550</td>
<td>0.410</td>
<td></td>
<td>0.390</td>
<td></td>
<td>0.491</td>
</tr>
</tbody>
</table>

What is obvious is that there is a distinct variation between countries as indicated by the eta-scores. Further, one may also note that the highest scores are to be found among the CEE-countries. It is only in terms of type A volatility that two non-CEE countries ranks high, namely Cyprus and Ireland\(^{16}\). Still there are WE-countries which score high on volatility like France and Spain but countries displaying low scores are all from Western Europe like United

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\(^{16}\) The high scores for Ireland has to do with the fact that that the group of independents for each election are treated as genuinely new parties; if treating the group of independents as stable parties the score for type A goes down from 7,11 to 1,83.
Kingdom, Switzerland and Austria. It is also noteworthy that v generally, with the exception of Denmark,\(^\text{17}\), displays higher scores than for total A+B; the reason is that following the coding principles of Powell and Tucker (2012) parties with less than 2% in voter support are not counted.

The variation by region is mapped in Table 4 where the mean values for Western Europe differs sharply from those for Central and Eastern Europe. Yet, somewhat surprisingly, the eta scores are significant but not that high and the reason is that there is also a distinct variation between countries within Western Europe.

Table 4: Variation in v, type A, type B and total A+B by region

<table>
<thead>
<tr>
<th>grp</th>
<th>v</th>
<th>type A</th>
<th>type B</th>
<th>total A+B</th>
</tr>
</thead>
<tbody>
<tr>
<td>WE</td>
<td>10.57</td>
<td>2.19</td>
<td>7.54</td>
<td>9.74</td>
</tr>
<tr>
<td>CEE</td>
<td>28.32</td>
<td>8.73</td>
<td>16.27</td>
<td>25.00</td>
</tr>
<tr>
<td>Total</td>
<td>13.31</td>
<td>3.20</td>
<td>8.89</td>
<td>12.10</td>
</tr>
<tr>
<td>Eta sq</td>
<td>.430</td>
<td>.229</td>
<td>.279</td>
<td>.363</td>
</tr>
</tbody>
</table>

To summarize, there is a substantial variation in aggregate volatility all over Europe, and this is true for all kinds of operationalizations used, countries in CEE displaying higher scores than countries in WE. Type B volatility is higher than type A volatility, although less so in Western Europe; the two types of volatility (A and B) captures different aspects of volatility, but they do also match the total scores. So the next step is going from variation in space to variation in volatility over time.

c) Variation over time: by decade

Looking at the variation in volatility over time we may establish a pattern (Table 5). Volatility goes down from the late 1940s till the 1970s when there is a rise, temporarily broken in the 1980s to increase again with the 1990s where the highest scores are to be noted for the present decade, the 2010s. Thus this trend pattern captures the “earthquake elections” of the 1970s as well as the entry of the CEE countries with the 1990s. The eta scores suggest that the variation over time is most pronounced for the v measure whereas the type A volatility displays a low eta score. It is also clear that the variation in volatility is stronger in terms of spatial variation than with respect to the temporal variation.

Table 5: Variation in v, type A, type B and total A+B by decade

<table>
<thead>
<tr>
<th>decade</th>
<th>v</th>
<th>type A</th>
<th>type B</th>
<th>total A+B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940s</td>
<td>11.54</td>
<td>4.09</td>
<td>6.90</td>
<td>10.99</td>
</tr>
<tr>
<td>1950s</td>
<td>8.82</td>
<td>1.72</td>
<td>6.56</td>
<td>8.28</td>
</tr>
<tr>
<td>1960s</td>
<td>7.92</td>
<td>1.77</td>
<td>5.72</td>
<td>7.49</td>
</tr>
<tr>
<td>1970s</td>
<td>10.59</td>
<td>2.63</td>
<td>7.34</td>
<td>9.97</td>
</tr>
<tr>
<td>1980s</td>
<td>10.23</td>
<td>2.32</td>
<td>7.13</td>
<td>9.44</td>
</tr>
<tr>
<td>1990s</td>
<td>16.49</td>
<td>4.07</td>
<td>10.45</td>
<td>14.52</td>
</tr>
<tr>
<td>2000s</td>
<td>17.79</td>
<td>4.15</td>
<td>11.75</td>
<td>15.91</td>
</tr>
<tr>
<td>2010s</td>
<td>22.25</td>
<td>6.11</td>
<td>14.12</td>
<td>20.23</td>
</tr>
<tr>
<td>Total</td>
<td>13.31</td>
<td>3.20</td>
<td>8.89</td>
<td>12.10</td>
</tr>
<tr>
<td>Eta sq</td>
<td>.188</td>
<td>.058</td>
<td>.173</td>
<td>.156</td>
</tr>
</tbody>
</table>

\(^{17}\) To illustrate the Danish exception we may look at the votes for Retsforbundet in 1945 (= 1.86) and in 1947 (4.54) resulting in a v of 2.66/2 and a type A of 4.54/2.
The pattern of variation for aggregate volatility seems to fit with an expected pattern where CEE countries has higher scores than the WE countries and the 1970s and the 2010s are decades to distinguish. But how reliable are the scores estimated? May there be systematic biases in the estimates presented in Table 3 to Table 5? One way to enquire into this problem somewhat further is to compare these estimates with other estimates reported in the research literature, and based upon discrepancies among estimates scrutinise and analyse a few critical elections from which we may draw lessons and learn from mistakes. This is the task for the next section of the paper.

4. Mapping variation in estimates of aggregate volatility

Let us now continue with mapping the variation in estimates of aggregate volatility as reported in the research literature. The purpose with this section is first to identify groups of elections, and countries, where there is a general agreement about the level of aggregate electoral volatility as well as where there are major discrepancies in the volatility scores estimated. Secondly, a comparison between my own estimates and those reported in the literature makes it possible to select a number of elections where there are disagreements. Thirdly, based on this comparison a few critical elections may be scrutinised more closely in order to gain an understanding of what choices may have had an impact on the estimates arrived at.

a) Variation in estimates in the research literature: standard deviation and coefficient of variability

Two measures are employed to map the variation in estimates of volatility. The size of the standard deviation is conditioned by the size of the volatility scores, whereas the size of the coefficient of variability is normalised through the division of the standard deviation with the mean. The two measures correlate quite strongly \( r = .80 \), but as may be noticed in Table 6 the order among the countries vary slightly when the two measures are sorted by size.

