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Neighbours or Friends? When Swiss Cantonal Governments Co-operate with Each Other

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ABSTRACT Intergovernmental co-operation among Swiss cantons is considered to be much more intensive than in many other federal states. This article investigates different explanations for when and why subnational entities co-operate with each other, and tests them on the Swiss case. In the Swiss case, co-operation seems to be closely connected to the small-scale structure of subnational units. Swiss cantons are fairly small, often smaller than the relevant areas for the provision of public services. This means that cantons need to co-operate with their neighbours and proximate cantons. Further, in the absence of an administrative level that unifies areas with a common language, concordats are a means to co-ordinate policies among German-speaking and French-speaking cantons. The different partisan colours of the cantonal governments only marginally hinder them from co-operating with each other.

KEY WORDS: Concordats, federalism, Swiss cantons, network analysis

Introduction

Whereas the co-operation of subnational governments across borders has received substantial attention from researchers, notably with the emergence of new European regional networks of co-operation (see for instance, Keating, 1998), the co-operation of federal sub-units *within* the same country is a field studied only rarely. This neglects the fact that networks between subnational governments may play an important role in policy making and implementation in decentralized states, and that findings from within-state subnational co-operation might inform the potential for the trans-border co-operation of subnational governments.

In Switzerland, the networks of co-operation among subnational governments have changed dramatically in the last decades. In the 1980s, inter-governmental co-operation was still considered to be underdeveloped. This was explained as a result of restrictions to the transfer of policy competences (Frenkel, 1986; Wälti, 1996: 126). But, even at this time, intergovernmental co-operation had already started to increase

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substantially, to the point that, today, Switzerland is discussed as a country with intensive subnational co-operation (Freiburghaus and Zehnder, 2003: 1; Bolleyer, 2006a, 2006b). Co-operation occurs at both subnational levels of co-operation—therefore, among the 26 cantons (through conferences and concordats) and among the 2700 Swiss municipalities (Arn and Friedrich, 1994; Kübler *et al.*, 2003). While municipal autonomy varies greatly from canton to canton, cantonal competences are equal for all 26 cantons, which in many policy fields are far-reaching. When the Swiss federal state was founded in 1848, the federal government obtained only minimal competences (in particular, customs, postal services, currency, defence, foreign affairs), while all other competences remained at the level of the cantons. Even if the centralization of policies has increased considerably with time, the Swiss cantons still control very important political fields, such as justice and police, health services, elementary and secondary education, and large parts of tertiary education (Vatter, 2007b). Not accidentally, cantons also control an important share of public spending: only some 39% of the expenditures (at 2001) pass through the federal administration, while the remaining 61% are administrated by cantons and municipalities.

In the symmetrical structure of Swiss federalism, cantons all have the same competences, so that on the one hand they can easily co-operate in the policy fields they are in charge of, and on the other, co-operation can be analysed easily in a comparative setting. Given that co-operation in the Swiss case is said to be more intensive than elsewhere (Bolleyer, 2006a, 2006b), the Swiss system of co-operation might be particularly interesting for an explanatory analysis. This article aims to test explanations for inter-cantonal co-operation more systematically: Why do Swiss cantons co-operate so intensively? And why do some co-operate more intensively than others? As one of the first studies of its kind, it uses a quantitative comparative approach to address why some subnational units co-operate much more intensively than others.

Bolleyer's studies focus on the cross-country level, comparing subnational co-operation in Switzerland to other federal countries. Her studies presume co-operation to be generally strong among Swiss cantons and weak among subnational units of the other countries investigated (Spain, Canada, United States). This view not only neglects the possibility that the intensity of subnational co-operation can differ extremely among subnational units of the same country, but also overlooks the fact that a research design with countries as single observations allows the comparison of only very few cases, so that probabilistic tests with alternative hypotheses are not possible. In contrast, I take the within-country comparison of co-operation among Swiss cantons as an opportunity for analysing the differences in co-operation between cantons, and using a quantitative analysis to do so. Despite many similar features, societies vary among different cantons and, due to the extensive organizational autonomy of Swiss cantons, there are still substantial differences in many aspects of political life, so comparative analyses at the subnational level are promising. The 26 cantons offer enough cases for simple statistical analysis, so they appear as an ideal laboratory for comparative studies (Lijphart, 2002).

Bolleyer (2006a) has related the frequent co-operation in Switzerland to its consociational model of government. This study tests for additional explanations that might account for the varying intensity of co-operation. I show that to a large degree the close co-operation of Swiss cantons is a consequence of the very small-scale structure of

Swiss federalism, where the relevant areas for policy implementation are often much larger than the administrative structures, and cantons are often much too small to provide efficient public services at a high level of specialization to their citizens. For this reason, Swiss cantons often need to build larger units for policy co-ordination and implementation, so they co-operate with their neighbours and other geographically proximate cantons. Finally, concordats appear to be a solution to the lack of an administrative level that corresponds to the cultural or linguistic areas in Switzerland. Inter-cantonal co-operation is thus the only way to provide common policies for all French-speaking or all German-speaking areas, particularly in fields where cultural aspects play a particular role.

Methodologically, my study relies on quantitative models that help to analyse dyadic data, namely on the quadratic assignment procedure (QAP). Earlier studies (Bochsler *et al.*, 2004; Bochsler and Sciarini, 2006a) employed methods of network analysis for a descriptive analysis of inter-cantonal co-operation.

The article proceeds as follows. First, a review of previous research shows a lack of quantitatively measured models looking at co-operation between Swiss cantonal governments. Secondly, I develop my own model, which integrates several cost- and benefit-related factors affecting co-operation. The model is then tested using a database comprising the concordats between the Swiss cantons, and using relational data on common characteristics of pairs of cantons. The conclusion summarizes and relates the main findings to the small-scale structure of the Swiss cantons and to the linguistic diversity of the country.

Horizontal Co-operation in the Swiss Federal System: Previous Research

Switzerland is made up of 26 different-sized cantons, ranging from 10 000 to over 1.2 million residents. This structure has remained almost untouched since the beginnings of the federal state of Switzerland in 1803 and 1848, despite the loss of significance of cantonal borders for the economy and society, and the increase in inter-cantonal ties and mobility over time. Although the very small-scale structure of many cantons is seen as outdated (Frey, 2005; Sciarini, 2005), recent proposals for a reform of the subnational division of Switzerland have repeatedly failed to pass the hurdles of the democratic process, as they are considered to be illusionary, or lacking political feasibility.

