formation.[20] The party systems in the dataset are not a 'sample', they are the 'universe' of European party systems. Therefore, statistical significance is noted as an indicator of the strength of the relationship. When it is not noted, the coefficients are all 'significant' at the 0.01 level.

C2.P17   For some party systems (i.e. post-Communist Armenia, pre-World War I Greece, Portuguese First Republic, and Spanish Restoration), given the unavailability of data on electoral support, we will use percentage of seats as a proxy when calculating party institutionalization, polarization and, for the latter three cases, also volatility. As far as volatility is concerned, for the French and Polish Second Republics we use the comparison between legislative and constitutional assembly elections. In other words, we have only 57 cases[21] for which 'perfect' data is available on all these indicators. For the sake of robustness, in the book we will use both the whole universe of cases (65, except for volatility, for which we cannot have more than 62 cases) and the 'perfect' 57 cases, reporting results for the latter only when they significantly differ from the former.

C2.P18   Table 2.1 displays when a party system was formed, when the first democratic (breakaway or founding) elections took place, when the so-called founding cabinet was inaugurated, and when the last cabinet was appointed.

C2.S2
2. Operationalization of Closure: Alternation, Formula, and Access

C2.P19 Before we develop the theoretical argument about the links between closure and other phenomena of interest, we need to clarify how closure itself is measured. In addition to presenting the nitty-gritty of operationalization, the discussion of the indices also allows us to refine the fundamental concepts of the book, and more specifically, to reflect on how time is related to party system closure.

C2.P20   Whether a particular party system is closed or open can be conceptualized either in a dichotomous or in a continuous fashion. A considerable body of research employs a dichotomous approach to tap party system closure (O´Dwyer, 2006; Müller-Rommel, 2005; Müller and Fallend, 2004; Rybář, 2004; Linz and Montero, 2001; Toole, 2000; Mair, 1996). But disregarding differences

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[20] The number of cabinets per country varies between 2 (post-World War II Turkey and inter-war San Marino) and 61 (France's Third Republic).

[21] Only one democratic election took place in post-communist Armenia, post-World War II Greece or the post-World War I Yugoslav Kingdom.

in quantity is problematic. Other things being equal, a large new party in government, for example, represents a greater break with the past than the appearance of a small one. Therefore, in principle, continuous variables that reflect the degree of change should be preferred. Consequently, in this book, and building on previous efforts (Casal Bértoa and Enyedi, 2016; Casal Bértoa and Mair, 2012; Mair, 2007), we opt for continuous operationalization, using *the percentage of minister changes* as the basis for all the three components of closure—alternation, formula, and access.[22]

C2.S3

2.1 Alternation in Government

C2.P21 The measurement of *alternation* is based on the sum of the differences in ministerial shares of parties in two consecutive governments (or 'total net change', an intermediate step in calculating volatility—cf. Pedersen, 1979). Party systems where the total net change is close to its minimum (0) or maximum (200) values will be considered to be closed. The first is an example of no change, the latter is an example of complete turnover. Values closer to the midpoint of the scale represent party systems that are the most open, in line with our theoretical discussion in Chapter 1. Therefore, to arrive at the closure score on alternation we take the absolute difference of the total net change from 100. This also scales the measure to range from 0 to 100.[23] The change in the proportion of ministries belonging to specific parties is disregarded when there is no change in coalition membership. Consequently, the closure value for alternation is calculated as follows:

$$alternation = \left\{ \begin{matrix} \left|^{100} \left\| 100 - \sum_i \mid p_{i,t}\, s - p_{i,t-1} \right\|\right|, & if\ G_t = G_{t-1} \\ & if\ G_t \neq G_{t-1} \end{matrix} \right.$$

C2.P22 where G_t and G_t-_1 are the sets of governing parties at times t and $t-1$ and $p_{i,t}$ and $p_{i,t}-_1$ refer to the proportions of ministers that party i held in government t and $t-1$.

---

[22] Like Mair, we consider partisan ministers, but not independents. Therefore, we count in terms of persons (cabinet members) and not ministries. Furthermore, we count all the members of government, including the premiers, as equally relevant. Of course, considering the weight of the ministries would provide for a more precise measure, but it is not possible to have this information across so many years and countries.