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18 For my own curiosity I have compared these estimates with previous estimates I have made; the estimates reported in this paper have been computed from a new dataset and, as far as possible, these estimates have been made independent from those reported earlier. Depending on disposition the correlations reported may therefore be characterized as worrying or encouraging: \( v \) and Ersson & Lane 1998 \( r = .92 \) and \( v \) and Lane & Ersson 2007 \( r = .95 \).
Table 6: Variation in estimates in the research literature of total volatility by country

<table>
<thead>
<tr>
<th>country</th>
<th>cv</th>
<th>country</th>
<th>stddev</th>
</tr>
</thead>
<tbody>
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<td>norway</td>
<td>0.04</td>
<td>malta</td>
<td>0.27</td>
</tr>
<tr>
<td>denmark</td>
<td>0.04</td>
<td>norway</td>
<td>0.41</td>
</tr>
<tr>
<td>sweden</td>
<td>0.05</td>
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<td>0.42</td>
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<tr>
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<td>0.43</td>
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<td>0.08</td>
<td>iceland</td>
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</tr>
<tr>
<td>finland</td>
<td>0.09</td>
<td>unitedking</td>
<td>0.74</td>
</tr>
<tr>
<td>ireland</td>
<td>0.10</td>
<td>ireland</td>
<td>0.74</td>
</tr>
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<td>0.11</td>
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<tr>
<td>unitedking</td>
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<td>1.53</td>
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<td>1.88</td>
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<td>6.76</td>
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</tr>
<tr>
<td>Total</td>
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<td>Total</td>
<td>2.56</td>
</tr>
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</table>

What is obvious is that there is indeed a variation among the European countries with respect to estimates in the research literature on aggregate volatility scores. There seems to be small disagreements for the Nordic countries, whereas there is more of a discrepancy in the estimates for countries in Central and Eastern Europe but this is also true for Italy, France and Portugal. To gain a better understanding of these discrepancies it is necessary to enquire closer into different estimates of the aggregate volatility scores.

b) Variation in estimates of aggregate volatility: median scores and new own scores (v)

The estimates to compare are on the one hand the ones I have presented earlier (v in Tables 3 to 5) and the median scores for volatility in the research literature as summarized above (Table 6). I prefer the median scores to the mean scores since they bypass some extreme outliers. However, to start with Table 7 displays the correlation between v and median and mean scores for the whole sample (all) as well as for the WE-set and the CEE-set of countries.
Table 7: Correlation between v, median and mean by all and WE and CEE

<table>
<thead>
<tr>
<th></th>
<th>All (n=390)</th>
<th>WE (n=330)</th>
<th>CEE (n=60)</th>
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</thead>
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<td></td>
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<td>mean</td>
<td>median</td>
</tr>
<tr>
<td>v</td>
<td>r=.903</td>
<td>r=.855</td>
<td>r=.835</td>
</tr>
<tr>
<td></td>
<td>median</td>
<td>mean</td>
<td>median</td>
</tr>
<tr>
<td>v</td>
<td>r=.903</td>
<td>r=.855</td>
<td>r=.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>r=.688</td>
<td></td>
</tr>
</tbody>
</table>

From the correlations we may note that there are discrepancies in the estimates of v and median, less so in WE than in CEE; and the correlations between v and median are stronger than what is the case for v and mean. Disaggregating the correlations between v and median to the level of countries there are a few cases displaying distinct differences influencing the overall correlations: Croatia (few observations), Slovakia (the 1992 and 2002 elections), but also Cyprus (few observations), Iceland (the 1999 election) and Poland (the 2001 election).

To present an overview of differences in estimates Table 8 contains information about the mean values for median (i.e. estimates from the research literature), difference (absolute) between estimates in v and median (i.e. means for all elections); to normalize the figures for presentation the column diff is divided with the column median, and the countries are sorted by this variable (diff/median).

Table 8: Comparison of different estimates of aggregate volatility

<table>
<thead>
<tr>
<th>country</th>
<th>median</th>
<th>diff: v vs. median</th>
<th>diff/median</th>
</tr>
</thead>
<tbody>
<tr>
<td>sweden</td>
<td>8.38</td>
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<td>0.037</td>
</tr>
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<td>12.59</td>
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<td>0.040</td>
</tr>
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<td>0.055</td>
</tr>
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<td>0.061</td>
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<td>0.063</td>
</tr>
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<td>11.89</td>
<td>0.75</td>
<td>0.063</td>
</tr>
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<td>0.069</td>
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<td>0.071</td>
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<td>8.21</td>
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<td>0.087</td>
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<td>0.094</td>
</tr>
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<td>36.51</td>
<td>3.66</td>
<td>0.100</td>
</tr>
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<td>12.92</td>
<td>1.40</td>
<td>0.106</td>
</tr>
<tr>
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<td>12.69</td>
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<tr>
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<td>1.29</td>
<td>0.125</td>
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<tr>
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<td>1.31</td>
<td>0.143</td>
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<td>6.39</td>
<td>0.94</td>
<td>0.147</td>
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<td>1.91</td>
<td>0.166</td>
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<tr>
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<td>33.08</td>
<td>5.88</td>
<td>0.178</td>
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<tr>
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<td>4.71</td>
<td>0.181</td>
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<tr>
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<td>2.78</td>
<td>0.183</td>
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<tr>
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<td>6.44</td>
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<td>ireland</td>
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<td>cyprus</td>
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<td>15.25</td>
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<tr>
<td>Total</td>
<td>13.14</td>
<td>2.14</td>
<td>0.163</td>
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Some of the countries ranking high may be disregarded either because of few observations (Croatia and Cyprus), or due to the handling of independents (Ireland and Switzerland) whereas there are other countries for which there are reasons to scrutinize some of the elections in more detail (Slovakia, Iceland, Poland and Estonia). On the other hand it is also the case that there are countries where disagreements are less pronounced, and this is true for WE-countries as well as for CEE-countries, but also among these cases there may still be a few elections to take a closer look at.

