Party Systems and the Choice Sets Voters Confront in Transitions to Democracy

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Abstract
Elections in the wake of dramatic transitions from authoritarian regimes to democracy often confront voters with overwhelming choice sets. This paper examines the conditions that produce tractable sets of party options for voters, presents cross-national data on the choice sets and competitiveness in elections after dramatic transitions, and examines how the electoral formula used in Tunisia's transitional election affected the electoral outcome. The paper argues that, in transitional contexts characterized by high uncertainty, electoral rules that reward economies of moderate scale, such as the Hare Quota formula, can encourage the consolidation of the choice set.

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Transitions, Elections, and Choice Sets

Elections in transitional democracies are often characterized by uncertainty, among political leaders and voters alike, over which parties (or electoral alliances, movements, fronts, etc.) are viable and which are not. Uncertainty diminishes the ability of political elites to present voters with tractable choice sets and the ability of voters to distinguish among the choices presented. Consider a situation in which leaders of two would-be parties, A and B, are considering whether and how to compete in an upcoming election. The parties share some basic principles, but they also differ on some policies and, perhaps even more importantly, their leaders are rivals. Imagine they share (perhaps based on previous elections) the following expectations:

- Party A can command about 4-6% of the vote.
- Party B can command about 8-10% of the vote.
- It will be necessary to get about 10% of the vote to win any representation.

Party A is not close to the threshold for success, so a vote for Party A is, effectively, wasted whereas the same vote cast instead for Party B might help it get over the hump and win representation. The leaders of parties B, moreover, are motivated to court the leaders and supporters of Party A, maybe parceling out list positions or policy concessions – even forming a coalition, call it AB – to minimize the risk that they come up empty. The motivation and the ability to coalesce depends on shared expectations about electoral viability, which in turn depend on knowledge about the levels of support across parties, and about how support levels will translate into representation. In a transitional democracy, especially following dramatic swings from authoritarian government, both sorts of knowledge may be in short supply, limiting coalitions and contributing to intractable choice sets.

In transitional democracies, the set of choices voters confront is often overwhelming and bewildering. In their first post-Arab Spring election, Tunisian voters faced over 500 party lists and alliances. Egyptian and Libyan voters were presented with dozens of lists and with separate ballots that included dozens of candidates. Afghan voters regularly face ballots with hundreds of individual candidates in parliamentary elections. In both Tunisia and Egypt, moreover, the structure of competition in the first elections was lopsided, with the top political party winning far larger voter shares than any other competitors.

In the wake of dramatic transitions from authoritarianism to democracy, how can we evaluate whether elections deliver quality choices to citizens? And can the design of electoral rules affect that outcome? This paper starts with the premise that elections should deliver at least two things: a set of alternatives among which voters can meaningfully distinguish, and genuine competition among those alternatives.[1]

Cognitive psychologists and behavioral economists have long recognized that the number of options among which people can make meaningful distinctions is limited (Iyengar 2010). Miller (1956) famously advanced the proposition that the "magical number" of options on a single dimension of choice among which humans can meaningfully discern is seven, or thereabouts. This line of reasoning suggests there may be a sweet spot in terms of the number of alternatives presented to voters – a

[1] Tractability of the choice set and competitiveness are not necessarily related, causally or empirically. Daunting choice sets can combine with lopsided competition, as in Tunisia and Egypt, or with closely contested elections, and the same is true for much

range that combines variety with cognitive tractability – and perhaps also has downstream effects on governability and government accountability. This paper makes the case that electoral formulas can reward *economies of moderate scale* in party competition, and thus encourage choice sets voters in the range of cognitive tractability.

All electoral formulas reward economies of scale in some manner, penalizing very small parties by denying representation below some minimum vote threshold, whether legally defined or not. Most formulas deliver progressively larger bonuses to larger parties. The choice of electoral formula is a choice about how seat bonuses and penalties should be distributed. The prescriptive argument here is that bonuses should be concentrated on parties as they reach the range of electoral viability in order to motivate potential allies to coalesce to capture those gains. Electoral engineers in new democracies should aim for economies of scale that peak in the lower end of the viable range and decline (or at least not grow) above that. Seat bonuses should be targeted to encourage groups below the threshold of viability to coalesce and rise above it. In the transitional environment, incentives for large parties to coalesce are of relatively less value.

The rest of this paper follows in two sections. The first presents some descriptive data on choice sets and on competition in early elections after dramatic democratic transitions. I measure the fragmentation of the vote across parties and the gap between the first- and second-place parties, across countries and over time to determine whether, and how quickly, the choice sets voters confront in new democracies converge in terms of their tractability, and whether competitiveness tends to increase or decrease over time after transitions. The second section of the paper examines the first Tunisian election after that country's transition to competitive elections in 2011. From Tunisia's unusual outcome, I derive a claim about characteristics of electoral rules under proportional representation (PR) that should foster tractability.

Elections after big swings to democracy

The Polish template?

Following the collapse of Central European communism in 1989. The first democratic election for Poland's parliament, the Sejm, took place in 1991.[2] In the absence of an established party system and of firm expectations about which leaders and alliances would be viable, Poland adopted an inclusive electoral rule, with list proportional representation (PR), votes pooled at the national level, and no minimum threshold for representation, such that list winning a fraction of a percent of the nationwide vote could gain representation. The top panel of Figure 1 shows the highly dispersed distribution seats across the 30 lists that won seats in the 1991 election, the largest with 12% of the vote. 7% of the valid ballots were cast for the hundreds of lists that won less than 0.1% of the votes, and no seats. Another 6% of ballots were invalid.

[Figure 1]

[2] Poland held a partly competitive Sejm election in June 1989. Parties other than the Communists and their rural ally, the Peasant Party, were allowed to contest 1/3 of the seats. The landslide victory for the anti-communists triggered a mass defection of communist deputies, such that the Sejm then selected a non-communist government. The first open elections, however, took place in 1991.

During the next couple of years, Polish governments were highly unstable and susceptible to shifting coalitions. By 1993, the Sejm agreed to dissolve itself and call new elections, but under modified rules that adopted a 5% legal threshold for representation.[3] The 1993 election saw a continued dispersal of the vote, but the legal threshold restricted representation to the 6 parties that cleared the barrier, in turn conferring large winner bonuses to most of them given that 35% of votes were cast for parties that won no representation (next panel in Figure 1). Coalition options were reduced, governments stabilized, and the new Sejm endured through its constitutional term. In the next election, in 1997, expectations about viability among both voters and elites strengthened, with fewer lists on the ballot, less than half as many votes thrown to parties below the threshold, and a resulting higher correlation between vote shares and seat shares. The pattern continued through the next 4 elections, up to the present (next panels), with 5 or 6 parties winning representation in each contest.

The Polish experience would appear to be an archetype for how electoral engineering can foster the formation of a tractable choice set following a dramatic swing to democracy. Competition opens up, expectations about viability are initially ill-defined, and the choice set is bewildering. After the imposition of a rule that establishes a clear benchmark for strategic alliances and voting, the set of viable choices narrows, and actors update expectations and behavior accordingly.

The elections that followed the overthrow of autocratic regimes in North Africa in 2011 raise the question of whether the Polish experience provides a template for transition after a sudden democratization. Figure 2 shows the distribution of vote shares across lists in the Tunisian election for a constituent assembly from October of that year (top) and the Egyptian election for a National Assembly that spanned December 2011 into January 2012. Votes were more dispersed in Tunisia than in Egypt (and about 10% of the vote that went to lists winning <0.25% is not shown on the top graph), but in both cases, the largest party won just less than 40% while the rest of the vote was spread across a large number of much smaller competitors, many of dubious viability.[4] The Egyptian experiment in electoral democracy was interrupted (or perhaps terminated) in the summer of 2013 by a military coup,[5] but Tunisia ratified a new constitution early in 2014 and is slated for a second parliamentary election later this year. A key question the case raises is whether a party will emerge that provides Tunisians with a tractable choice set and competition for the control of government power.

[Figure 2]

Cross-national data

I focus on the choices voters confront in new democracies, particularly where the transition from non-democracy is rapid and dramatic, because the causal effect of electoral rules on the choice set should be most apparent (or least opaque) when transitions are most abrupt and discontinuous. Observational research on the effects of

[3] Two caveats were that a party representing German-speaking Poles was exempted from the threshold, and a 7% threshold applied for multi-party alliances.

[4] Egypt used a mixed electoral system that combined list PR competition in districts electing 4-8 seats with two-round candidate-centered elections in 2-member districts. Figure 2 shows party vote shares in the PR contest.

[5] The status of Libya's second parliamentary elections, originally scheduled for July 2014, is also in doubt due to sustained militia violence.

institutional design on representation is plagued by the problem of imperfect identification, and the empirical exercise here does not pretend to resolve that problem. Electoral systems are not randomly assigned across societies. Political actors, who anticipate their strengths and those of their rivals, almost always have a hand in shaping the rules. So the relative degree to which rules shape the structure of competition, as opposed to the reverse, is perpetually hard to determine. That said, where the electoral field of competitors most closely resembles a clean slate, where expectations about relative strengths are weakest and alliances are least fixed, the effects of electoral system design should be most discernible. For this reason, I focus on founding elections, following swings from non-democracy to democracy that are most pronounced.