[23] For an alternative way of arriving at the same score see Casal Bértoa and Enyedi (2016).

C2.S4

2.2 Government Formula

C2.P23 The government formula aspect of party system closure measures the novelty of the combination of governing parties. The current set of parties in government is evaluated in the context of all combinations that have occurred in the past, and is compared to the government with which it had the highest number of parties in common. This requires us first to identify the most similar government in the past, and then to compare the two governments with each other. The degree of difference shows the novelty of the evaluated government. A cabinet of Communists, Socialists, and Greens, for example, is compared to the one with Communists, Socialists, Greens, and Populists rather than to the one composed of Communists, Socialists, and Liberals, because in the former case three parties overlap while in the latter case only two. If there are several governments with an equal number of overlapping parties, the one closest in time (i.e. the most recent) is chosen for the comparison.

C2.P24   If one compares a party combination with a combination from the past, then 4 fundamental possibilities exist. 1: they are identical, 2. They are completely different, 3. The previous combination is a subset of the current combination. 4. The current combination is a subset of the previous combination. In the first case familiarity (or continuity) is perfect, 100%. In the second there is no continuity, the closure figure for formula is 0. In the third case we calculate the degree of familiarity by taking the current government as 100% and subtract from it the share of those parties that were not part of the past government with which we compare the current one. In the fourth case we take the past government as 100% and subtract from that figure the share of those parties of the past government which did not join the current government. Finally, we need to distinguish the situation when the parties of a current coalition government have been in office before, but separately, without their current coalition partners. We regard this configuration as completely novel, i.e. similar to option 2, and assign to it the value 0 for familiarity.

C2.P25   The four situations described above appear in four separate rows in the equation below:

$$
formula = \begin{cases}
0, & if \ \left|G_t^*\right| = 0 \\
0, & if \ \left|G_t^*\right| = 1 \quad and \quad \left|G_t\right| > 1 \\
\sum_i p_{i \forall i \in Gt}, & if \ \left|G_t^*\right| > 1 \quad and \quad \left|G_t^*\right| < \left|G_t\right| \\
\sum_i p_{i \forall i \in Gx}, & if \ \left|G_t^*\right| = \left|G_t\right| \quad and \quad \left|G_x\right| \geq \left|G_t\right|
\end{cases}
$$

C2.P26 where G^{*}_{t} is the largest subset of the set of parties currently in government (G_{t}) that was in a government (together) before; G_{x} is the previous government with which the government in question had the highest number of parties in common (i.e. the government it is compared to; if several such governments exist, then the most recent one is considered); p refers to ministerial shares of parties either in G_{t} or G_{x} and i indexes the parties in G^{*}_{t}, the familiar part of the government.[24]

C2.P27   It follows from these rules that a single party government receives 0 on closure if the party has never governed before. If this party used to be part of a coalition in the past, then the percentage of the previous coalition partners is subtracted from 100. If the Social Democrats, who provided 90 per cent of the ministers in a Social Democratic-Green government, decide to continue without the Greens, who controlled only one-tenth of the ministers, then continuity, and therefore closure, is high: 90. If only the Greens continue in office, then closure is only 10, expressing that the degree of discontinuity, and therefore of innovation, is considerable, given that in this instance a small, marginal party has turned into the sole government party.

2.3 Access to Government

C2.S5

C2.P28 *Access*, the third component of closure, is measured as the proportion of ministers from parties that have been in government before. It reflects the extent to which the set of governing parties is changing through the analysed period. Closure in terms of access is 0 if the new government consists solely of parties that have never been in government before and is 100 if a government is formed by parties that have all occupied governmental office in the past. It is calculated as follows:

$$access = \sum_{i} p_{i\,\forall i \in P}$$

C2.P29 where p_{i} is the proportion of ministers belonging to party i in the government in question and P is the set of parties that have been in previous governments.[25]

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[24] The operationalization of party mergers constitutes a challenge, as merged parties might not be totally new. For that reason, when a merged party participates in government we trace back the affiliation of the ministers to their original parties. If a minister cannot be linked to any of the pre-merger parties, then he/she is excluded from the counting unless all the merged parties had been previously in government together.

[25] In the case of merged parties, the record of the predecessor parties is taken into account.

