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Abstract

The effect of electoral rules on party systems have been well known since Maurice Duverger first proposed his famous law: that plurality elections tend to result in two party systems and proportional systems tend to multipartism. Most research on electoral rules and party systems has focused on ‘first order’ national elections. Often considered to be ‘second order’ in terms of issues and voting behaviour, European Parliament elections are also held under different electoral rules to national elections. This paper examines the effects that these ‘second order electoral rules’ have on the effective number of parties competing in EP elections. It proposes that where the district magnitude used in European Parliament elections is greater than that used in national elections, the number of parties competing in EP elections will shift over successive elections from the established national level party system towards what we would expect from the EP electoral rules in isolation. Using a combination of Taagepera’s logical quantitative modelling method and multi-level mixed-effects regression, support is found for this theory. The consequence of this finding might suggest that EP elections are becoming decoupled from national level politics. However, further analysis reveals that the size of the EP party system has a feedback effect on the size of the party system at national elections, suggesting that European and national politics are becoming more entwined than ever.

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On June 7, 1979 a unique experiment in electoral democracy began. Over the next four days voters from each of the (then) nine members of the European Community cast their ballots in the first direct elections for the European Parliament. The 1979 election – the first ever international election – marked not just a significant milestone in European integration but also the beginning of an important opportunity for the study of elections and voting behaviour. The study of simultaneous elections in multiple countries provide scholars of elections a set of uniquely comparable cases that can, as van der Eijk, Franklin, and Marsh argued after the fourth European Parliament election, give us insights into not just how voters make decisions on the European level but how the institutional and contextual factors condition vote choices more generally.¹

Many of the issues surrounding European Parliament elections have been well explored, particularly the question of how voters decide to cast their ballot. Following the first European Parliament election Reif and Schmitt proposed their ‘second order election’ hypothesis: that in the absence of any real power to change the forces that govern European integration (because such power lies outside the European Parliament), voters will cast their votes largely according to domestic political concerns.² Six European Parliament elections (a total of 118 country-election observations across 27 countries) and much scholarly attention later, Reif and Schmitt’s argument continues to frame research into European Parliamentary elections. The centrality of domestic politics in European Parliament voting has been confirmed by many subsequent studies.³ Even those who argue that European issues have at least some role to play in European Parliament voting have tended to acknowledge the persistence of second order effects.⁴ Similarly, other aspects of European


Parliament elections such as the role of campaigning and media coverage in European Parliament elections have been viewed through the second order paradigm.\textsuperscript{5}

However one aspect of European Parliament elections – that they are held using electoral systems that differ both between member-states and in some cases from the electoral system used in national elections – has received scant attention. There are of course exceptions: Kousser argues that when the rules governing European Parliament elections are less of a barrier to small parties than national electoral systems, voters will alter their voting strategies accordingly.\textsuperscript{6} Farrell and Scully investigate how differing electoral formula lead to differing electoral outcomes focusing on differences between European Parliament elections in different member-states rather than the difference between national and European Parliament elections.\textsuperscript{7} Shifting the focus away from the elections themselves, Hix has shown that whether MEPs are elected by open or closed lists is a good predictor of voting behaviour in the European Parliament.\textsuperscript{8} Similarly, Hix and Hagemann have investigated the effects of different electoral systems on the link between voters and MEPs.\textsuperscript{9} With these exceptions, the impact of differing electoral systems, particularly in the classical Duvergerian sense of the number of parties winning votes, has for the most part been overlooked.

That this is the case is perhaps understandable. If we accept that European Parliament elections are largely second order elections, then we might simply expect the party system resulting from


European Parliament elections to continue to resemble that of the national party system. Similarly the prevailing view is that European integration more generally has had a limited impact on national party systems.\textsuperscript{10} There are two areas where scholars have argued that European integration \textit{has} had an impact on national party systems. First, because many policy areas are now decided at the European level, it has restricted the space in which parties can compete.\textsuperscript{11} Secondly, because of the number of decisions taken in intergovernmental meetings and the fact that parties have not yet come up with mechanisms in response to this development, European integration has increased the power of executives \textit{vis-à-vis} their parties.\textsuperscript{12} One area where there is a clear consensus that European integration has \textit{not} had a major impact on national party systems is on the political cleavages on which parties compete: many scholars agree that party competition over Europe may have the \textit{potential} to redraw the lines of party competition, but for the moment at least, it has not actually done so.\textsuperscript{13}

Whilst the above may be true, this paper argues that because scholars have tended to look for some sort of ‘European’ impact of European integration on party systems they have missed an important effect of European Parliament elections on national party systems. This paper examines the effect of European Parliament elections simply qua elections and argues that where the electoral system used for European Parliament elections is more permissive (that is, has a larger district magnitude) than the system used in national elections, the party system produced by European Parliament elections will come to resemble what we would expect from that electoral system alone. For reasons that will be made clear, we should not expect the effect of this change to be limited to the European arena: a consequence of the growth in the size of the party system at the European level may be followed by the subsequent growth of the size of the party system at the national level as well.