These comparisons indicate that by and large my estimates tend to go together with what has been reported in the research literature, but there are also a lot of cases, countries as well as elections, which require a closer look to draw conclusions about what may lay behind different estimates of volatility scores. The next section will scrutinize a few critical elections in these respects.

c) Critical elections to scrutinize

To gain an understanding for why there are differences in estimates of the volatility scores it is necessary to go into details. By looking closer at elections that may be deemed as critical, since there are sometimes huge differences in the scores estimated, and to find out which decisions that lie behind a specific estimate may elucidate the more general decision principles that should be applied. The elections, and countries, selected in this section is based on the size of discrepancy identified (Table 8), but not exclusively so. There is one country (Romania) which displays a relatively high score of difference but on closer inspection it is difficult to pinpoint why the estimates differ. There are other countries (Denmark, Finland and Norway) for which the difference score is small, but there are nevertheless some interesting elections to look at. Overall the countries, and elections, presented in Table 9 below may still illustrate some of the difficult decisions that have to be made when classifying changes in party systems such as identifying party splits and party mergers as well as the occurrences of birth of genuinely new parties and the death of old parties.

For a sample of 27 elections data on different kinds of volatility scores are presented; first, there are my own original estimates (v) employed in this paper (and presented in Table 3 to 5); second, there are alternative estimates (denoted by an subscript _alt) inspired by what has been reported in the research literature; third, a measure of absolute difference is reported in the last column taking the absolute difference between v and alt_v, and the elections are sorted according to the size of this measure; fourth, I have also added the mean scores (see Table 9 below) which includes outliers and makes it possible to relate v, v_alt to the mean. From the Table it is very clear that decisions about how to classify parties over a pair of elections may implicate huge differences in the estimations of the volatility score. I will comment these data country wise thus starting with the Czech Republic and end with Norway.\footnote{A crucial distinction that will be employed refers to what is counted as splinter parties and what is classified as genuinely new parties. I have encountered a few attempts to list parties in Europe where this distinction is applied (Mair 1999, Hug 2001b, Sikk 2005b, Bolleyer 2010, Bolin 2012b; unfortunately Tavits 2008b does not fully apply this distinction). Within brackets ([]) I will add whether my classification applied agrees or disagrees with the ones reported in these studies; it is important to stress that agreements/disagreements refers to my interpretation of how the authors classify the parties in question as being splinter parties or genuinely new parties, and nothing else/more.}
Table 9: Differences in estimates of volatility for a number of elections due to changes in classifications of party splits and party mergers (v vs. v_alt)

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<th>country</th>
<th>election</th>
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<th>type B</th>
<th>total A+B</th>
<th>v_alt</th>
<th>mean</th>
<th>type_A_alt</th>
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</table>

Note: In this sample v correlates with v_alt (r=,64) and with mean (r=,75); v_alt correlates with mean (r=,87)

i. Czech republic
- 1990-1992: At issue for the election pair 1990 – 1992 is how to classify the Civic Forum (OF) and the parties which emanated from OF in the 1992 election. If the new parties are classified as splinter parties then one may arrive at my original estimate (v = 19,44); if the new parties are classified as genuinely new parties, then the alternative estimate would be more appropriate (v_alt = 62,38). One position is the one taken by Powell & Tucker (2012: 12) who argue:

To take an example, we can consider the fragmentation of the Civic Forum in the Czech part of Czechoslovakia, which took place prior to the 1992 parliamentary election. In 1990, the pro-democracy Civic Forum dominated the election taking 53.15% of the vote. The movement subsequently divided into four parties to contest the 1992 election: the Civic Democratic Party (33.9%), the Civic Democratic Alliance (5.0%), the Civil Movement (4.4%) and the Club of Engaged Non Party Members (2.0%). In this case, no party kept the original name and there was no single clear successor party. So all four parties are considered new parties, and thus all contributed to Type A Volatility.

In a similar vein Mansfeldová (2004: 227) writes that the changes in the political system led to the “disintegration of the Civic Forum into several new parties.”
On the other hand one could argue that the four parties in question were splinter parties emanating from the Civic Forum. Rose and Munro (2009:101) writes that Civic Forum “[i]n 1991 split into Civic Democratic Party, Civic Movement, Civic Democratic Alliance, and Club of Active Non-Partisans.” Töka (1997:14-15) classifies OH as a successor of OF and KAN as part of OF in 1990 but is in doubt about how to classify OF. Wightman (1993: 84) classified ODS and ODA as the “main successor parties” to OF. Jehlička et al. (1993: 253) discussing the 1992 election write: “The ‘new’ significant parties are /…/ direct successors to Civic Forum (ODS, ODA, OH) /…/.” And Klíma (1998: 497) write about the succumbing Civic Forum which was “thus split into three successor parties: the Civic Democratic Party (ODS), Civic Democratic Alliance (ODA), and Civic Movement (OH).”

What it boils down to is what is meant with genuinely new parties, with successor parties, and what implications there are if we identify splinter parties. Applying strict criteria these four parties may be classified as genuinely new parties; yet, my reading of Bartolini & Mair (1990: 311) where they state that when “a party splits into two or more parties, the relevant electoral volatility is computed by subtracting the combined vote of the new parties from that of the original party in the election immediately preceding the split”, support the interpretation that Civic Forum was splinted into four parties where the votes for these parties in 1992 should be compared with the vote for Civic Forum in 1990. Thus, in my opinion, it is still an open issue which of the two approaches that should be considered the “correct” one. [Sikk 2005 agrees]

ii. Iceland

Not less than five elections display relatively high figures for the difference score reported in Table 9. I will briefly comment upon each of the five pairs of elections chronologically:

- 1949-1953 elections: Although the magnitude for difference is low, at issue is how to consider the Republic Party [mr#18] as a splinter from the Progressive Party [mr#18] as suggested by Mackie and Rose (1991: 211) or as a new party (as judged from the scores arrived at by Pétursson 2005: 153)? My choice is splinter party which implies applying combined votes for the 1949 and 1953 elections. [Hug 2001 agrees]