Co-operation among cantons is only one of a number of possible forms of inter-governmental co-operation. *Vertical co-operation* denotes co-operation between different levels of a federal system. Typically, federal sub-units take part in decision making, in federal law-making, or may play a role in their policy implementation (see Scharpf *et al.*, 1976; Kissling-Näf and Knoepfel, 1992; Kriesi, 1995: 56–58; Kübler *et al.*, 2003; Vatter, 2007a: 81–94 for the Swiss case). Adding to this, there is considerable entanglement of the national and subnational administrations in financial matters (Wälti, 2003: 96–102). This is different from *horizontal co-operation*, which occurs at the same level of administration among non-hierarchically ordered entities; either between municipalities or, in the Swiss case, between cantons (see Scharpf *et al.*, 1976: 34). When the centralization of competences is politically difficult, horizontal co-operation appears to be a viable alternative that makes it possible to regulate policies at a lower level of

the state but nevertheless co-ordinate them across cantons (Wälti, 1996: 126). There are two main kinds of horizontal co-operation among Swiss cantons: first, there are inter-governmental co-ordination bodies, called *conferences* and, secondly, there are treaties among cantons, known as *concordats*.

Inter-cantonal *conferences* bring together ministers or government officials of Swiss cantons. They are formed due to the need for policy co-ordination across cantonal borders. The most important conference, that of the cantonal governments, acts as a plenary assembly of all cantonal governments. It was founded in 1993 following co-ordination problems that emerged in the Swiss negotiations with the European Communities. It is much younger than most of the 16 sectoral conferences, which bring together all cantonal ministers in the fields of education, justice and police, health services, construction and environment planning, agriculture, military, public finances, forestry, welfare, guardianship authorities, registry offices, economy, drug control, energy, public transportation and fire services. Four regional government conferences—that are subordinate to the national conference of the cantonal governments—unify cantons that are located in the west, the north-west, the east and central Switzerland, along with dozens of regional conferences of ministers, and hundreds of regional and national conferences of government officials in their fields of competences, which often have a rather technocratic character (Wälti, 1996: 127; Trees, 2005; Bolleyer, 2006a; Bochsler and Sciarini, 2006a).

Bilateral or multi-lateral *concordats* address specific issues, such as the attendance of cantonal schools by students from other cantons, inter-cantonal institutions in the penal system, mutual support of cantonal police forces from different cantons in the case of events that exceed the capacity of a single cantonal police service, or inter-cantonal rules about the liberation from (cantonal) taxes on inheritance. Today, at least 760 concordats exist, with between two and 26 affiliated cantons. Each canton is related with every other canton through at least 16 concordats, but the intensity of collaboration varies widely. Some pairs of cantons even have more than one hundred common concordats (Bochsler and Sciarini, 2006a).

Previous research has focused mainly on horizontal co-operation, exploring the opportunities and problems of a new meta-level of governance, and asking questions about democratic legitimacy and control.¹ On the other hand, the internationalization of politics, specifically due to the integration process into European institutions in the Swiss case, casts the role of federal sub-units into question in some policy fields. The reinforcement of horizontal co-operation has been discussed as one possible solution to this problem.²

Horizontal co-operation is not a new phenomenon in Swiss federalism, but its use has increased in the last decades. While the earliest concordats date from the founding years of contemporary Switzerland, or even before, most concordats have been established since 1965, when the Swiss system of ‘horizontal federalism’ gained importance (Figure 1).

This is reflected too in the increasing interest of researchers in co-operation among Swiss cantonal governments. Nevertheless, quantitative analytical studies of the system of Swiss horizontal federalism have remained rare. Bochsler and Sciarini (2006a) employed network analysis tools (multidimensional scaling) in order to map the pattern of inter-cantonal co-operation (Figure 2). Most of the concordats include just

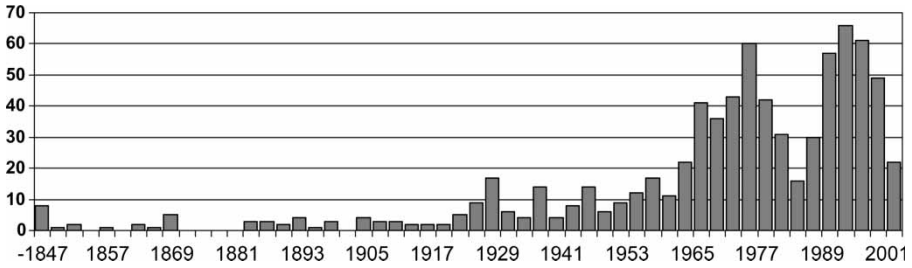


Figure 1. Number of existing concordats by year of establishment. *Source:* Bochsler and Sciarini (2006a) and 2005 database of University of Fribourg and Bochsler and Sciarini.

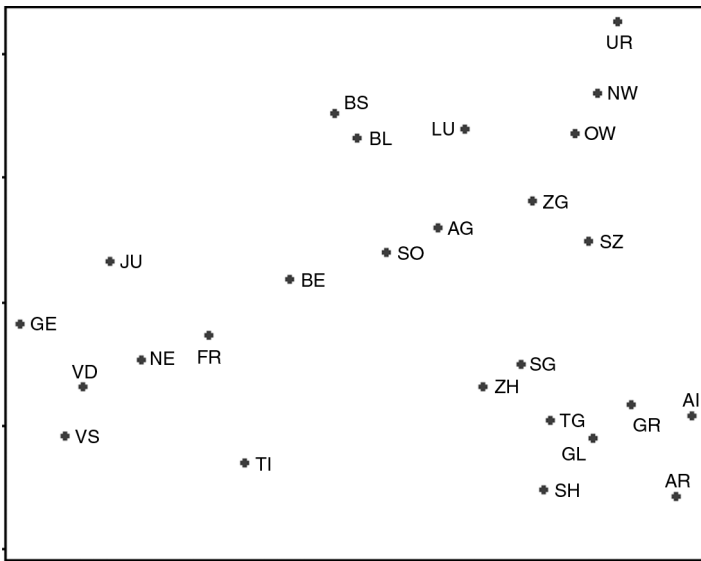


Figure 2. Structure of the system of concordats among Swiss cantons. *Source:* Bochsler and Sciarini (2006a) and 2005 database of University of Fribourg and Bochsler and Sciarini. See Appendix for the list of abbreviations of Swiss cantons.

two cantons, but others include more members—for instance, all 26 cantons acceded to some concordats. The study recognizes patterns of regional co-operation: often, neighbouring cantons collaborate most closely with each other. Furthermore, four small groups of cantons have a large number of common treaties (French- and Italian-speaking group of cantons; north-west; central; eastern Switzerland).

Bolleyer (2006a, 2006b) related the strong co-operation among Swiss cantons to the partisan structure of the Swiss cantonal governments. These are mostly characterized by oversized coalitions and a consensus-orientated style of governing. Based on a cross-country comparison, Bolleyer argued that the common practice of all-party coalitions, with a quasi-proportional division of the (ministerial) posts between all parties in a cantonal government, simplifies and enhances co-operation between the

Swiss cantons, in contrast to other federal countries with less inclusive government coalitions. In countries where subnational governments are formed as minimum-winning coalitions, one, or at best a few parties are represented in the cabinet. As a consequence, governments of different subnational entities often differ substantially in their partisan composition and might perceive each other as political enemies, which may be an obstacle for their co-operation. Not so in the Swiss case: if all major parties are represented in most cantonal governments, their composition overlaps or appears in many cases to be almost equal, so that there are fewer political obstacles to co-operation (Bolleyer, 2006a). Nevertheless, some differences between cantonal party systems, and between the government compositions, remain. However, there is no known systematic quantitative test including competing hypotheses which might explain the intensity and the structure of the system of concordats. This article aims to fill this research gap.

Explaining Co-operation between Cantons

Key previous contributions that have aimed to explain the dense structure of inter-cantonal co-operation (Bolleyer, 2006a, 2006b) have primarily drawn on the consociational political system in Switzerland, without considering alternative explanations in depth. In this study, I shall confront this hypothesis with two alternative explanations, relying on the *smallness* of Swiss cantons and on the multi-cultural character of the country. Both might also contribute to the explanation of the co-operation network.

Smallness of Cantons

The *problem of smallness* emanates in part from the widely unchanged structure of the Swiss cantons since the nineteenth century. While the administrative division is still almost the same, Swiss society and the economy have changed and nowadays have become much more integrated. Due to this new reality, an independent implementation of public policies becomes unfeasible or overly expensive in many cases (Kriesi, 1995: 72–73; Sciarini, 2005). If such a problem exists, it will certainly be most accentuated for the smallest of the Swiss cantons, since their size requires much more co-operation for providing public goods (see Benz *et al.*, 1992: 33–34).

Increasing complexity of policies and of policy implementation has not only increased the interconnections between the federal and the cantonal level of politics ('Politikverflechtung', cf. Scharpf *et al.*, 1976; Benz *et al.*, 1992), but it similarly requires a higher degree of specialization of government offices and employees. However, smaller administrations find it much harder to specialize to the same extent as larger administrations, and this is why small cantons struggle to keep up with the level of specialization that occurs in the larger ones (Geser, 1981: 16–25). Therefore, at the cantonal level the small cantons are particularly forced to cooperate with each other in fields where their own administration would be too small to provide the required level of specialization in an increasingly complex society and economy, and in the face of increasingly complex interconnections between the federal administration and the cantons.

Co-operation might also become an issue when cantonal administrations are expected to provide public services at lower costs, or with a higher quality. Many services might be very costly and inefficient if they are provided for only a small number of citizens and, given the economy-of-scale argument, serving larger groups of citizens might be possible at the same price, or be only slightly more costly. This argument will be felt even more strongly by small cantons. Given that many of the policies that are devolved at the cantonal level might be too costly to be provided for only a small number of beneficiaries, small cantons can hardly fulfil such policies on their own. Co-operation enables them to create larger units.

This reasoning leads to two hypotheses that might be tested empirically. First, the arguments imply that small cantons find it particularly hard to provide specialized services. They can co-operate either with other small cantons, or they can align with larger partners and profit from the larger size that allows more specialized services to be provided to citizens. If small cantons are particularly interested in inter-cantonal co-operation, then pairs of cantons in which one of the cantons is small will be expected to agree more easily in concordats compared to other pairs of cantons; accordingly, they will be connected through more concordats than others.

If the economy-of-scale argument applies, then policy implementation is particularly costly for cantons that do not have partners for co-operation. The marginal cost cuts through co-operation will, however, vanish with an increasing intensity of co-operation, so that cantons that have already an established co-operation in a certain policy field will profit less from additional concordats in the same field than isolated cantons do. Finding one partner in a field of policy co-operation might be much more important than finding many partners. On the other hand, an enlargement of a network of co-operation will lead to increased difficulties in policy co-ordination. We can thus hypothesize that the more a canton already co-operates in a policy field, the less likely it will agree to setting up additional concordats, all other circumstances being equal.

Thirdly, in small federal units, there are several cross-border co-operation problems that emerge. The common use of centralized infrastructure is a typical problem that emerges when the functional centre of a larger region is located in one canton, but also serves for the population of neighbouring areas. Generally, regional planning, traffic planning, construction and maintenance of traffic infrastructure, or the regulation of the use of public goods and their externalities,³ such as the environment (rivers, lakes, etc.), do not stop at administrative borders (see also Scharpf *et al.*, 1976; Benz *et al.*, 1992: 30–31). The smaller the administrative units are, the larger the ratio of borders to area will be, and the more the need for cross-border co-operation emerges. We can thus hypothesize that neighbouring cantons are more likely to co-operate with each other than other cantons. While borders are the best symbolization of this problem, it would be too simplistic to reduce the territorial dimension to co-operation with direct neighbours. In fields where a centre attracts persons of surrounding areas, or when concordats might enable citizens to use public services provided by cantons other than their own, the geographical proximity of two cantons would count much more than their direct neighbourhood.

We thus expect that the smallness problem is manifested in three different ways: first, concordats might be more likely if one of the co-operating cantons is small;

secondly, economy of scale teaches us that the more a canton co-operates, the less likely it is to join in additional concordats; and, thirdly, small-scale territorial structures would require more cross-border co-operation.

Governmental Co-operation in a Multi-cultural Society

The second explanation put forward is based on cultural differences within Switzerland. There are four different official languages and the cultural self-determination of the language groups is ensured, among others, through cantonal autonomy. This is particularly pronounced in the education system (cf. Kriesi, 1995: 67). To a large extent, the cantons are linguistically homogeneous, but there is no administrative level that would be congruent with the linguistic regions. Rather, German is spoken in twenty cantons, French-speakers are spread over seven cantons, and only the two smaller groups of autochthonous Italian speakers⁴ and Rhaeto-Romance speakers are concentrated in respectively, two and one canton. Since there is no level of policy making and administration that corresponds with a linguistic area, inter-cantonal co-operation is the only way to create such a polis, and linguistic ties might thus explain concordats in fields that are linked to cultural aspects and to education.

Political Determinants of Co-operation

The third explanation for the strong inter-governmental co-operation network in Switzerland relies on the practice of (almost) all-party-coalitions that prevail in most cantonal governments. Co-operative federalism would be nearly unthinkable in a party system characterized by party rifts and governments of different colours across different levels and between different regions. Differently minded governments would rarely agree on common policies, and would rather use the areas of co-operation for political struggles (Lehmbruch, 1978: 172–175). Given that co-operation in federal systems cannot be forced, and relies on unanimity of all participating actors, it requires “the continuous co-operation of governments of different political affiliation and therefore playing down of partisan conflict” (Lehmbruch, 1978: 172). If the partisan conflict becomes important, concordats can become politically delicate. As the policy field that needs to be harmonized or co-ordinated becomes increasingly politically relevant, the costs of the political agreement will rise.

Drawing on this argument, Bolleyer (2006a, 2006b) related the strong inter-governmental co-operation in Switzerland, compared to other federal countries, to the multi-partisan governments and consociational system. In this view, political agreement between different governments is eased by political overlaps, while political differences lead to a deadlock in inter-governmental co-operation. One might add that political parties offer an arena for the diffusion of political innovations, clearing the way for policy co-operation.⁵

While Bolleyer stressed the partisan commonalities between the Swiss cantonal party systems, her study does not consider the variance in the partisan composition of cantonal cabinets. Certainly, some are based on very similar multi-party coalitions, including all of the major Swiss parties, but others are more exclusive. For instance, the Christian Democrat Party often plays a dominant role in rural, catholic cantons, while

in urban and protestant cantons its role is weak or non-existent. Governments can be distinguished further by left-wing majorities that occur mainly in rather urban cantons, and coalitions that are (almost) exclusively composed of right-wing parties.

Indeed, there is anecdotal evidence that might support this hypothesis. A famous example dates back to 1991, regarding police co-operation among the cantons of central Switzerland. Since cantonal police forces are small, they rely on support from other cantons for major events, such as mass protests. In the spring of 1991, the canton of Obwalden, governed mainly by the right-wing Christian Democrats, called for its concordat partners to assist in a raid against Kurdish refugees who opposed their extradition. The topic dominated the domestic political debate in Switzerland at the time and divided the parties along the left–right axis. In the canton of Zug, partner in the concordat, the police ministry was controlled by a member of the left-wing Socialistic Green Alternative party (SGA), which sympathized with the refugees and refused any help to the Obwalden authorities. In many other instances, governments in cantons with a left-wing majority face criticism if they co-operate in common police deployments. This case illustrates the loss of political autonomy that accompanies inter-governmental co-operation, and such a loss is particularly harmful when concordats require a policy change in important fields. Therefore, we might expect that inter-cantonal co-operation will be weaker if the governmental coalitions differ in their partisan composition.⁶

Certainly, such visible conflicts on a partisan basis about concordats are not the everyday reality in Switzerland. This might be a consequence of the political commonalities between Swiss cantons, or the fact that there is a self-selection process of co-operation partners, with cantons co-operating with each other only when they agree on political questions. This means that the selection of co-operation partners keeps political disharmonies and partisan struggles to a minimum.

Operationalization of the Hypotheses

As mentioned, the dependent variable in the first-step model, the intensity of co-operation, is measured through the number of concordats through which each pair of cantons is related to each other. Although I acknowledge that there might be differences in the importance of different concordats, these are difficult to quantify, and I assume that a simplification process, of considering every concordat to be equally important, should not bias the results.

In similarity to the dependent variable, explanatory variables need to be operationalized not for single cantons, but for pairs of cantons. There are two ways to operationalize the *geographical proximity hypothesis*: first, through the existence of a common border between two cantons (dummy variable); second, through the geographical distance of two cantons (the distance of their capitals). The second measure has the advantage of being metrically scaled and it indicates that two cantons located close to each other, even if they are not immediate neighbours, might have an interest in co-operation, or might belong to a regional network of intense collaboration. Both variables will be tested. The importance of co-operation for small cantons is measured by their population size (resident population in 2000); according to the formulation of the hypothesis, I consider the population of the smaller canton in a pair.⁷ The *language*

hypothesis is tested through a relational dummy variable, which measures the common use of French, German, or Italian as official language in two cantons of a pair.⁸ Political differences between cantonal governments are measured through Gallagher's (1991) Least-Square Index (see Table 1 for an overview of the variables).⁹ The hypothesis of decreasing marginal utility is tested in a second step of the model. The operationalization of this model is introduced below.

Empirical Analysis and Results

Differences in Inter-cantonal Co-operation

The analysis of cross-cantonal co-operation is based on data on the existing treaties between the 26 Swiss cantons. Several attempts have been made to build up an inventory of all concordats, but most of them remain partial or are out of date. Frenkel and Blaser compiled a database of concordats in 1981, and the Government conference of Central Switzerland (Zentralschweizer Regierungskonferenz) provides a listing of treaties among the cantons of Central Switzerland.¹⁰ Some concordats have been included into the law collections of cantons, but this source is far from being systematic. The most complete recent inventory of concordats has been built up by the University of Fribourg in Switzerland, listing concordats up to early 2006.¹¹ It was completed on the basis of other available sources (mentioned before), and adopted for quantitative analyses by Bochsler *et al.* (2004: 94–99) and Bochsler and Sciarini (2006a). The database counts some 760 concordats and it shows that the involvement of cantons in inter-governmental co-operation varies substantially (Figure 3). With its 220 titles, the

Table 1. Variables included in regression models

Name of variable	Minimum	Maximum	Arithm. mean	Std. deviation
<i>Dependent variable: Number of concordats</i>				
All policy fields (log)	2.77	4.78	3.38	0.32
Education, science, culture	3	31	9.15	4.81
Health services, social security	2	21	3.30	1.90
Security, state organization	5	32	9.65	2.61
Infrastructure, environment, traffic	0	19	1.56	2.38
Economy, agriculture	2	14	4.47	1.71
Finances, taxes	1	5	2.67	1.04
<i>Independent variables in the first-step model (relational variables, n = 325)</i>				
Distance (log)	2.16	5.641	4.472	0.643
Common border	0	1	0.16	0.37
Partisan differences	0	0.77	0.34	0.13
French	0	1	0.065	0.246
German	0	1	0.646	0.479
Italian	0	1	0.003	0.055
Population of the smaller canton (log)	10.0	13.9	12.0	0.8
<i>Independent variables in the second-step model (variables by cantons, n = 26)</i>				
Population (log)	10.0	14.0	12.0	1.1
French speaking	0	1	0.269	0.452

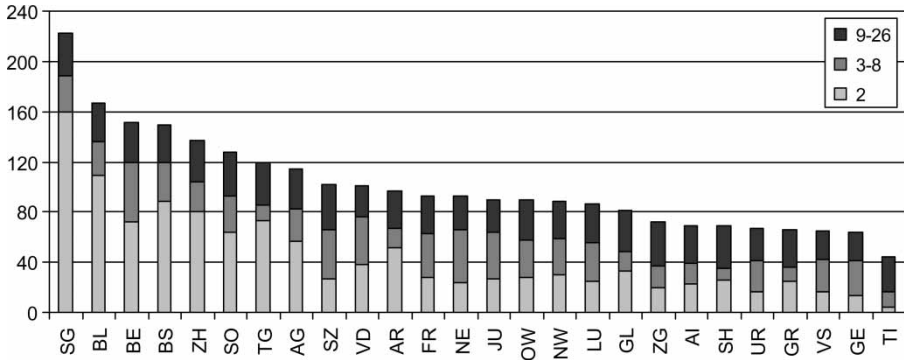


Figure 3. Number of concordats (network centrality) by canton and size of the concordat (by the number of member cantons). See Appendix for the list of abbreviations of Swiss cantons.

canton of St-Gall is the most central canton in the network of inter-governmental co-operation, while Ticino has the lowest centrality in the network,¹² with only 40 concordats, which might be related to the canton's geographical isolation and to the fact that only one other canton recognizes Italian as an official language.

In addition to the density of concordats by canton,¹³ I also analyse the structure of the inter-cantonal network of co-operation, or how intensively each pair of cantons is linked through common treaties. The combination of 26 cantons in pairs results in a matrix with 325 cases (dyads of cantons). Among these, the two neighbouring cantons Basle-City (BS) and Basle-Country (BL) head the list, with 119 common concordats. The least connected pair of cantons are Valais (VS) and Appenzell Outer-Rhodes (AR), with 16 network ties; the two are located in two opposite corners of the country. On average, each Swiss canton is linked with every other canton in thirty-one treaties. I further differentiate concordats by six policy fields and test to see if the explanation model is universally applicable for all of them.

When do Cantons Agree in Concordats with Each Other?

In the first-step model, I analyse the structure of the network of co-operation between Swiss cantons. All in all, for 26 cantons, there are 325 possible network ties, or pairs of cantons that might collaborate with each other. The number of concordats for every dyad is the dependent variable in this model. These data are peculiar because the investigated observations are not the nodes in the network (cantons), but dyads of cantons, namely the strength of the link between two cantons. Each of the 26 cantons is a node in the network, and the concordats are relational ties between the 26 nodes. As explanatory variables, I employ a first set of relational variables, characterizing the relation of two cantons. They are not based on the activity of one single cantonal administration, but the compatibility of two cantons and the ability of their administrations to co-operate with each other, based on geographical distance between the cantons or the existence of a common border, the common use of a language, or political differences. Each of these variables varies for *pairs* of cantons. In addition, I employ a second set of variables unrelated to pairs of cantons, but to the nodes in the

network, namely the cantons themselves. The main interest aspect of the second set of variables is how active a cantonal administration is in its co-operation, regardless of which canton it is confronted with. To begin with, I investigate the question of whether the increasing number of network connections of a canton leads to a drop in its activity. In a first step of the analysis, 26 dummy variables, one for every node, account for non-relational peculiarities of each canton (fixed effects) that affect the activity of the cantons in the network. The cantonal effects, measured through the dummy variables, will be more closely analysed in a second-step regression model. Dummy variables are frequently used in order to account for subgroup differences (Steenbergen and Jones, 2002: 220), or in this case, for differences among groups of dyads that lead to the same nodes.

Dyadic data cannot be analysed with standard analytical models, such as ordinary least-square (OLS) regressions. Standard regression models require that error terms for single observations are independent from each other. My dataset consists of a square matrix of 26×26 nodes (cantons), counting 325 possible dyads of nodes. In dyadic data, the common assumption in regression models that errors for single observations are independent is violated. Since different dyads are nested in the same nodes, problems of autocorrelation might occur, so that standard errors might be underestimated. Network data can be analysed with two applied statistical procedures. P* is the method that is arguably most frequently used for such analyses, but it is only suitable for problems with dichotomous outcomes—thus measuring only the existence of a connection between two nodes.¹⁴ Given that in my dataset, *all* cantons are connected to each other by a few concordats, and I am analysing why the *strength* of the network ties varies, I use the quadratic assignment procedure (QAP regression) for my analysis, which allows the analysis of metrically scaled dyadic dependent variables. QAP allows one to control for the interdependence of rows and columns in a matrix, which is assumed in network data. While the coefficients might be estimated by OLS, QAP uses a permutation procedure to test at which probability level the null hypothesis can be rejected. To this end, rows and columns of the investigated matrix are randomly permuted, which finally allows me to distinguish randomness from systematic effects, at levels of statistical significance (see Krackhardt, 1987, 1988 for details). For the analysis, I performed 10 000 random permutations of the matrix.¹⁵ To my knowledge, this is one of the first analyses that applies QAP in a study in political science.

The results of the regression model are presented in Table 2. The first specification shows the results for the general model, including all policy fields. Six further specifications are calculated for concordats of specific policy fields. While one of the smallness variables, the population size, shows rather surprising results, indicating that co-operation is less frequent if one of the participating cantons is small, the two other variables that are related to the small-size structure of Swiss cantons show clearly positive results: co-operation is most frequent among cantons that are proximate and among cantons with a common border. These variables are statistically significant in almost all models. The small size of Swiss cantons strongly contributes to the explanation in the policy field of *infrastructure, environment and traffic*. There, common borders are more important than in any other policy field, and the smallness variable follows the expected direction. In the policy field of *health services and social*

Table 2. Results of the quadratic assignment procedure (QAP) regression model

	(G) All concordats (log)		(1) Education, science, culture		(2) Health services, social security		(3) Security, state organization		(4) Infrastructure, environment, traffic		(5) Economy, agriculture		(6) Finances, taxes	
	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand
Constant	1.49	0.000	11.51	0.000	5.58	0.000	1.70	0.000	1.79	0.000	8.290	0.000	4.12	0.000
Population (smaller canton, log)	0.060**	0.182	2.45**	0.214	1.20*	0.265	0.784(*)	0.126	-0.282	-0.050	0.102	0.025	-0.101	-0.041
Common border	0.046**	0.124	1.61**	0.124	0.243	0.047	1.13**	0.160	2.04**	0.317	1.16**	0.252	-0.205*	-0.073
Distance (log)	-0.325**	-0.658	-9.88**	-0.574	-4.68**	-0.687	-4.33**	-0.463	-4.75**	-0.558	-3.18**	-0.519	-0.875**	-0.235
Partisan differences	-0.06(*)	-0.058	-0.844	-0.022	-0.841	-0.056	-0.663	-0.032	-1.47(*)	-0.079	0.162	0.012	-0.379	-0.046
<i>Official language</i>														
French	0.164**	0.294	7.43**	0.380	-0.417	-0.054	2.17**	0.205	-1.74**	-0.179	0.140	0.020	1.88**	0.444
German	0.128**	0.445	3.90**	0.388	0.452	0.114	2.69**	0.493	0.016	0.003	0.511(*)	0.143	0.236	0.108
Italian	-0.120*	-0.048	-6.22**	-0.072	-1.27	-0.037	-1.77	-0.038	-1.47	-0.034	-1.84*	-0.060	0.634	0.034
Dummy variables	Not reported (available upon request); shall be included in the second-step regression model.													
Adjusted R ²	0.823		0.794		0.575		0.626		0.602		0.668		0.714	

Note: (*)significant at $p < 0.1$; *significant at $p < 0.05$; **significant at $p < 0.01$. $n = 325$ pairs of cantons.

security, geographical distance is particularly important, and common borders are irrelevant. In this policy field, it is particularly relevant that citizens have access to a public service that is proximate to their residence and, accordingly, it is less the common border than the distance between cantons that plays a major role. In most other policy fields, distance plays a stronger role than proximity. Only in the policy field of *finances and taxes* does geographical space not play a central role. Both the distance and the common border variables are less important, and the latter even runs in the opposite direction from what is expected, which might be an artificial effect of multi-collinearity.

As for the size of the cantons, there is no clear result. Against expectations in certain policy fields (*education, science, culture, health services, social security*) large cantons co-operate more often than small ones. This means that there is no confirmation that smallness requires co-operation. These surprising results might be related possibly to the organizational complexity that accompanies the size of cantons. Geser (1981) showed that small cantons have a much less formalized structure of administration than large cantons. The smallest ones, over long periods, almost lack a professional administration; the state's duties mainly being undertaken by part-time members of the cantonal executives. This could well suggest that larger cantons more often formalize their co-operation in treaties, while small cantons sometimes co-operate informally.

Partisan differences play only a minor role in inter-cantonal co-operation. As expected, the variable is negatively correlated to co-operation in almost all models, but it reaches statistical significance only in the general model and one of the partial models. This result suggests that cantons with similarly composed governments co-operate slightly more easily, while cantons with opposed governments co-operate less often, but partisan differences are clearly not a general or major obstacle to co-operation.

Finally, the potential for co-operation is much higher among cantons with a *common official language*. Language appears as an important explanation for the density of the networks of concordats: *French-speaking* and *German-speaking* pairs of cantons agree in substantially more concordats than pairs of cantons of the reference category (no common official language).¹⁶ In line with expectations, a common language is particularly relevant in those policy fields where language plays a major role for the provision of state services—*education, science, culture*. The statistically shown relevance of language in the field of *security* and *state organization* might be less obvious, but one could possibly guess that this relies on different administrative cultures, separating German- from French-speaking cantons. In other fields, the variable reaches statistical significance only occasionally (and, in the field of infrastructure, environment, and transport it even appears to be statistically significant in the opposite direction).

How to Explain the Different Numbers of Concordats per Canton?

So far, the analysis has not only shown that the relational characteristics of the cantons can affect their co-operation, but it has also estimated fixed intercepts for each canton, measuring the average co-operation activity of the cantons, after controlling for relational features of pairs of cantons. My second-step model analyses the fixed parameters

estimated in the first-step model. I expect that the hypothesis of *decreasing marginal utility* will contribute to the explanation of the fixed effects. The hypothesis is built on the smallness argument. Given the small size of Swiss cantons, they need to co-operate with other cantons in order to increase the efficiency of public services and to be able to create specialized offices, which would not be sustainable in small administrations. This would mean that cantons rely on a certain minimal amount of co-operation, but after they establish co-operation with some other cantons, the benefits of additional co-operation decreases.

The dummy variables introduced in the first-step model to measure the fixed effects show that there is variation among the 26 cantons in their co-operation activity. Both peripheral cantons Ticino (TI) and Geneva (GE) are top-rated, with fixed parameters of 0.23/0.20 (see Figure 4). These high values signify that Ticino and Geneva establish more concordats with potential partner cantons than others do, provided that all other relational variables (language, distance to partner canton, confession) are equal.¹⁷

At first sight, the parameters for the fixed effects in the first-step regression model regarding the activity of cantons look inconsistent: the cantons with the highest fixed intercepts (high co-operation activity) are the ones with the lowest number of concordats. This paradox, however, corresponds to the expectation regarding the *effect of isolation or decreasing marginal utility*. Geneva and Ticino are geographically isolated at the very western and southern ends of Switzerland, so that they have few natural partners for co-operation and, on top of that, Ticino is linguistically isolated as one of only two Italian-speaking cantons. In order to reach even a low level of co-operation,

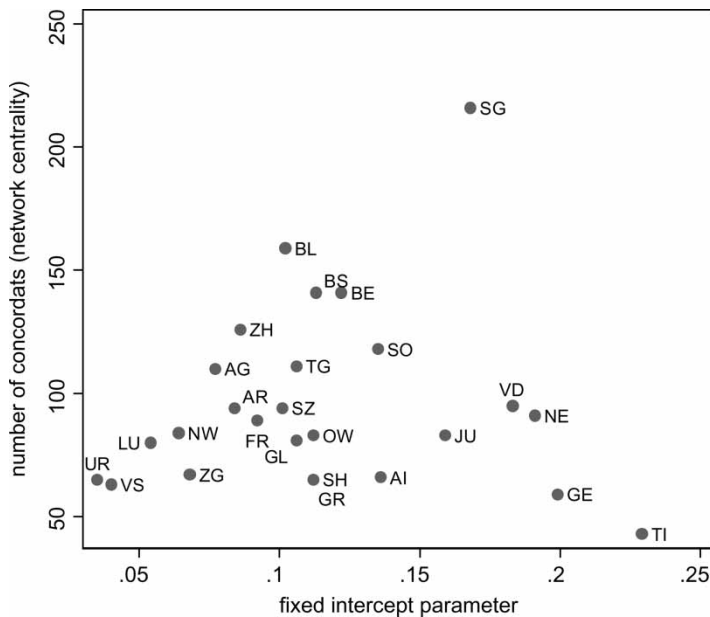


Figure 4. Estimated fixed intercept parameters from the first-step regression model (Table 2) and number of concordats by canton (network centrality). See Appendix for the list of abbreviations of Swiss cantons.

cantons such as Geneva and Ticino must actively seek co-operation, and agree to concordats in situations where other cantons would not join in, because otherwise they would remain completely left out of inter-cantonal co-operation.

On the other hand, cantons that are geographically close to other cantons and, due to this proximity, have very high numbers of concordats, have lower intercepts, meaning that they belong to the less active co-operation seekers. Such cases are Basle-Country (BL) and Basle-City (BS), and Bern (BE), a bilingual canton that is it an attractive partner for co-operation both with German- *and* with French-speaking cantons.

To measure this hypothesis more systematically, I employ two measures that both derive from the first-step regression model. The parameter estimates for the fixed intercepts (dummy variables) are re-used in the second-step models as the *dependent variable*. We expect that the activity of cantons depends on the potential of a canton to establish a network of co-operation. However, this cannot be measured through the number of concordats that a canton has established because such a measure would be endogenous to the cantons' network activity. This is why I measure instead the potential of the cantons to establish concordats, or the predicted number of concordats, after excluding the fixed intercepts from the model. I call this variable the *natural network potential* of a canton. This is the number of concordats that a canton would have, due to its geographical location, its language, and due to the political colour of its government, if it were as active in co-operation as an average canton. To estimate the *natural network potential*, I first calculate the expected number of concordats for all dyads of cantons, using the coefficients estimated in the first-step model, and assuming an average concordat-seeking activity.¹⁸ The *natural network potential* of each canton is the sum of potential ties with each of the 25 other nodes. Isolated cantons have a low potential of co-operation, while cantons with many potential partners for close co-operation have a high potential of co-operation, and might more easily find co-operation partners. Cantons with a high potential are naturally central in the network of concordats; those that are geographically, politically and linguistically isolated have a low potential. The official language of the cantons (dummy for French language) and their size are included as control variables.¹⁹

My OLS estimation, with the 26 cantons included as single observations, confirms the hypothesis of decreasing marginal utility, after controlling for other variables (Table 3). Again, the first specification included all concordats, and six further specifications were calculated for six specific policy fields. The *network potential* is the most important in six out of seven models, and statistically significant. As expected, the *lower* a canton's network potential, the *more active* it is in co-operation seeking (they have higher parameters for the fixed effects). This shows that it is essential for cantons with few (potential) concordats to find co-operation partners. For cantons with few concordats, it appears more important to reach additional concordats than for such cantons that have already established some co-operation. In two policy fields, *infrastructure, environment and traffic*, and *finances and taxes* the variable plays a minor role or there is no statistically significant effect. This might be due to the treaties in these fields. In the *infrastructure, environment and traffic* field, intensive co-operation is mainly due to the small-sized administrative structuring of Switzerland, so that traffic connections, infrastructure projects, but also rivers or lakes often cross

Table 3. Results of the ordinary least square (OLS) regression model

	(G) All concordats (log)		(1) Education, science, culture		(2) Health services, social security		(3) Security, state organization		(4) Infrastructure, environment, traffic		(5) Economy, agriculture		(6) Finances, taxes	
	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand	coeff.	stand
Constant	1.59		20.37		5.83		9.33		-0.179		9.42		1.44	
Population (log)	0.015**	0.337	0.227	0.146	-0.123	-0.192	0.264(*)	0.190	0.126	0.232	0.182	0.324	0.190(*)	0.383
French speaking	-0.006	-0.051	0.350	0.090	0.380	0.237	-0.007	-0.002	-0.008	0.309	-0.663(*)	-0.473	-0.485(*)	-0.391
Potential for concordats (log)	-0.280**	-0.834	-4.76**	-0.699	-1.10**	-0.390	-3.05**	-0.841	-0.224*	0.088	-2.70**	-0.577	-0.938	-0.107
Adjusted R^2	0.702		0.528		0.628		0.764		0.199		0.312		0.267	

Note: (*)significant at $p < 0.1$; *significant at $p < 0.05$; **significant at $p < 0.01$. $n = 26$ cantons (model 4, $n = 24$ cantons); robust standard errors.

cantonal borders. Co-operation in the *finances and taxes* field mainly consists of treaties on the liberation from (cantonal) taxes on inheritance, and such tax treaties provide a genuine and supposedly constant benefit for the cantons and their citizens, irrespective of whether or not there are already similar treaties with other cantons.

Finally, the size of the cantons (population) seems to have an impact in several models, although it is not always statistically significant. As in the first-step regression models, however, the direction of the coefficient is opposed to the expected direction, with large cantons co-operating more often, which again might be due to the higher degree of formalization in administrations of large cantons.

Conclusion

This article has shed light on the inter-governmental network of co-operation of Swiss cantonal governments, a topic which has not been studied previously by adopting a quantitative comparative approach. Using a database of intergovernmental treaties between Swiss cantons, I have investigated different explanations for inter-cantonal co-operation. On the one hand, the Swiss federalist system consists of fairly small cantons, which leads to the need for cross-border co-operation. My analysis confirms two hypotheses that were derived from the problem of small-sized cantons. On the one hand, I argue that as a consequence of the very small-scale structure of Swiss federalism, where the relevant areas for most policies are much larger than the administrative structures, policies often need to be planned and implemented across cantons, and this requires neighbouring or proximate cantons to co-operate, in order to build larger units. On the other hand, the empirical analysis also supports the hypothesis of decreasing marginal utility of co-operation. More specifically, many cantonal administrations are too small to provide a high degree of specialization of government offices and employees in an increasingly complex society and economy and in the face of increasingly complex interconnections between the federal administration and the cantons. For this reason cantons need to co-operate with each other, in order to reach a critical size. This implies that cantons with only few established concordats in a field are more interested in finding co-operation partners, in order to increase their administrative efficiency and because larger units allow them to establish more specialized offices. For cantons with an already established network of co-operation, the marginal gains from a new concordat will, *ceteris paribus*, however, be lower, so that cantons with many established concordats are less active in co-operation-seeking than those with a relatively isolated position. After accounting for these factors, which are related to the small-scale structure of the Swiss federalism, the hypothesis about small cantons being involved in co-operation more often did not contribute additionally to the explanation.

Further, concordats play a considerable role linked to Swiss linguistic diversity. Even if most cantons are linguistically homogeneous, the two largest language groups in Switzerland (German and French speakers) are distributed across many cantons, and lack an administrative level that corresponds to the linguistic regions of Switzerland. Instead, intergovernmental co-operation between cantons offers the opportunity for policy co-ordination across German- or French-speaking cantons, and the creation of common institutions and regulations within linguistic regions.

However, partisan similarities, and differences, as hypothesized by Bolleyer (2006a, 2006b), emerge only as a weak factor in the model, and remain below standard levels of significance.

In a barely covered field of research, this article offers first insights into the structure of the network of inter-cantonal co-operation, and allows the analysis of a few hypotheses in quantitative way. At the same time, the scope of this article remains limited: it does not consider the varying importance of different types of co-operation. Given that earlier research has characterized intergovernmental co-operation in Switzerland as being more intensive than elsewhere, it is questionable whether the structure is similar to other cases. Certainly, however, the Swiss case is a prime example from which other subnational authorities can learn how to co-operate, either within a state, or for cross-border co-operation.

While the substantial findings of this article help us to understand how Swiss cantons co-operate, they also provide suggestions about possibilities for increasing trans-border co-operation of subnational governments. The methodology applied in this article might likewise be employed for the analysis of regional co-operation and international co-operation of governments.

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Notes

¹More can be found in Abderhalden (1999), Boegli (1999), Schöni (2005: 17–18), Rhinow (2002) and Kramer (1997: 282).

²See, for instance, Häusermann (2003), Abderhalden (2000) and Minger (2004).

³While the theoretical literature reflects the gains in planning efficiency and co-operation from an economic perspective, Balthasar (2003), Kissling-Näf and Zimmermann (1996) and Sager (2003), among many others, provide a few illustrative examples for inter-cantonal policy harmonization, which is not always formalized. For co-operation at the municipal level, Arn and Friedrich (1994) and Ladner *et al.* (2000: 63–74) list motivations which are similar to the ones at the inter-cantonal level.

⁴The Italian-speaking community that lived over long periods in southern Switzerland are addressed as autochthonous in order to distinguish it from more recent migrations of Italian speakers, mostly coming from Italy, to other German- or French-speaking cantons. In the cantons where the Italian community is not autochthonous, Italian is not an official language.

⁵There is a wide literature on policy diffusion; see, for instance, Dobbin *et al.* (2007) or Braun and Gilardi (2006), for an overview.

⁶To be precise, since most cantons have multi-partisan governments, not only the composition of the cabinet, but also the party affiliation of the relevant ministers might play a role too. However, since the party affiliation of ministries changes often, the hypothesis can be operationalized only at the level of the (usually very stable) composition of the whole government, and not at the level of single ministries.

⁷A different operationalization, using the mean population of both cantons, was tested, but does not provide better results.

⁸Since only one canton uses the fourth Swiss national language, Rhaeto-Romance, officially, it cannot be used as a relational variable.

⁹The differences are measured for the government composition of 2005, data taken from Bochsler and Sciarini (2006b). For every party P which is represented in one of both governments A and B , its seat shares in government A , a_p , and in government B , b_p , are needed. The Least-Square Index is calculated as follows: $LSQ = \sqrt{[\sum (a_p - b_p)^2 / 2]}$. For governments that are identically composed, the difference is 0; if two governments are solely composed of members of two different parties, the difference is maximal and accordingly coded 1 (see Table 1 for the variables included in the regression models). It might seem that the recent government composition was less indicative of the network density than government composition in earlier stages, when treaties were concluded. I have tested other measures, on the one hand for the government composition of 1990, and on the other hand a measure which is based on the confessional cleavage which used to be an important aspect of differences in cantonal politics in Switzerland for a long time (see Bochsler and Sciarini, 2006a). However, none of these measures leads to different results.

¹⁰http://www.zrk.ch/prog/default.asp?struktur_id=57

¹¹<http://federalism.unifr.ch/concordat/ge/index.html>. It is plausible that the database is not complete. For the present analyses I see, however, little reason that possible gaps would be so systematic as they lead to biased results.

¹²The number of concordats in which a canton participates is a non-standardized measure of network centrality. Given that each concordat is counted only once, even if it establishes several network ties, my count indicator is equal to a weighted centrality measure, where each network tie is weighted with $1/(k-1)$ for concordats with k participants. See Wassermann and Faust (1994: 173–219) for an overview over centrality measures.

¹³This would only indirectly reflect the structure of the network of concordats, and give us information about the centrality of a node in the network.

¹⁴One of the specific network analysis methodologies, p^* , controls for these dependency effects, and helps to explain the absence or the (symmetrical or asymmetrical) occurrence of ties between nodes of a network, using relational characteristics and characteristics of the whole network. The method provides logit models and explains dichotomous outcomes (Wasserman and Pattison, 1996; Anderson *et al.*, 1999; Pattison and Wasserman, 1999).

¹⁵The regression model is estimated with UCINET.

¹⁶Only two cantons have *Italian* as a common official language; this variable therefore relies on only one positively coded tie, and should not be over-interpreted.

¹⁷Certainly, given the structure of the data, it is impossible to establish directly if a canton is particularly active in seeking co-operation, or if it is simply often addressed by other cantons for co-operation. The variable measures, thus, if—given all contextual factors being equal—a canton is more likely to join in a concordat than others. This does not mean that more active cantons in co-operation necessarily are the ones that take the initiative for co-operation.

¹⁸Since the fixed intercepts are not exogenous to the model, they are set at average (geometric mean of all the cantonal parameters).

¹⁹My dependent variable is not a naturally measured variable, but one derived from another regression model. This makes it particularly important to control for deviations through heteroskedacity (Lewis and Linzer, 2005).

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Appendix: Abbreviation of Cantons

AG, Aargau; AI, Appenzell Inner-Rhodes (Appenzell Innerrhoden); AR, Appenzell Outer-Rhodes (Appenzell Ausserrhoden); BE, Berne (Bern); BL, Basle-Country (Basel-Landschaft); BS, Basle-City (Basel-Stadt); FR, Fribourg; GE, Geneva (Genève); GL, Glarus; GR, Grisons (Graubünden); JU, Jura; LU, Lucerne (Luzern); NE, Neuchâtel; NW, Nidwalden; OW, Obwalden; SG, St. Gall (St. Gallen); SH, Schaffhouse (Schaffhausen); SO, Solothurn; SZ, Schwyz; TG, Thurgau; TI, Ticino; UR, Uri; VS, Valais; VD, Vaud; ZG, Zug; ZH, Zurich (Zürich).