To identify big swings to democracy, I start with the Polity IV data, which provide a 21-point scale running from -10 (dictatorship) through 10 (fully democratic). Polity assigns values for 209 countries for every year from their origin (or 1800) up through 2012 (or the end of existence). I define a dramatic transition as any case where a country makes a swing of >=10 points in its Polity score, then largely sustains that gain, never producing a Polity score more than 4 points below its post-swing gain, up through 2012.[6,7] Big swings to democracy are rare events, with only 147 in the Polity data, comprising less than 1% of country-year observations. Of these, 76, or just above half, experienced little or no backsliding – that is, the country never subsequently produced a Polity score more than 4 points below the score reported on upon its big, positive swing. Those 76 cases are listed in Table 1.

[Table 1]

As Table 2 reports, more than ¾ of the dramatic democratizations occurred after World War II, and the rate of backsliding within that set is about the same as the overall rate. Finally, more than a third of the dramatic transitions happened since the collapse of European communism. In this last set, fully ¾ have not yet experienced serious backsliding although, of course, the more recent the swing, the less the exposure to the hazard of backsliding.

Table 2. Big swings to democracy in Polity IV data

	Total	Post-1944	Post-1988
Big Swings	147	113	56
Little/No Backslide	76	66	42

[6] It is easy enough to set different criteria for transitions to democracy, including more moderate swings – say 5-point gains followed by backslides of no more than 2 points, or setting a threshold (for example, Polity=5), and then identifying cases where a country crossed the threshold and did not slide back. I have identified sets of transitions according to these criteria, and it will be worth exploring further whether they exhibit patterns different from the "big-swing data."

[7] Polity assigns scores off the 21-point scale (e.g. -66, -77, -88) for countries under foreign occupation or in the midst of regime transitions. In such cases, I identify swings based on the difference between the first standard value after such an interruption and the last prior standard value.

Of the countries that experienced dramatic democratization and limited backsliding, I am particularly interested in those that subsequently experienced a series of parliamentary elections, to examine patterns of competition and party system fragmentation. To identify such cases, I started with the Quality of Government dataset from the World Bank (2013), and supplemented those data with electoral results collected from various government and scholarly websites. To date, I have data from 26 countries that experienced at least 5 elections following dramatic democratizations. These 26 cases are shown in bold text in Table 1.

Now consider the question of whether the structure of party competition in the wake of dramatic democratizations follows any pattern. Is the Polish sequence of hyper-fragmentation leading to consolidation of the party system typical? Note also that Polish elections, apart from 2001 when the center-right coalition split while the left remained united, have consistently been competitive, with the margin of victory for the leading party or coalition always less than 10% above the next competitor. Do elections in the wake of dramatic democratizations generally grow more, or less, competitive over time?

The dot plots in Figures 3 and 4 offer perspective on these questions. Figure 3 shows the distribution of the fragmentation of party competition in the first through the fifth post-transition election following big swings. Fragmentation is measured as the effective number of vote-winning parties in parliamentary elections (Laakso and Taagepera 1979). The red, hatched lines show the median effective number of parties at each election, which bounces between 3.7 and 4.1 without diminishing appreciably across the range. The mean is similarly stable. The standard deviation in ENPV drops from 2.5 to 2.1, but on the whole, the distribution of values is pretty consistent from the founding election to the fifth.

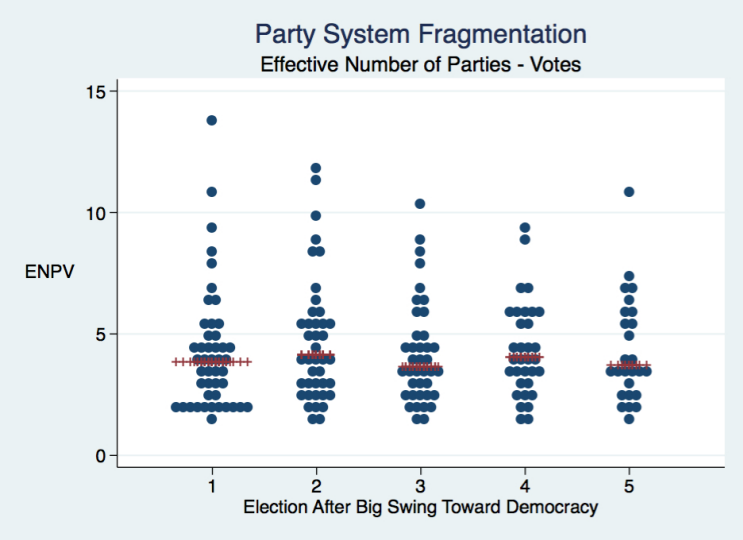


Figure 3.

Figure 4 presents a similar plot, but this time showing the margin of victory between the first- and second-place party in parliamentary elections. In this case, we do see a trend toward increasing competitiveness across elections, with the median margin dropping from 14% to 5% across the elections, and the mean margin from 16% to below 10%.

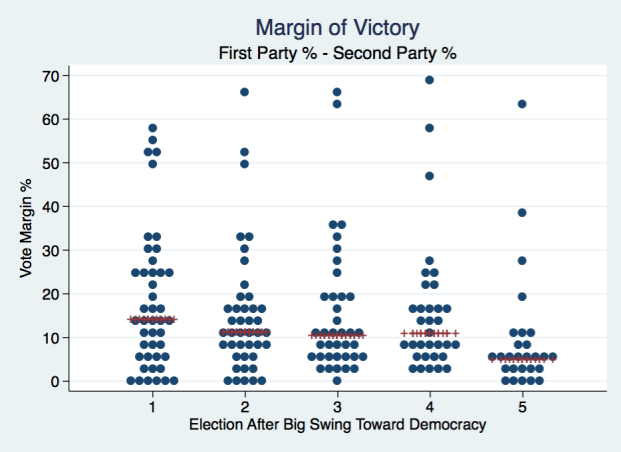


Figure 4.

What do we see if, rather than pooling the data, we follow the trajectory of individual countries? There are certainly countries that followed the Polish pattern of diminishing fragmentation, but equally there are about as many that saw fragmentation increase. Figure 5 shows some both patterns, with the four cases where ENPV shrank the most (Poland, Estonia, Hungary, and Greece) in the top panel and those where grew the most (Brazil, Turkey, Bulgaria, and Romania) below.

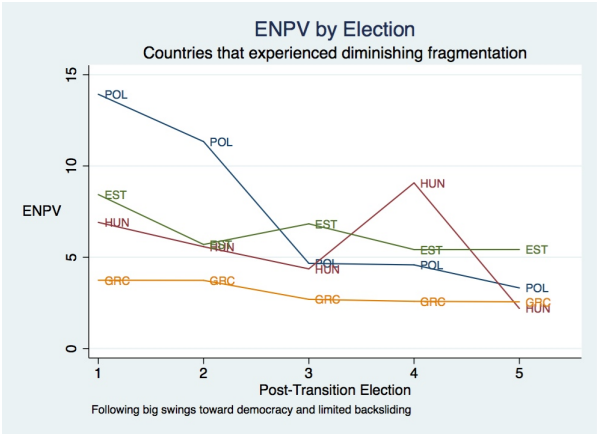
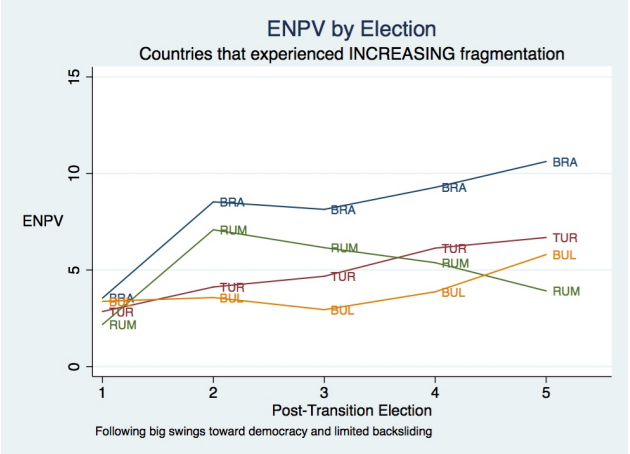
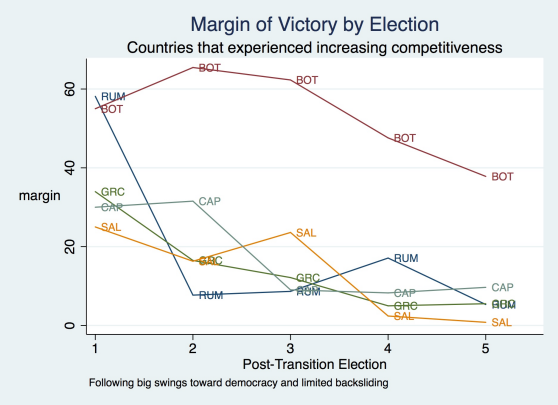


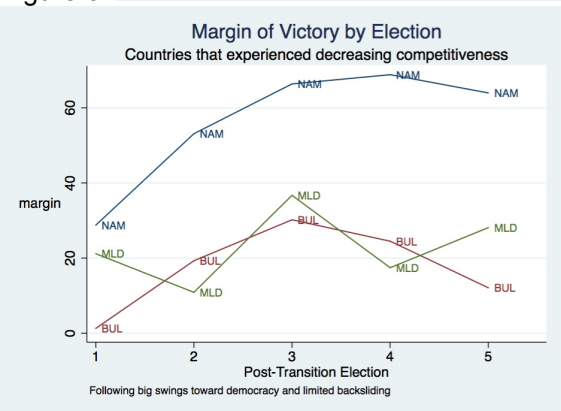
Figure 5.