- 1979-1983 elections: Here I consider the Social Democratic Federation [mr#22] a splinter, or a breakaway, party from the Social Democrats [mr#7] (Mackie & Rose 1991:211); if so the v-measure is 11.29; if classified as a genuinely new party v_alt is 17.02. [Mair 1999, Hug 2001, Bolin 2012 agrees]

- 1983-1987 elections: At issue is, mainly, how to classify Citizens’ Party II [mr#24]; is it a genuinely new party, or can it be looked upon as a splinter from the Independence Party [mr#13]? My option is the second one. [Hug 2001 agrees and Mair 1999, Bolin 2012 disagrees]

- 1991-1995 elections: At stake here is People’s Movement [mr#29]; is it a genuinely new party or a breakaway from the Social Democrats [mr#7]? Mackie and Rose characterize it as a breakaway party, which I agree with, and consequently apply the combined votes for the two elections for the two parties. [Bolin 2012 agrees]

- 1995-1999 elections: Here we have a complicated pair of elections and depending upon how parties are classified volatility may go from the low 4.31 (=v) to a high 44.57 (=v_alt). The 1999 election involved a process of splits and mergers mainly on the left-wing scene. At the 1995 election there were four parties to the left, namely Social Democrats [rm#7], People’s Alliance [rm#14], Women’s Alliance [rm#23] and People’s Movement [rm#29]. The aim was to arrange a United Front (Social Democratic Alliance) of these four parties before the 1999 election but the left wing of the People’s Alliance [rm#14] withdraw and formed a Left-

Movement-Greens (Hardarson & Kristinsson 2000: 412; Kristjánsson & Indridason 2011: 163). On one hand the two new parties may be classified as genuinely new parties or on the other hand they may be classified as mergers where the two parties emanated from the four parties; I have opted for the second alternative, but I am aware of that this may be a case where the combining of votes from the two elections stretches the meaning of splits and mergers a bit too far. [Bolin 2012 agrees]

iii. Slovakia
Here are two elections in need of a closer investigation:
- the 1990-1992 elections: The status of VPN is similar to that OF in the Czech republic; should HZDS and ODÚ be classified as successor parties to VPN or classified as genuinely new parties? If the first option is chosen v scores 20,75 whereas if the second option is applied the score for v_alt is 50,1. Rose & Munro (2009: 116) classifies both parties as splinters from VPN; Jehlička et al. (1993: 253) call the two parties as direct successors to Public Against Violence; and Burš & Just (2010: 75) write about VPN and “their successor parties, the HZDS and ODÚ”. Further, following the detailed party family tree outlined by Deegan-Krause (2011) these two parties are recognized as splits from VPN. Thus I find it reasonable to treat VPN and its successor parties in the same way as is the case with the Czech Civic Forum. [Sikk 2005 agrees]
- 1998-2002 elections: At this pair of elections the focus is on the Smer party; is Smer a splinter from SDL or should Smer be considered a genuinely new party? The volatility score varies from v=18,53 to v_alt = 31,83 whether Smer is classified as genuinely new party or not. In his detailed analysis of this pair of elections Výtisk (2007: 35) treats Smer as a genuinely new party. Yet, it is the case that one can call Smer a splinter party from SDL (Deegan-Krause 2011). We also know that Fico had a leading position within SDL prior to the formation of Smer in 1999; later in 2005 SDL merged with Smer (Passin 2012: 8). In my opinion, it is therefore not unreasonable to treat Smer as a splinter party and apply a formula for combining the votes of SDL and Smer in this pair of elections.

iv. Malta
Here are at least two pairs of elections that merit attention:
- 1947-1950: The issue for this pair of elections is Malta Workers’ Party (MWP); is it a splinter party from the Labour Party or a genuinely new party? Mackie & Rose (1991: 313) notes that MWP was formed “in October 1949 by Dr. Paul Boffa, the former leader of the Labour Party”, and McHale & Skowronski (1983: 633) adds that he “resigned as leader of the Malta Labour Party (MLP) following an MLP vote of no confidence.” My interpretation is that it could be treated as a splinter party; if not the volatility scores goes up from v=23,24 to v_alt=46,44.
- 1955-1962: The two parties at issue for this pair of elections are Democratic Nationalist Party II (DNP) and Christian Workers Party (CWP). As for DNP II Mackie & Rose (1919: 313) notes that it was formed by “former members of the Nationalist Party” and it is classified as a “progressive offshoot of the Nationalist Party” by McHale & Skowronski (1983: 631). The CWP also had strong links to the Labour Party (MLP) as it was founded “in 1961 by a former secretary-general of the Malta Labour Party” (McHale & Skowronski 1983: 630). Thus, it seems reasonable also to treat these parties as splinter parties where the practice of combining the vote may be valid; depending on which choice is made the volatility score may vary between 13,40 (=v) and 22,88 (=v_alt). [Mair 1999 agrees with CWP but disagrees with DNP]
For Poland a number of pairs of elections could have been selected for closer study, but the pair 1997-2001 stands out as a deviating case:

- 1997-2001: What is the relation between the remnants of Solidarity, the AWS (Solidarity Electoral Action) and PiS (Law and Justice) and PO (Citizens’ Platform)? Is it such a connection where it is meaningful to treat PiS and PO as splinter parties, or should they rather be seen as genuinely new parties? According to Rose & Munro (2009: 198) PiS “emerged from Solidarity Electoral Action” and PO was “created by former members of Solidarity Electoral Action and of Freedom Union”. My understanding is that most analysts regard PiS and PO as genuinely new parties; yet, we here have a problem of drawing a proper line between splinters forming new parties and actors forming a genuinely new party. I have opted for the splinter version which gives an $v=23.91$, whereas choosing the genuinely new party option gives an $v_{alt}=46.10$.

vi. Latvia

The pair of elections chosen for Latvia is 2002-2006:

- 2002-2006: The focus is here on how to treat Harmony Centre (SC) and its predecessors; should SC be seen as a splinter from PCTVL (For Human Rights in a United Latvia) or as a genuinely new party in 2006? According to Rose & Munro (2009: 162) parties belonging to the PCTVL alliance “broke away, forming Harmony Centre”, and therefore it seems to be reasonable to classify SC as a splinter party related to PCTVL, and consequently the principle of combining the vote for SC and PCTVL may be applied; depending on what choice is made $v$ varies between 17.83 and 30.86 ($=v_{alt}$).

vii. Slovenia

A diverging pair of elections in Slovenia is the 2004-2008 pair:

- 2004-2008: Here two parties are in focus and at issue is how to treat Zares and Lipa and their predecessors; are they splinter parties or genuinely new parties? Again, following Rose & Munro (2009: 235) they treat both as splinter parties; Zares is a splinter from LDS whereas Lipa is a splinter from SNS. Treating them as splinter parties and combining the votes $v$ is 26.45, while treating them as genuinely new parties gives an $v_{alt}=36.68$.

viii. Lithuania

The election pair selected for Lithuania is 2004-2008:

- 2004-2008: At issue here is whether there were splits within the Social Democratic Party (LSdP) and the Liberal and Centre Union (LbCS) between the elections or birth of genuinely new parties. Relying on Rose & Munro (2009: 178-79) LSdP in 2004 were joined in an alliance with New Union – Social Liberals (NS-SL) but NS-SL contested the 2008 election independently and the Frontas Party which took part in 2008 was a splinter from LSdP; the Liberal Movement of the Republic of Lithuania (LRLS) was a splinter from LbCS. Considering these parties as splinter parties and combining the vote for this pair of elections results in an $v=27.64$, while treating them as genuinely new parties increases the volatility score to 36.67 ($=v_{alt}$). In my opinion the splinter option is the more appropriate one.

ix. Italy

Calculating volatility scores for Italy is indeed tricky, especially for the post-1992 period, but here only two pairs of elections will be looked upon:

- 1946-1948: The focus for this pair is on PSDI (Partito Socialista Democratico Italiano). In the literature the PSDI is considered a splinter party emanating from the Socialist Party (PSI). Mackie & Rose (1991: 263) write that it was “a centrist breakaway from the Socialist Party
led by Giuseppe Saragat.” Being a splinter party, according to my understanding, the principle of combining votes for the old and the new parties for the pair of election should be applied. Therefore I find it somewhat surprisingly that Bartolini & Mair (1990: [342]) treat PSDI as a genuinely new party. My estimate of \(v = 16.51\) whereas treating PSDI as a genuinely new party increases \(v\) to 23.59 (\(= v_{\text{alt}}\)).

- 1994-1996: The choice of focus for this pair of elections is the Dini List – Italian Renewal (RI); is RI to be classified as a genuinely new party or does it have any predecessors? Partly based on Prévost (2011) I have opted for a combination of the Segni Pact and parts of the Socialist Party as predecessors; admittedly, this is questionable, and maybe the proper thing would be to classify RI as a genuinely new party. Which choice is made matter, but not that much, since the estimates varies between \(v = 9.48\) and \(v_{\text{alt}} = 14.22\). [Bolin 2012 disagrees]

x. France
As was recognised already by Pedersen, estimating volatility scores for the French party system is not easy. Two pairs of elections will be chosen and here my estimates are higher than the ones reported in the literature.

- 1962-1967: The conservative political scene in France is not easy to track down. Two alternatives, among many, to face for this pair of elections refers to where to place the CNIP of 1962 (mr#12); my option has been to keep the CNIP as part of the Modéres and let MRP (mr#13) align with CD (mr#21) which results in a \(v\) of 13.14; the options chosen by Bartolini & Mair (1990: [334]) was to align CNIP and MRP with CD which gives an \(v_{\text{alt}}\) of 6.92.

- 1968-1973: At issue for this pair of elections is, inter alia, how to treat the Reformateurs (mr#26); should it be considered to be a genuinely new party (my option giving \(v = 23.81\)) or considered to be aligned with CD (alternative option giving \(v_{\text{alt}} = 17.19\)). Still one may note that the volatility score estimated by Bartolini & Mair (1990: [334]) is distinctly lower with 10.9.

xi. Estonia
The pair of elections selected for Estonia is another case where my estimation is higher than what is reported in the literature:

- 1999-2003: It is about how to treat the Coalition Party (rm#3) after the 1999 election; my interpretation was that we here have a case of a party death, or exit, (Rose & Munro 2009: 133) resulting in a \(v\) of 34.68. However, a closer examination suggest that it is reasonable to consider the Coalition Party as merging with the People’s Union (rm#28); this is how Pettai (2004: 994) treats the party, and a similar interpretation may be drawn from the overview available from Erakonnad (http://www.erakonnad.info/vaimised.html; accessed in July 2012), which results in the alternative estimate of \(v_{\text{alt}} = 28.93\).

xii. Luxembourg
- 1964-1968: The Popular Independent Movement (MIP; mr#18) entered parliament in 1964 but the major part of the party merged with the Democratic Party (rm#16) prior of the 1968 election; the alternative I have opted for is a merger of these two parties resulting in a \(v = 4.93\); another alternative is to treat MIP as a stable party for this pair of elections giving an alternative estimate of \(v_{\text{alt}} = 10.28\).