That this might be the case is easy to see from a cursory glance at the evidence. In the first European Parliament elections in 1979, four parties won seats in Germany and France. At the most recent elections in 2009 six parties won seats in Germany and seven won seats in France. Similarly, several


small parties, such as the French and British Greens, achieved representation in the European Parliament before winning seats in the national legislatures. In order to understand why these developments have happened and to assess these claims more systematically it is necessary to turn to the literature on the effects of electoral systems.

Electoral systems and the size of party systems

In the 1950’s the French sociologist Maurice Duverger first proposed what has since become known as Duverger’s law: that the plurality electoral rule tends to result in a two-party system and that more proportional systems tend to result in multipartism.\(^\text{14}\) This basic insight has been expanded, systematised, and generalised by many scholars in the ensuing decades and has become a cornerstone of electoral research.\(^\text{15}\) In its generalised form, Duverger’s law has come to mean that the more permissive an electoral system (usually measured in terms of district magnitude – i.e. the number of candidates elected by each electoral district), the larger the resulting party system.

As expressed by Cox, Duverger’s law arises because of the needs of voters and elites to strategically coordinate their electoral behaviour so as not to waste their vote or candidacy by supporting a losing party.\(^\text{16}\) Elections are difficult strategic coordination exercises for two reasons – everyone votes at approximately the same time and vote choices remain unknown until after the end of the election. Consequently voters and elites must rely on information from previous elections in order to solve their coordination problems.

Take the case of a plurality election - since there is only a single winner, voters will tend to support one of two parties. Those who approve of the winner of the previous election will continue to support that candidate happy in the knowledge that many others do so as well. For those that oppose the previously winning candidate their best chance of electing a different candidate is to pool their votes together on the next most likely to win, the second most popular candidate at the previous election. Extending the argument beyond individual candidates to political parties, elites who do not wish to waste their candidacy running for an unviable party and so will only run for one of the two most viable parties – the previous winning party and the party that came second.


\(^{16}\) Cox, *Making Votes Count.*
This argument extends to more proportional electoral systems as well, and Cox proposes a generalisation of Duverger’s law as the number of serious candidates running in an election will be the number of candidates elected by a district plus one.\(^\text{17}\) For example, in a district that elects four candidates voters and elites who do not support any of the previously winning candidates will support the next most viable candidate: the one who came fifth in the previous election. As the district magnitude increases an electoral system becomes more permissive in the sense that it facilitates electoral coordination because a smaller number of elites and voters need to coordinate their preferences in order to win seats and so the risk of wasting your vote by voting for a smaller party is lower.

If we imagine some sort of hypothetical electoral ‘state of nature’ where no previous elections have been held and there are no established political parties, we would expect that if an election were held there would be many ‘wasted’ votes and parties as there was no previous information by which voters and elites could coordinate. Over successive elections however it would gradually become clear which candidates and parties were proving popular and the number of serious parties would approach what we would expect from Duverger’s law.

Turning to European Parliament elections - from the above we would expect a similar pattern to the electoral state of nature described above, except that the starting party system will not be the numerous parties of the state of nature, but the already existing party system established by national elections. If the electoral system used in European Parliament elections is approximately the same as that used in national elections then we would expect no change to the resulting party system at European Parliament elections. If however we would expect the electoral system used at European Parliament elections to produce a party system size that is different to national elections (that is Duverger’s law is correct and applies equally to ‘first’ and ‘second’ order elections) then over successive European Parliament elections the resulting electoral party system will move from being very similar to the national party system to what we would expect from the electoral system used for European Parliament elections in isolation. As we shall see, in no cases are European Parliament elections run under electoral rules that we would expect to result in a substantially smaller party system than the national party system, and so we have two types of European Parliamentary electoral systems – those in which we would expect the resulting party system to remain the same as the national party system, and those in which we would expect the party system to get larger (i.e. the electoral system is more permissive). This leads to the first hypothesis:

\(^{17}\) Ibid.
Hypothesis 1: When the electoral system used at European Parliament elections is more permissive than that used in national elections, the size of the party system at European Parliament elections will grow over consecutive elections from the size of the national party system to what we would expect from the European Parliament electoral system as predicted by Duverger’s Law.

If support for hypothesis 1 is not found there are at least two plausible reasons why this might be the case – first, that Duverger’s law does not apply to second order elections, or secondly that more generally Duverger’s law is simply not true.

Duverger’s Law and Second Order Elections

In the first case it is easy to understand why the second order nature of European elections might be considered a reasonable objection to the theory of the Duvergerian effects put forward here: although the literature on European Parliament elections does not deal explicitly with Duvergerian effects, a reasonable corollary of European Parliament elections being decided primarily by domestic political concerns is that party systems will continue to resemble existing national party systems. This point underlines a key aspect of the effect of electoral systems in producing party systems: electoral systems do not operate directly on party systems themselves, rather they facilitate the actions of elites and voters in deciding elections, and so there are no grounds to expect that Duverger’s law should only apply to national elections. Rather we must look to the motivations of elites and voters in understanding how electoral rules facilitate party system change.