With respect to competitiveness, there are more cases, and a stronger pattern, of diminishing than of increasing victory margins. Figure 6 shows the most dramatic cases of diminishing margin of victory (Romania, El Salvador, Greece, Cape Verde, and Botswana) in the top panel, and those with the largest increases in margin (Namibia, Bulgaria, and Moldova) below.

Figure 6.





For the 26 countries for which I have election results data for at least 5 post-big-swing elections, I calculated two descriptive statistics to summarize the direction of change in fragmentation and competitiveness:

- **ENPV Ratio** = $ENPV_1/ENPV_5$, where the subscripts denote the first (or founding) and fifth elections, respectively.
- **Margin Difference** = $Margin_5$ - $Margin_1$

When the ENPV Ratio is >1, the vote in the first parliamentary election was more fragmented than in the fifth and when ENPV Ratio <1, the system grew more fragmented. When Margin Ratio is positive, the victory margin grew from the first to fifth election, whereas when it is negative, the fifth election was more closely contested than the first. The set of 26 countries is listed alphabetically in Table 3.

[Table 3]

Table 4 shows the same set of countries from Table 3, but sorted on the left by ENPV Ratio, and on the right by Margin Difference. In most of the cases, the ENPV Ratio is between 0.7 and 1.3, indicating that fragmentation levels did not change dramatically from the first to fifth election. By contrast the margin of victory dropped in far more cases than it rose, often substantially.

[Table 4]

The scatterplot in Figure 7 shows that Margin Difference and ENPV Ratio are not strongly correlated (.22). That is, whether a country witnessed increasing competitiveness in early post-transition elections was largely unrelated to whether it experienced increasing or diminishing levels of vote fragmentation. The two characteristics of elections identified at the outset as desirable – tractability of the choice set and competitiveness – appear to be mutually independent.

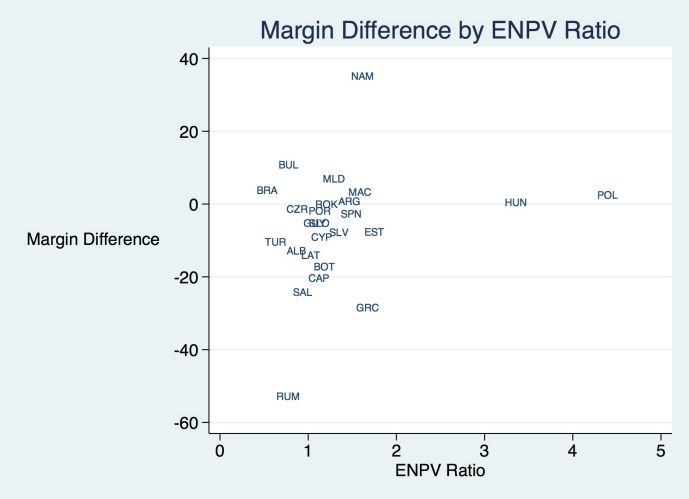


Figure 7.

Summing up so far

Notwithstanding the similarities between the first post-Arab Spring elections in North Africa and the Polish example cited here, the broader cross-national data on elections following dramatic democratizations do not show a pattern of hyper-fragmentation followed by consolidation of the choice set, but they do suggest a general trend toward increased competitiveness. Further research will seek to identify correlates of both outcomes discussed here: vote fragmentation and competitiveness.

Tunisia: Electoral formula and economies of moderate scale

Can the rules of electoral competition be designed to maximize economies of moderate scale, and therefore the incentives for would-be party leaders in transitional democracies to coalesce into alliances large enough to make a credible claim to govern, or at least to form a substantial part of a governing coalition? The evidence I present here is drawn not from a range of national elections. Instead, the point of departure is the election for Tunisia's National Constituent Assembly (NCA) in October 2011. Initially, I examine how the choice of electoral formula affected outcomes in that election. Subsequent analyses are based on simulated vote distributions that deviate from the Tunisian 2011 results according to a series of parameters that allow us to compare the effects of various PR formulas across a range of vote distributions.

On October 23, 2011, Tunisians went to the polls to elect the first constituent assembly following from the first uprising of the Arab Spring. The Assembly had 217 members, elected by closed-list proportional representation (PR) across 33 districts. Each voter cast a ballot for a list of candidates, and the distribution of seats across lists within each district was determined by an electoral formula widely known as the Hare Quota with Largest Remainders (HQLR). The choice of HQLR had enormous consequences for the outcome of the Constituent Assembly election.

The competitive field in Tunisia's 2011 election was unbalanced. The largest party, Ennahda, won 37% of the vote, more than four times the total of the next largest alliance.[8] Based on this result, the HQLR method awarded Ennahda 41% of the seats in the Assembly, or 4% above its vote share. It is noteworthy that, despite dominating the field of parties, Ennahda's seat bonus was not the largest. The bonuses of much smaller alliances were as large – and in one case, even larger – than Ennahda's in absolute terms, and many times larger in relative terms. Together, these seat bonuses for small alliances determined that Ennahda fell well short of a majority of the seats in the Constituent Assembly and, consequently, had to negotiate with other alliances in the process of drafting a constitution. By contrast, had Tunisia chosen differently – for example, had it chosen the other most common PR formula for converting votes to seats, the d'Hondt Divisor (DHD) method – Ennahda would have won 69% of the Assembly seats and been in a position to impose a new constitution unilaterally.

The technical decision to use HQLR as opposed to DHD (or any of the other formulas used less commonly among PR systems) to convert votes to seats greatly increased the number of lists winning representation and, in particular, diminished the representation of the largest party. This, in turn, determined that Tunisia's constitutional moment would be characterized by negotiation among diverse parties and groups rather than imposition by the dominant party.[9]

The logic and mechanics of PR formulas

In the world of PR, there are two main "families" of formulas for converting votes to seats: quota and remainders methods, and divisor methods. Within each family, there

[8] Technically, the competitive unit at the district level in Tunisia's elections was a list of candidates. Lists could be registered by political parties, but also by movements, groups, blocs, fronts, alliances, etc. I refer to "lists" when discussing competition at the district-level, and to "alliances" as a generic term for coalitions of politicians who coordinate at the national level. Ultimately, however, I will also discuss the implications of such coalitions for the development of political parties and a party system in Tunisia.

[9] The extent to which the leaders who selected Tunisia's electoral formula anticipated this outcome is a fascinating question. Stepan (2012) notes that, in April 2011, the Ben Achour Commission, composed of representatives from political parties and civil society groups, reached a broad consensus on a number of procedural matters related to the transition, including that elections to a Constituent Assembly should be fully proportional, rather than majoritarian. However, whether the Commission considered various electoral formulas within the broader phylum of PR, and made a conscious choice of HQLR rather than others, is not explicit. Whether by design or by fortune, HQLR, in conjunction with Tunisia's district structure, generated electoral economies of moderate scale.

are various formulas, although Hare and d'Hondt are the clear "heads" of each family, used in more countries than all other variants combined.

Quota & Remainders Methods
The basic principle here is to set a "retail price," in the currency of votes, at which seats in each electoral district may be "purchased" by lists. That price, or quota, is determined by dividing the total number of valid votes cast in a district by some number – in the case of the HQLR, the district magnitude (DM), or the number of seats at stake in the district.[10] Once votes are tallied, each list is awarded as many seats in the district as full quotas of votes it won. For each seat awarded in this manner, a quota of votes is subtracted from the list's district total. If not all seats in the district can be awarded on the basis of full quotas, any remaining seats are allocated, one per list, in descending order of the lists' remaining votes. These seats, then, are purchased for less than the retail price (or quota) for a seat. Lists that win seats on the basis of their remainders are, effectively, buying seats "wholesale." The difference between purchasing seats retail versus wholesale under HQLR is critical to understanding Tunisia's 2011 election outcome, and the prospect for perverse incentives that could undermine the development of a political party system in the years ahead.

Note that, under HQLR, it is virtually impossible for all seats in a district to be purchased at retail price – that is, unless the distribution of votes were such that every list won vote totals perfectly divisible by the district magnitude. Thus, the HQLR method almost guarantees that, within a given district, lists will pay different prices for seats they win. To mitigate this problem, electoral system designers sometimes reduce the size of quotas by increasing the divisor used to determine them. For example, the Droop Quota (DQ) is calculated as:

Number of Votes / (District Magnitude + 1)

The smaller quota allows for more seats to be bought at retail (and thus, fewer on the basis of remainders), mitigating the problem of inequities across lists in the purchase price of seats.[11]

Divisors Methods
Rather than set a price in votes for the purchase of seats, divisors methods use the tallies of votes across lists to establish a matrix of quotients pertaining to lists, then allocate seats in descending order of quotients until all the seats in a given district are awarded. A hypothetical example illustrates. Imagine a district in which four lists – A, B, C, and D – compete and 1,000 votes are cast. The votes are distributed across lists as illustrated in the second row of Table 5: 415, 325, 185 and 75, respectively. The DHD method proceeds by calculating a matrix of quotients by dividing each list's tally by the

[10] The Hare quota is also known as the "simple" quota.
[11] Of course, reducing the size of quotas opens the possibility that votes could be distributed across lists in a manner that allows more full quotas to be won than there are seats available in the district. The likelihood of breaking the seat budget in this way depends on the number of lists competing in the district and the distribution of votes among them, as well (obviously) of how low the quota is set, but any quota-and-remainders-based electoral rule that seeks to mitigate the price inequity problem by reducing the size of the quota must provide some mechanism of handling the seat budget problem, if it should arise.

sequence of integers 1, 2, 3, and so on. These quotients are shown in the successive rows of Table 2. Once the matrix is constructed, seats are awarded in the descending order of quotients. In this district, for example, if DM=5, then the distribution of seats would be A(2), B(2), C(1), D(0). By contrast, if DM=10, the distribution would be A(5), B(3), C(2), D(0).