C2.S6

2.4 From Government Change to Years

C2.P30 Our raw data are party composition of governments and the units are therefore determined by government changes. For the analyses that follow, however, we use a version of the dataset that has years as its fundamental units. There are two major justifications for structuring the data in terms of years. First, much of the other data of interest—like the indicators of the level of democracy or of economic development—are recorded on a yearly basis. Second, it can be argued that a year represents a natural cycle in a political system. Although not necessarily in line with the calendar year, parliamentary work has a yearly cycle, state budgets are prepared for particular years and, more often than not, political parties also function internally on a yearly basis.

C2.P31 We move from government changes to yearly data according to the following logic. If there are several government changes in a particular year, then the value for closure for that year is the average for all government changes. If a government does not change in a given year, then the value for closure of that year is 100, indicating stability. In the dataset of yearly closure figures those years that had only non-competitive governments are without closure scores, but for calculating the indices we input for such years the values of the last 'normal' year preceding the extraordinary period. Since we cannot know how the relations among parties have changed, for these extraordinary years we opt for assuming continuity.

C2.S7

2.5 Yearly Raw Closure Scores vs Period Averages

C2.P32 The average of the yearly alternation, formula and access data provides us with the raw yearly closure scores.[26] In most analyses in this book we will aggregate the yearly closure scores across particular periods (e.g. decades) or across the entire lifetime of a party system. The yearly raw scores will not be presented, because they are not relevant on their own.

C2.P33 In order to facilitate an understanding of how the calculation process was conducted,[27] Table 2.2 presents information on the percentage of ministers (in parentheses) per governing party in five different cabinets in five imaginary countries. Country 1 reflects the typical two-party system in which the party winning

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[26] The three components could be aggregated in various ways, including using their common principal component. We opt for giving equal weight to the three components in order to acknowledge their equally important theoretical status.

[27] For an even more graphical step-by-step explanation of how to calculate the closure index, please see https://www.youtube.com/watch?v=Bx5cu4yQ-0E&t=83s (accessed 7 November 2020).

C2.T2 **Table 2.2** Theoretical examples of government formation in five imaginary countries

Cabinet/year	Country 1	Country 2	Country 3	Country 4	Country 5
1st	A (100)	A (100)	A (60)+B (40)	A (60)+B (30)+C (10)	A (33.3)+B (33.3)+C (33.3)
2nd	B (100)	B (80)+C (20)	C (70)+B (30)	D (100)	D (60)+E (40)
3rd	A (100)	A (100)	A (75)+B (25)	A (45)+B (35)+E (20)	F (75)+G (25)
4th	A (100)	B (100)	C (65)+B (35)	D (80)+B (20)	D (60)+E (30)+F (10)
5th	A (100)	B (75)+C (25)	A (55)+B (45)	A (50)+B (25)+F (25)	H (100)

the elections forms a single-party majority government. Country 2 displays the structure of competition in a typical two-bloc party system in which a party (or bloc of parties) on the right is pitted against a party (or bloc of parties) on the left. Country 3 constitutes an example of a two-plus-one party system. In the last two columns one instance of moderately (country 4) and one of extremely (country 5) fragmented party systems are depicted.

C2.P34 Table 2.3 calculates the alternation, government formula and access scores for each of the cabinets in Table 2.1.[28] The final row computes the average of the three criteria, that is, the closure score for the five-year period.[29]

C2.P35 The dataset comprises 2389 years in 65 systems.[30] Seventy per cent of these years have the value 100 on closure. The lowest closure value measured for a particular year is 17, the mean is 91.3, standard deviation 16.6. At the level of system averages (that is, the mean values for the entire lifetime of the party system), the range is, of course, much narrower, extending from 59 to 98.9. The mean is 86.8, the standard deviation 8.2.

C2.P36 The scores come from the higher segment of the spectrum, confronting us with the sometimes-forgotten fact that democracies tend to possess highly structured and stable political systems. The same aspect of reality is revealed by Pedersen's electoral volatility figures: they can theoretically also vary between 0 and 100, but rarely climb above 30.[31] In fact in the 62 party systems in our dataset for which we

[28] Note that for the years between elections or cabinet changes all the three components of party system closure receive a score of 100.