If elites have no interest in altering the existing party system and/or voters have no interest in shifting their support for existing parties, then we will observe no change in the resulting party system, regardless of the electoral system in use. If however a sufficient number of voters and members of the elite decide that they wish to support a new electoral party or alter the balance of power between the existing parties then the ease with which they can do so will be determined by the electoral rules at play. If the electoral system at European Parliament elections is the same as at national elections then elites and voters may find that the party system is already ‘full’, making the entry of a new party difficult. A more permissive set of electoral rules at the European Parliament level introduces a gap between the existing party system and the potential party system, allowing space for the entry of new parties. The motivations for elites and voters may well be second order in the sense that they are motivated by domestic rather than European political concerns. Whether they are or not does not alter the theory presented here (though it may determine which parties are supported), which simply assumes that some new party or parties wish to enter the party system and/or existing parties wish to alter the balance of the party system, and that voters are willing to
support them. If these assumptions do not hold then the predicted growth of the party system will not occur. Given the existence of parties which have entered representative politics at European Parliament elections and the fact that voters have voted for them in European Parliament elections suggests that these assumptions are not unreasonable.

If the above is correct and support is found for hypothesis 1, the increase in the size of the party system at European Parliament elections in some countries will also have implications for our understanding of the role of European Parliament elections in national politics. One question raised by the theory offered here is how a growth in the party system at the European Parliament level will impact on the party system at the national level. If Duverger’s law applies in an absolutely strict fashion then we would not expect any change at the national level. If this was the case however this would have a serious implication for the second order election paradigm as it would suggest that the party system at European Parliament elections was becoming decoupled from the national party system. However, an understanding of elections as an exercise in which elites and voters must coordinate their preferences suggests that this will not happen and that the national party system will grow alongside the European Parliament party system.

Just as European Parliament elections are not run in isolation from national elections, neither are national elections run in isolation from European Parliament elections. If European Parliament elections are primarily concerned with domestic politics then it should not be surprising if elites and voters look to European Parliament elections for information about the preferences of others with regard to national politics. If European Parliament elections are run under more permissive electoral rules than national elections, then this will facilitate the entry of new parties (or the growth of support for existing parties) into national politics because they provides an arena in which the potential supporters of such parties can coordinate their preferences at a lower cost than in national elections. The existence of a secondary arena in which to coordinate electoral preferences may help overcome the Duvergerian effects of a more restrictive electoral system and so the resulting party system at the national level may outstrip the size of the party system we would expect from Duverger’s law.

**Hypothesis 2: If the size of the party system at European Parliament elections increases then this will lead to a corresponding increase in the size of the party system at national elections.**

**The Validity of Duverger’s Law**

Although Duverger’s law is one of the most widely cited ideas in the study of elections, it has recently come under attack on two fronts. First, some scholars of the origins of electoral systems have argued that the frequently observed correlation between the permissiveness of an electoral
system and the size of a party system occurs not because of any effects of the electoral system but that electoral systems are in fact endogenous to party systems because they are originally chosen by the parties which run in those elections. Although the historical basis of some of these arguments has been criticised, it is not necessary for the theory proposed here to dispute the argument that in most cases electoral systems are endogenous to party systems. It is only necessary to disagree with the implication of this argument - that the fact electoral systems are largely endogenous to party systems means that there are no electoral system effects as proposed by Duverger’s law. Here endogeneity is just as much of a problem for those who argue that there are no Duvergerian effects because parties choose electoral systems as it is for those who support it: the existing research has no way of knowing whether Duvergerian effects would exist if an electoral system was imposed exogenously.

European Parliament elections provide a unique opportunity to examine the validity of Duverger’s law because European Parliament elections approximate a natural experiment on the effects of electoral systems. The electoral systems used in European Parliament elections are ultimately decided by the member states and so studying European Parliament elections does not entirely overcome the endogeneity problem, but at the very least, the choice of electoral system in European Parliament elections is influenced by exogenous factors.

Throughout the history of European integration, various attempts have been made to introduce uniform electoral procedures to elect the European Parliament. Long before the first European Parliament elections were held, article 138(3) of the Treaty of Rome declared that:

“The Assembly [European Parliament] shall draw up proposals for elections by direct universal suffrage in accordance with a uniform procedure in all Member States. The Council shall, acting unanimously, lay down the appropriate provisions, which it shall recommend to Member States for adoption in accordance with their respective constitutional requirements.”

Despite several proposals from the then European Parliament, it was not until 1976 that the Council finally agreed to implement the direct election of the European Parliament. The design and adoption of

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of ‘uniform procedure’ was deferred until a later date and elections in the meantime were to be held according to national procedures.

After repeatedly failing to reach agreement on any uniform procedures the general principle was reasserted in the Maastricht Treaty (Section E, Article 40 of the provisions amending the Treaty of Rome) before being amended by the Amsterdam Treaty (Article 38) to include the watered down provision that European Parliament elections be held using “uniform procedure... or in accordance with principles common to all Member States”. In 2002 the European Parliament and Council finally agreed some common principles: that elections to the European Parliament would be held using some form of Proportional Representation, that member-states were free to establish constituencies provided they did not affect proportionality, and that electoral thresholds could not exceed 5 percent. At the time of the agreement these principles simply affirmed the existing arrangements for electing MEPs to the European Parliament. Importantly though, this decision restricts the choice of electoral system for European Parliament elections available to member-states joining the EU after 2002.

Perhaps more importantly, even for the member-states that established their electoral procedures for European Parliament elections prior to the agreement, one important determinant of the permissiveness of the electoral system used was established exogenously: the number of seats each member-state has in the European Parliament. The number of MEPs allocated to each member-state has been negotiated in the various EU treaties but is essentially determined in proportion to the relative population size of each member-state. This fact, particularly when combined with the decision of most member-states to implement a single national constituency, has been an essential factor in determining the district magnitude of the electoral system used for European Parliament elections. Consequently, as figure 1 illustrates, although in some cases the European Parliament district magnitude falls into or near the range we would expect if electoral system choice was simply endogenous to party system size, in many cases it does not: in 56 percent of the times European Parliament elections have been held in member-states, they have been held using a more permissive electoral system than that used in national elections.

This provides the perfect opportunity to test the arguments of those who have disputed the causal effects of Duverger’s law. Colomer has argued that the growth of a party system occurs before the introduction of a more proportional electoral system and they do not continue to grow following its introduction, and consequently the only effect of the permissiveness of an electoral systems is to

20 The correlation between the number of seats a member-state has in the European Parliament and district magnitude used in European Parliament elections is $r = 0.6018$. For comparison, the correlation between assembly size and district magnitude for national elections in EU member-states is $r = -0.2689$. 
reinforce existing party systems rather than alter them. Consequently, if hypothesis 1 is correct and the European Parliament party system size of those member-states using more permissive electoral systems does increase, it will show not only the effects of European Parliament elections but also the more general validity of Duverger’s law.

![Figure 1](image1.png)

*Figure 1. Observed relationship between the size of a national party system and the district magnitude used at European Parliament elections and the relationship we would expect if district magnitude was endogenous to party system size (the scales shown are logarithmic).*

A second objection comes from scholars who have disputed the validity of Duverger’s law for plurality national elections. The crux of this argument is that outside of the United States we simply do not observe the Duvergerian expectation of two party competition in plurality elections. Again, the present theory does not dispute this empirical finding but rather the reason that it occurs. As has already been discussed, elections at one level do not occur in isolation from elections at another.

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21 Colomer, “It’s Parties That Choose Electoral Systems (or, Duverger’s Laws Upside Down).”

22 The boundaries of the expected relationship are calculated by solving Taagepera’s generalisation of Durverger’s law: \( N_p = 1.25 (2 + \log M) \pm 1 \) (this is discussed in more detail later) for district magnitude \( M \) rather than party system size \( N_p \), with the conceptual limit that district magnitude must be at least 1.

level, and so the reason we may not observe the expected Duvergerian pattern in national elections is because subnational and supranational elections (which may be held with different electoral systems) provide additional arenas in which to coordinate political preferences.

The analysis here can only directly address one of the cases covered by Dunleavy and Diwaker, the United Kingdom, because it focuses only on EU member-states.²⁴ Although the present analysis cannot offer a direct refutation of Dunleavy and Diwaker’s argument, if hypothesis 2 is correct then this will provide support for the alternative explanation outlined above which suggests it would be premature to reject Duverger’s law. In previous work Dunleavy has addressed the interaction of different electoral systems in the UK, arguing that the introduction of more proportional electoral systems for European Parliament and devolved elections indicated that the UK was undergoing a ‘Colomer shift’ in its electoral systems (i.e. that party system change precedes electoral system change).²⁵ It is interesting to note however that the UK party system grew by the same amount in the three general elections following the introduction of more proportional rules for some elections in 1999 (from 3.2 to 3.7 effective electoral parties) as it did over the 15 elections held between 1945 and 1997 (from 2.7 to 3.2 effective electoral parties).

Data and Methodology

Analysis is conducted on a dataset of the 118 times a European Parliament election has been held in an EU member-state. Data was gathered on the mean district magnitude and size of party system, measured using Laakso and Taagepera’s effective number of electoral parties ($N_v$), for each European Parliament election and national elections.²⁶ Data on the size of the party system is taken from the ParlGov database.²⁷ Data on the district magnitude at national elections is taken from Bormann and Golder.²⁸ District magnitude for European Parliament elections are new calculations based on the allocation of European Parliament seats at each election and the number of European Parliament constituencies in each country.

The methodological approach taken to analyse this dataset is a combination of two methods: logical quantitative modelling and multilevel mixed-effects regression. Underpinning the analysis is a

²⁴ Dunleavy and Diwakar, “Analysing Multiparty Competition in Plurality Rule Elections.”
consideration of the introduction of European Parliament electoral systems using the logic of a
natural experiment, with the ‘treatment’ condition being whether or not an EU member-state uses a
more permissive electoral system for European Parliament elections than they do for national
elections. By the strict standards of a natural experiment the allocation of EU member-states into
the treatment condition would not meet the as-if random criteria. Given the nature of the
‘treatment’ in the analysis it should not be surprising that the mean national district magnitude in
the treatment condition is on average smaller (7.52) than in the control condition (36 - though
without the inclusion of the Netherlands and Slovakia which both have single national districts with
a magnitudes of 150 the average is much more similar at 11.57) and the European Parliament
district magnitude is on average larger in the treatment condition (41.13) than in the control
condition (10.13). That the treatment is not distribute as-if random necessitates a modelling
approach that goes beyond simply measuring the treatment effect, but as will be seen, the logic of
experimentation underpins the model developed here.

The allocation of cases into the control and treatment conditions is shown in table 1 below. In three
cases (Austria, Finland, and the United Kingdom) different elections in each country are allocated to
different conditions because of changes to the European Parliament election system. In the case of
Austria and Finland, a decrease in the number of seats allocated to them decreased the district
magnitude to a point where it was no longer more permissive than domestic elections. In the case of
the United Kingdom the electoral system was changed from a plurality system to a proportional
system for European Parliament elections from 1999 onwards.

<table>
<thead>
<tr>
<th>Control</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>Austria 2004-</td>
<td>Austria 1996-1999</td>
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<tr>
<td>Belgium</td>
<td>Bulgaria</td>
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<tr>
<td>Cyprus</td>
<td>Czech Republic</td>
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<tr>
<td>Estonia</td>
<td>Denmark</td>
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<tr>
<td>Finland 2009-</td>
<td>Finland 1996-2004</td>
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<tr>
<td>Ireland</td>
<td>France</td>
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<tr>
<td>Latvia</td>
<td>Germany</td>
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<td>Lithuania</td>
<td>Greece</td>
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<td>Luxembourg</td>
<td>Hungary</td>
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<td>Malta</td>
<td>Italy</td>
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<td>Netherlands</td>
<td>Portugal</td>
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<td>Slovakia</td>
<td>Romania</td>
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<tr>
<td>Slovenia</td>
<td>Spain</td>
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<tr>
<td>United Kingdom 1979-1994</td>
<td>Sweden</td>
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<tr>
<td>United Kingdom 1999-</td>
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</tr>
</tbody>
</table>

TABLE 1. ALLOCATION OF CASES INTO CONTROL AND TREATMENT (EUROPEAN PARLIAMENT ELECTORAL
SYSTEM MORE PERmissive THAN NATIONAL ELECTORAL SYSTEM) CONDITIONS.
In order to develop a model of the effect of a more permissive European Parliament electoral system this paper adopts the logical quantitative approach developed by Taagepera. Taagepera identifies a number of problems with traditional approaches to quantitative social science including: the frequent limitation of hypotheses to purely directional effects which results from the absence of a priori predictive modelling, and the assumption that variables relate to each other either additively or multiplicatively which if taken to their logical ends predict absurdities and logical impossibilities and fail to capture all possible relationships between variables. Taagepera’s solution to this problem is to introduce a modelling technique based on the logical and conceptual limits and anchor points of the relationship of variables to one another. The end result is a mathematical expression of a theoretical model, with only a small number of coefficients (usually one) to be empirically estimated. An additional advantage of Taagepera’s method is that it allows us to form links between different models, allowing us to substitute values from one model into another. In short, a method which resembles other sciences quite closely. Although Taagepera’s approach has yet to enter the mainstream of social science research, it has found an increasing acceptance in the field of electoral systems – an area Taagepera identifies as particularly appropriate to the logical quantitative modelling approach because unlike many areas of social science it contains many variables that have a natural zero values (ratio variables).

Two logical models are developed here: one to model the effect of the permissiveness of an electoral system on the size of the European Parliament party system (hypothesis 1), and a second to model the effect of the consequent growth in the European Parliament party system on the size of the national party system (hypothesis 2). In each model there is only one constant (coefficient) to be determined empirically. In order to do so, multilevel mixed-effects modelling with random slopes for each member-state is used. The end result of this technique is that a series of ‘country constants’ are estimated rather than a single universal constant for each model. Although a universal constant for each model would be desirable from a theoretical standpoint, statistical tests show that the


30 An amusing but telling illustration of Taagepera’s argument he asks whether traditional social science methods can find the law of gravity. Taagepera asks several eminent social scientists (who retain their anonymity) if they can uncover the relationship between a set of variables generated by the law of universal gravitation \(F = \frac{GMm}{r^2}\). The answer to Taagepera’s question is a resounding no.

country constant approach fits the model significantly better – suggesting that factors outside the scope of the models influence the rate at which the effects proposed here apply to each country.

A logical quantitative model of European Parliament party system size

The theory of the effect of district magnitude on the European Parliament party system size has two logical and one conceptual limits: the number of parties in the party system and the number of European Parliament elections held cannot be less than zero, and the upper limit on the number of parties in the party system is determined by Duverger’s law. Taagepera suggests that when the relationship between two variables \( x \) and \( y \) is constrained on three sides as is the case here the simplest way to model the relationship is to make the slope of the equation proportional to the remaining distance to the ceiling.\(^{32}\)

\[
\frac{dy}{dx} = k(C - y)
\]

Where \( C \) is a finite ceiling value for \( y \).

And \( k \) is a positive constant.

This corresponds to an equation describing the exponential approach to ceiling:

\[
y = C \left(1 - e^{-kx}\right) + y_0
\]

Where \( y_0 \) is the value of \( y \) when \( x = 0 \).

This equation captures the hypothesised relationship proposed here: When the electoral system used at European Parliament elections is more permissive than that used in national elections, the size of the party system at a European Parliament election \( y \) will increase from the number of parties at the national election prior to the first such European Parliament election held \( (y_0) \) at some rate \( (k) \) over subsequent elections \( (x) \) until the size of the party system has increased by the degree predicted by Duverger’s law \( (C) \).

We can measure some of these variables directly. The dependant variable for each European Parliament election \( i \) is the size of the party system measured by the effective number of electoral parties: \( N_{Ve_i} \). The size of the ‘base’ party system is measured by the size of the national party system before the first European Parliament election is held: \( N_{v_0} \). The proposed effect is hypothesised to take place over subsequent elections \( E \) following the introduction of a more permissive electoral system for European Parliament elections. The ceiling of the effect of the electoral system \( C_i \) is

calculated by subtracting the base party system $N_{Vn}$ from the ‘maximum’ size of the party system for each European Parliament election: $N_{Vemaxi}$. In order to calculate $N_{Vemaxi}$ Taagepera and Shugart’s mathematical generalisation of Durverger’s law is used:\(^{33}\)

$$N_V = 1.25 \left(2 + \log M\right) \pm 1$$

Where $M$ is the district magnitude.

Due to calculation problems caused by the observed $N_{Ve_i}$ being greater than the estimate of $N_{Vemaxi}$ in six cases (the model is estimated, as outlined below, relies on calculating the difference between $N_{Vemaxi} \left[C_i + N_{Vn}\right]$ and $N_{Ve_i}$; if $N_{Ve_i}$ is greater than the estimate of $N_{Vemaxi}$ then calculation is impossible as the log of a negative number is undefined) an additional ‘effective party’ is added to the estimate, so $N_{Vemaxi}$ is calculated as:

$$N_{Vemaxi} = 1.25 \left(2 + \log M\right) + 2$$

Substituting all of these variables into the earlier equation yields a logical quantitative model of the effect of a more permissive electoral system for European Parliament elections on the size of the party system:

$$N_{Ve_i} = C_i \left(1 - e^{-KE}\right) + N_{Vn}$$

This model is illustrated in figure 2.

The experimental logic underpinning the model is that when the European Parliament electoral system is not more permissive than that used at national elections there will be no additional effect of the electoral system (that is $C_i$ equals zero). When this is the case the model simplifies to:

$$N_{Ve_i} = N_{Vn}$$

In other words, the model predicts that when there is no ‘treatment’ of a more permissive electoral system at European Parliament elections, the size of the party system at European Parliament elections will not change from its initial size. $N_{Ve_i} = N_{Vn}$ also serves as the null hypothesis for the treatment cases.

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\(^{33}\) Taagepera and Shugart, *Seats and Votes: The Effects and Determinants of Electoral Systems*, 145.
FIGURE 2. AN ILLUSTRATION OF THE LOGICAL QUANTITATIVE MODEL OF EUROPEAN PARLIAMENT PARTY SYSTEM SIZE.

In order to estimate the rate \((k)\) at which the change in party system size occurs it is necessary to rearrange the equation to a linear equation with \(E\) as the right hand side (independent variable) side of the equation.

Taking \(N_{Ve}\) from both sides of the equation, dividing both sides by \(C_i\) and subtracting one from both sides yields:

\[
\frac{C_i - N_{Ve} + N_{Vn}}{C_i} = e^{-kE}
\]

Taking the natural logarithm of both sides yields:

\[
\log(C_i - N_{Ve} + N_{Vn}) - \log(C_i) = -kE
\]

Regressing the values of \(-\log(C_i - N_{Ve} + N_{Vn}) - \log(C_i)\) on \(E\) for the 67 treatment cases using multi-level modelling with random slopes will yield an estimate for \(k\) for each country, the results of which are shown in table 2.
The results in table 2 show that all but two of the countries (Finland and Spain) meet the first criteria for assessing the logical quantitative model: that $k$ is positive (because the hypothesised direction of change is an increase in the party system). In both Finland and Spain the decrease in the size of the European Parliament party system modelled by the negative $k$ here corresponds to a similar decrease in the size of the national party system despite Duvergian ‘space’ for more parties, and so it seems that the key assumption of the theory offered here - that some new party or parties wish to enter the party system and/or existing parties wish to alter the balance of the party system, and that voters are willing to support them – does not hold in these cases. Consequently Finland and Spain are excluded from further analysis so as not to bias the estimates of model fit by including possibly well-fitting estimates that go in the opposite direction to that predicted by the theory.

Now that we have an estimate of $k$ for each country we can estimate the model for each country and assess how well it fits the data. Figure 3 illustrates the fit between the $N_{Ve_t} = N_{Vn}$ model for the control cases, and the full ($N_{Ve_t} = C_i (1 - e^{-kE}) + N_{Vn}$) and null ($N_{Ve_t} = N_{Vn}$) models for the treatment cases. The R-squared values for each of these three models are 0.63, 0.70, and 0.49 respectively. The difference between the goodness of fit of the $N_{Ve_t} = N_{Vn}$ model between the control and treatment conditions suggests that there is indeed some treatment effect of having a more permissive electoral system at the European Parliament level. Using the $N_{Ve_t} = N_{Vn}$ model residuals as a measure of the change in the party system from $N_{Vn}$, a t-test was conducted to see whether the difference in model fit represents a statistically significant treatment effect, which
supports the argument that there is indeed a treatment effect: \( t(106) = 2.1242, p<0.05 \). The improved fit of the \( N_{\theta} = C_i(1 - e^{-\lambda E}) + N_{\theta_n} \) model suggests that as was predicted in hypothesis 1, this treatment effect is an increase in the size of the party system. That the full model is a better fitting model than the null model for the treatment condition is confirmed by an F-test: \( F(3, 58) = 57.29 \), statistically significant below the \( p<0.01 \) level, confirming hypothesis 1.

Figure 3 illustrates the fit between the model and the data for each of the countries in the treatment condition and forecasts party system change for the 2014 and 2019 European Parliament elections. As with almost all comparative research the model fits some cases better than others. In three countries – Germany, Sweden, and the UK – the model matches the observed data very closely. In countries with more volatile changes in to the party system (which suggests that changes other than the Duvergerian effects of European Parliament elections is affecting party system size) the data matches the model less well.
A logical quantitative model of the effect of European Parliament elections on national party system size

The proposed feedback effects of an increase in European Parliament party system size on the size of national party system size can be modelled in much the same way as the earlier model. Again the model is constrained on three sides: the number of elections and size of the party system cannot be less than zero, and here the ceiling is provided not by institutional determinants but by the size of
the European Parliament party system. Thus the model proposes that the size of the national party system at national elections following a European Parliament election ($N_{V_{nE+1}}$) will increase from the initial party system size ($N_{V_n}$) by the differences between the size of the European Parliament party system size and the initial party system size ($N_{V_{EE}} - N_{V_n}$) at some rate ($r$) over consecutive elections ($E$):

$$N_{V_{nE+1}} = (N_{V_{EE}} - N_{V_n})(1 - e^{-rE}) + N_{V_n}$$

This model, and its relationship to the model of European Parliament party system change is illustrated in figure 5.

Again because $N_{V_{EE}}$ is predicted to be $N_{V_n}$ by the earlier model, the difference between them is zero in the control condition and so again the model predicts that there will be no change in the size of the national party system, which also models the null hypothesis for the treatment cases:

$$N_{V_{nE+1}} = N_{V_n}$$
The model is then rearranged into a linear model in the same way as the first model and a multilevel mixed-effects regression with random slopes is run to calculate values for $r$. The $r$ for each country is shown in table 3, with the exclusion of Hungary in which $r$ could not be calculated because of calculation problem caused by the log of zero being undefined. The results in table 3 indicate that all of the countries in the treatment condition meet the requirement of having a positive value for $r$, indicating an overall increase in the size of the national party system.

<table>
<thead>
<tr>
<th>Country</th>
<th>$r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria 1996-1999</td>
<td>.2630202</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>.0361775</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>.108582</td>
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<tr>
<td>Denmark</td>
<td>.0446544</td>
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<tr>
<td>France</td>
<td>.0461233</td>
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<tr>
<td>Germany</td>
<td>.3428493</td>
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<td>Greece</td>
<td>.1123378</td>
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<td>Italy</td>
<td>.249852</td>
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<tr>
<td>Portugal</td>
<td>.12022</td>
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<tr>
<td>Romania</td>
<td>.1437991</td>
</tr>
<tr>
<td>Sweden</td>
<td>.1478426</td>
</tr>
<tr>
<td>United Kingdom 1999-</td>
<td>.1463123</td>
</tr>
<tr>
<td></td>
<td>.1468142</td>
</tr>
</tbody>
</table>

**TABLE 3. ESTIMATES OF $r$ FOR EACH OF THE COUNTRIES IN THE TREATMENT CONDITION.**

Using these values of $r$ we can then assess how well the model fits the data. Table 4 illustrates the fit between the $N_{v_{nE+1}} = N_{v_n}$ model for the control cases and the $N_{v_{nE+1}} = (N_{v_{E}} - N_{v_n})(1 - e^{-rE}) + N_{v_n}$ and $N_{v_{nE+1}} = N_{v_n}$ models for the treatment cases. The $R$ squared values for these models are 0.71, 0.68, and 0.54 respectively, again indicating that the null model fits the control cases better than the treatment cases and the full model fits the treatment cases better than the null model. However although the mean null model residuals are greater for the treatment cases (0.55) than the control cases (0.47), a $t$ test is not statistically significant: $t(92)=-0.3458$, $p=0.3652$. That this is the case may be partly due to a reduced $n$: for 15 European Parliament elections the next European Parliament election was held prior to the next national election (usually when European Parliament elections were held earlier on accession to the EU) and so there is no observation for $N_{v_{nE+1}}$. Additionally the $N_{v_{nE+1}} = N_{v_n}$ model assumes that that there will be no change in the national party system for any reason, and not just as a result of European Parliament elections – the $t$-test fails not because there is no change in the national party system in the treatment conditions, but because there are changes to the party system size in some of the control cases. An $F$ test confirms that the
full model fits the control cases better than the null model: $F(3, 58) = 27.76$, statistically significant below the $p<0.01$ level, offering some support for the theory that European Parliament elections are exerting some influence over national party system size. The combination of all of this evidence offers mixed support for hypothesis 2 – we cannot reject the hypothesis because it is clear that there are changes in national party system size, but we cannot completely accept it either because there are changes in party system size in the control condition as well. The model used here is not fine grained enough to account for changes in party system size due to other reasons, but the evidence here does that at least suggest that the possible effects of European Parliament elections on national party systems.

Table 4. Fit between predicted and observed size of national party system by model.

Figure 6 illustrates the fit between the model and the data for the countries in the treatment condition and forecasts party system change resulting from the 2014 and 2019 European Parliament elections (using the earlier forecast for the European Parliament party system size at those elections. Again, although some cases fit the data better than others, the overall picture tends to support the theory of an influence of European Parliament party system size on national party system size.

Conclusion
This paper set out to analyse two questions: have there been Duvergerian effects of European parliament electoral systems, and if there are, are they feeding back into national party systems or are European Parliament elections becoming decoupled from national elections? The evidence strongly supports the argument that there have indeed been Duvergerian effects of European
Parliament electoral systems. In member-states where more permissive electoral systems are used for European Parliament elections there has tended to be growth in the size of the party system along Duvergerian expectations.

FIGURE 6. OBSERVED, FITTED, AND FORECAST SIZE OF NATIONAL PARTY SYSTEM.
That this is the case is an important finding for scholars of both European Parliament elections and electoral systems more generally. Although a great deal of attention has been paid to voting behaviour in European Parliament elections, the importance of the relationship between national and European Parliament electoral systems has been missed by most of the existing scholarship. The evidence here also strongly supports the validity of Duverger’s law against those who have argued that we only observe the correlation between electoral and party systems because of endogeneity. When an electoral system is introduced due to at least some exogenous influence, as is the case of some European Parliament elections, we see that the resulting party system is predicted by the permissiveness of the electoral system.

The evidence for the second question – how have changes to European Parliament party systems impacted on national party systems – is more ambiguous. On one hand, the model which predicts a change in national party system that corresponds to the size of the European Parliament party system clearly and statistically outperforms a model suggesting that there will be no such change. On the other hand though, the evidence for a ‘treatment effect’ on national party system size is ambiguous. Although national party systems in member-states that have more permissive European Parliament electoral systems have on average grown more than those that do not, the difference is not statistically significant.

At the very least this results indicates that the impact of European Parliament elections on national party systems is an area worthy of further scholarly attention. Even if there is a feedback effect of European Parliament party system size onto national party system size, some of the results here raise more questions about the nature of that effect than they answer. Why for instance, is it the case that in some countries, such as Germany, the size of the national party system has tracked the size of the European Parliament party system quite closely, whilst in others, such as Sweden and the UK, although there has been an increase in the size of national party systems following European Parliament elections, the magnitude of the effect has lagged behind the change in the European Parliament party system itself? Is the resulting gap between the sizes of the two party systems evidence that the party system at European Parliament elections is being decoupled from national politics in some countries, or is it simply that because of considerations at national elections the feedback effect is simply occurring more slowly?

To reiterate the remarks of van der Eijk, Franklin, and Marsh: European Parliament elections do not just tell us about Europe, they also give us insights how institutional and contextual factors condition vote choices more generally. The questions raised in this paper also have broader implications for

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34 van der Eijk, Franklin, and Marsh, “What Voters Teach Us About Europe-Wide Elections.”
research on electoral systems. Too often elections and electoral systems are studied as if they exist in a vacuum. Although European Parliament elections may be unique as the only supranational elections in the world, many other countries have experience with using different electoral systems for different elections, whether for different chambers of parliament, for presidents and legislatures, and regional or local elections. How these different elections interact in determining political outcomes is a seriously neglected area of the study of politics, which has tended to assume that only the electoral system for the most important political arena matters. The results here suggest that we have been wrong to do so and that the electoral system of ‘second order’ elections like the European Parliament may well have important consequences for first order politics.
References


Grofman, Bernard. “Constraints on the Turnout Gap Between High and Low Knowledge (or Income) Voters: Combining the Duncan-Davis Method of Bounds with the Taagepera Method of