Table 5. Illustration of the DHD method in a hypothetical district.

List	A	B	C	D
Votes	415	325	185	75
1st Q	415.0	325.0	185.0	75.0
2nd Q	207.5	162.5	92.5	37.5
3rd Q	138.3	108.3	61.7	25.0
4th Q	103.8	81.3	46.3	18.8
5th Q	83.0	65.0	37.0	15.0
6th Q	69.2	54.2	30.8	12.5

The initial intuition behind divisors methods may be slightly less obvious than with quota-and-remainders methods, but an advantage is that all seats are awarded according to a uniform principle. As with quota-and-remainders methods, one can imagine a rationale for altering the simplest version of the formula in order to achieve certain representational goals. For instance, calculating quotients by dividing vote tallies by the simplest sequence of integers (1, 2, 3 …), as under DHD, erodes the value of large tallies only gradually, allowing larger lists to accumulate seats before smaller lists win any. (Note, from the DM=10 example, that List A wins its fifth seat before List D wins its first.) Thus, some electoral system designers aiming to encourage more inclusive outcomes recommend increasing the divisors by which quotients are calculated more rapidly (e.g. 1, 3, 5, …, as under the St. Lague Divisors system), eroding larger tallies more precipitously, and letting smaller lists in the door to representation with relatively lower vote shares.

In short, either a quotas-and-remainders approach or a divisors approach can be modified from its simplest (HQLR and DHD, respectively), in order to adjust the degree to which the formula rewards large versus small lists. The simplest quota system widely in use, HQLR, is relatively friendly to small lists because the quota (retail price) it sets to purchase seats is high. Lists that win enough votes to purchase seats at retail pay a steep price for doing so, and in turn have their tallies diminished rapidly, meaning that lots of seats tend to be awarded by remainders, at discount prices, and to lists that did not even necessarily secure any full quotas. By contrast, the simplest form of divisor system, DHD, is relatively friendly to large lists because, in constructing the matrix of quotients by which seats will be awarded, it erodes the tallies of large lists more gradually than do alternative sequences of divisors. Thus, the simplest forms of the two approaches have *opposite* effects.

The simplest formulas, moreover, are by far the two most commonly used among countries that elect their legislative assemblies by list PR. Table 6 shows the distribution of democratic countries employing each formula as of the early 2000s for elections to

their lower or only legislative chamber.[12] The largest number of countries uses HQLR, but nearly as many use DHD, and a further set employs both formulas, distributing seats at the initial district level by full Hare Quotas, but then foregoing the use of remainders to award seats in those districts; instead aggregating lists' district remainder votes in "super-districts," and distributing additional seats by DHD at this higher tier.

[Table 6]

Note that many other features of electoral rules, besides formulas, shape the relative prospects for large versus small lists to win seats. District magnitude (DM) is critical here (Taagepera and Shugart 1989; Cox 1997). Under any PR formula, lower DM favors larger lists, while higher DM reduces the vote share needed to win representation, opening the door to representation by smaller lists. Many of the countries listed in Table 2 also employ legal thresholds that establish a minimum vote share lists must win to be eligible to win seats, thus discouraging smaller parties and alliances and favoring larger ones.[13] Creating upper-tier districts for the aggregation of remainder votes, as in the countries using both HQLR and DHD, avoids price inconsistency between seats purchased by full quotas versus remainders, but the opportunity to purchase seats at a discount is relatively more important to small lists than to large ones.

In short, there are various ways to tilt the field of electoral competition in ways that affect the relative prospects for larger versus smaller lists. Using the HQLR method was one decision among many, but it was potentially important, particularly in conjunction with the low-to-moderate DMs used in the Tunisian election and the unbalanced distribution of support among the lists competing. The next section illustrates why and how this was the case.

Tunisia data, results, and simulations

Constituent Assembly delegates were elected from 33 districts – 27 in Tunisia plus 6 for Tunisians voting abroad throughout Europe, the Americas, and the Middle East. Districts elected between 1 and 10 members, but most districts elected 5 or more, with the expatriate districts accounting for those that elected just a handful. Across all 33 districts, 560 distinct groups registered lists to compete. The vast majority of these lists – over 400 – were unique to a single district, and many more competed in only a handful of districts. Only four alliances – Ennahda, Congress for the Republic, Ettakatol, and the Democratic Modernist Pole – managed to contest all 33 of the districts, including those for Tunisians abroad. Two more – the Progressive Democratic Party and Popular Petition – contested 32 districts, and six others contested more than 25.

[12] Countries electing all their legislators in single-member districts (SMDs), such as the United States, the United Kingdom, India, France, and many others are not included. For countries using mixed systems combining SMD elections for some seats with list PR for others, the formula used for the list PR seats is indicated.

[13] Legal thresholds may apply at the national level (e.g. Israeli parties must win 2% of the vote nationwide to be eligible for any representation) or the district level (e.g. lists in Costa Rica that do not win at least one half a full quota in a given district are ineligible to be awarded seats by remainder in that district) or both (e.g. Argentine parties that win 3% nationwide are eligible to win seats in any district, but failing that, a list must win 8% of the votes in a given district to be eligible for seats in that district, regardless of its rank order in the DHD quotient matrix.

To evaluate the impact on the election outcome of the decision to use HQLR, I collected district-level data on the distribution of votes across lists, calculated the distribution of seats according to HQLR, DHD, and other variants of quota-remainder and divisor methods for comparison. The standard reservation with regard to any simulated outcome based on electoral rules that were not used in practice is that, had different rules been employed, political actors – leaders and citizens alike – may have behaved differently, precisely in response to the incentives the rules generate. With some rules, the effect, and the incentives, are obvious. For example, imposing a 5% legal threshold at the national level, as in the Polish example discussed above, clearly discourages smaller parties, creating obvious and compelling disincentives for would-be leaders to register, or for voters to support, any lists except those expected to win wide support. The difference between HQLR and DHD, by contrast, is unlikely to be appreciated by voters, and perhaps only murkily grasped by political elites, at least initially. The simulations here rest on the counterfactual that behavior under DHD would not have differed from behavior under HQLR; the same leaders would have registered lists, and voters would have expressed the same preferences with their ballots.

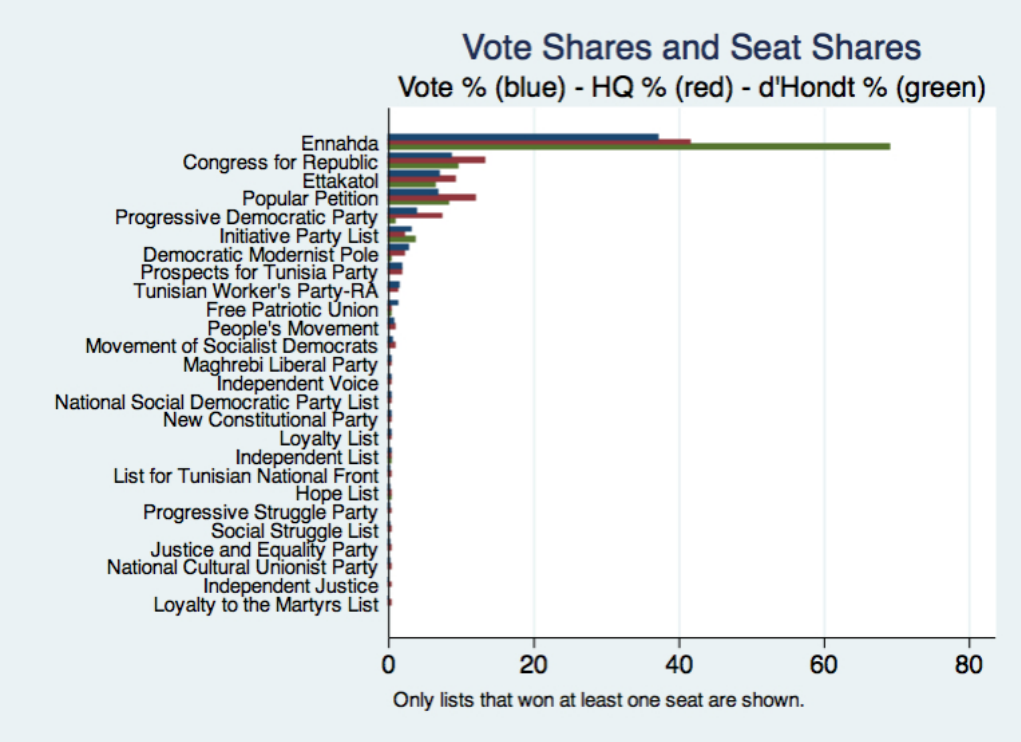
The data were collected from the "District Records" (الفرعية الهيئات محاضر) pages of the "Results" section of the website of Tunisia's Independent Higher Authority of the Election (the French acronym is ISIE). I first reproduced the seat distribution under HQLR, the electoral formula employed in the 2011 election, then simulated results as if the election had been conducted using DHD, and also the main alternative quota-and-remainders formula (Droop) plus another, lower quota (Low); and the most common alternative divisors formula (St. Lague), as well a third divisor formula, which I refer to as Wentworth. [14] All six sets of results are summarized in Table 7, which shows all the alliances that won any seats under each rule, in descending order of their share of the vote nationwide. The top ten alliances won representation under HQLR, whereas the top seven would have done so under DHD. Beyond this, however, the correspondence between national-level rank (in the left-hand column) and representation is less consistent. Many locally based lists that won relatively few votes nationwide had enough votes concentrated in a particular district to pick up a single seat, particularly under HQLR.