[29] As mentioned above, if more than one cabinet change takes place during a year, their averages will be used for calculating the index.

[30] The number of years per country taken into account varies between 1 (the Kingdom of Serbs, Croats and Slovenes) and 122 (Switzerland).

[31] Only 9.6 per cent of all (680) pairs of democratic elections held in Europe between 1848 and 2019 had a higher volatility figure than 30. Without Greece I this figure is only 8.2 per cent.

Table 2.3 Numerical representation of government changes along the dimensions of alternation, formula and access in the five hypothetical cases

Cabinet/year	Country A			Country B			Country C			Country D			Country E		
	Alt	For	Acc	Alt	For	Acc	Alt	For	Acc	Alt	For	Acc	Alt	For	Acc
1st	FG			FG			FG			FG			FG		
2nd	100	0	0	100	0	0	40	0	30	100	0	0	100	0	0
3rd	100	100	100	100	100	100	50	100	100	100	80	80	100	0	0
4th	100	100	100	100	80	100	50	100	100	60	0	100	100	90	100
5th	100	100	100	100	100	100	30	100	100	80	75	75	100	0	0
Five year component averages	100	75	75	100	70	75	42.5	75	82.5	85	38.8	63.8	100	22.5	25
Five year closure score	250/3 = **83.3**			200/3 = **81.7**			200/3 = **66.7**			187.6/3 = **62.5**			147.5/3 = **49.2**		

Notes: Alt = alternation; For = formula; Acc = access; FG = founding government.

C2.T3

whave volatility figures,[32] the averages range between 3.9 in Malta and 49.3[33] in Greece I; the mean is 18.8, the standard deviation is 10. These data indicate that in terms of range and variation, Pedersen's electoral volatility index and the closure index are rather similar.

C2.S8

2.6 Time-weighted Index

C2.P37 The raw yearly closure score from 1995 in France allows us to answer the question of whether the governments of that year were in line with the traditions of the Fifth Republic, but it will not tell us whether the citizens of France lived in that year under a closed or an open party system. In order to answer the latter question, that is, to capture the state of a party system in a particular year, we need to consider the developments of the previous years and decades, too.

C2.P38 As opposed to the period averages discussed above, the challenge here is to aggregate information from across many years in such a way that we can still characterize the state of the system *at a specific time point*. The challenge of aggregating information from many time points is less present concerning other dimensions of party systems. Take fragmentation. A particular figure for fragmentation collected from a particular year, for example 5.3 as the effective number of parties in Austria in 2013, expresses well the degree of fragmentation of the Austrian party system at that particular time point. Contrary to that, it would be a mistake to consider a party system open (i.e. de-institutionalized and unpredictable) just because in a particular year the composition of the government was novel. Even more obviously, the fact that in a particular year no change has happened in terms of government composition does not make the system completely closed. The study of the events of a particular year will not suffice to pass judgment on the systemic characteristics we are interested in.[34]

C2.P39 The specificity of closure stems from the fact that it is a cumulative phenomenon. If 19 years out of 20 were spent in a predictable fashion, then, bar some catastrophic events, the party system can be considered to be a closed one even during the 20th, more turbulent, year.[35] By following this logic we assume that being exposed to certain ways of government building across a period of time

[32] It includes seat volatility for Greece I, Portugal I and Spain I, as well as electoral volatility between 'constitutional assembly' and first (and only) legislative elections in both France I and Poland I.

[33] If one disregards the very volatile, short-lived Turkey I, and also Greece I and Portugal I for which only seat volatility figures are available, then the Lithuanian party system, with an average of 35.5, is the most volatile case.

[34] Time is, of course, also built into the raw closure figures in the sense that the formula and access components compare current governments with past governments.

[35] A person can be considered to be fundamentally healthy even on a day when she has a cold.

leaves a mark on the participants in the system, and therefore all years of the respective period need to be taken into account.

C2.P40   In order to understand how misleading it would be to characterize the system based exclusively on information about a single year, consider Norway in 2005. Due to the innovative ('red-green') coalition of the Labour party, the Socialist Left and the Centre,[36] the closure score based on information from that single year would place Norway among the open systems of Europe. But in fact, the inertia in Norwegian party politics has always been relatively high, and the Norwegian citizens and politicians living in 2005 could reasonably count, based on their experience of a century of well-structured party competition, on continuity in party relations. Indeed, Norway has remained one of the most institutionalized systems of Europe up to the present day, notwithstanding the innovations of 2005.

C2.P41   Spain in 1996 is an even more extreme case: in this year the country elected the Popular Party to government, a party that had never governed before, and this party was able to form a government on its own. This means complete openness or innovation on the formula and access dimensions, and altogether a closure score placing Spain among the most open systems of Europe. But, in reality, at this time, at the turn of the century, Spain had one of Europe's most stable and predictable systems, a fact that becomes apparent once one considers information from a longer time span.

C2.P42   Now that we have established that information from a longer time span needs to be aggregated to grasp the degree of closure, we need to establish the form of aggregation. If we intend to *characterize a party system* in general, then the best index is the non-weighted average of all years of the lifetime of the party system.[37] There is no reason to prioritize one year above another one. If, on the other hand, the purpose is to capture *the state of affairs in a particular year*, then giving the same weight to each year from the beginning of the party system would be misleading. In the mind-set of the actors the past surely matters, but it probably matters less than the present, and the distant past must matter less than the immediate past, simply because political actors remember recent coalitions better than governments created decades ago. Accordingly, in order to capture the degree of closure in a particular year, the raw value for that year and all past raw yearly values need to be aggregated in such a way that greater weight is given to more recent periods, in line with the following weighting scheme:

$$weights = \frac{\{t,\ldots,1\}}{\sum\{t,\ldots,1\}}$$

[36] The Labour and Centre parties had only once been together in government: during Gerhardsen's so-called unification (national union) cabinet following the end of World War II (June–October 1945).

[37] Of course, the score derived in this way will be time bound, in the sense that revisiting the same party system one year later will lead to a different score. In the case of older party systems adding one year will make little difference, but in the case of short-lived systems the change can be discernible.

C2.P43   where t is party system year in question (counted for the years which fall under governments that are considered). This logic ensures that the weights across the years of the party system are a function of the duration of the system.[38] If the duration of the party system is 100 years, then the most recent 50 years will receive the same overall weight as the most recent 25 years in a 50 year-old system or the most recent 5 years in a 10 year-old system. For example, if we were to calculate a weighted average closure for the third year of a party system, the weights for the raw closure values for that year and the two previous years would be {3,2,1}/(3+2+1)={0.5,0.33,0.17}. If the closure values for these three years are 100 for the first year, 50 for the second year, and 40 for the third year, then the weighted average value for the third year would be calculated as 100*0.17+50*0.33+40*0.5=53.5.

C2.S9   ## 2.7 The Chief Weapon Is Surprise

C2.P44   Closure is supposed to tap the degree of predictability, or familiarity, in the relations among parties in the governmental arena, openness implies novelty and surprise. Formula and access can be easily interpreted in these terms. As far as alternation is concerned, the pattern is somewhat more complex. Obviously, governments that continue after an election strengthen the 'familiarity' of the system. The regular wholesale change of governments is also associated with familiarity in the sense that it occurs most often in systems in which two standard alternatives alternate. But wholesale change can also bring 'surprise' if the new government consists of parties that have not governed before.[39]

C2.P45   The third option for alternation, partial turnover, also has a somewhat ambivalent status in this regard. It typically occurs when some parties have no fixed position in the standard coalitional alignments and switch allegiance from one camp to another. In these cases partial alternation is associated with the lack of predictability. But under certain scenarios this pattern can also become predictable; for example, if a centrist party (e.g. the German Free Democrats in the past) regularly moves between partnerships with a left-wing and with a right-wing party. In these instances partial alternation does not necessarily surprise the political actors.

C2.P46   Using terms such as 'familiarity' or 'surprise' reminds us that the concept of closure has a subjective, psychological aspect. We assume that the actors, citizens and politicians, find the repetition of pre-existing patterns familiar, and are

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[38] Note that the proposed weighting scheme assumes not only that the more distant past matters less but also that anything before the beginning of the democratic party system does not matter at all.

[39] In these instances the standard interpretation of wholesale change as a sign of predictability is, therefore, wrong. But the overall closure scores are not substantially influenced by this anomaly because there are very few cases of wholesale change based on completely new parties.