

# Are Mixed Electoral Systems the Best Choice for Central and Eastern Europe or the Reason for Defective Party Systems?

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*Mixed electoral systems have been celebrated enthusiastically in the literature and by political practitioners, arguing that they combine the best of both worlds with regards to several aspects of political representation. This article calls this view into question, arguing that the mixed incentives of mixed electoral systems might hamper the stabilization and institutionalization of party systems in young democracies. Empirical results from 19 democracies in Central and Eastern Europe suggest that the learning and stabilization effect that is exerted through simple electoral systems fails under mixed systems. Using a variance model analysis, this study rejects the common belief that mixed systems lead to more moderate party systems with regards to party system fractionalization. Rather, outcomes under mixed systems vary much more widely than under proportional representation, are associated with higher disproportionality, and tend to increase volatility.*

*Los sistemas electorales mixtos, que combinan sistemas electorales de mayoría con los de representación proporcional (RP), han sido alabados con entusiasmo por la literatura y los políticos, argumentando que combinan lo mejor de ambos mundos con relación a los diversos aspectos de la representación política. Este artículo cuestiona tal punto de vista, señalando que los incentivos contradictorios de los sistemas electorales mixtos podrían dificultar la estabilización e institucionalización de los sistemas de partido en democracias emergentes. Los resultados empíricos de diecinueve democracias en*

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*Europa Central y del Este sugieren que el efecto de aprendizaje y de estabilización que es ejercido en los sistemas electorales simples fracasa bajo los sistemas mixtos. Utilizando un análisis de modelos de varianza, este estudio rechaza la creencia común que los sistemas mixtos conducen a un sistema de partidos más moderado en referencia a su grado de fragmentación. En cambio, bajo sistemas mixtos, los resultados varían mucho más extensamente que bajo RP. Más aún, los sistemas mixtos están asociados con una superior desproporcionalidad que en RP y tienden a incrementar la volatilidad.*

German-style mixed electoral systems have become a bestseller in the charts of the electoral reforms since the 1990s. Mixed electoral systems, as defined here, have several overlapping sets of electoral districts for the same elected body, in which each voter gives her vote according to different electoral formulae. One part of the seats, the “PR tier,” is elected by proportional representation (PR), whereas the “district tier” usually consists of single-seat districts. This combination of two opposing logics of electoral systems is seen to moderate a number of outcomes. Mixed systems have been discussed by academics under catchphrases such as “the best of both worlds” (Shugart and Wattenberg 2001a, 592-6). They were and are frequently applied in recently democratized countries, particularly in Central and Eastern Europe. I use these countries as a laboratory to investigate the impact of mixed systems on several dimensions of the consolidation of party systems.

So far, only one comparative study has investigated the effects of mixed systems on democratic quality (Doorenspleet 2005), and its results are disappointing, showing that mixed systems are associated with worse outcomes than PR. This raises the question of the causes of this bad performance. While Doorenspleet focused mostly on aspects with a rather weak immediate link to the electoral system, this study considers several dimensions of party system development that are closely related to the electoral rules. I measure the three dimensions, interelection volatility (change in party strength between two subsequent elections), disproportionality (difference between the vote distribution on parties and the seat allocation), and party system fragmentation (number of parties in parliament). All three aspects are considered to be related both to the consolidation of party systems (Duch and Palmer 2002; Lewis 2006; Tóka 1997) and indirectly to the consolidation of democracy (Merkel 1998, 52-3; Tóka 1997).

I expect that mixed electoral systems are not able to stabilize party systems as quickly as simple electoral systems do. The literature on simple electoral systems has argued that parties and voters quickly adopt their behavior to the electoral rules, termed the *psychological effect* of electoral systems, which leads to a *learning effect* after a few repeated elections (Bakke and Sitter 2005, 251; Dawisha and Deets 2006; Duverger 1951; Tavits 2005). This leads to stable party systems with low volatility and low disproportionality (Taagepera 1999).

It is highly questionable, though, if a combination of the two opposed worlds and countervailing institutional incentives performs similarly well for the stabilization of party systems.

This study compares outcomes of electoral systems in the post-communist democracies in Central and Eastern Europe, which all have fairly similar contexts. Party systems developed concurrently and from a starting position that is more similar than in most other groups of countries which are employed in cross-national studies. Eight countries in the region have applied mixed electoral systems. My study is based on a sample of 82 elections from 19 post-communist countries, from Albania up to Russia, including also the Western Balkans countries that have widely been neglected by earlier comparative studies of party systems.

The results suggest that the learning effect is much weaker under mixed electoral systems compared to PR. The study rejects the common belief that mixed systems lead to more moderate party systems with regards to party system fractionalization. Rather, outcomes under mixed systems vary much more widely than under PR. Further, mixed systems are associated with higher disproportionality, and tend toward higher interelection volatility. I explain this as a consequence of the absent learning effect because of the complexities of mixed electoral systems.

This article first reviews the debate on the political effects of mixed electoral systems. The next section sketches out the theory of the learning effects of electoral systems, and the section after applies this theory to mixed systems. The empirical sections explain the research design, operationalization, and methodological aspects, and discuss the results of the analysis.

### **Mixed Electoral Systems and Their Effects**

Mixed electoral systems experienced their golden age in the 1990s and in the beginning of the twenty-first century (Massicotte and Blais 1999; Shugart and Wattenberg 2001b). They were often introduced as a compromise between the two extreme forms of PR and plurality and majority vote, in situations where the contending elites could not agree on one of these electoral systems in negotiations.<sup>1</sup> Likewise, they are perceived to allow moderated and better outcomes in many different dimensions of political representation and of party systems (Grotz 2000, 707-8; Kostadinova 2002; Shugart and Wattenberg 2001a).<sup>2</sup> Against this background, it comes as a surprise that Doorenspleet

<sup>1</sup> This was the case for Bulgaria (Koulov 1995, 244), Hungary (Schiemann 2001), but not so in Albania (CSCE 1992, 6; Simon 1997, 362) and Croatia (Kasapović 1996, 94-6). Elements of the best of both worlds view were present in Russia (Moser and Thames 2001, 260-5; White, Rose, and McAllister 1997) and in Ukraine (Birch 1998), while the motives for electoral reform have been mixed in Lithuania (Benoit 2004; Gelazis 2001; Mikkel and Pettai 2004, 338-9).

<sup>2</sup> Further, they combine party elements (list PR) with personality elections in single-seat districts (Shugart 2001; Shugart and Wattenberg 2001a, 582), the simultaneous election of locally linked

(2005, 40), measuring five indicators of democratic quality, concludes that “the mixture of majoritarian and proportional systems combines the defects of both systems in a new mixed type of electoral system.” Her findings are most consistent for the comparison of PR and mixed systems, while the plurality and the majority vote are often similar to mixed systems.

Early work on mixed electoral systems has suggested that the effect of both elements—PR and plurality or majority vote—can be analyzed separately, assuming that mixed systems are not much more than the combination of two distinct mechanisms (for instance Moser 1995, 377; Moser and Scheiner 2004; Reed 1999; Stratmann and Baur 2002).<sup>3</sup> Others have shown interactions between both parts of mixed systems, addressed as *contamination* (Cox and Schoppa 2002; Ferrara and Herron 2005; Ferrara, Herron, and Nishikawa 2005; Herron and Nishikawa 2001; Rose, Munro, and White 2001, and many others).<sup>4</sup> Both models expect that mixed systems lead to overall outcomes in between PR and plurality/majority vote. In their investigation of the effect of mixed electoral systems on party fractionalization, Kostadinova (2002) and Ferrara, Herron, and Nishikawa (2005, 130) find that under mixed systems, more parties are created than under the majoritarian vote, but fewer than under PR, although differences are not statistically significant.<sup>5</sup> Shugart and Wattenberg (2001a, 582-4) argue that mixed systems allow small parties to persist, particularly in the case of compensatory systems,<sup>6</sup> but still help to align parties in two electoral blocs. Research on the impact of mixed electoral systems

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legislators and national list candidates (Bawn 1999, 490-1; Shugart 2001; Stratmann and Baur 2002; Thames 2005, and many others), and mixed systems can result from compromises between players with diverging interests about which electoral system to choose (Shugart and Wattenberg 2001a, 578-81; see Schiemann 2001 for an example). Crisp (2007) criticizes these views.

<sup>3</sup> A similar operationalization can be found in Birch (2003, 127-32), who measures the impact of the share of PR mandates on volatility, and argues with specific effects of single-seat districts versus PR.

<sup>4</sup> Studies on Russia, Ukraine (Herron 2002) and Italy (Ferrara 2004), show that political parties might forgo fielding their own candidates in each district if they are linked through strategic agreements to other parties.

<sup>5</sup> In a comparative study of electoral systems in Central and Eastern Europe, Kostadinova (2002) finds that the number of parties under mixed systems is lower than under PR, but higher than under majoritarian systems. Looking at elections worldwide, Ferrara, Herron, and Nishikawa (2005) come to the same conclusion for mixed electoral systems without any compensation mechanism (mixed-member majoritarian systems), while mixed compensatory (mixed-member proportional) systems are associated with higher fractionalization than PR (none of these differences is statistically significant). Ferrara, Herron, and Nishikawa (2005, 132-7) have further attempted to link variation in the effective number of parties to the share of PR mandates, but their results are not very conclusive results. The results seem to be highly dependent on the model applied.

<sup>6</sup> Noncompensatory systems allocate seats separately in both tiers, while compensatory systems link both tiers. There, PR mandates are used for compensation and given to parties that score badly in the single-seat district, in order to establish an overall result that is close to proportional (see Shugart and Wattenberg 2001b).

on other aspects of party system institutionalization has so far remained limited, apart from exceptions. Moser (1999), for instance, argues that mixed systems lead to intermediate levels of disproportionality.

### **Institutional Incentives for a Stabilization of Party Systems**

My study of the impact of mixed electoral systems on the development of party systems is conducted at the macro level, looking at institutional effects on the party system and on the stabilization of electoral competition. I rely heavily on the approaches that have been employed to explain the impact of simple electoral systems on party systems, and I discuss the extent to which they might apply for mixed electoral systems as well. My explanation employs the idea of the psychological and the mechanical effect of electoral systems (Duverger 1951). With regards to emerging democracies, the psychological effect has also been termed the *learning effect of electoral systems* (Dawisha and Deets 2006; Tavits and Annus 2006; Tworzecki 2003).

In small electoral districts or in majoritarian systems, only a few large parties can get represented in parliament (or another elected body), while permissive electoral systems—PR in large electoral districts—also enable small political parties to compete and to win seats approximately proportional to their vote share (Cox 1997; Duverger 1951; Rae 1967; Taagepera and Shugart 1989). These outcomes result from two different effects. On the one hand, district size and the electoral formula impose a natural electoral threshold (cf. Lijphart 1994), which is low in permissive systems, or large in concentrating systems. On the other hand, political parties anticipate these electoral rules, and compete only if they are confident they can pass the threshold. Otherwise, their campaign efforts would be in vain, and they would appear in the public discussion as unviable competitors, so that voters might turn to a more viable party.

In the first postauthoritarian elections, when the electoral institutions have only recently been introduced, the political players struggle to anticipate their effect. Accordingly, many parties compete hoping for electoral success, but many will fail to pass the electoral threshold. Over time, the political players and voters adapt to the mechanics of the electoral systems. Even under highly disproportionate electoral systems, parties compete only if they are confident of their ability to convert votes for them into seats, and voters learn to vote for successful parties, so that the outcomes become highly proportional, and the number of wasted votes declines (Tavits and Annus 2006).

### **Learning in Mixed Electoral Systems**

It is questionable, though, if such a learning effect, developed for simple electoral systems, is applicable to mixed systems too. Learning relies on the clear incentives that are sent through the electoral system to the players in the

electoral game. Such clear incentives are absent, however, in mixed electoral systems.

The combination of two tiers, each with a fully different logic of seat allocation, leads to a situation where thresholds are genuinely different in both parts of mixed electoral systems. While in the PR part the threshold is determined by district size of the PR district and by possible legal thresholds, in the single-seat districts the threshold is much higher. Only a candidate with more than 50 percent support in a local district can be sure of winning the seat, although in a fractionalized field of competition, seats are often allocated to candidates that get less than 50 percent of the votes (or less than 50 percent of the votes in the first round). Highly strategically acting voters might vote with a different strategy in each of both tiers, at least if there are two distinct votes for each tier. However, one might doubt if many voters will adopt sufficiently sophisticated voting strategies that fit the institutional incentives of each of both tiers.<sup>7</sup> On the supply side of the electoral market, parties and party supporters can hardly apply different strategies in the same election, since there are synergies and positive side-effects when running in both tiers (see Ferrara, Herron, and Nishikawa 2005, 65-79, for a thorough discussion). This is why the literature speaks of a *contamination* between both tiers.

In simple electoral systems the mechanical and psychological effects eliminate excessively small parties from competition. The same process does not hold for mixed electoral systems, because small parties can fail in one part of the electoral system, but are able to survive on the basis of their result in the other tier. This results in a damaging of the logic that constrains parties mechanically and psychologically to fit to the institutional rules. We expect that under unclear incentives, many votes are cast for parties that are only partly successful, and this might result in a delay of the learning effect and in an incomplete adaptation of the party system to the electoral rules.

The expectations need to be further differentiated for the subtype of mixed systems with a compensatory element, which has the overall effect of bringing the seat allocation closer to that of PR. There, even small parties can usually win an (almost) proportional share of mandates if they pass the electoral threshold, and from this perspective, their effect on party systems might be rather similar to PR systems (provided that the compensatory element is strong enough to provide a PR-like seat allocation). Focusing on a different perspective, there might still be mixed incentives, considering that elections in the single-seat districts might contribute to a concentration on the two most prominent candidates, while the overall outcome of the electoral system is proportional.

<sup>7</sup> Strategic behavior sometimes requires a very precise understanding of the electoral rules and their impact. Whereas in simple electoral systems, information shortcuts might help voters who do not understand the details of seat allocation to behave strategically, it is questionable how efficient such processes might be under more complex rules. See Karp and others (2002) for two studies of strategic voting behavior under mixed electoral systems.

### **Variance Model: Explaining Fractionalization and Disproportionality**

While the *laboratory model* holds that both parts of mixed electoral systems work independently of each other (Moser and Scheiner 2004; Reed 1999; Stratmann and Baur 2002), the alternative *average incentive model* states that under mixed systems, there is a “balance in the strategic choice” that parties need to find, in between the different institutional incentives (Kostadinova 2002, 25; see as well Ferrara, Herron, and Nishikawa 2005). Both models expect that party fractionalization under mixed electoral systems will be lower than under PR, but higher than in the case of majoritarian rules.

My *variance model* rejects the implicit expectation that outcomes under mixed electoral systems are determined by a constant mix between both PR and majoritarian influences. We need to understand how parties react to the electoral rules, if they are large enough to win seats in one tier (theory would suggest that they will more easily get seats in the proportional tier), but too small to succeed in the other one (typically in the single-seat districts). Such parties have a basis of political power in the PR tier that might encourage them to remain in the electoral competition, and possibly to hope to win in subsequent elections. However, the failure in one of the tiers might be perceived as costly and disadvantageous. Drawing on Duverger’s (1951) psychological effect of electoral systems, I expect that for party activists and politicians it might not be satisfactory to invest in electoral campaigns if only half the votes won (those in one tier only) are converted into parliamentary seats. Lacking representatives from local districts, such parties would be less visible to potential voters. However, the constraints exerted through mixed electoral systems toward a concentration of the party system are weaker than in the case of electoral systems with single-seat districts. In certain contexts, the repeated disproportionality might create institutional pressure that is strong enough to encourage parties to merge, and the electoral competition will be concentrated on two major parties. In the absence of substantial gerrymandering or malapportionment, such a party system would also be characterized by low disproportionality, because, given the small number of competitors, only few “wasted” votes for unsuccessful parties remain. It is useful to know that in the literature on electoral systems, disproportionality and related measures, such as “wasted votes,” are employed as indicators of nonstrategic behavior of parties and voters (Duch and Palmer 2002).<sup>8</sup> Over time, under strategic behavior, disproportionality will reach low levels, regardless of the degree of

<sup>8</sup> Ordeshook and Shvetsova (1994, 106, fn 4) have made a similar argument. Other studies that have investigated the learning effect have employed the concept of “wasted votes” or “votes that are excluded from representation,” cast for parties that do not win seats in parliament (Bakke and Sitter 2005; Birch 2007, 15; Dawisha and Deets 2006; Tavits and Annus 2006, and so on). While the concept of “wasted votes” might intuitively be easier to capture than disproportionality, it relies on a crude distinction of parties that do get into parliament from others that do not, neglecting that votes might as well remain (almost) unconsidered if a party with a substantial vote share wins only very few seats, for instance when votes in one of the tiers are wasted, or when the

proportionality of the electoral system. Similarly, the disproportionality created in mixed electoral systems might, in the long run, reduce the number of parties in competition. In order not to waste their votes, or to improve their *seat–vote ratio*, parties that are only successful in one tier have very strong incentives to grow or to merge with another party.

In other contexts, the political tension between parties and the ties between voters and their parties might be strong enough for midsize parties to run despite the unfavorable electoral rules. Unlike in pure single-seat systems, they still win a certain degree of representation. If as many parties compete as the PR part of the system can accommodate, the smaller parties will face difficulties in winning seats in the plurality or majority tier, so that they cannot win a seat share that is fully proportional to their vote share. When mixed electoral systems are related to large party systems, disproportionality is thus expected to be high.

Different contexts might further complicate clear expectations about mixed electoral systems. In certain situations, parties have managed to coordinate their candidates in the single-seat district tiers, which is an indirect way of proportionalizing the seat allocation in parliament (see D’Alimonte 2001; Ferrara 2004, for the case of Italy). Whereas for simple electoral systems, there are expectations about what party systems emerge, the outcomes of mixed electoral systems might vary more, depending on context factors. Unlike previous studies, which have expected a moderate impact of mixed systems, my model suggests that there is strong variance in the systems’ outcomes.

### **Mixed Electoral Systems and Volatility**

Only a few contributions have analyzed the determinants of inter-election volatility in young democracies. They have argued that low interelection volatility matters for party system institutionalization (Mainwaring 1998) and that it supports democratic consolidation (Mainwaring and Scully 1995; Merkel 1998, 53).<sup>9</sup> Sikk (2005, 403) points out that high volatility rates in Central and Eastern Europe are driven by the emergence of new parties. Institutional explanations have shown that large district magnitude (Tavits 2005) is supportive of volatility, while in single-seat district systems it is low (Birch 2001). Birch (2003, 119-34) finds a positive effect of the share of PR mandates on the entry of new parties,<sup>10</sup> which would be contrary to my expectation about mixed systems. Most previous explanatory studies have relied on very few cases, but included a considerable number of independent variables. None of these

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party wins votes in many electoral districts, but gets a seat only in one of them. This is why disproportionality might be a more accurate measure for the degree of nonstrategic voting (see as well Anckar 1997).

<sup>9</sup>Tóka (1998, 591-2) warns that very low rates of volatility might as well be associated with political immobilization and a lack of real party competition, and strong political polarization.

<sup>10</sup>She speaks of replacement, defined as the turnover of votes created through the entry of new parties.

studies have directly related volatility to mixed electoral systems. I expect, however, that mixed systems might be important to explain electoral volatility.

I argue that under simple electoral systems with clear incentives, and in a stable electoral competition, it is difficult for new parties to emerge. In the absence of important external shocks that lead to important changes in voters' positions, we might assume that the distribution of voters in the political space is not extremely variable. In two-party systems under restrictive electoral systems, new competitors are unlikely to enter into the electoral market as a result of the high effective threshold for entry, while in multiparty systems most relevant issues are covered, so that entry is also quite difficult. Accordingly, after an initial process of adaptation to the institutional rules, it might be difficult for new parties to appear, and volatility in simple electoral systems should decline.

Mixed electoral systems might not always have the same structuring power on party systems as simple ones. They combine low entry costs (low thresholds) in the PR tier with nonproportional elements of the systems. This creates the potential for disproportionality, which provides incentives for a reshuffling of the party competition, for instance through party mergers. A reorganization of the electoral market will, however, result in volatility, because this causes a reorientation of voters and changes in the electoral strength of political parties. If a mixed electoral system has led to the concentration in two large parties, these parties cannot fully represent the political preferences of all voters accurately. Because of the low threshold, and unlike in single-seat systems, small new parties might very well try to occupy certain positions that cannot be taken by the large parties. In sum, I expect that the combination of low entry thresholds with nonproportional elements will open the potential for a rather fluid configuration of party competition.

### **Hypotheses**

The arguments of this section can be summarized in three testable hypotheses for the three dimensions addressed in this article.

Hypothesis 1: Mixed electoral systems do not necessarily lead to more or less party fragmentation than simple electoral systems, but rather to more heterogeneous outcomes than simple electoral systems.

Hypothesis 2: Mixed electoral systems lead to higher disproportionality than simple electoral systems, but most of all, the outcomes in terms of disproportionality vary much more under mixed systems.

Hypothesis 3: Mixed electoral systems are associated with higher levels of volatility than simple electoral systems.

### **Research Design**

Recently democratized countries in Central and Eastern Europe have, in the last two decades, applied mixed electoral systems more often than any

other region of the world. This is why the 20 democracies of this region are particularly suited for an investigation of the effect of mixed electoral systems.<sup>11</sup> Before the recent experiences with mixed systems in Central and Eastern Europe, any investigation could only be carried out on the single case of Germany. Post-communist democracies in Central and Eastern Europe appear well suited to act as a laboratory for an evaluation of the political consequences of institutional choices. The countries started the transition to democracy at the same time and all have similar legacies.<sup>12</sup> All thus offer a comparable social and political context. We know that the choice of electoral systems strongly followed from the distribution of forces between political parties. Where communist parties had a strong impact on the new constitutions, they favored systems that at least partly included the majority vote (Bielasiak 2006; Elster 1993, 189). However, the outcomes were highly unexpected, and often do not reflect the strategic decisions that were taken by the constitution builders.<sup>13</sup> The mixed electoral systems that are or have been applied in the region are fairly similar, given that PR seats are allocated in a single nationwide district, with a legal threshold between 2 and 5 percent. Accordingly, for both parts of a mixed electoral system, voters and parties need to make different strategic considerations. The systems vary with regards to one main institutional aspect, which is addressed below more in detail: some include a (partial) compensation mechanism, while others lack such compensation.

This study compares the outcomes of mixed electoral systems to those obtained under nonmixed (simple) electoral systems. The cases of comparison are almost exclusively variations of PR systems. Purely majoritarian rules were only applied in rare instances, mainly in the very initial elections. In the first elections, however, the pattern of competition was fairly different from later instances, and several of the employed variables here mainly missing. Further, the majoritarian vote was used in the 1994 elections in Macedonia and in Ukraine. However, both were exceptional in their character. In Macedonia, one of the two major parties boycotted the second round of the 1994 elections.

<sup>11</sup> I include all post-communist countries in Europe, except for Belarus, that did not have reasonably free and fair elections in the period of investigation, and except for the Russian 2007 elections (for the same reason). Namely: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Ukraine. Instead of the FR Yugoslavia, I include its members in their democratic period: Montenegro after 1998, Serbia after 2000. Both are considered to be independent democracies, given that, after 1997, elections were only held for the subnational parliaments, and both political systems developed independently. Kosovo was excluded, because relevant variables are missing (see later in the text).

<sup>12</sup> Certainly, the idea of having a perfect laboratory is illusionary, for instance because the political context of the communist period was varying among countries (see for instance Kitschelt *et al.* 1999). To be more precise, the legacies are less different in Central and Eastern Europe compared to other sets of countries.

<sup>13</sup> Shvetsova (2003) shows that most parties did not accurately anticipate their strength and the effect of electoral institutions. Most attempts at institutional engineering in their own interest later proved to be rather to their disadvantage.

And, both in Macedonia and in Ukraine, we lack over a longer time period to study the development over time.<sup>14</sup> Hence, a reliable comparison is possible between PR and mixed systems, while every comparison to solely majoritarian systems—if data is available—relies on very specific cases.

### Data and Operationalization of the Dependent Variables

Three main dimensions that are discussed in the comparative literature are particularly relevant for the investigation of party systems and the impact of electoral systems. The *fractionalization of party systems* considers the extent, to which a party system is concentrated on a few major players, namely the dimension of representation versus concentration. *Interelection volatility* concerns the extent to which the set of major parties in a country remains stable over electoral periods in order to facilitate voter's orientation and to enable accountability and continuity. *Disproportionality* is concerned with the learning effect of parties from electoral rules.

The fractionalization of party systems is usually measured through the effective number of parties (Laakso and Taagepera 1979). Disproportionality and volatility are measured with the least-square measure of disproportionality (Gallagher 1991; Taagepera and Grofman 2003). It compares two distributions, in the case of disproportionality the vote shares of political parties and their seat shares in parliament, and in the case of volatility the change in the vote distribution between elections.<sup>15</sup> In mixed systems with two votes for each voter,<sup>16</sup> volatility and disproportionality might be calculated based on the votes and seats cast in either part of the system, or one might attempt to combine both in a joint measure (Šedo 2007). I rely on the PR vote, which is the vote cast for a political party. It theoretically corresponds closest to the voters' party preferences. I multiply the indicator by 100 in order to have a scale from 0 (perfect proportionality, or no changes at all between periods) to 100 (if all mandates were won by a party with no votes, or if all voters switched from one party to another in an electoral period).

<sup>14</sup> Further, volatility data for the period 1990-94 cannot be established, because we would need detailed vote shares for the 1990 elections for this calculation.

<sup>15</sup> The indicator relies on the sum of the squared differences between the two distributions  $x$  and  $y$  for each party  $i$ . Small deviations in the distributions, or minor changes of vote shares, count less than strong overrepresentation or underrepresentation of a party, or landslide gains or losses of votes. The measure is less sensitive to the size of party systems than other frequently used indices of volatility and disproportionality.

$$Gh = \left[ \frac{1}{2} \sum (y_i - x_i)^2 \right]^{1/2}$$

<sup>16</sup> Apart from the 1992 elections in Albania, all mixed systems in Central and Eastern Europe in the period of investigation were two-vote systems. A one-vote system was introduced in 2008 in Romania.

Data for the number of parties and disproportionality are taken from my own database that contains the results of 95 elections in Central and Eastern Europe in the period 1990-2007.<sup>17</sup> The volatility measures have been calculated using a database by Lane and Ersson (2007), which allows tracking the changes in the party systems. For the completion of the results for recent elections and missing countries, I rely on the official results provided by the electoral commissions.<sup>18</sup>

### Estimating Mean and Variance

Most models that are employed in political science are aimed at explaining the mean of the distribution of dependent variables, even if the mean is not the only aspect that we might be interested in investigating. Nevertheless, many studies that would be interested in other characteristics of the distribution of the dependent variable, such as variance, still test the effects on the mean of the distribution of a dependent variable (see Braumoeller 2006).

$$\beta = \mu[y(x=1)] - \mu[y(x=0)] \quad (1)$$

Such models have, however, only been applied in some exceptional cases in political science.<sup>19</sup> My hypotheses require employing variance models. They partly regard not the mean of the distribution of the dependent variable, but its variance  $\sigma^2$ . I thus expect that on several dimensions, variance of the distribution of the dependent variable under mixed electoral systems  $\sigma^2(x=1)$  will differ from the variance of the distribution under simple electoral systems  $\sigma^2(x=0)$ . More precisely, outcomes under mixed electoral systems will vary more than under simple electoral systems. The causal effect  $\gamma$  of my explanatory variable  $x$ , electoral systems, will thus be estimated as follows:

$$\gamma = \sigma^2[y(x=1)] - \sigma^2[y(x=0)] \quad (2)$$

<sup>17</sup> Sources are listed in the appendix to Bochsler (2008).

<sup>18</sup> Sources are listed in the appendix to Bochsler (2008). Bosnia and Serbia were coded from my own database (Bochsler 2008), for the Baltic States, I rely on Sikk (2006, appendix). In line with Lane and Ersson (2007) and Sikk (2005), I use a narrow definition of volatility, counting only net gains of votes through new parties, votes that parties won or lost from other parties, or votes for parties that disappeared between elections. Party mergers, splits or changes of party names do not add to volatility.

<sup>19</sup> In the field of research on electoral behavior and values see Alvarez and Brehm (1995, 1997), and Selb (2008), while Kriner (2006) and Stokes (1965) use variance models with aggregated electoral data. A prominent example of a cross-national study in comparative politics is King (1989).

Given this variance-oriented expectation, standard regression analyses, such as ordinary least-square models, would not only not allow the measurement of the hypotheses, but would be methodologically misleading and highly problematic as well. Standard regression models assume homoskedasticity of the distribution of the error term, or at maximum, they employ simple fixes for heteroskedasticity problems. This is particularly problematic if we expect that variance is not constant over predicted values of the dependent variable. Further, standard regression models only estimate a function for the mean of the distribution of the dependent variable, but not for variance, which is the focus of my research problem, and which my hypotheses suggest depends on the explanatory variables. I am thus interested in finding determinants of variance in the outcome variables.

For this reason, I use an estimator that establishes both a function of the mean and of the variance of the dependent variable. This is done with a maximum likelihood estimator that establishes the parameters of the outcome term and the variance at the same time (Braumoeller 2006; Davidian and Carroll 1987).  $X$  is the vector of explanatory variables for the mean function;  $Z$  the vector for the variance function, and  $\beta, \gamma$  are vectors of parameters for both functions.  $\alpha$  is the constant in the mean term, and  $\alpha_0$  the constant in the variance term.

$$\text{Outcome: } N \sim (\mu, \sigma^2)$$

$$\mu(y) = \alpha + \beta X \quad (3)$$

$$\sigma(y)^2 = \exp(\alpha_0 + \gamma Z)$$

### Empirical Tests and Results

The models presented in this section investigate the three aspects of party system consolidation, based on elections in Central and Eastern Europe in the period 1990-2007. The electoral system type serves as the main explanatory variable.

A look at simple cross-tables seems to confirm the expectation about higher variance under mixed electoral systems at first sight. The dependent variables vary considerably by type of electoral system. In mixed electoral systems, party system fragmentation typically amounts to 3.59 effective parties (geometric mean). This is about .4 effective parties less than gained seats in PR systems and about .4 effective parties more than in the five occasions where majority vote systems were employed. However, the outcomes vary much more under mixed electoral systems than under PR. Similarly, with regards to volatility and disproportionality, mixed electoral systems are located in between PR systems and majority vote systems. Disproportionality varies substantially among mixed electoral systems (Table 1). For the analysis of disproportionality, five cases were dropped, because only data on seat shares, but no data on vote shares

**Table 1. Dependent Variables in the Model**

	PR	Majority Vote	Mixed Systems
Effective number of parties, ln	1.39 (.38) N = 66	1.17 (.89) N = 5	1.28 (.58) N = 24
Effective number of parties*	4.02	3.23	3.59
Volatility (least-square index, PR votes)	15.8 (7.4) N = 51	25.8 (—) N = 1	19.9 (9.7) N = 20
Disproportionality (least-square index, PR votes, all seats)	.07 (.03) N = 63	.23 (.14) N = 3	.13 (.07) N = 24

Arithmetic mean (standard deviation), number of cases. Mixed electoral systems are further distinguished into non-compensatory systems and partly compensatory systems (Hungary) or compensatory systems.

\* Given that the variable ranges from 1 to infinity and is not normally distributed, I report the geometric mean instead of the arithmetic mean.

by parties were available.<sup>20</sup> Volatility is established from the vote shares in two subsequent elections. This means that volatility can only be calculated starting from the second elections for which results are available, these are 72 out of 95 cases. The degree of volatility and its variance seem higher under mixed electoral systems, but the difference in variance is not very considerable.

The distribution of the cases is visualized in Figure 1. It distinguishes outcomes under mixed electoral systems (O), PR systems (X), and majority vote systems (+), controlling for the gross domestic product (GDP) per capita. The graphs confirm the impression that disproportionality and volatility tend to be higher under mixed electoral systems, compared to PR. Further, they show that variance of outcomes is higher under mixed electoral systems, particularly with regards to fractionalization and disproportionality. Given the rather small number of cases, we need to be aware that individual cases might substantially contribute to these results. However, the identification of particularly exposed cases in the figures reveals that the variance can not be attributed to one single country. The results of the bivariate analysis (Table 1) and of the scatterplots (Figure 1) conform with my hypotheses about the effect of mixed electoral systems on the mean and on the variance of the three dependent variables.

Twenty-four elections in the region were held under mixed electoral systems, in Albania (all five elections since 1992), Bulgaria (1990), Croatia (1992, 1995), Hungary (all five elections), Lithuania (all elections since 1992), Macedonia (1998), Russia (four elections from 1993 to 2003), and Ukraine (1998, 2002). In most of these cases, mixed systems with no compensatory mechanism were applied, where seats are allocated separately in each of both tiers. Differently, in all five Hungarian, and in three Albanian elections (1992, 2001, 2005), the

<sup>20</sup> Data is available from the author.



mandates to produce a fully proportional seat allocation (Bochsler 2007a), and scholars treat the Hungarian system more as a mixed noncompensatory system (Ferrara, Herron, and Nishikawa 2005, 55; Thames 2005, 288), a hybrid (Benoit 2005, 235), or a “supermixed” system (Massicotte and Blais 1999, 357), than as a mixed compensatory system. Similarly, I have argued that in the recent Albanian mixed system with just 40 PR seats out of 140, the proportional element is not large enough to provide a full compensation (Bochsler 2007a). This legitimizes treating the Albanian and the Hungarian cases of (partially) compensating systems jointly with the mixed noncompensatory systems which are much more frequent in Central and Eastern Europe, and not jointly with PR systems (however, considering the Albanian and the Hungarian systems as PR would only slightly affect the regression results; results are reported in the Appendix).

I have included a number of control variables in the model. In several countries, mixed electoral systems were employed in some of the first few elections after transition, and later abolished when the countries switched to PR. The comparison of mean outcomes might thus be not very reliable, given that party systems might typically have changed over time, and scholars suppose that there is a learning effect, so that party systems slowly adapt to electoral systems. This is why I control for the democratic experience since the initial democratization, counting the number of elections that have passed thereafter. And, given that party attachments grow over time, the time dimension should also be considered when examining volatility.<sup>21</sup> In the volatility models, I further include a dummy variable that identifies the second election after transition to democracy, accounting for the fact that first elections were very different from the second ones, and important changes in the party landscape might thus be due to reasons which are inherent to the initial process of party system formation (Bochsler 2007b; Dawisha and Deets 2006). Some nonpolitical variables, namely the level of economic development, have proved to be important for the stabilization of party systems, and volatility has been shown to be driven by bad economic performance of governments (Mainwaring and Zoco 2007; Remmer 1991; Roberts and Wibbels 1999; Tavits 2005). I apply economic growth and unemployment as a proxy for the governments’ economic performance, while the GDP per capita measures the economic development of

<sup>21</sup> Many voices hold that party systems in post-communist countries are very fluid and voters are only exceptionally attached to political parties (Mair 1997). This is also one of the aspects often discussed in the party institutionalization literature, although often only rudimentarily measured (Mainwaring and Torcal 2006). In Central and Eastern Europe, evidence can be found that links between voters and parties that are rationally motivated by the voters’ interests and beliefs are indeed created (for instance, Brader and Tucker 2001; Miller, Reisinger, and Hesli 1998; Miller *et al.* 2000). Tóka (1998) shows that values can play an important role in party orientation in Central Europe.

**Table 2. Overview over the Explanatory Variables and Control Variables Employed for the Empirical Tests**

	N	Mean	Std dev	Min	Max
Mixed system (dummy)	82	.280	.452	0	1
Majority vote (dummy)	82	.037	.189	0	1
Ordinal number of election	82	3.634	1.427	1	6
2nd election (dummy)	82	.183	.389	0	1
GDP per capita in USD, lagged, nat logarithm	79	7.676	.907	5.531	9.679
Unemployment rate, %, lagged	82	13.905	10.422	.000	41.995
Economic growth, %, lagged	80	1.461	8.668	-34.861	29.944

*Sources:* Own database for the electoral system variables (sources listed in Bochsler 2008), IMF (2008), EBRD (2008) for the economic variables.

a country (Table 2).<sup>22</sup> Further tests, including inflation as control variable, did not lead to any fundamentally different results or better models, and, thus are not included here. Two dummy variables identify mixed electoral systems and majority vote systems; PR is the reference category. Of the 20 democracies in Central and Eastern Europe, the relevant data are available for 19 cases (counting 82 elections), while Kosovo needed to be excluded as a lack of economic data.

For every dependent variable I have estimated three models using different control variables for the economic success of governments. The results mainly confirm my expectations (Table 3).

The models show that party system fragmentation is only marginally lower under mixed electoral systems, compared to the reference category (PR). Party system fragmentation is much more heterogeneous under mixed electoral systems.<sup>23</sup> As expected (Hypothesis 1), mixed systems, rather than providing for more moderate party systems, seem to have fairly unpredictable consequences for party system fragmentation, depending on further, unidentified context factors.

Similarly, mixed electoral systems are associated with very different outcomes for disproportionality. In this dimension, there is substantially more

<sup>22</sup> These economic variables are typically employed in the literature on economic voting, given that they are crucial for the appreciation of the government in public, and might affect the incumbent vote (see Lewis-Beck and Stegmaier 2000 for an overview; for Central and Eastern Europe, see Tucker 2006). Among the data typically used in this literature, I chose the variables which are most systematically available for the countries and the period under study. GDP per capita in USD, inflation, and GDP growth were taken from the International Monetary Fund (IMF 2008). Unemployment rates and some missing cases of GDP per capita were coded from the yearly Transition Reports of the European Bank for Reconstruction and Development (EBRD 2008).

<sup>23</sup> Previous studies have suggested that there is a minor difference between in party fragmentation between mixed electoral systems and simple electoral systems (Kostadinova 2002), but it appears rather small.

**Table 3. Variance Model, Parameter Estimates for the Mean Model and the Variance Model, and Robust Standard Errors (RSE)**

Dependent Variable: Party Fractionalization						
	(1)		(2)		(3)	
	Coef.	RSE	Coef.	RSE	Coef.	RSE
Mean function						
Constant	1.037	.409	1.316	.162	1.247	.144
Mixed system	-.124	.125	-.074	.120	-.113	.126
Majority vote	-.070	.743	.371	.583	-.238	.453
nr of election	.007	.038	.011	.033	.030	.032
ln(gdp) lag	.43	.53				
Unempl lag			.002	.005		
Growth lag					.006*	.004
Variance function						
Constant	2.808	1.487	-1.084	.532	-1.435	.628
Mixed system	.681*	.379	.846**	.387	.835**	.403
Majority vote	1.460*	.814	1.261*	.760	1.224	.876
nr of election	-.116	.150	-.334***	.122	-.144	.157
ln(gdp) lag	-.574***	.205				
Unempl lag			.020	.014		
Growth lag					-.044*	.025
N	79		82		80	
Pseudo R <sup>2</sup>	.266		.1731		.2004	
VWLS R <sup>2</sup>	.0333		.0159		.0477	
χ <sup>2</sup> mean function	2.67		1.11		5.37	
χ <sup>2</sup> variance function	25.95***		17.55***		16.78***	
Dependent Variable: Disproportionality						
	(4)		(5)		(6)	
	Coef.	RSE	Coef.	RSE	Coef.	RSE
Mean function						
Constant	16.719	3.054	7.228	1.186	7.211	1.527
Mixed system	5.299***	1.454	4.980***	1.720	6.373***	1.661
Majority vote	19.931**	9.947	30.532***	3.029	17.332*	10.300
nr of election	.173	.347	.133	.220	-.207	.355
ln(gdp) lag	-1.393***	.399				
Unempl lag			-.083***	.021		
Growth lag					-.016	.038
Variance function						
Constant	7.332	1.742	3.564	1.109	2.576	1.010
Mixed system	1.356**	.582	1.522**	.606	1.448***	.557
Majority vote	2.447**	.949	2.594**	1.143	2.671***	.866
nr of election	-.005	.290	-.013	.242	-.034	.259
ln(gdp) lag	-.649**	.283				
Unempl lag			-.093***	.018		
Growth lag					-.015	.028
N	79		80		79	
Pseudo R <sup>2</sup>	.1534		.1526		.1239	
VWLS R <sup>2</sup>	.2851		.4291		.2037	
χ <sup>2</sup> mean function	37.18***		136.4***		21.8***	
χ <sup>2</sup> variance function	35.74***		55.56***		17.92***	

Continued

**Table 3. Continued**

	Dependent Variable: Volatility					
	(7)		(8)		(9)	
	Coef.	RSE	Coef.	RSE	Coef.	RSE
Mean function						
Constant	38.192	8.103	15.523	4.301	17.203	4.595
Mixed system	2.633	2.339	4.232*	2.256	3.517	2.319
Majority vote						
nr of election	.591	.805	.191	.938	-.141	.988
2nd election	1.031	3.017	2.212	3.481	.534	3.741
ln(gdp) lag	-3.078***	.967				
Unempl lag			-.061	.079		
Growth lag					-.180*	.103
Variance function						
Constant	8.341	1.921	3.809	1.004	4.793	1.064
Mixed system	.543	.434	.634	.413	.319	.444
Majority vote						
nr of election	.118	.196	.027	.208	-.192	.230
V2nd election	-.686	.681	-.232	.705	-.813	.892
ln(gdp) lag	-.632**	.258				
VUnempl lag			-.006	.018		
Growth lag					.030	.034
N	68		68		68	
Pseudo $R^2$	.0431		.0197		.0164	
VWLS $R^2$	.1531		.0718		.1038	
$\chi^2$ mean function	16.02***		5.80		18.35***	
$\chi^2$ variance function	12.10**		3.62		4.25	

The pseudo  $R^2$  measures the explanatory power of the model, by computing  $1-LL$  (full model)/ $LL$  (constant only model), but is problematic when applied in variance models. A better evaluation of the explanatory power might be based on the VWLS  $R^2$  (variance weighted least squares), for which the observations in the main model are weighted by the inverted variance from the variance model.

\*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ .

variance among countries applying mixed electoral systems, but disproportionality is also larger under mixed systems than under PR. This confirms my second hypothesis, according to which mixed systems are associated with higher disproportionality, and highly varying outcomes (if focusing only at the subtype of mixed noncompensatory electoral systems, then disproportionality would be even higher, see Appendix).

A look at the third dimension, volatility, completes the image that mixed electoral systems do not substantially help to stabilize party systems, if compared to PR (Hypothesis 3). Instead, my results suggest that there might be a slight increase in volatility under mixed systems, but the results are only barely statistically significant. There is no special effect of variance on this dimension.

In order to avoid an overspecification of the model, given that mixed electoral systems were only applied in two dozen cases, the estimation has been

reduced to a rather simple model not including further institutional features, such as the share of PR mandates or the threshold applied in the PR tier. The models presented in the Appendix show that the results do not rely on the institutional difference between mixed systems with and without any linkage between both tiers (compensatory versus noncompensatory systems).

A dummy variable has been included in the model in order to control for the effect of majority vote systems, because outcomes under majoritarian systems might be substantially different from PR systems. However, the results rely on only two elections, Macedonia and Ukraine, both in 1994, because in other majority vote elections, economic control variables are missing. Given the small number of cases, the parameter does not differ (at common levels of statistical significance) from the one for mixed electoral systems in any of the models. Both elections under majoritarian rules were quite specific (see earlier discussion), so that we should not generalize from these two cases. In the volatility and inflation models, the two occurrences of majority vote systems could not be included, because there is no previous election that would allow me to calculate volatility.<sup>24</sup>

The economic control variables do explain some variance. The higher the GDP, the lower the volatility and disproportionality, and the more homogeneous outcomes are on all three dimensions. High unemployment is associated with lower and more homogeneous values of disproportionality, and economic growth with a larger number of parties. After accounting for these variables, no independent effect of time could be found. However, the time dimension strongly correlates with some of the economic control variables, so that the nonresult does not imply that the dependent variables do not change over time.<sup>25</sup>

Several other operationalizations were tested in order to check the robustness of the models. In order to focus on the main substantial results, I have not included these additional models in the table. First, I have further calculated all models for the explanation of volatility and disproportionality, including the effective number of parties (log) as control variable.<sup>26</sup> This would increase the  $R^2$  (but might be a tautological operationalization), but only marginally affect the parameter estimates and standard errors of the other variables. This supports the view that the three investigated dimensions are

<sup>24</sup> On the one hand, volatility data for the period 1990-94 cannot be established, because we would need detailed vote shares for the 1990 elections for this calculation. On the other hand, given the small number of majority systems and the strong correlation of the majority dummy variable with lagged inflation, both cases with majority vote were excluded from the inflation models.

<sup>25</sup> This result does not contradict previous empirical studies. Tavits (2005, 292) found a positive rather than a negative effect of time on volatility (over eleven of 13 years that she investigated), after introducing economic control variables in her model. Tavits and Annus (2006) found an expected effect of time on wasted votes, but did not include any economic variable, while Birch (2003, 132) did not control for time, after including economic variables.

<sup>26</sup> As suggested for instance by Pedersen (1983) or Kostelecky (2002, 180) for volatility.

correlated, but not identical. Second, I have replicated the models with nonlagged economic variables, because certain effects might be short term rather than lagged by one year. This does not strongly affect the coefficients of the mixed electoral system variable, while the coefficients of the economic control variables increase.<sup>27</sup> Third, I have tested several transformations of the inflation variable, given the skewed distribution of this variable, but the results change only punctually and do not highly affect the institutional effects.

Overall, the models confirm the hypotheses about the effect of mixed electoral systems in two out of the three dimensions. Compared to the reference category (PR), party system development under mixed systems is much less predictable. On the one hand, mixed systems are associated with higher variance in the number of parties and in the disproportionality dimension. This confirms my expectation that very different party systems might emerge; some tending to follow the incentives of the single-seat district tier, and others tending to follow the incentives of the PR tier. This also explains why disproportionality varies substantially under mixed electoral systems. On the other hand, the average disproportionality and volatility is higher under mixed systems than under PR (in the case of volatility, the difference is barely statistically significant). This shows that the learning effect under mixed electoral systems is not as strong as under PR. More precisely, the institutional incentives are not strong enough for parties and voters to adapt their strategies and voting behavior. The learning effect of mixed electoral systems when applied in young democracies appears not to work uniformly as it does under PR, and therefore party systems are much more volatile. These aspects are important detractors from the best of both worlds view of mixed electoral systems, at least for their application in emerging democracies.

### **Conclusions: Best of Both Worlds or Pandora's Box?**

In many countries where electoral system reforms are discussed, mixed electoral systems appear as a very promising option, as they are suggested to allow for the combination of single-seat district elections with a more proportional element. Similarly, academic work on these systems has concluded that mixed electoral systems outperform simple electoral systems in many aspects (Shugart and Wattenberg 2001a), among other reasons because they lead to more moderate party systems (Ferrara, Herron, and Nishikawa 2005; Kostadinova 2002).

<sup>27</sup> For the volatility model, nonlagged economic growth is a considerably better explanation of variance, and mixed electoral systems have a lower effect, after controlling for nonlagged growth. Full results for the nonlagged models are reported in an online appendix to this article on <http://www.unige.ch/ses/spo/staff/corpsinter/bochsler> (accessed on April 20, 2009).

The expectation of milder effects of mixed electoral systems on party systems, compared to simple electoral systems, and of more moderate systems, cannot be empirically verified. A comparison of electoral system effects in Central and Eastern Europe to the PR systems applied in this region shows that such effects cannot be systematically found. Instead of providing the best of both worlds, the outcome of mixed electoral systems varies substantially from country to country, much more than under PR. In some cases, mixed systems are associated with high party fractionalization, and there is strong disproportionality in the seat allocation, while in other occasions they are associated with a fairly concentrated party system and low disproportionality (as a result of the rare occurrence of purely majoritarian systems, the comparison with them relies only on singular cases, and should not be overinterpreted).

I explain this with the highly contrasting incentives that are sent out through mixed electoral systems, allowing many parties to compete and win seats in the PR tier, whereas the single-seat districts reduce the chances of the two front-runners winning parliamentary mandates. It seems that these countervailing incentives hinder one very crucial function of electoral systems in democratizing countries, the learning effect on party systems, which helps to stabilize the party system. Accordingly, volatility is higher under mixed electoral systems than under simple electoral systems. Overall then, rather than the image of moderate party systems and milder effects, mixed electoral systems can be associated with a Pandora's box. Party systems remain more fluid, and the outcomes are highly unpredictable.

The methodological aspect is a further difference between this research and earlier work. Previous studies have often been interested in average effects, and have investigated whether these average effects are situated somewhere in between PR and majority or plurality systems. According to my model, which expects higher variance under mixed electoral systems, this would be a misspecification, neglecting heteroscedasticity, and it should not be surprising that, because of the substantial variance of outcomes of mixed electoral systems, no statistically significant differences could be found. In contrast, I have also analyzed the resulting variance. My results suggest that mixed electoral systems do not lead to party systems in the golden middle between PR and majority or plurality systems, but rather that results vary substantially. The golden middle seems to be a misunderstanding, resulting from studies that concentrated on finding *average outcomes*. However, this average remains hypothetical and is hardly ever reached, as the two extremes continue their domination.

In Central and Eastern Europe, the golden age of mixed electoral systems might soon be over. A series of countries that employed mixed electoral systems abandoned them in the 1990s, and later Ukraine, Russia, and recently Albania have decided to switch to PR. Only three countries (Hungary, Lithuania, and—most recently, after the period of investigation—Romania) continue to employ mixed electoral systems.

## Appendix

### **Replication of the Model with a more Narrow Operationalization of the Mixed Electoral System Variable**

In the models presented in the article, I have treated all mixed electoral systems jointly, no matter if they have a partial link between both tiers, or not. In eight out of 24 cases, Hungary and Albania, there is a linkage mechanism. This means that (a part of the) PR mandates are allocated to parties that scored badly in the single-seat districts, which should provide an overall result that is closer to a proportional seat allocation than in the 16 cases where a mixed electoral system with no such compensatory mechanism was employed. Some scholars even call the German prototype of a mixed compensatory system a personalised PR system (Kreuzer 2004; Moser 1995, 383).

In order to be sure that my results do not stem from a possibly misleading joint categorization of different systems, I have tested a different operationalization. In these models, I assume that mixed electoral systems with a compensatory element are rather similar to PR. Accordingly, I employ a more narrow definition for my operationalization of mixed electoral systems, counting only the mixed electoral systems with no compensatory mechanism as such. Table A1 shows that results hardly change, and in these models, the impact of mixed electoral systems emerges even stronger and more significantly than when employing a broad definition. Only in the disproportionality model does the impact of mixed electoral systems become weaker and lose significance.

**Table A1. Variance Model, Parameter Estimates for the Mean Model and the Variance Model, and Robust Standard Errors (RSE)**

Dependent Variable: Party Fractionalization						
	(1)		(2)		(3)	
	Coef.	RSE	Coef.	RSE	Coef.	RSE
Mean function						
Constant	.841	.410	1.263	.161	1.221	.136
Mixed sys (n)	.170	.148	.121	.156	.079	.179
Majority vote	.105	.770	.425	.584	-.141	.499
Nr of election	.16	.037	.017	.033	.026	.031
ln(gdp) lag	.56	.55				
Unempl lag			.003	.005		
Growth lag					.007*	.004
Variance function						
Constant	1.436	1.633	-1.066	.532	-1.486	.667
Mixed sys (n)	.759*	.446	.829**	.379	1.142**	.463
Majority vote	1.579**	.807	1.250	.762	1.405	.861
nr of election	-.138	.157	-.344***	.122	-.133	.165
ln(gdp) lag	-.378	.226				
Unempl lag			.022	.14		
Growth lag					-.032	.024
N	79		80		82	
Pseudo R <sup>2</sup>	.2554		.1755		.215	
VWLS R <sup>2</sup>	.0339		.0196		.0391	
χ <sup>2</sup> mean function	3.05		1.54		4.62	
χ <sup>2</sup> variance function	18.99***		18.90***		17.86***	
Dependent Variable: Disproportionality						
	(4)		(5)		(6)	
	Coef.	RSE	Coef.	RSE	Coef.	RSE
Mean function						
Constant	21.533	4.218	7.492	1.164	8.026	2.061
Mixed sys (n)	4.049***	1.479	4.504**	1.734	7.422***	1.869
Majority vote	20.100**	9.160	30.617***	2.856	15.946	10.138
nr of election	-.065	.456	.141	.218	-.304	.555
ln(gdp) lag	-1.766***	.557				
Unempl lag			-.091***	.021		
Growth lag					.048	.047
Variance function						
Constant	1.258	2.145	3.446	1.200	2.474	1.140
Mixed sys (n)	-.066	.527	1.644**	.686	.731	.492
Majority vote	1.573*	.868	2.639**	1.172	2.755***	.820
nr of election	.119	.400	.33	.265	.125	.363
ln(gdp) lag	-.994**	.391				
Unempl lag			-.096***	.018		
Growth lag					.016	.029
N	79		80		79	
Pseudo R <sup>2</sup>	.1039		.145		.0826	
VWLS R <sup>2</sup>	.2942		.413		.2033	
χ <sup>2</sup> mean function	43.08***		151.88***		20.05***	
χ <sup>2</sup> variance function	26.76***		56.96***		12.91**	

Table A1. Continued

	Dependent Variable: Volatility					
	(7)		(8)		(9)	
	Coef.	RSE	Coef.	RSE	Coef.	RSE
Mean function						
Constant	36.494	8.165	14.995	4.943	15.738	4.795
Mixed sys (n)	5.093	3.533	6.027**	2.734	5.687*	3.128
Majority vote						
nr of election	.545	.797	.365	.957	.205	1.043
2nd election	2.186	3.032	3.164	3.531	2.062	3.895
ln(gdp) lag	-2.867*	.964				
Unempl lag			-.76	.74		
Growth lag					-.217**	.106
Variance function						
Constant	8.369	1.958	3.943	.986	4.593	1.155
Mixed sys (n)	.706	.498	.535	.413	.456	.526
Majority vote						
nr of election	.123	.187	.006	.205	-.143	.243
2nd election	-.511	.672	-.164	.685	-.725	.986
ln(gdp) lag	-.642**	.258				
Unempl lag			-.009	.018		
Growth lag					.21	.31
N	68		68		68	
Pseudo $R^2$	.0486		.0227		.0206	
VWLS $R^2$	.1757		.0971		.1196	
$\chi^2$ mean function	16.75***		6.80		13.66**	
$\chi^2$ variance function	12.46**		2.71		4.12	

Narrow definition of mixed systems.

\*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ .

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