xiii. Greece
For both pairs of elections the treatment of Polan (Political Spring; mr#50) is at issue; Polan was formed by Samaras in 1993 as a breakaway from New Democracy (ND; mr#36) but Polan did not participate in the 2000 election although expressing support for ND and joined ND later in 2004.
- 1990-1993: Treating Polan as a splinter party from ND combining their votes in the pair of elections means a $v$ of 8.80; if not the alternative estimate goes up to $alt_v = 13.68$.
- 1996-2000: Treating Polan and ND as a forthcoming merger and combining their votes for the pair of elections gives an $v$ of 5.14; if not the alternative estimate goes up to $alt_v = 8.09$. [Bolin 2012 agrees]

xiv. Denmark
In general different estimates of volatility in Denmark goes together; yet, here I single out the treatment of the Socialist People’s Party (SF; mr#16) at the 1960 election and the treatment of the Danish People’s Party at the 1998 election.
- 1957-1960: SF was formed in 1959 by the previous CP-leader Aksel Larsen who had been excluded from DKP (mr#9), and he had the support from DKP members and voters but not the DKP organisation. When SF entered parliament at the 1960 election the old CP was ousted; a majority of the MPs elected were earlier members of DKP (Kragh 1976: 119-124, Logue 1982: 83). To me SF is a case of a splinter party where the combining of votes for SF and DKP would be needed to compute the volatility score; if so $v = 9.18$. If classifying SF as a genuinely new party the alternative estimate $alt_v = 12.22$. It is interesting to note that Bartolini & Mair (1990: [329]) treats SF as a genuinely new party. [Hug 2001 agrees; Mair 1999 disagrees]
- 1994-1998: Danish People’s Party (DF) was formed in 1995 when 4 MP:s left the parliamentary group of Progress Party (FrP; mr#21). When DF was elected into parliament at the 1998 election a majority of the MP:s were previous members of FrP (Pedersen 2006). For me, this is another case of a splinter party where it is relevant to combine the two parties’ votes at this pair of elections; if so the estimate for $v = 8.21$; if DF is treated as a genuinely new party the $alt_v = 12.22$. [Bolleyer 2010, Bolin 2012 agrees]

xv. Hungary
- 2002-2006: At issue is the treatment of the Centre Party (rm#19); the party took part in the 2006 election but the major part of the party joined the Fidesz-KDNP (rm#20) coalition in the 2006 election why I have opted for combing the vote of Fidesz, KDNP and Centrum for this pair of elections resulting in a $v = 4.76$; if not the alternative volatility score would increase to $v_{alt} = 8.33$.

xvi. Finland
- 1954-1958: During the end of the 1950’s there were disagreements within the Social Democratic Party; a few MP’s broke with SSP (mr#1) and were returned in 1958, but a formal break with SSP and the formation of TPSL (mr#15) waited till 1959 (Helenius 1977:281, Berglund & Lindström 1978: 41). For this pair of elections the forthcoming TPSL has been classified as a splinter party from SSP; such a treatment of TPSL gives a $v = 4.73$ while another handling increases the volatility score to $v_{alt} = 6.47$. [Hug 2001 agrees]

xvii. Norway
- 1957-1961: Inspired by the events in Denmark a new party SF (mr#14) reached the Storting at the 1961 election; contrary to the Danish case the Norwegian SF had its origins in the social democratic Norwegian Labour Party (DNA; mr#4) (Lorenz 1974: 156-157). Mackie & Rose (1991: 359) classifies SF as a “breakaway group from the Labour Party” and can therefore be treated as a splinter party resulting in a $v = 2.01$; disagreement on this point increases the score to $v_{alt} = 3.58$. [Hug 2001 agrees; Mair 1999 and Bolin 2012 disagrees]
This review has highlighted the difference between genuinely new parties and new parties formed through party splits or party mergers. Crucial for applying this distinction for concrete cases is what is meant by a genuinely new party. I have tended mostly to agree with those defining this group of parties quite narrow as when Hug suggests that genuinely new parties are those “which emerge without the help from members of existing parties.” Following this line of reasoning the number of genuinely new parties will be rather low for the sample studied in this section of the paper. It may be too restrictive, but it implicates a continuity within the party system which may be lost if the definition of genuinely new parties is allowed to be too wide. Still it is obvious that what choice is made for handling the parties participating in a pair of elections has consequences for the size of the volatility scores to be estimated.

5. Conclusion

This attempt to map variation in volatility in Europe indicates that for a large number of elections various estimates tend to go together. Yet, there is not a perfect match, and for some groups of countries and some pairs of elections there are distinct divergences in estimates presented in the research literature. Therefore it is wise yet another time to look at how to arrive at estimates of the aggregate electoral volatility that may be considered to be valid and reliable. Below a brief summary of what I have achieved in this paper:

a) Electoral data:
In this paper I have made an effort to collect electoral data for all parties participating at an election thus minimising the number of voters allocated to a category of other parties. It has not been a successful effort in every instance, but for many countries more or less all parties are covered in the data sets employed. These data sets therefore are reasonably accurate, but the increased level of accuracy has in general not had any great impact on the estimations of the volatility scores; this is illustrated with scores reported for v which are slightly higher than scores reported for median or mean (as reported in the research literature).

b) Independents and other parties:
The treatment of independents and other parties does matter slightly more; should independents and other parties be treated as continuous parties or as genuinely new parties? In the literature the continuous option is often chosen, but when it is possible to break down the category of other parties it is often, not always, the case that we here face new parties which many times properly would be classified as genuinely new parties. The sheer number of these small parties appearing at elections in countries like Spain and Belgium makes it extremely difficult to classify these parties properly, and to do so one need to have access to country expertise.

c) Measuring volatility:
Three different measures of volatility scores have been employed and compared (see Table 1). My impression from this comparison is that Pedersen’s index of aggregate volatility (v) comes out quite well, and I see no need to abandon this measure for other alternative measures; other measures like Isq and 1-cos are appropriate as complements but the v-measure can still be employed as the core measure of aggregate electoral volatility.
d) Operationalizations of volatility:
The volatility score has been proposed to be broken down in various aspects; Bartolini & Mair invented the distinction between block and within-block volatility; Powell & Tucker has proposed breaking down with respect to volatility originating from new parties (type A) and originating from stable parties (type B). My sense is that this is an interesting invention which may elucidate different kinds of aggregate electoral volatility, thus enriching the description of volatility, but this distinction is not a solution for achieving more reliable estimations of volatility; crucial for estimating type A volatility is defining what genuinely new parties stands for.

e) Rules for classifying parties participating in a pair of elections:
Again it is my sense, that crucial for achieving more reliable, and thereby also converging, estimates is to reach agreement about how to classify parties contesting a pair of elections. I have in the previous section highlighted the definition of genuinely new parties to be able to distinguish them for new parties originating from splits or mergers of existing parties. At issue is in particular whether a narrow or a broad definition of genuinely new parties should be applied. Reaching more of an agreement on this issue would improve agreements among various estimates of aggregate electoral volatility presented in the research literature.