[Table 7]

The question here is how the choice of formula affected which alliances were favored, and by how much, in the translation of votes to seats. At the national level, an alliance's seat bonus is the difference between the share of seats it is awarded and the share of the overall vote it won. Figure 8 illustrates this by showing vote shares (blue bars), seat shares under HQLR (red bars), and seat shares under DHD (green bars) for all the lists that won representation in the Constituent Assembly. For an alliance with more seats than votes, the difference between the length of the red bar and the blue bar represents the size of its seat bonus in the election as it was conducted. The difference between green and blue bars shows the bonus an alliance would have earned under DHD -- or its seat penalty, if the blue exceeds the green.

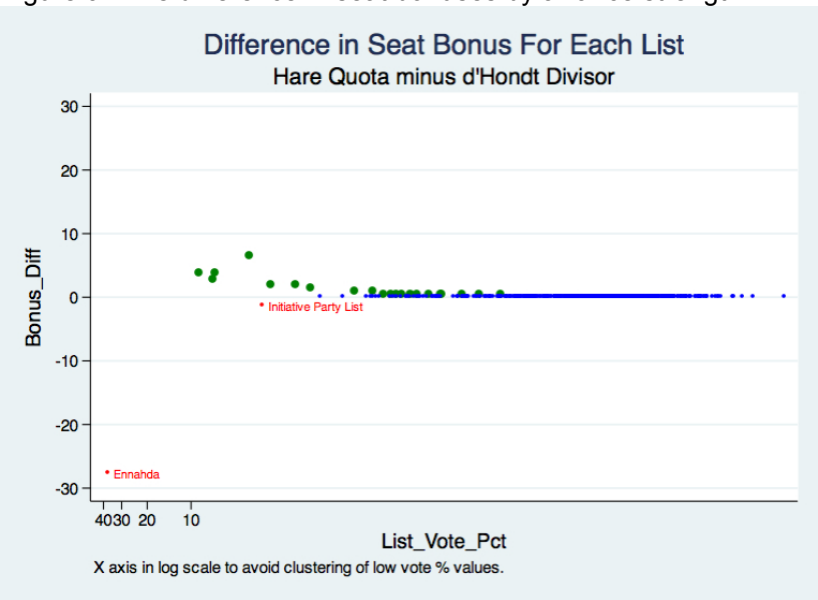
[14] The district-level data on which the analysis and simulations are based are available on my website along with a STATA do-file for producing the results and figures presented here.

Figure 8. Vote shares, seat shares, and simulated seat shares among alliances that won representation in the Constituent Assembly.



The crux of the difference between HQLR and DHD, however, is in how the two systems treat large versus small alliances, and the aggregate effects on the latter, in particular, are obscured in the thicket of tiny bars in Figure 8. Figure 9 remedies this by plotting this difference between the seat bonuses for each alliance under the two systems against the alliance's national vote strength. Each data point in Figure 9 represents an alliance's seat bonus under HQLR minus its bonus under DHD. Thus, points above zero (colored green) represent alliances that did better under HQLR than they would have under DHD; those below zero (colored red), by contrast, would have fared better under DHD than they did under HQLR; whereas the blue points represent alliances whose bonus (or penalty) was equivalent under both rules. The X-axis in Figure 9 is reversed, such that reading from left to right moves from larger alliances to smaller, and is shown on a log scale to avoid clustering the abundant observations with small vote totals all on top of each other.

Figure 9. The difference in seat bonuses by alliance strength.



The largest alliance, Ennahda, did far worse under HQLR than it would have under DHD, and the Initiative Party List also fared slightly worse, capturing 2.3% of seats under HQLR compared with a simulated 3.7% of seats under DHD for its 3.2% overall vote share. The big gains that Ennahda (and to a much lesser extent, the Initiative) failed to capture under HQLR were distributed across fully 21 other alliances that won more representation under HQLR than it would have under DHD.[15]

The most remarkable characteristic of the windfall of seat bonuses generated by HQLR, dramatically illustrated in Figure 9, is the extent to which it accrued to small alliances rather than Ennahda. The starkness of this distributive effect resulted from a confluence of Tunisia's moderate DMs, with its Goliath-versus-multiple-Davids structure of competition. The high HQs drained the coffers of the only large alliance – Ennahda – that regularly paid full price for its seats, opening the way for the smaller contenders to buy seats at wholesale prices and rack up seat bonuses. Under DHD, by contrast, Ennahda's big lead over all other contenders would have eroded only slowly, and it would have captured not just a majority of all seats, but a supermajority of 69%, allowing that one party to dominate the process of writing and approving a new charter of government.

Comparisons with other countries

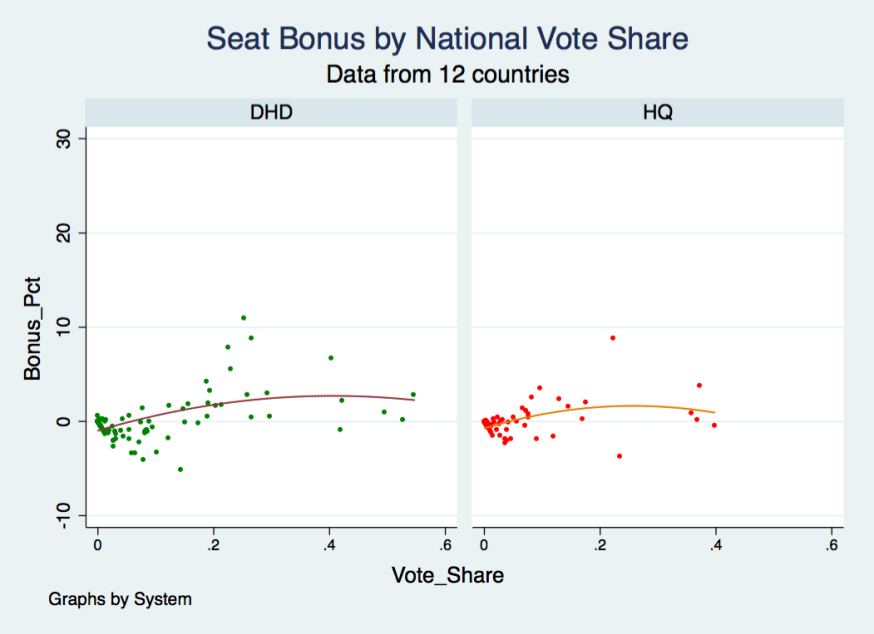
A broader comparative perspective can shed light on the extent to which the Tunisian outcome was exceptional, and on what might be the implications of adopting alternative electoral formulas. Figure 13 illustrates the relationship between vote shares and seat bonuses from the most recent parliamentary elections in twelve countries that rely on list PR for their lower chamber elections and do not employ legal thresholds. The countries included are:

- HQLR: Brazil, Costa Rica, El Salvador, and Panama;

[15] Three other lists would have won a single seat under either rule.

- DHD: Colombia, Cape Verde, Dominican Republic, Finland, Guatemala, Portugal, Switzerland, and Uruguay.

Figure 10: Seat bonus by vote share for the most recent parliamentary elections in 12 countries (4 HQLR, 8 DHD) that elect their lower chambers by list PR.



The two panels show a broadly similar relationship between vote share and seat bonuses in DHD and HQLR systems. Under both formulas, there is a positive relationship between vote share and seat bonus – smaller parties tend to be penalized (i.e. negative bonuses) and larger parties get bigger bonuses. Under both formulas, that positive relationship is subject to diminishing returns, although that relationship appears to be more pronounced under HQLR than DHD, even across the narrower range of vote share values in the HQLR systems.[16] This is due to the ability, under HQLR, of small-to-moderate sized parties to accumulate bonuses by purchasing seats only at discounted prices on the remainders market.

Comparing the formulas using Tunisia's 2011 results

Figure 11 shows analogous graphs for the Tunisian 2011 election. In addition to the showing the results under HQLR, and simulated results under DHD, it also shows simulated results under:

- the most common *alternative* quota-and-remainders formula (Droop Quota) and divisors formula (St. Lague), as well as
- two other formulas that extend the logic of flexibility in both the quota-and-remainders approach and the divisors approach, which I call the Low Quota and Wentworth Divisor methods, respectively.

[16] Arithmetically, any positive returns would have to diminish, given that a party that wins 100% of the vote cannot win more than 100% of seats.

Recall that the difference between the Hare and Droop Quota is simply the size of the denominator used to calculate the quota (DM for Hare, DM+1 for Droop). In addition to Hare and Droop Quota systems, the Low Quota simulation shows the outcome of the 2011 Tunisian election using a quota of DM+2. On the divisors side, recall that the difference between the two commonly used formulas is whether the sequence of integers used to calculate quotients is 1,2,3,4… (d'Hondt) or 1,3,5,7,… (St.Lague). In addition to these formulas, the Wentworth Divisor simulation shows the outcome of the 2011 Tunisian election using the sequence 1,4,7,10,...

[Figure 11]

Beginning with the top left panel, the pattern of seat bonuses that actually applied under HQLR is similar to the pattern from other countries from Figure 10, although the bonuses earned by the alliances that won less than 10% of the vote were larger than would have been expected based on the comparative data because the smaller lists dominated the market for remainder seats. Of Ennahda's 90 seats, it purchased 62 on the basis of full Hare Quotas, and 28 on the basis of remainders. Of the other 127 seats in the Constituent Assembly, divided among 25 other parties, alliances, and local lists, only 14 were purchased on the basis of full quotas, and the remaining 113 were awarded wholesale, by remainders.

The top, central panel shows the pattern of seat bonuses that would have applied had the Droop Quota with Largest Remainders formula been applied in Tunisia, rather than Hare Quota. The results are subtly different, as illustrated in Table 8. Had Droop been used, Ennahda's seat total would have risen to 97, and a few of the other moderate-sized lists would have done about the same as under HQLR, while some of the smaller lists would have been reduced in size slightly, or shut out altogether. Because Droop would reduce the retail price paid to purchase seats by full quotas, the number purchased at retail goes up, and the number awarded by remainders declines from 141 to 126.

Table 8. Seats awarded by full quotas and remainders under varying formulas

Retail vs. Wholesale by Various Q&R Formulas

	Hare		Droop		Low	
	Q	Rem	Q	Rem	Q	Rem
Ennahda	62	28	77	20	90	16
Congress for Republic	3	26	3	27	7	21
Ettakatol	4	16	4	17	4	17
Popular Petition	4	22	4	22	6	17
Progressive Democratic Party	0	16	0	13	0	12
Initiative Party List	3	2	3	3	3	3
Democratic Modernist Pole	0	5	0	4	0	3
Prospects for Tunisia Party	0	4	0	3	0	3
Tunisian Worker's Party-RA	0	3	0	1	0	1
Free Patriotic Union	0	1	0	1	0	1
People's Movement	0	2	0	2	0	2
Movement of Socialist Democrats	0	2	0	1	0	1
Maghrebi Liberal Party	0	1	0	1	0	0
Independent Voice	0	1	0	1	0	1
National Social Democratic Party List	0	1	0	0	0	0
New Constitutional Party	0	1	0	1	0	1
Loyalty List	0	1	0	1	0	1
Independent List	0	1	0	1	0	1
List for Tunisian National Front	0	1	0	1	0	1
Hope List	0	1	0	1	0	1
Progressive Struggle Party	0	1	0	0	0	0
Social Struggle List	0	1	0	1	0	1
Justice and Equality Party	0	1	0	1	0	1
National Cultural Unionist Party	0	1	0	1	0	0
Independent Justice	0	1	0	1	0	1
Loyalty to the Martyrs List	0	1	0	1	0	1
Totals	76	141	91	126	110	107

The top right panel of Figure 11 shows the relationship of vote shares to seat bonuses under the Low Quota and Remainders formula. As the retail price drops, the ability of large lists to purchase seats by full quota expands. Ennahda would take 28 more seats at retail under Low than under the Hare Quota, and its overall seat share rises accordingly, to 106 – just shy of an Assembly majority. But note that the effect on other lists entering the market for retail price seats is modest. Two other lists, Congress for the Republic and Popular Petition, would have won an additional five seats, combined, by full quota, but in each case, their overall number of seats would have declined by virtue of winning fewer on remainders.

The bottom row of Figure 11 shows the simulated outcomes under DHD, St. Lague, and Wentworth Divisor methods. The most striking thing about DHD (left panel) is the bonus of over 30% that would have accrued to Ennahda. Among list PR systems, as the comparative data in Figure 10 underscore, this would be an inordinate bonus.[17] The distortion is a product of a combination of Tunisia's moderate district magnitudes with the enormous imbalance in electoral strength between Ennahda and all other contenders. The series of DHD divisors eroded Ennahda's vote tallies slowly enough that, in five of the smaller districts, it won every seat, and many more it won all but one or two. The unusually lopsided competition of Tunisia in 2011, combined with DHD, would have been a recipe for an inordinate winner's bonus, but as the comparative data show, where competition is more balanced, winner's bonuses on this scale are not the norm. Winner's bonuses can also be modified within divisor-based systems by altering the sequence of divisors. As the remaining panels of Figure 11 show. The central panel shows the St. Lague simulation, in which Ennahda's winner's bonus would still have been substantial, at 18%, but far less than under DHD. The right-hand panel shows the results under a Wentworth Divisor, which would have provided Ennahda a 7% winner's bonus, good for 44% of the Assembly seats, still well short of a majority.

Comparing formulas under alternative vote distributions

The simulations above show us what outcomes might have prevailed under various formula *given the distribution of votes among Tunisian lists in 2011*. HQLR would have most effectively delivered economies of moderate scale, with a concave seat bonus function that peaks in the "viable party" range. But we want to know whether that result is general – that is, would it apply under other vote distributions, too – or whether it was idiosyncratic to that particular context of competition in Tunisia in 2011. If it is general, then it supports the proposition that HQLR should be adopted in proto-democracies when fragmentation of the vote is expected to be a problem.

My approach here was to re-run the analyses done on the actual Tunisian results on variations of those results – simulated elections that deviate from the real one on the distribution of votes across lists. I produced seven alternative datasets with the following properties:

- E+10 and E+20
    - Ennahda's vote total in each district is increased by an average of 10% and 20%, respectively, but with the size of the increase normally distributed around that, with a standard deviation of 5%.

[17] Bonuses on this magnitude are not unheard of in single-winner systems, like the UK, Canada, India, and the United States, but they are extremely rare under list PR systems.

    - The district vote totals for all other parties decreased by 10% and 20%, respectively (s.d. 5%).
- E-10, E-20, E-30, E-40, and E-50
    - Ennahda district level decreased mean 10%, 20%, 30%, 40%, 50%
    - All others district level increased correspondingly – all with s.d.5%

I used those data to replicate analyses previously produced above. The results are summarized in Figure 12. The panel on the left, middle provides a point of reference, summarizing the seat bonus functions for each of the six electoral formula, based on the actual results. In each graph, the solid blue line shows the function for HQLR and the solid yellow line for DHD. The red and green dashed lines show Droop and Low quotas, respectively, and the red and green dotted lines show St. Lague and Wentworth divisors. In the actual results, HQLR delivers the most concave function, with moderate economies of scale, and DHD the most convex, with steeply increasing economies of scale. The other formulas are, as we know, more moderate.

[Figure 12]

The top two panels show the various bonus functions in simulated results even more lopsided than what actually transpired – that is, with Ennahda winning larger vote shares and those of other parties diminished. In these simulations, the "break-even point" (the vote share at which parties win at least as large a share of seats) under DHD is pushed even higher and bonuses at the high end even larger. HQLR remains the kindest formula to small/moderate lists. More interesting is what happens in the remaining panels (middle and bottom row), where the simulated vote distributions are less skewed than in the actual election, and the relative vote share of Ennahda and its competitors converge. Here, the differences in bonus functions among formulas diminish, but the relative properties are consistent. The diminution of differences is not surprising when one considers what produced the variation in the actual election – the phenomenon of smaller lists buying seats wholesale on the remainders market while Ennahda paid retail. With less skewed results, the disparity declines, yet DHD still provides by far the largest bonuses to the largest parties whereas HQLR distributes relatively generous bonuses to small-to-moderate parties.

Beyond the transition stage

Elections in transitional democracies often (not always) present intractable choices sets, lopsided competition, or both. Uncertainty about the viability of would-be parties and alliances is inherent during transitions, but as expectations begin to take shape, the choice of electoral formula affects whether the rewards for coalescence are targeted at smaller or larger parties. The results from Tunisia 2011 and the simulations derived from that election both suggest that HQLR produces economies of moderate scale which, in turn, should produce the incentives for political elites and voters to coordinate behind lists that can command vote shares in what I have called the low end of the viability range of 10-15%. Note that these results are based on a district structure like Tunisia's, with DM in the low-to-moderate range for PR systems (5-10 seats per district). The differences among formula should converge at higher DM and should be even more pronounced at lower DM.

I have suggested that the incentives that come with economies of moderate scale, which reward parties in the viability range, are beneficial in new democracies, where the choice sets facing voters may be overwhelming and bewildering, and incentives for small

parties and alliances to seek common ground with compatible groups, and to coalesce into larger alliances in order to capture electoral economies of scale, would be salutary. But what about in democracies where the choices have already winnowed to a cognitively tractable set of parties in the viability range? Parties at the low end of this range benefit from HQLR precisely by "hunting for remainders," paying wholesale not retail for their seats.

The incentive for parties to atomize under quota-and-remainders systems is not merely an abstraction. For example, Colombia used HQLR throughout much of the late 20th Century, and for historically idiosyncratic reasons, also allowed political parties to run multiple lists within the same district. The result was a hyper-proliferation in which even large parties would split into scores of factional lists in order to win seats by remainders. The practice came to be known as Operation Wasp (*Operacion Avispa*, in Spanish) because it was more effective to fight electoral battles as a swarm of tiny micro-lists than by uniting as a party under a single banner. But although Operation Wasp made sense as a short-term electoral tactic, its larger effects were widely regarded as corrosive to Colombian parties. The factionalization that served their district-level electoral purposes presented obstacles to unifying behind common policy platforms and to effective governance. In 2004, Colombia reformed its electoral system, replacing the HQLR formula with DHD, and requiring each party to run a unified list at the district level.

In short, the results shown here suggest that the choice of HQLR was fortuitous in the context of the Tunisian transition. It is worth noting that the Tunisian Assembly (which has served as the country's parliament while also producing a new Constitution in early 2014) opted to retain the same district structure and formula for parliamentary elections slated for late 2014. That configuration should encourage coalescence among the large array of would-be allies that fell short of viability in 2011, which in turn would contribute to the tractability of the Tunisian choice set. Looking farther down the road, however, if and when the Tunisian party system coheres, there may be a case for shifting to a moderate divisor-based system (for example, St. Lague or, better still, Wentworth) that would eliminate dual pricing and the incentive to hunt seats by remainder.

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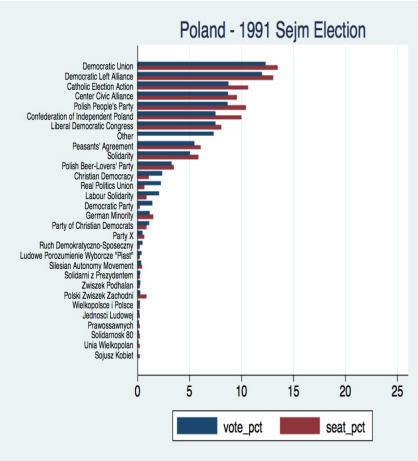
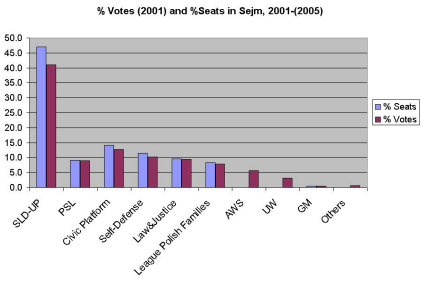
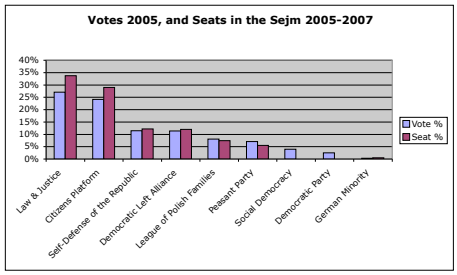
Figure 1.Polish Elections



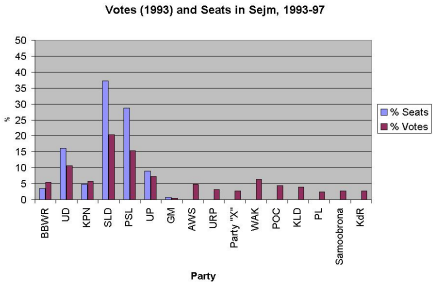
2001



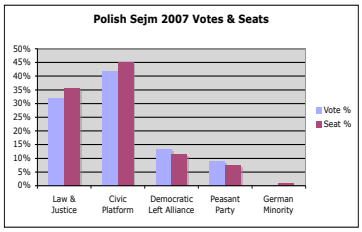
2005



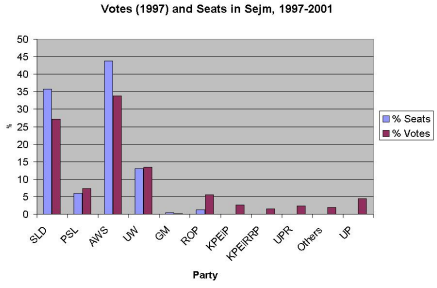
1993 Election
(Adoption of 5% Legal Threshold)



2007



1997 Election



2011

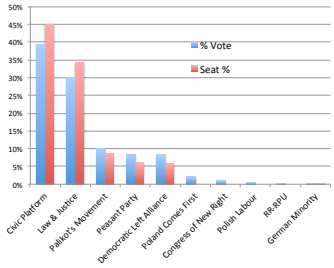
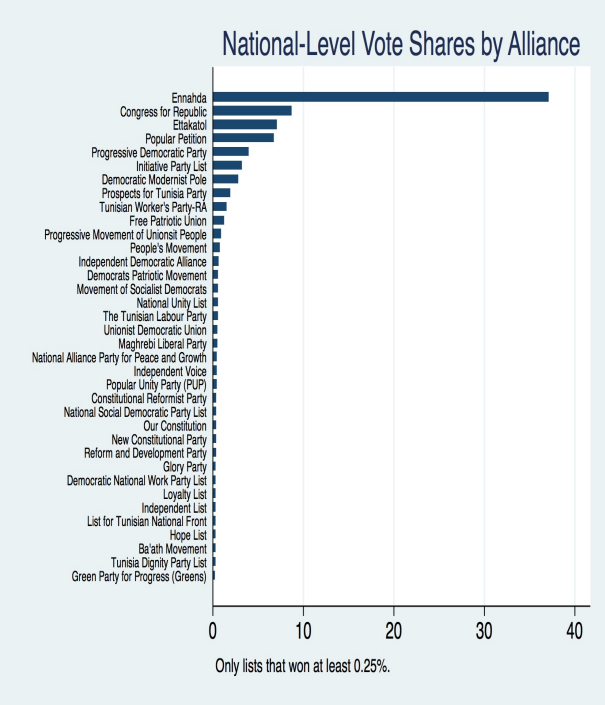


Figure 2. Tunisian and Egyptian Elections, 2011

Tunisia



Egypt

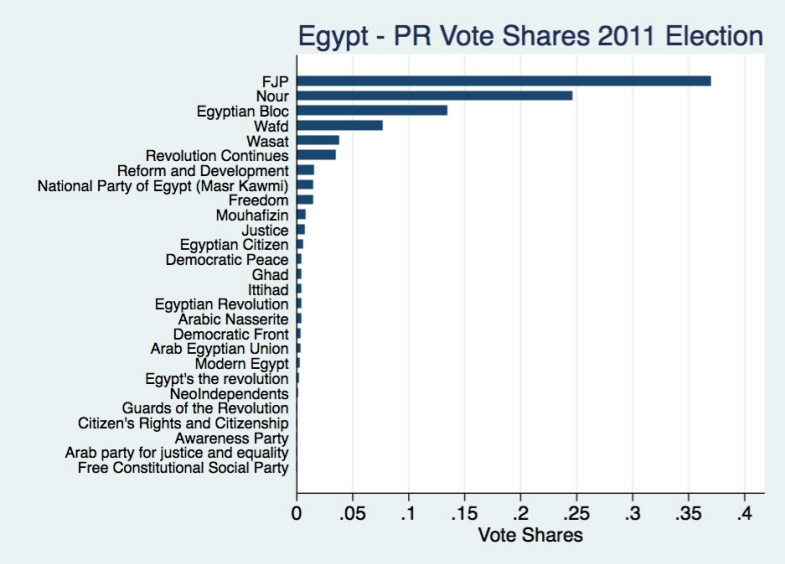


Table 1. 76 Big Swings to Democracy followed by little or no backsliding (of 141 big swings)

Country	Year
Switzerland	1848
Belgium	1853
Japan	1868
Norway	1898
Australia	1901
Denmark	1915
Finland	1917
Netherlands	1917
Sweden	1917
Ireland	1921
Austria	1946
Israel	1948
Italy	1948
Sri Lanka	1948
India	1950
Colombia	1957
Jamaica	1959
Cyprus	**1960**
Trinidad	1962
Botswana	**1966**
Mauritius	1968

Country	Year
Greece	**1975**
Portugal	**1976**
Solomon Islands	1978
Spain	**1978**
Ecuador	1979
Bolivia	**1982**
Argentina	**1983**
Turkey	**1983**
El Salvador	**1984**
Brazil	**1985**
Uruguay	1985
Philippines	1987
Korea South	**1988**
Panama	1989
Paraguay	1989

Country	Year
Poland	**1989**
Albania	**1990**
Bulgaria	**1990**
Czechoslovakia	1990
Germany	1990
Hungary	**1990**
Namibia	**1990**
Romania	**1990**
Benin	1991
Cape Verde	**1991**
Estonia	**1991**
Latvia	**1991**
Lithuania	1991
Macedonia	**1991**
Moldova	**1991**
Slovenia	**1991**
Ukraine	1991
Guyana	**1992**
Mali	1992
Czech Republic	**1993**
Lesotho	1993
Slovak Republic	**1993**

Country	Year
Malawi	1994
Mozambique	1994
Sierra Leone	1996
Armenia	1998
Indonesia	1999
Nigeria	1999
Croatia	2000
Ivory Coast	2000
Yugoslavia	2000
East Timor	2002
Kenya	2002
Congo	2006
Montenegro	2006
Nepal	2006
Kosovo	2008
Bangladesh	2009
Iraq	2010
Somalia	2012

Table 3. 26 big swings to democracy with at least 5 post-transition elections

	Founding Election			Founding Election vs. 5th Election	
Country	**Year**	**ENPV**	**Margin**	**ENPV Ratio**	**Margin Difference**
Albania	1991	2.1	17.5	0.7	-12.8
Argentina	1984	4.2	9.7	1.3	0.8
Botswana	1969	2.0	55.0	1.0	-17.2
Brazil	1986	3.6	0.3	0.3	3.8
Bulgaria	1991	3.4	1.3	0.6	10.8
Cape Verde	1991	2.1	30.0	0.9	-20.3
Cyprus	1970	3.5	14.3	1.0	-9.1
Czech Republic	1997	4.7	3.2	0.7	-1.3
El Salvador	1986	2.8	25.0	0.7	-24.2
Estonia	1992	8.4	8.4	1.6	-7.6
Germany	1990	2.2	7.1	0.9	-7.1
Greece	1975	3.7	34.0	1.5	-28.4
Guyana	1993	2.1	13.0	0.9	-5.2
Hungary	1990	6.9	3.3	3.1	0.4
Korea South	1988	2.1	0.0	1.0	0.0
Latvia	1993	6.3	19.0	0.8	-14.1
Macedonia	1999	5.0	2.9	1.4	3.3
Moldova	1994	4.0	21.2	1.1	6.9
Namibia	1991	2.4	28.8	1.4	35.2
Poland	1991	13.9	0.3	4.2	2.5
Portugal	1976	4.4	11.0	0.9	-1.9
Romania	1990	2.2	58.1	0.6	-52.8
Slovak Republic	1995	5.3	24.6	0.9	-5.2
Slovenia	1993	6.3	8.9	1.2	-7.8
Spain	1979	4.2	4.5	1.3	-2.6
Turkey	1983	2.9	14.6	0.4	-10.4

Table 4. Sorted by ENPV Ratio

Country	ENPV Ratio
Poland	4.2
Hungary	3.1
Estonia	1.6
Greece	1.5
Macedonia	1.4
Namibia	1.4
Argentina	1.3
Spain	1.3
Slovenia	1.2
Moldova	1.1
Botswana	1.0
Cyprus	1.0
Korea South	1.0
Cape Verde	0.9
Germany	0.9
Guyana	0.9
Portugal	0.9
Slovak Republic	0.9
Latvia	0.8
Albania	0.7
Czech Republic	0.7
El Salvador	0.7
Bulgaria	0.6
Romania	0.6
Turkey	0.4
Brazil	0.3

Sorted by Margin Difference

Country	Margin Difference
Namibia	35.2
Bulgaria	10.8
Moldova	6.9
Brazil	3.8
Macedonia	3.3
Poland	2.5
Argentina	0.8
Hungary	0.4
Korea South	0.0
Czech Republic	-1.3
Portugal	-1.9
Spain	-2.6
Guyana	-5.2
Slovak Republic	-5.2
Germany	-7.1
Estonia	-7.6
Slovenia	-7.8
Cyprus	-9.1
Turkey	-10.4
Albania	-12.8
Latvia	-14.1
Botswana	-17.2
Cape Verde	-20.3
El Salvador	-24.2
Greece	-28.4
Romania	-52.8

Table 6. Use of HQ and DHD across list PR countries.

PR Countries using …			
HQLR	**DHD**	**HQ *and* DHD (in different tiers)**	**Other formulas (e.g. including Droop Quotient, St. Lague Divisor, etc.)**
Albania	Argentina	Austria	Denmark
Armenia	Bolivia	Belgium	Hungary
Benin	Bulgaria	Estonia	Latvia
Brazil	Cape Verde	Greece	New Zealand
Costa Rica	Chile	Netherlands	Norway
El Salvador	Colombia		Poland
Georgia	Croatia		Slovakia
Germany	Czech Republic		South Africa
Honduras	Dominican Republic		Sweden
Indonesia	Ecuador		
Israel	Guatemala		
Italy	Finland		
Lithuania	Japan		
Mexico	South Korea		
Namibia	Mozambique		
Nicaragua	Paraguay		
Panama	Peru		
Philippines	Portugal		
Romania	Spain		
Senegal	Switzerland		
Slovenia	Turkey		
Sri Lanka	Uruguay		
Taiwan			
Thailand			
Ukraine			
Venezuela			

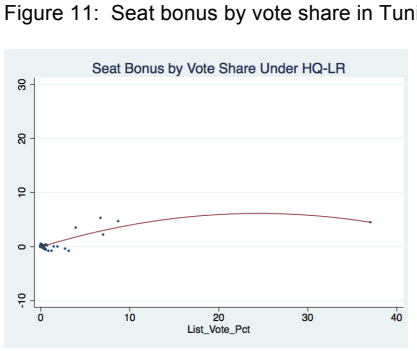
Sources: Colomer 2004; Nohlen 2005.

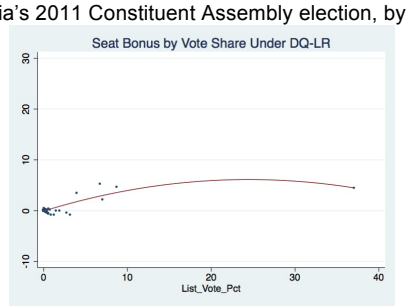
Table 7. Votes, HQLR seats, and simulated DHD seats for lists winning any representation.

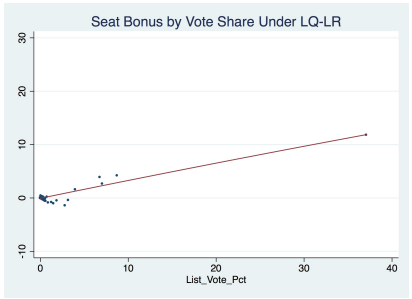
Rank	List	Votes	Vote%	Seats					
				HQ	DQ	LQ	DHD	SLD	WD
1	Ennahda	1,501,774	37.09	89	97	106	150	119	103
2	Congress for Republic	353,299	8.72	29	30	28	21	27	30
3	Ettakatol	285,460	7.05	20	21	21	14	18	20
4	Popular Petition	273,659	6.76	26	26	23	18	23	25
5	Progressive Democratic Party	160,471	3.96	16	13	12	2	9	14
6	Initiative Party List	129,131	3.19	5	6	6	8	6	5
7	Democratic Modernist Pole	113,022	2.79	5	4	3	1	3	3
8	Prospects for Tunisia Party	76,621	1.89	4	3	3	0	2	3
9	Tunisian Worker's Party-RA	60,565	1.50	3	1	1	0	1	1
10	Free Patriotic Union	51,671	1.28	1	1	1	1	1	1
12	People's Movement	30,497	0.75	2	2	2	0	1	1
15	Movement of Socialist Democrats	22,804	0.56	2	1	1	0	1	1
19	Maghrebi Liberal Party	19,219	0.47	1	1	0	0	0	1
21	Independent Voice	16,891	0.42	1	1	1	0	1	1
24	National Social Democratic Party List	15,569	0.38	1	0	0	0	0	0
26	New Constitutional Party	14,228	0.35	1	1	1	0	0	1
30	Loyalty List	12,607	0.31	1	1	1	0	0	1
31	Independent List	11,980	0.30	1	1	1	1	1	1
32	List for Tunisian National Front	11,396	0.28	1	1	1	0	1	1
33	Hope List	11,299	0.28	1	1	1	1	1	1
38	Progressive Struggle Party	9,322	0.23	1	0	0	0	0	0
45	Social Struggle List	7,823	0.19	1	1	1	0	1	1
47	Justice and Equality Party	7,621	0.19	1	1	1	0	1	1
52	National Cultural Unionist Party	5,581	0.14	1	1	0	0	0	0
63	Independent Justice	4,232	0.10	1	1	1	0	0	1
79	Loyalty to the Martyrs List	3,022	0.07	1	1	1	0	0	1

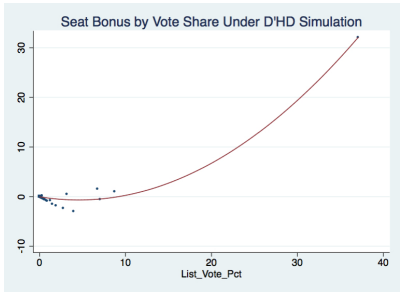
HQ – Hare Quota-Largest Remainders, DQ – Droop Quota-Largest Remainders, LQ – Low Quota-Largest Remainders.
DHD – d'Hondt Divisor, SLD – St. Lague Divisor, WD – Wentworth Divisor.

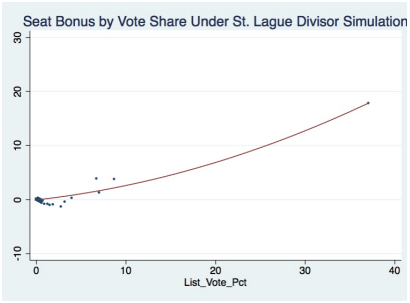
Figure 11: Seat bonus by vote share in Tunisia's 2011 Constituent Assembly election, by various PR formulas.











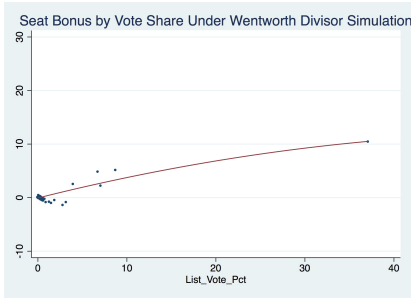


Figure 12. Seat bonus functions of 3 Quota and 3 Divisor formulas, from simulated vote distributions.