f) Solutions proposed:
I can imagine that the following proposals may be conducive for arriving at more accurate estimates of aggregate electoral volatility:

i. Common analytical framework: One way to arrive at a common framework for classifying political parties attending a pair of elections would be the establishment of a research project combining a team of project leaders with in-house expertise at their disposal and another team of country experts familiar with the party system of their own country. What I have in mind is the kind of project headed by T. Bergman, W.C. Müller and K. Strøm studying government coalitions in Western Europe (Müller & Strøm 2000, Strom, Müller & Bergman 2003, and Strøm, Müller & Bergman 2008); another venue could be the approach taken in the Handbooks edited by Sten Berglund and his colleagues (Berglund et al. 1998, 2004 and forthcoming 2013).

ii. Examine critical cases: There is a need to assign time to a close and detailed examination of critical cases of elections where there are divergent estimations, to be able to arrive at a common analytical framework; this could be done within a research project, but not necessarily so.

iii. Country expertise: There is a need of country expertise to be able to establish party family trees which makes it possible to trace splits and mergers, births of new parties and deaths of old parties to facilitate decisions about whether we are facing a genuinely new party or not; one example of such an exemplary mapping of party families is the one produced by Deegan-Krause (2011) for the Slovakian party system.

g) Comment on Mogens Pedersen’s achievement
I started this paper with Mogens Pedersen and therefore it may be appropriate to end it with a few brief comments on his contribution to the study of aggregate electoral volatility. Tracing the evolution of the Nordic party systems as well as many of the Western European ones has not always been easy, but doing so one is seldom faced with major difficulties. Pedersen himself was, however, clearly aware of the difficulties associated with tracing splits and
mergers among the French and Italian party systems; the difficulties associated with the Italian party system has increased with the new political system of the 1990s. At the time of writing his articles in the end of the 1970s the party systems of Central and Eastern Europe was not yet the object of empirical studies, so he was not aware of the problems arising with the study of these new party systems. It would of course still be possible to address this question to Mogens Pedersen directly, but I see no reason to bother him now, about whether he with the hindsight of today would have been eager to engage in the study of aggregate electoral volatility in Europe. I can here only speculate, but I would expect him to have been truly hesitant for such an endeavour. There are, after all, huge differences between the relatively stable party systems of the Nordic countries when comparing them with the still relatively unstable party systems of Central and Eastern Europe.
References:


Bochsler, Daniel: Database on sub-national results of national elections in post-communist democracies (first chamber of national parliament); data available from: http://www.bochsler.eu/ceedata/.


CIAS (The Center for Integrated Area Studies, Kyoto University): The Database on the election and political system in East Central European Countries; data available from: http://www.seinan-gu.ac.jp/~sengoku/database/


Eraannad.info; 20 aastad erakondasid Eestis 1988-2008; http://www.erakonnad.info/
Gherghina, Sergiu (2012) Explaining electoral volatility in Central and Eastern Europe: A Party Organizational Approach, Department Political Science, Faculty of Social and Behavioural Sciences, Leiden University; PhD Thesis; https://openaccess.leidenuniv.nl/handle/1887/18567
Jarlov, Carsten & Ole P. Kristensen (1978) Electoral Mobility and Social Change in Denmark, Scandinavian Political Studies,1: 61-78.


Mackie, Tom & Richard Rose (1997) *A decade of election results: updating the international almanac*, University of Strathclyde: Centre for the Study of Public Policy.


Popescu, Marina & Martin Hannavy: Political Transformation and the Electoral Process in Post-Communist Europe; data available from: [http://www.essex.ac.uk/elections/](http://www.essex.ac.uk/elections/)


Shair-Rosenfield, Sarah (2008) *Assessing the causes and effects of electoral volatility: party system fragmentation, time, and executive turnover*, A thesis submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements of the degree of Master of Arts in the Department of Political Science, Chapel Hill; [https://cdr.lib.unc.edu/record?id=uuid%3a249ecd6b-2a73-457b-9b5b-c9fcdd687ae4](https://cdr.lib.unc.edu/record?id=uuid%3a249ecd6b-2a73-457b-9b5b-c9fcdd687ae4)


Tóka, Gábor (1997) Political Parties and Democratic Consolidation in East Central Europe, University of Strathclyde: Centre for the Study of Public Policy (Studies in Public Policy; 279).


Appendix A: Election results data

Listed below are the main sources used to collect electoral data for the 31 European countries.

General sources:
Books & periodicals:
Mackie, Tom & Richard Rose (1997) *A decade of election results: updating the international almanac*, University of Strathclyde: Centre for the Study of Public Policy.

Websites:
Bochsler, Daniel: Database on sub-national results of national elections in post-communist democracies (first chamber of national parliament); data available from: [http://www.bochsler.eu/ceedata/](http://www.bochsler.eu/ceedata/).
CfIAS (The Center for Integrated Area Studies, Kyoto University): The Database on the election and political system in East Central European Countries; data available from: [http://www.seinan-gu.ac.jp/~sengoku/database/](http://www.seinan-gu.ac.jp/~sengoku/database/)
Popescu, Marina & Martin Hannavy: Political Transformation and the Electoral Process in Post-Communist Europe; data available from: [http://www.essex.ac.uk/elections/](http://www.essex.ac.uk/elections/)

Austria:

Belgium:

Bulgaria:

Croatia:
Arhiva Izbora: Election results; data available from: [http://www.izbori.hr/arhiva/arhiva.html](http://www.izbori.hr/arhiva/arhiva.html)
Cyprus:
Ministry of the Interior: Parliamentary elections 2011; data were available from: http://live.elections.moi.gov.cy (now dead link)

Czech Republic:

Denmark:
Danmarks statistik: Valgoversigt; data available from: http://www.dst.dk/valg/index.htm

Estonia:
Vabariigi Valimiskomisjoni: Riigikogu valimised; data available from: http://www.vvk.ee/arhiiv/riigikogu-valimised/

Finland:

France:
Ministère de l'Intérieur, de l'Outre-mer, des Collectivités territoriales et de l'Immigration: Législatives 2012 - Résultats France entière, métropole et outre-mer - Tour 1; data available from: http://www.data.gouv.fr/var/download/027091f0c429e219ca91adc93358731a.xls
Ministère de l'Intérieur: Résultats électoraux en France; data available from: http://www.interieur.gouv.fr/sections/a_votre_service/elections/resultats/

Greece:

Germany:
Der Bundeswahlleiter: Bundestagswahlen; data available from: http://www.bundeswahlleiter.de/de/bundestagswahlen/fruehere_bundestagswahlen/
Hungary:
National Election Office: Election results; data available from:
Vokscentrum: Parliamentary election results; data available from:

Iceland:
Statistics Iceland: Election results; data available from:
http://www.statice.is/Statistics/Elections/General-elections
Wikipedia: Alþingiskosningar; http://is.wikipedia.org/wiki/Al%C3%B3Eingiskosningar

Ireland:
Department of the Environment, Community and Local Government: Voting; data available from:

Italy:
Ministerio dell’Interno: ARCHIVIO STORICO DELLE ELEZIONI - Consultazione dati; data available from:
http://elezionistorico.interno.it/

Latvia:
Centrālā vēlēšanu komisija: Saeima elections; data available from:
Statistics Latvia: Statistics Database: Politics and Religion; data available from:

Lithuania:
The Central Electoral Commission of the Republic of Lithuania: Previous elections; data available from:

Luxembourg:
Ministère de l'Intérieur: Le site officiel des élections au Grand-Duché de Luxembourg; data available from:
http://www.elections.public.lu/fr/index.html

Malta:
Lane, John C.: Elections in Malta: Parliamentary Election Results, 1921 – 2008; data available from:
http://www.maltadata.com/

Netherlands:
Kiesraad: Databank verkiezingsuitslagen; data available from:
http://www.verkiezingsuitslagen.nl/Default.aspx
Nederlandse verkiezingsuitslagen 1918-nu; http://www.nlverkiezingen.com/
Parlamente & Politiek: Verkiezingen Tweede Kamer 1918-2010; data available from:
http://www.parlement.com/9291000/modulesf/g87hwdf0

Norway:
Statistisk sentralbyrå: Statistikkbanken: Stortingsvalg; data available from:
http://statbank.ssb.no/statistikkbanken/Default_FR.asp?Productid=00.01&PXSid=0&nvl=true&PLanguage=0&tilside=selecttable/MenuSelP.asp&SubjectCode=00

Poland:
Panstwowa Komisja Wyborcza: Elections results; data available from:
http://pkw.gov.pl/wybory-sejm-senat/

Portugal:
Comissão Nacional de Eleições: Resultados eleitoras; data available from:

Romania:
Permanent Electoral Authority: Polls results; data available from:

Spain:
Ministerio del Interior Consulta de resultados electorales; data available from:
http://www.infoelectoral.mir.es/min/home.html

Slovakia:
Statisticky urad Slovenskej republiky: Parlamentné voľby; data available from:

Slovenia:
Ministry of Public Administration: Decision-making by citizens; data available from:

Sweden:
Valmyndigheten: Tidigare val; data available from: http://www.val.se/tidigare_val/
Statistics Sweden: Demokrati: Allmänna val; data available from:
http://www.scb.se/Pages/SubjectArea____12261.aspx

Switzerland:
Schweizerische Bundeskanzlei: Nationalratswahlen; data available from:
Wikipedia: Wahl in der Schweiz;

United Kingdom:
Boothroyd, David: United Kingdom Election Results; data available from:
http://www.election.demon.co.uk/
House of Commons: Elections results: UK; data available from:
http://www.parliament.uk/topics/Election-results-UK.htm
The Electoral Commission: General elections; data available from:
http://www.electoralcommission.org.uk/elections/results/general_elections
Appendix B: Aggregate volatility estimates in the research literature

Studies/data sets with a comparative focus covering more than one country:


Bakke, Elisabeth & Nick Sitter (2005) To Stay the Course or Cross the Floor: Members of Parliament, Parties and Party Systems Change in Central Europe, Oslo: The Centre for European and Asian Studies at Norwegian School of Management.


http://www.caton.de/wahlsystem-kontext


Jäckle, Sebastian: Government Survival Example – Dataset; data available from:

http://www.sebastianjaeckle.de/teaching.html

Knutsen, Oddbjørn: Western Europe: Parties, voters and elections; data available from:

http://folk.uio.no/stvok1/

Kopecky, Petr (2007), Building Party Government: Political Parties in the Czech and Slovak


Sikk, Alan (2001) *Stability of Post-Communist Party Systems*, University of Tartu, Department of Political Science (MA Thesis); http://lepo.it.da.ut.ee/~allans/ma/ma.doc


Studies/data sets with a focus on one country:

**Austria:**


**Belgium:**


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21 I have employed this data set as it stands to calculate the volatility scores.


Croatia:

Czech Republic:

Denmark:

Estonia:

Finland:

France:
Germany:

Hungary:

Iceland:

Ireland:

Italy:


Latvia:

Lithuania:
http://www.parlamentostudiosi.lt/Nr9/9_politika_1.htm

Malta:

Netherlands:
Nederlandse verkiezingsuitslagen 1918-nu; http://www.nlverkiezingen.com/23

Norway:

Poland:

22 I have employed this data set as it stands to calculate the volatility scores.
23 This databank presents data on gains and losses for the parties participating at a pair of elections which I have used for calculating a volatility score.

Portugal:

Romania:

Slovakia:

Spain:
Ocaña, Francisco A. & Pablo Oñate (1999) Índices e indicadores del sistema electoral y del sistema de partidos: Una propuesta informática para su cálculo, Reis: Revista española de investigaciones sociológicas, 86: 223-245;
http://dialnet.unirioja.es/servlet/articulo?codigo=760050

Sweden:
http://www.scb.se/statistik/_publikationer/ME0106_2010A01_BR_ME05BR1101.pdf
Switzerland:

United Kingdom: