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The Swiss business elite (1980–2000): how the changing composition of the elite explains the decline of the Swiss company network

Felix Bühlmann, Thomas David and André Mach

Abstract

In this paper we analyse the decline of the Swiss corporate network between 1980 and 2000. We address the theoretical and methodological challenge of this transformation by the use of a combination of network analysis and multiple correspondence analysis (MCA). Based on a sample of top managers of the 110 largest Swiss companies in 1980 and 2000 we show that, beyond an adjustment to structural pressure, an explanation of the decline of the network has to include the strategies of the fractions of the business elites. We reveal that three factors contribute crucially to the decline of the Swiss corporate network: the managerialization of industrial leaders, the marginalization of low degree holders and the influx of hardly connected foreign managers.

Keywords: business elites; capitalism; Switzerland; financialization; networks; field.

Felix Bühlmann, FORS, University of Lausanne, Bâtiment Vidy, CH-1015 Lausanne, Switzerland. E-mail: felix.buhlmann@fors.unil.ch

Thomas David, Institute of Economic and Social History, University of Lausanne, Bâtiment Anthropole, CH-1015 Lausanne, Switzerland. E-mail: thomas.david@unil.ch

André Mach, Institute of Political and International Studies, University of Lausanne, Bâtiment Anthropole, CH-1015 Lausanne, Switzerland. E-mail: andre.mach@unil.ch

Introduction

The most monumental battles waged by those researching elites were undoubtedly fought by Anglo-American scholars in the 1950s and 1960s. The opposition between an 'elitist' or 'critical elite theory' strand (Mills, 1956) and a 'pluralist' or 'functionalist' school (Dahl, 1961) drew lines that are still significant today (Scott, 1990). Whereas Mills asserted that seemingly democratic societies fall cyclically under the rule of small power elites who hold positions simultaneously in the economic, political and military fields, Dahl thought that, as a result of modernization and social differentiation, elites would become increasingly sectoral and dispersed (Dahl, 1961; Mills, 1956). Once these two theoretical frameworks were laid out, much of the literature on elites in the 1960s and 1970s was dedicated to testing their assumptions empirically and applying these theoretical ideas to other countries to enlarge comparative knowledge on elites, although the arguments are no longer subject to major substantial developments. What have been developed are methods that serve arguments for or against a cohesive power elite. While in the 1950s scholars relied on simple accounts of the interconnections between firms and political institutions, in the 1970s we observe the emergence and increasing use of social network theory (Fennema & Schijf, 1978; Mizruchi, 1982; Scott, 1990). Its advocates showed that in the second half of the twentieth century in most Western countries, large firms were organized into dense networks, connected through the mutual interlocking of board members and directors (Scott, 1990; Stokman, Ziegler, & Scott, 1985). Since the early 1990s, however, there have been rather consistent indications from researchers in several countries that these networks have begun to erode as a result of capitalism's thorough reorganization (Beyer & Höpner, 2003; Davis & Mizruchi, 1999; Heemskerk, 2007). The decline of such a historically specific mode of coordination poses a theoretical and methodological challenge to scholars in the social sciences. Ideas about elites and their functioning that were taken for granted must be called into question, new concepts must be developed and novel combinations of methods must be explored and discussed (Froud *et al.*, 2006; Savage & Williams, 2008). With an innovative blend of methods, this paper takes on the challenge to contribute to an understanding of the decline of corporate networks and the transition between two modes of coordinating capitalism.

Such an endeavour must be rooted in a case study. We argue that Switzerland is a reasonably adequate case for investigating the decline of corporate networks. With other small European states, such as the Netherlands, Sweden or Denmark, Switzerland shares a number of characteristics that render it particularly suitable for explaining current dynamics of elite reorganization. Because of their early dependence on international markets and their ensuing vulnerability to their external environment, small European states have tended to develop strong mechanisms of cooperation among economic and political elites, and their elites are among the most interwoven

and transversal (for a general account, see Katzenstein, 1985, 2003; for specific examples, see Christiansen & Rommetvedt, 1999; David & Mach, 2004; Heemskerck & Schnyder, 2008; Nollert, 1998). Switzerland is a particularly good example in this respect because, since the foundation of the nation-state in 1848, the Swiss political system has relied on important neo-corporatist institutions, a militia parliament and a militia army. This weak reliance on professionalism means that a large group of individuals occupy simultaneously seats in decisive political organizations, on boards, as top managers of large companies and at high ranks in the Swiss army (David *et al.*, 2011; Kriesi, 1980). In addition, the economic field of small states is often characterized by a strategic collaboration among industrial and financial sectors in the form of dense networks of interlocked directorates. In Switzerland, this collaboration was the paramount strategy of the Swiss elites to secure their power and influence against other groups of actors during the twentieth century (Schnyder *et al.*, 2005). At the same time, small states have been particularly exposed to 'recent globalization'; their companies have become internationalized more quickly and more radically than those of larger states and their economies are more consistently exposed to the dynamics of globalization (Van Veen & Elbertsen, 2008). This experience of small states is not only interesting in its own right. When Katzenstein asserts that 'large states are growing smaller' (2003, p. 27), he means that large states will be similarly confronted with new ways of elite coordination and the greater vulnerability that comes with the dynamics related to globalization.

The paper is organized as follows. We first explain why a combination of network analysis and multiple correspondence analysis (MCA) is useful for grasping current changes. After discussing the recent changes in the Swiss economic field, we ask three questions to ascertain how these developments can be addressed methodologically. We then compare the field of the Swiss elite in 1980 and in 2000 and draw a series of conclusions concerning its cohesiveness, its internationalization and the educational backgrounds of its fractions.¹ In our conclusion, we argue that MCA makes it possible to better understand the composition and strategies of specific elite fractions and must therefore be further developed in future research on business elites.

Combining social network analysis and multiple correspondence analysis

Methods are crucial in the current debates about elites (Savage & Williams, 2008). Particularly in periods of transition, we first have to understand what is before we can understand the causal relationships between the elements we study. Therefore, we advocate the reconsideration of sophisticated and substantively important 'descriptive' methods, rather than the use of 'causal' regression analysis (for a thorough defence of this strategy, see Savage (2010)). We deploy two methodological strategies. First, we combine network analysis

and MCA. While network analysis is suited to observing and describing the dynamics of the network decline, MCA focuses on the actors and can explain which relational mechanisms are at the origin of this decline. Second, we compare the networks and the field of the Swiss business elite at two historic moments – in 1980 and 2000. In this way, we explore the potential of a historical use of two methods that many scholars have considered – and criticized (Rosenthal, 1997) – as methods that are able to produce only a ‘structural snapshot,’ neglecting the historical dynamic.²

In order to bring the actors, their social backgrounds and their strategies into the foreground, we draw on the contribution made by Bourdieu to the sociology of elites in the late 1970s. His paper ‘Le patronat’, written with Monique de Saint Martin, distinguished fractions of the French business elite based on putatively heterogeneous variables, such as social origin, education, career, sector, accumulated mandates, ideological orientation and memberships in society or business clubs (De Saint Martin & Bourdieu, 1978). The underlying approach – MCA – was then used in additional papers and books throughout the 1980s and 1990s (Bourdieu, 1988, 1996).³ MCA, a multivariate method, condenses the information contained in a large number of variables and allows the researcher to represent this information in a relational graph (De Saint Martin & Bourdieu, 1978). This graph represents a cloud of individuals and a cloud of categories and constructs a ‘field’ or a ‘space’ illustrating the system of relationships among them. The more closely (respectively more distantly) individuals are situated to each other, the more (respectively fewer) categories they share. Inversely, spatial proximity between two categories indicates that these categories are shared by a larger number of individuals. Let us briefly showcase its analytical potential compared with network analysis.

Network analysis is based on graph theory and employed in elite research to identify linkages between companies. These linkages can be of personal, monetary or commercial character. Network analysis allows the examination of the structure of a company (or person’s) network and the measurement of its cohesion or centrality. From this, conclusions can be drawn about the structure of the business elites, their cohesion and the specific role of certain companies (Stokman *et al.*, 1985). However, there is a tendency in network analysis to favour linkages that are easily measurable over those that are not and to separate the structural analysis of positions and interlocks from the sociological analysis of background, education and career (Froud *et al.*, 2006). It favours the former and amounts, in most cases, to an analysis of connections between companies. In other words, the individuals who ensure the links between entities are in danger of being analytically marginalized.

MCA is rather descriptive in character and allows the researcher to integrate a large number of seemingly diverse variables. It gives individuals visibility as social actors and is able to grasp the conflicting or cooperative relationships between different fractions in a field. The researcher is compelled to ‘treat the characteristics attached to the agents as strictly relational characteristics, as

differences that occur to the individuals or groups in their objective relationships with other individuals or groups and to reveal, at the same time, the system of relationships of opposition and similarity that defines the space of characteristics' (De Saint Martin & Bourdieu, 1978, p. 4).⁴ Applied to elite research, such a perspective forces researchers to think relationally and to conceive of the elite as a field of positions and fractions. Change can then be understood as a consequence of conflicts and coalitions among these fractions. But MCA has certain shortcomings:⁵ the proximity among variables or individuals is based on the notion of 'objective homology' (De Nooy, 2003). This notion stems from the assumption that actors sharing certain properties (such as social origin, education or the economic sector in which they work) tend to think and act in a similar way. In other words, they develop a similar habitus, expressing themselves with comparable strategies. While such mechanisms are indubitably important, they cause real interactions between actors and the decisions, coalitions or agreements that might result from such interactions to fade into the background.⁶ This empirical weakness of minimizing the importance of social networks is compounded in Bourdieu's work by the relative underdevelopment of the concept of 'social capital' in comparison with other forms of capital (Albrecht, 2002). Hence, the social interactions and connections, for example among members of the board or CEOs central to Anglo-American elite research, are only marginally examined by Bourdieu⁷ (Albrecht, 2002; De Nooy, 2003).

However, an oppositional view of MCA and social network analysis is in no way necessary or justified. The two methods can be combined in fruitful ways. In his re-analysis of the literary field in Cologne, Germany, Albrecht (2002) is probably one of the pioneers of such a blend of social network analysis and MCA. In addition to the usual properties of the literary field, he integrates two types of network indicators in an MCA: membership in associations and literary groups and a network index, based on the number and structure of social relationships (2002, pp. 212–13). In this paper, we attempt to implement a combination of MCA and social network analysis and to adjust it to the requirements of elite research.

Financialization and the decline of the Swiss company network

In order to be able to understand the current space of Swiss business elites, we must first recall two important dynamics: the financialization of contemporary capitalism and the erosion of the network of interlocking directorates.

In the mid-1980s, the historical dynamics of most Western capitalist regimes began to thoroughly change. For one thing, this was the result of 'deregulatory' policy decisions. Within the framework of the General Agreement on Tariffs and Trade (GATT), during the Uruguay round of the World Trade Organization (WTO) the international state community negotiated for the liberalization of the markets for goods, persons and – most importantly –

financial services. As a correlative, national governments also rolled back public regulation of trade, services and investment in order to open their home markets to foreign competition and capital (Moran, 2006; Scott, 2003). In Switzerland, these transformations came about during the 1990s in the shape of reforms of the Stock Corporation Law, a new regulation of the Swiss Stock Exchange and the introduction of internationally standardized accounting rules. As a result, the power of domestic and closely interconnected groups of shareholders was undermined in favour of international and institutional investment groups (Mach *et al.*, 2007; Schnyder *et al.*, 2005). Moreover, this led to (and was paralleled with or in certain cases even preceded by) a major reorganization of the economic structure and the business strategies of prominent economic actors. Profiting from the opening opportunities, the leading Swiss banks, in particular, answered with a disengagement from investment in industrial firms and a turn towards more lucrative markets in investment banking, asset management and wealth management. In the 1980s and 1990s, both large Swiss banks, UBS and Credit Suisse, bought into the lucrative Anglo-American investment banking market and took over First Boston, O'Connor Associates and Warburg. Concomitantly, they restructured traditional retail and credit banking in their home market and entered alliances with large insurance companies as part of 'bancassurance strategies'. The result was that, while banks' income from traditional retail banking and revenues from interest declined, an ever larger percentage of bank income stemmed from capital market operations. These new business strategies prompted a decreasing willingness by the banks to entertain close ties with industrial companies. The banks' interest in being on the boards of large industrial companies as a part of 'credit monitoring' died down. What is more, they actively avoided these positions because their participation in one of these bodies could be perceived as a conflict of interest between the roles of monitor and of investor (Schnyder *et al.*, 2005).

To scrutinize the influence of these changes on the Swiss corporate network, we refer to a database from the project 'Les élites suisses au XXe siècle: un processus de différenciation inachevé?'.⁸ For the purposes of this paper, we use a sample of the members of the boards of directors of the 110 largest Swiss companies in 1980 and in 2000.⁹ We observe a significant disintegration of the network, similar to developments in other countries dominated by a strong and nationalized network of interlocking directorates (Carroll, 2008; Davis & Mizuchi, 1999; Heemskerck, 2007; Moran, 2006; Scott, 2003). The particular pattern of interlocking directorates among the banks and industry, established in the early twentieth century, broke up, starting at the margins between 1980 and 1990 and then losing significant strength from 1990 to 2000. On top of a general decrease in the density of the network, the financial sector in particular, which traditionally functioned as a hub for the network, increasingly lost its central position. The *inclusiveness* of the network, for instance, the proportion of connected firms (as a percentage of the total number of firms), dropped from 93.7 per cent in 1980 to 89.1 per cent in 2000. The proportion of isolated

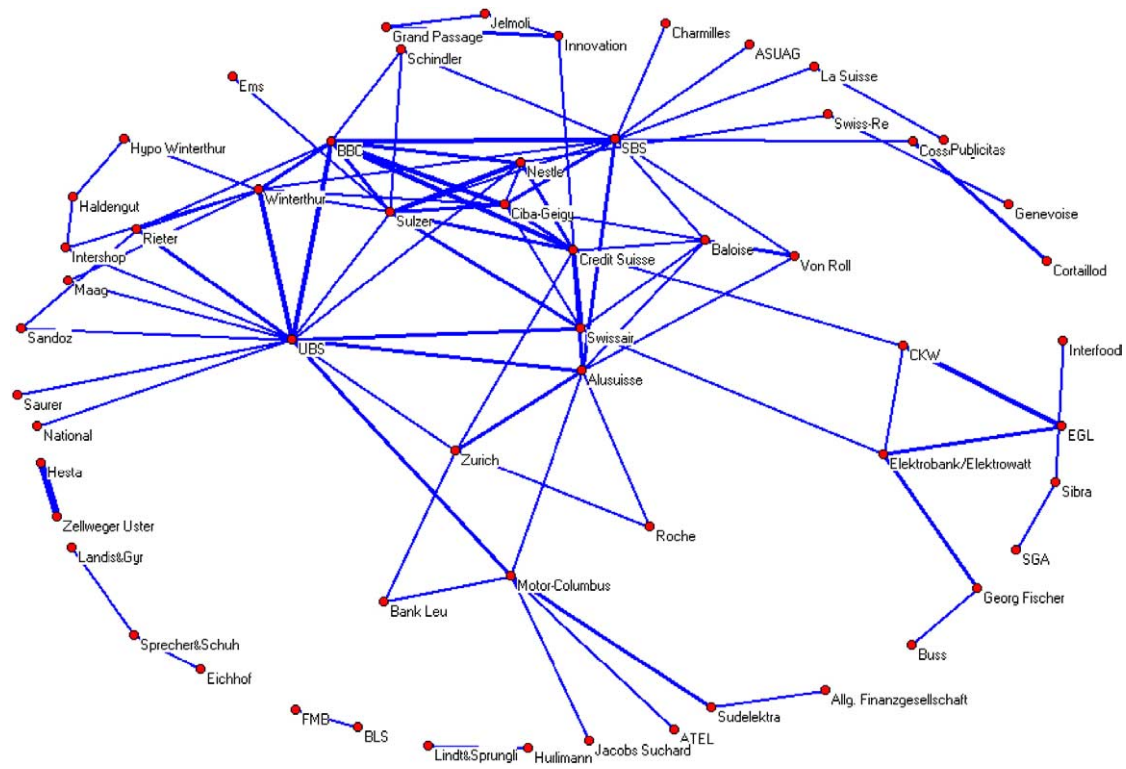


Figure 1 Swiss network of interlocking directorates 1980, 2-m slices

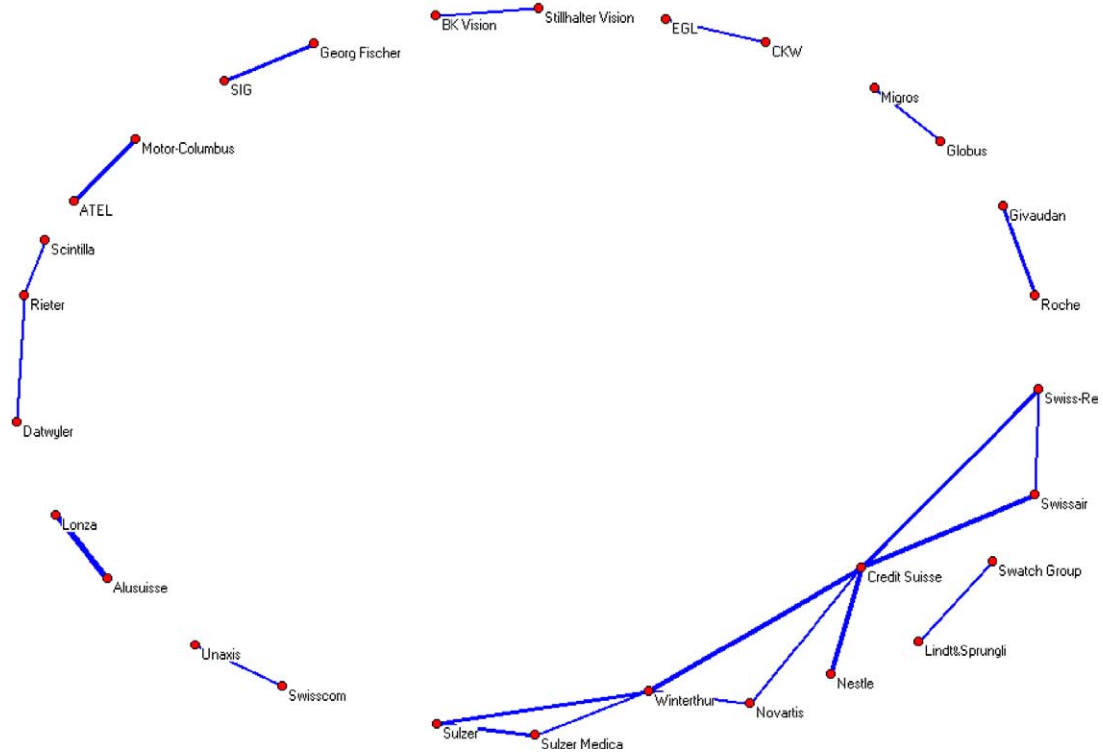


Figure 2 Swiss network of interlocking directorates 2000, 2-m slices

firms almost doubled between 1980 and 2000 (from 6.3 per cent to 10.9 per cent), suggesting a loosening of ties among companies. Overall network density confirms this disintegration, as it decreased from 7.1 per cent in 1980 to 3.6 per cent in 2000, marking the lowest percentage in the entire twentieth century (Schnyder *et al.*, 2005). The mean degree¹⁰ of a network, which is yet another measure of structural cohesion, confirms the decline of the Swiss company network. Between 1980 and 2000, it halved (7.8 in 1980 to only 3.8 in 2000).¹¹ Figs. 1 and 2 on the 2m-cores (at least two ties between nodes) illustrate the disintegrating trend of the network of interlocking directorates between 1980 and 2000.

Transformation of Swiss business elites?

The more unambiguous these results are at first sight, the more urgently they call for more thorough explanation. While acknowledging the importance of market pressures and increasing competition to explain the transformation of the interlocking network, recent sociological research on elites has created suspicions about functionalist explanations that conceive of changing corporate strategies towards interlocks as a quasi-natural reaction to a new economic environment (Fligstein, 2001; Beyer & Höpner, 2003). We agree with these authors and argue that more attention must be paid to the actors, their social backgrounds and their strategies. It is at this point that MCA can be used as a complementary method. In fact, the relational perspective of this method and its emphasis on individuals and fractions is well suited to investigating the changing composition of the Swiss business elite and the possible effect of this transformation on the networks. What is more, with MCA, we are able to discuss three key points of inquiry that follow from the disintegration of the Swiss corporate networks: the ties between the political and economic fields that seem to loosen as the corporate network disintegrates; globalization of the market and the influx of foreign managers in the top positions of large Swiss companies; and the presumed changes in the educational profile of the Swiss business elite.

Recent studies show that, in the last several decades, the close ties among economic and political elites have clearly eroded. Significantly fewer members of the business elite were active members of a political party, an economic interest association or an extra-parliamentary commission in 2000 than in 1980 (Schnyder *et al.*, 2005). It has been argued, then, that this declining integration of politics and business is a sign of a differentiation between the two fields and could be the prelude to real pluralism and the professionalization of the Swiss elites. MCA will show whether the weakening ties among the fields really affects all segments of the business elite to the same extent.

Internationalization of the Swiss business elite since 1980 has accompanied or presumably even triggered the disintegration of the Swiss company network (David *et al.*, 2009; Davoine, 2005). Some might contend that foreign managers

come from different social backgrounds, do not share educational curricula with the Swiss fraction of the elite and may be unwilling (or legally unable) to socialize in the traditional meeting places of the Swiss elite. MCA can reveal whether the educational and positional profiles of the new international fraction are actually different from those of their Swiss counterparts and shed light on the participatory practices of foreign top managers when it comes to economic interest associations or extra-parliamentary commissions. These patterns of participation, as well as the willingness of the foreign fraction to accumulate Swiss mandates, will decide the shape and the functioning of the new Swiss business elite.

Internationalization is only one facet of the transformation of the social profile of Swiss business elites. The proportion of top managers trained in law dramatically decreased between 1980 and 2000, whereas the proportion of managers with a degree in business studies grew (David *et al.*, 2009). In addition, research has shown that postgraduate education has become more widespread; MBA programmes in particular have become an essential part of the training of an ever-larger section of Swiss top managers. As a consequence, managers have become more open to finance-oriented corporate and shareholder-value practices,¹² strengthening the disintegration of the interlocking directorates' network. But who are the managers with business training? How are holders of business degrees or MBAs distributed in the space of Swiss business elites? In terms of MBA training, with what type of basic training is the MBA usually combined?

Analysis of the space of Swiss business elites

For the MCA of the Swiss business elite, we will use the same sample of companies as in the network analysis. This time, however, the analysis is limited to the CEOs and the presidents of the boards of directors. This sub-sample is thus composed of 191 (respectively 184) CEOs and presidents of boards of the 110 largest Swiss companies in 1980 and 2000.¹³

The variables can be distinguished in a sociodemographic segment (comprising citizenship and all educational information) and a positional segment (including business positions, military positions and political positions).¹⁴ Because women are almost completely absent from both samples, gender is not a variable in the analysis. In addition, foreign citizens are almost absent from the 1980 sample and are therefore used only as a binary variable in the 2000 data, with the modalities 'Swiss' and 'non-Swiss'. The age/cohort variable distinguishes among those over 60, those between 50 and 60 and those younger than 50 years of age and was used as a passive, supplementary variable. The educational channels are measured using the highest educational level ('non-academic', 'BA/MA', 'PhD'), educational discipline ('law', 'engineering', 'business studies' and 'other education') and location of the university ('Eidgenössische Technische Hochschule Zurich (ETHZ)', 'University of

Zurich', 'University of Berne', 'Universities of St. Gallen and Basel', 'Universities Romandes', including the universities of Fribourg, Lausanne, Neuchatel, Geneva and the Ecole Polytechnique Federal Lausanne and 'universities abroad'.¹⁵ In addition, we distinguished between those possessing an MBA ('MBA yes' vs. 'MBA no') and those who have stayed abroad in the past ('stay abroad yes' vs. 'stay abroad no'). Regarding the positions of the actors in the economic field, we first used the economic sector of the principal mandate (food, banking, distribution, insurance, machine industry, chemistry, construction/engineering, and other sectors). The most important sectors, such as banking or machine industry, remain the same in both samples; others, for statistical reasons, are coded in a slightly different way. We also measured function in the company with the variables 'Executive' (CEOs) or 'President of the Board'. Second, we included measures of the centrality of companies and the 'betweenness' of persons obtained from earlier network analyses (David *et al.*, 2009). The degree of *firm centrality* is an expression of the number of ties a company has to other companies in the network, whereas the '*betweenness of persons*' determines the extent to which a person lies among other nodes in the network. In both cases, individuals have been ordered according to their rank of centrality/betweenness and allocated to the following categories: rank 1–10 for centrality (resp. 1–20 for betweenness), rank 10–50 (resp. 21–50), rank 50–90 (resp. 50+) and rank 90+. In addition to these business-based variables, we coded a certain number of political and military positions. In Switzerland, the armed forces are a particularly important institution for the constitution of the elite. It is a non-professional militia in which every male Swiss citizen must serve. As a result, the higher ranks are also, to a large degree, not professionalized and are open to actors who simultaneously occupy higher political or economic positions. This is an important factor in the often-asserted strong integration of the Swiss elites. A position in the army is measured by military rank, distinguished as 'Colonel', 'Major', 'Captain', 'Lieutenant', and 'no military function'. Positions in the political field are measured using three binary variables: active membership in a political party,¹⁶ membership on a committee of a business interest association and membership in an extra-parliamentary commission.¹⁷

In this study, we use the method of specific MCA that ignores 'missing' or 'don't know' modalities when defining the distances between individuals (Le Roux & Rouanet, 2004). All variables, i.e., educational as well as positional, are active and therefore contribute to the construction of the field. We show both the cloud of individuals and the cloud of modalities in the same graph. The importance of axes (i.e. eigenvalue) was used to determine the number of axes to be interpreted. We decided to limit ourselves to the first and second axes. In accordance with standard analytical procedure, we first analysed the axis in detail and then conducted a more general interpretation of the spaces. We calculated a modified rate according to Benzecri. This measure gives an idea of the importance of both axes (Le Roux & Rouanet, 2004). The contributions of

the variables and modalities, as well as the size of the categories on the first two axes, are presented in Appendix 2.

The Swiss business elite in 1980: a two-headed dominant fraction

The horizontal axis in Fig. 3 (eigenvalue = 0.19; modified rate = 33.84 per cent) describes differences related to education, military rank and centrality in terms of betweenness in the network of Swiss companies. On the right side of the plane, we find actors with academic training in law, holding a PhD, and having attended the universities of Berne (UniBE) or Zurich (UniZH). In addition, this fraction of the Swiss business elite occupies positions linking important components of the company network (betweenness 1–20) and serving in companies scoring high in centrality (Centrality Top 10). Strikingly, close to these positions we also find top managers who rank high in the Swiss armed forces (Colonel, Captain), are members of extra-parliamentary commissions (Yes Comm extraparl) and are on committees of political parties (Yes Party) or are members of committees of national economic interest associations (Yes Interest Group). The left half is occupied by younger actors (< 50) who possess none of these characteristics: they hold a degree in business studies (Business Studies) or no academic degree (Non Academic), work in marginal sectors (in the service, SER, or distribution sector, DIST), have rarely earned a high rank in the military (No Military Function) and belong to no political (No Comm extraparl) or economic associations (No Interest Group).

The vertical axis (eigenvalue = 0.18; modified rate = 29.07 per cent) puts technological counter to legal training, coupled with an internal differentiation between two types of *academic* degrees. In the upper half, we find actors with training in engineering at the ETHZ, close to the machine industry (MEM). This group rarely holds a PhD (but sometimes an MBA) and is active in the most central companies of the Swiss network (Centrality Top 10). Located in the lower half, closer to the banking/insurance sector (ASSR, BQSF), is a group trained in law or business, holding PhDs from the Universities of Zurich (UniZH), Berne (UniBE), Basel or St. Gallen (UniSG and UniBA).

Generally, we might distinguish three fractions in the field of the Swiss economic elite of 1980. On the left is a rather heterogeneous but dominated fraction.¹⁸ Its members are endowed with little cultural capital (no PhD, sometimes even no academic degree). They are rather young, work in marginal sectors of the Swiss economy (distribution, services) and are situated at the margins of the Swiss company network. In addition, they occupy executive rather than president of the board positions and have no links whatsoever with the political or military world. We can assume that some of these properties are mutually dependent. Klaus Johann Jacobs, for example, who was born into a German coffee dynasty in 1936, can be found in the left half. Having arrived in 1973 in Switzerland, he was denied access to the traditional meeting places of

the Swiss business elite, such as the armed forces, and he also has no connection to the Swiss political world. It is no wonder that he is also excluded from mandates in other large Swiss firms and plays no major role in the Swiss company network. He shares his position of network marginality with a heterogeneous mix of Swiss managers who have no academic education, work in marginal sectors or hold degrees in business.

This heterogeneous dominated fraction¹⁹ is opposed to a two-headed dominant fraction on the right side: the members of the technological fraction in the upper half are characterized by a degree in engineering from ETHZ and strong ties to industrial companies with central positions in the Swiss company network. They occupy higher ranks in the military (Major, Captain) and are fairly well represented in politics. This fraction includes dynastic figures such as Georg Sulzer of Sulzer Machine Company (president of the board of Sulzer; four further mandates with UBS, Swissair and Winterthur insurance company; engineering degree from ETHZ; captain in the armed forces). Another is the 'doyen of Swiss aviation' Armin Baltensweiler (CEO of Swissair, member of four major boards, engineering degree from ETHZ and captain in the Swiss Army). These actors represent their industry on commissions and economic interest groups. Sulzer, for example, was a member of the committee of 'Economiesuisse' (the most powerful business interest association) and of the association of the Swiss machine and metal industry (Swissmem).

In the lower right quadrant is the finance fraction. Members of this group are slightly less central in the company network but possesses more cultural capital (PhDs), are educated in law, cultivate more direct ties to the political domain (as members of parliament) and occupy higher military ranks. A representative of this group is, for example, Nikolaus Senn who holds a PhD in law from the University of Zurich, entered UBS in 1951 and became its CEO in 1980 and became president of its board in 1988. In 1980, he sat on the boards of seven additional major Swiss firms. In the armed forces, he is a colonel and a member of the general staff of the Swiss Army. In addition, he sits on the committee of the influential Swiss Bankers Association and is a member of two extra-parliamentary commissions.

It seems as if the dominant fractions of the Swiss business elite in 1980 are functionally differentiated into a technological and a finance fraction. But it also seems that, except for these functional differences, both fractions are well represented in integrating institutions, such as the army, and in wider political networks. The co-presence of properties such as high military rank, a large number of mandates on important boards and functions in para-political associations also suggests that these properties are mutually dependent on one another. Because members of this group know each other from university or the military,²⁰ one might argue that they develop a common mindset and invite each other to become members of their respective boards.

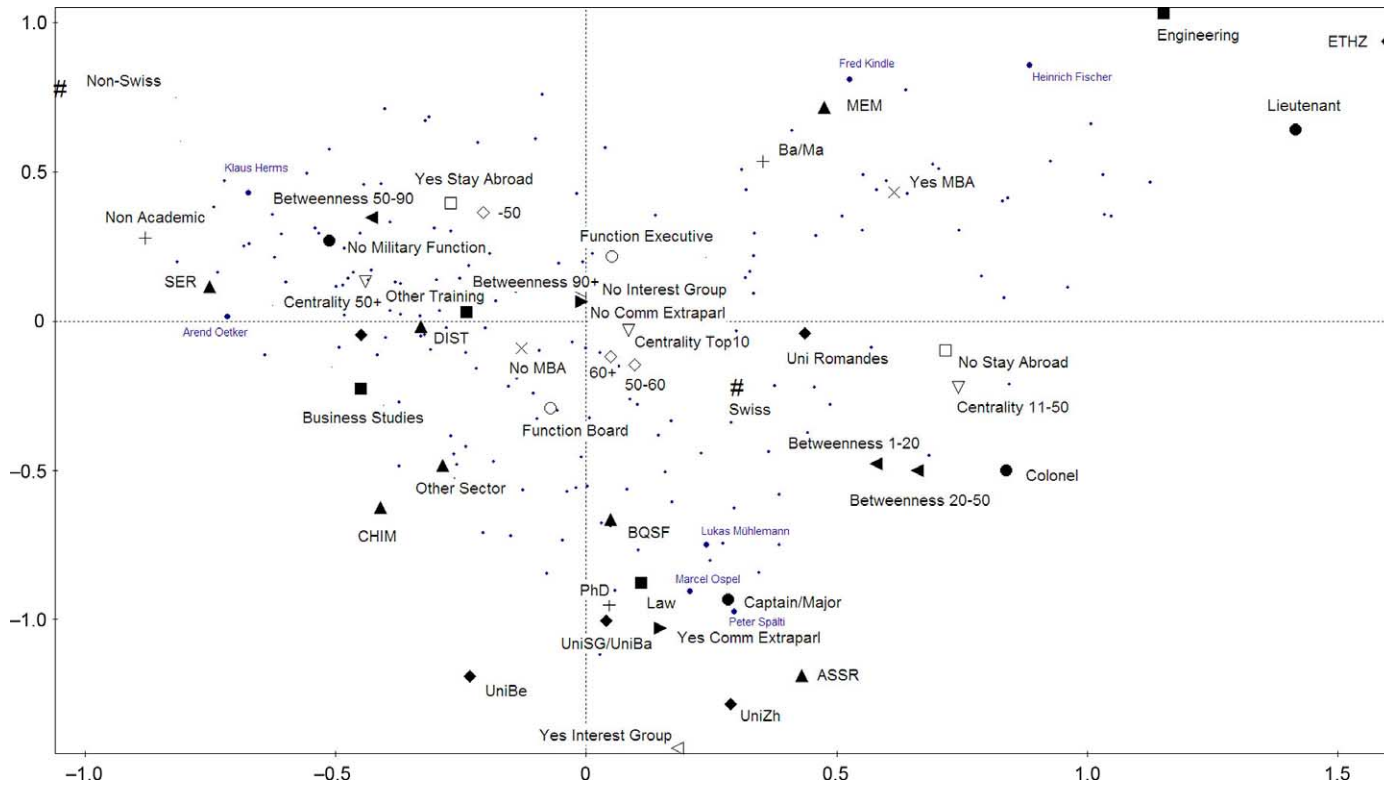


Figure 4 Space of Swiss business elite 2000, plane 1–2

The Swiss economic elite in 2000: internationalization and managerialization

The horizontal axis in Fig. 4 (eigenvalue = 0.20; modified rate = 37.13 per cent) reflects, as it did in 1980, differences with respect to educational disciplines and to centrality in the Swiss company network, but that opposition is now *reinforced* and *overlapped* by the distinction between Swiss and foreign citizens (non-Swiss). Therefore, on the left side we find younger (< 50) foreign managers, actors with no academic degree (Non Academic) or an MBA (Yes MBA), and those who work, for example, in the service sector (SER). Unsurprisingly, these business leaders have no function in the Swiss army (No Military Function) and are marginal in terms of company centrality (Centrality 50+) and personal betweenness (Betweenness 50–90). On the right side are Swiss managers with degrees in engineering from ETHZ. These actors also occupy positions that are more central (Centrality 11–50) and linking (Betweenness 20–50), and rank high in the military (Colonel).

The second axis (eigenvalue = 0.19; modified rate = 29.88 per cent) distinguishes between the technological sector (MEM) and the banking/insurance sector (ASSR, BQSF). The discriminating factors are a mix of location of university and discipline, completed by type of degree and economic sector. In the upper half, we find engineers with a degree from ETHZ who work in industry (MEM), whereas in the lower half are those with PhDs in law from the universities of Zurich (UniZH), Bern (UniBE) or Basel/St. Gallen (UniSG/UniBA) who work in the financial service sector. The actors with MBA training are situated in the right-upper half (Yes MBA), close to the engineers active in the industrial sector (MEM).²¹ It seems that an MBA is a complementary degree for engineers, rather than being an additional education for law or business degree holders. Conspicuously, there are no major differences in terms of company centrality or personal betweenness along this axis.

What happened to the three fractions we were able to identify in 1980? Even though certain oppositions observed in 1980 remain the same, the field is now more clearly organized into three poles, reflecting a clearer differentiation between the technological and the finance fractions of the dominant group. In the left half, we can still observe actors at the margins of the Swiss business network. They often have only one mandate, are not central in the network, hold no rank in the Swiss armed forces and have no links to politics. However, in 2000, a majority of these people are foreign managers. Klaus Herms, for example, the CEO of Kühne and Nagel, or Arend Oetker, president of the board of Hero, are found in that sector of the space. Both are Germans, have degrees in business studies and held one or two mandates in somewhat marginal sectors, such as food production or logistics. In other words, it seems as if the reasons that this dominated fraction does not accumulate mandates and has no links to politics are different in 2000 than in 1980. It is the

increasing *internationalization* of the fraction that prevents these actors from gaining access to the Swiss political world and the Swiss corporate networks.

Again, they are opposed to a two-headed dominant fraction: the technological fraction continues to be educated at ETHZ and is close to engineering and the machine industry. However, it seems that the group has lost its connections to the political world.²² What is more, the industrial fraction now seems more closely associated with an MBA. This is especially reflected in the biographies of the younger members of the technological fraction (on the left), such as Fred Kindle (CEO of Sulzer)²³ or Heinrich Fischer (CEO of Saurer). These new types of CEOs and presidents of the boards of directors of the largest companies in the machine industries, who often hold a supplementary MBA, are also much less connected to other companies, especially to the banking sector, in 2000 (Widmer, 2009).

The core of the finance fraction, on the contrary, seems not to have changed much since 1980. Its members still hold several mandates, rank high in the military and cultivate close connections with the political world.²⁴ Even though more of its members now hold a business degree than in 1980, a large majority of the finance fraction still holds a PhD in law and attended the universities of Zurich, Berne or St. Gallen/Basel. Peter Spälti, for example, the president of the board of Winterthur Insurance, is also a colonel and member of the general staff in the Swiss army, was a member of parliament representing the Liberal Party (1983–91) and was a member of the council of the Swiss National Bank. The troika of business, politics and military and its interweaving as a mechanism of elite recruitment and strategy of power perpetuation still seems in place among this fraction, though younger members of this fraction, such as Lukas Mühlemann, CEO of Credit Suisse, stood emblematically for the ‘shareholder revolution’. Besides the fact that he sits on the boards of several large companies and is on the committee of the Swiss Bankers Association, he symptomatically studied at the University of St. Gall, has an MBA from Harvard and, most famously, made his career largely at McKinsey & Co., a firm considered to be most central to the imposition of a shareholder orientation on the Swiss economy. In other words, there are signs that the finance fraction is not immune to change.

Differentiation? Internationalization? Business education?

What conclusions can be drawn from the empirical analyses concerning the interconnectedness of business and political elites, the internationalization of the Swiss business elite and the transformation of their educational profiles?

The former close ties between economic and political elites have indeed eroded. In 1980, at least 5 per cent of business elite members were active members of a political party (holding a seat in the federal parliament or in a cantonal legislature), around 10 per cent were members of an economic interest association and almost 20 per cent were sitting in an extra-parliamentary

commission. In 2000, fewer than 5 per cent of the sample were active members of political parties and only 5 to 10 per cent were members of interest associations or extra-parliamentary commissions. Yet not all business fractions have retired from politics to the same extent. The relational analyses show that business leaders who had contacts in the Swiss political world in 2000 had profiles similar to those who had already cultivated these linkages in 1980. In particular, they typically hold a PhD in law from the University of Zurich or Berne. We can therefore assume that this group with law degrees championed – and still champions – a style of management that includes close ties to politics and networking with other companies. The members of this group, we can assume, consider these connections indispensable for their business and maintaining a thriving economy. However, it seems that between 1980 and 2000, the linkages between business and politics weakened. It seems that the technological fraction ceases to cultivate ties to politics. Whereas in 1980 both dominant fractions participated in the political field, in 2000 the membership in interest groups or in extra-parliamentary commissions has become a privilege held by members of the finance fraction. This seems to be due to a sort of a ‘managerialization’ of those in the technological fraction. As a consequence of more and more future industrial managers acquiring an MBA, members of this group seem increasingly to dissociate from corporate networks and possible reliance on other forms of coordination (Widmer, 2009).

Whereas in 1980 only seven (3.7 per cent) top managers were non-Swiss citizens, this number had risen to 38 (20.7 per cent) in 2000. Their numerical growth thus potentially weakens the cohesiveness of the Swiss business elite as a whole because foreign top managers share a series of characteristics that set them apart from native elite members. The foreign managers have, for instance, not attended Swiss universities. This not only weakens the traditional Swiss elite recruitment channels (ETHZ and studying law at the universities of Zurich and Bern) but also increases the variety of educational curricula. The foreign managers come from a range of countries, and this has the potential to interfere with the creation of a uniform mindset among the Swiss business elite (David *et al.*, 2009). The influx of foreign managers also changes the educational profile in terms of disciplines: a smaller proportion of them are trained in law or in engineering than their Swiss counterparts, and only 19 per cent of foreign managers earned a PhD, compared with 36 per cent of the Swiss. Third, MCA situates foreign managers close to ‘marginal’ sectors, such as alimentation, services and distribution. A closer examination confirms this: foreign top managers are well represented in the services (30 per cent), and they struggle to enter finance sectors such as banking (15 per cent) and insurance (0 per cent). The most influential positions in the Swiss economic field, we can therefore argue, are not so effortlessly and rapidly taken by outsiders.²⁵ It seems that access to these positions – still controlled by the rather homogeneous dominant fraction – is dependent on time-consuming strategies of networking and confidence-building. All in all, internationalization

is one reason, but not the most salient, for the dissolution of the Swiss corporate network.

Relational analysis confirms but also adds nuances to the thesis about the decline of law studies as the paramount route to the Swiss business elite. Even though business studies became more important, holders of a business degree are far from dominating the entire Swiss business elite. In 2000, the Swiss machine industry is still very closely linked to engineering and is dominated by graduates of the Swiss Federal Institute of Technology Zurich. It is clear that 57 per cent of engineers in the sample work in the machine industry, and 41 per cent of all managers in the machine industry are engineers. By contrast, law graduates show a strong presence in banking (26 per cent), insurance (27 per cent) and chemistry (35 per cent). The presence of people holding degrees in business studies is still slightly below the proportion of law graduates: 19 per cent of the highest positions in banking and 18 per cent in the machine industry sector are occupied by people with a business background. In addition, we can see from both graphs that an MBA figures as a complementary title for engineers working in the machine industry but *not* for law or business degree holders. Even though the number of people holding an MBA degree increased from 1980 to 2000, the position of an MBA in the field and its function have only slightly changed.

In sum, we can say that the transformations all three fractions experienced contributed to the decline of the corporate network. However, these contributions are of a different nature and are not to be subsumed under the same mechanism. It seems that the decline of the network of interlocking directorates can be explained by the composite effects of the strong internationalization of the dominated fraction, the managerialization of the technological fraction and, to a lesser extent, the marginalization of law graduates within the finance fraction.

Conclusions

We have argued that, since the debate between the elitist and the pluralist strands began, researchers examining the elite have struggled to make theoretical advances. Subsequent battles have been fought on methodological grounds, with network analysis increasingly gaining a monopoly. While these empirical debates lost some of their virulence in the late 1980s, all of a sudden the reorganization of capitalist regimes in the 1990s added fresh fuel to the dispute. The transformations of business elites, we argue, have been most virulent and radical in small states that had at the same time particularly dense corporate networks, close links between business and politics, and were strongly exposed to the recent processes of globalization. This paper participates in that discussion with a case study of Switzerland, arguing that the combination of network analysis and MCA is a promising approach to inspecting elites during this period of transition. While the first provides

evidence that the Swiss corporate networks underwent a strong dynamic of dismantlement between 1980 and 2000, the second can explain that this is due to the transformation of the social composition and the strategies of the three fractions of the Swiss business elite. The dominant finance fraction maintains rather strong ties to political worlds and tends to accumulate several mandates, although law graduates are becoming slightly less prominent within the finance fraction. More important is the ‘managerialization’ of the technological fraction. In order to rise to top positions, managers in the technological and industrial sectors increasingly complete their basic education as engineers and also study for an MBA. What is more, the technological fraction moved away from political engagement in 2000. Third, the dominated fraction in the rather marginal sectors of the Swiss economy has become much more internationalized. Since foreign managers have difficulties accessing the traditional meeting places of the Swiss business elite, they contribute to the weakening connections between business and politics and by the same token among the firms themselves. As a cumulative result of these three trends, company networks have lost density and cohesion, and there is a potential for them to lose importance as a coordinating mechanism of the Swiss economy.

Small European states have experienced a decline of both neo-corporatist control mechanisms and networks of interlocking directorates in the course of recent globalization (Christiansen & Rommetvedt, 1999; Heemskerk, 2007). In general, this analysis confirms that the decline of these ‘coordinating mechanisms’ of capitalism cannot be explained exclusively by functional arguments. The combination of network analysis and MCA championed in this paper is able to grasp the erosion of networks and further encourages a research strand that sketches a road towards the ‘rediscovery’ of actor-theoretical and power-theoretical approaches to elite research (Beyer & Höpner, 2003). MCA shows that business elites are not monolithic blocs with a homogeneous social composition. It allows for the conceptualization of elites as a field with different fractions that are in a dynamic relationship with each other. This perspective also makes it possible to understand the decline of the company network as the composite and cumulative effects of the strategies of the fractions composing the elites. We argue that, especially in periods of transition, relations that have been institutionalized and codified, such as corporate networks, are reopened for negotiation and a struggle among different groups of actors (Savage & Williams, 2008). It is therefore important to use methods that conceive of the transformation of the conception of control as a relational dynamic among several business elite fractions with differing social characteristics and educational backgrounds. Further research using this perspective should more carefully investigate the coalitions and conflicts of these groups in order to examine which groups are able to prevail in the power struggle and to transform their position into revenue, power and legitimate positions.

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Notes

1 The term ‘fraction’, as employed here and throughout this paper, corresponds to the French ‘fraction’ as it is often used by Bourdieu. In general, the English versions of Bourdieu’s work also translate it in this way (see, for example, Bourdieu, 1996). In his work Bourdieu uses the terms ‘class’ and ‘class fraction’, the latter corresponding to a sub-group of class. In a similar way, we employ the terms ‘elite’ and ‘elite fraction’. In our use of the term we adopt the Bourdieusian definition. For Bourdieu, situating himself between a nominalistic and a realistic approach, classes or class fractions share a certain number of characteristics in the social space. This does not necessarily mean that they constitute ‘real groups’ (self-aware, organized, with a spokesperson, etc.). On the other hand, these classes or fractions have a higher probability of becoming organized and constituted as groups. This depends on a series of conditions, such as their homogeneity and their proximity in the social space (Bourdieu, 1984). Correspondingly, certain of the elite fractions we will examine are more homogeneous and self-conscious than others. However, we do not always have enough empirical material to allow discussion of the self-awareness of these groups or the conflicts among them.

2 In particular, historical network analysis has recently made important advances (see, for example, Vedres & Stark, 2010). Unfortunately, with our data, we are not yet able to understand these network transformations as a process. When it comes to MCA, very few historical comparisons have been made yet (Bourdieu, 1996).

3 Oddly, the method at the heart of Bourdieu’s work never found a wider echo in the Anglo-American research about elites. We can think of three reasons for this: 1) ‘Le Patronat’ (1978) has never been translated into English and *The State Nobility* (1996) has rarely been perceived as a piece of elite sociology; 2) De Saint Martin and Bourdieu refused to use the term ‘elite’ because in their view the notion was analytically tarnished as the self-attribution of the dominant as the ‘elected group’; 3) MCA, even on a more general level, struggled to impose itself in American and British sociology.

4 Translated by the authors.

5 For a broad albeit heterogeneous collection of critical voices, see, for example, the special issue of *Histoire et mesure*, 12(3), 1997.

6 Interactions between actors that are not ‘structurally homologues’ are particularly likely in competitive spaces, such as the economic space. On the other hand, it is likely that structurally close actors, for example, two large banks, have only a few strategic interactions with each other because they are direct competitors.

7 See De Saint Martin & Bourdieu (1978, pp. 30, 38). Here they examine interlocking directorates, albeit in a rather unsystematic way.

8 This project was conducted at the University of Lausanne by Andre Mach and Thomas David, funded by the Swiss National Science Foundation (grant no. 100012–113550/1). The data collection was carried out by Stéphanie Ginalski, Frédéric Rebmann, Claudio Ravasi, Andrea Pilotti and Steven Piguet.

9 The firms have been chosen on the basis of a combination of criteria of market capitalization and turn-over (Schnyder *et al.*, 2005).

10 The mean degree is defined as the mean of the sum of degrees of all nodes in the network.

11 A more detailed comparison of the Swiss network of interlocking directorates in 1980 and 2000 is given in Appendix 1.

12 On the ideology of shareholder value, see Lazonick & O'Sullivan (2000).

13 The reason that we did not obtain 220 individuals in our sample is that some of the people accumulate mandates or are at the same time CEO and president of the board of the same firm.

14 Information about the social background of the actors, for example, their social class or the occupations of their parents, would have been extremely helpful for drawing an even more insightful picture. However, especially for Swiss business leaders (compared, for example, with political leaders), such data are very difficult to obtain systematically.

15 In order to prevent redundancies, the category 'universities abroad' is used only as a passive category, which does not contribute to the construction of the field.

16 We rely here on the following information: member of the national committee of a political party, member of parliament or member of a political executive organism. It is very likely that many more members of the economic elite are simple members of a party without being politically active.

17 According to the current official definition, extra-parliamentary commissions are organizations that assume tasks on behalf of executive authorities but are essentially composed of people who are not civil servants.

18 The term 'dominated' as we use it here stems from the French word 'dominé'. The translation of this notion is delicate, and alternatives such as 'minority' or 'less dominant' might be more adequate. As in the translation of Bourdieu's work (for example, Bourdieu, 1996) but also in contributions from other scholars working within a field framework (Fligstein, 2001) 'dominated' is used, we continue to use the term in this paper.

19 It goes without saying that their heterogeneity is one more reason for their dominated status, which means it is unlikely that they are able to organize themselves as a challenging force when faced with the more homogeneous dominant fractions.

20 In the Swiss armed forces, all Swiss citizens who are declared suitable must serve a first period of seventeen weeks at the age of 20. Until the age of 35 (and if they rank higher, then even longer), they must serve regular periods of training up to four weeks per year. These periods of military training are both a meeting place for the business elite and a formative experience for many managers.

21 Even though only the contribution to the horizontal axis is above average, with respect to MBA, the second axis (i.e. the distinction between engineers and law degree holders) is also significant according to the t-test (value = 2.7). In terms of proportion, whereas only six out of twenty-four law degree holders have an additional MBA, twelve out of seventeen engineers possess a supplementary MBA.

22 The properties 'member of an extra-parliamentary commission' and 'member of an interest group' being now situated in the lower right quadrant and therefore being more clearly associated with the finance fraction.

23 His solid and traditional roots in a technological culture, reflected in his engineering degree from ETHZ, are strategically completed by a business education,

mostly in the form of an MBA. Not only did Kindle earn an MBA at a US university, his closeness to a liberal business orientation is reinforced by a four-year spell at McKinsey Associates.

24 At least in the year 2000, the top management of large Swiss banks is not yet 'internationalized'. Only in 2001 did the Briton Luqman Arnold become the first non-Swiss CEO to take the helm of a large bank (UBS). This suggests that the way for challengers towards the most dominant positions of the space of the Swiss elites is tortuous and time consuming.

25 It is important to note not only that the profile of foreign managers is very different, but also that the reasons for occupying a top position in a Swiss company can vary widely. We can distinguish between founders/shareholders, 'mountaineers' in Swiss companies, 'mountaineers' in merger and acquisition companies and internationalized managers.

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Felix Bühlmann was trained in sociology and political science at the universities of Geneva, Berlin, Lausanne and Manchester. He is currently Head of Social Reporting at the Swiss Centre for Expertise in the Social Sciences (FORS) at the University of Lausanne, Switzerland. He has recently published in the *European Sociological Review*, *Sociology* and the *Swiss Journal of Sociology*. His current research interests include economic sociology, political sociology and sociology of the sciences.

Thomas David is Professor at the Faculty of Political and Social Sciences and director of the Institute of Economic and Social History at the University of Lausanne. Recently he has been working on issues such as elites in twentieth-century Switzerland, European corporate networks during the twentieth century, social inequalities and international relations in a historical perspective. He is the author of several books and has recently published in the *World Political Science Review*, *Swiss Political Science Review* and *Business and Politics*.

André Mach is Senior Lecturer in Comparative Political Economy at the Institute of Political and International Studies (University of Lausanne). His areas of specialization include: comparative political economy, economic sociology, elites sociology, industrial relations, corporate governance, competition policy, interest groups, Swiss politics, impact of globalization on national politics and policies. He has recently published in *Business and Politics*, *World Political Science Review*, *Swiss Political Science Review* and *Journal of European Public Policy*.

Appendix 1: The Swiss company network 1980 and 2000

| Size and structure of network | 1980 | 2000 |
|--|-------|-------|
| Number of companies (N) | 111 | 108 |
| Number of connected firms (in % of N) | 93.69 | 89.09 |
| Isolated firms (%) | 6.31 | 10.91 |
| Degree 1–2 (%) | 17.12 | 28.70 |
| Ties | | |
| Number of ties | 543 | 242 |
| Number of multiple ties | 77 | 20 |
| Number of ties (dichotomized) | 434 | 207 |
| Density (%) | 7.11 | 3.58 |
| Density within main component (%) | 8.26 | 4.82 |
| Main characteristics | | |
| Mean board size | 10.78 | 9.46 |
| Diameter | 6.00 | 11.00 |
| Average geodesics | 2.63 | 3.92 |
| Mean degree | 7.82 | 3.83 |
| Mean normalized betweenness* | 1.32 | 3.21 |
| Mean normalized closeness (within main component) [†] | 39.22 | 26.77 |
| Clustering coefficient | 0.42 | 0.41 |
| Fragmentation (%) | 12.30 | 25.90 |

Notes

*The normalized betweenness centrality is the betweenness divided by the maximum possible betweenness expressed as a percentage (Borgatti *et al.*, 2002).

[†]The normalized closeness centrality of a vertex is the reciprocal of farness divided by the minimum possible farness expressed as a percentage, where farness of a vertex is defined as 'the sum of the lengths of the geodesics to every other vertex' (Borgatti *et al.*, 2002).

Appendix 2: Contributions and frequencies of active variables and categories, 1980 and 2000

| Contributions of active categories | | 1980 | | | 2000 | | |
|------------------------------------|-----------------|--------|--------|-----|--------|--------|-----|
| Variables | Categories | Axis 1 | Axis 2 | n | Axis 1 | Axis 2 | n |
| Stay abroad | Stay abroad yes | 0.30 | 1.6 | 33 | 0.9 | 2.1 | 61 |
| | Stay abroad no | 3.7 | 0.0 | 70 | 6.2 | 0.1 | 59 |
| | TOTAL | 4.0 | 1.6 | 103 | 7.1 | 2.2 | 120 |
| Sector | SER | 0.9 | 0.8 | 15 | 3.2 | 0.1 | 28 |
| | BQSF | 0.2 | 0.0 | 33 | 0.0 | 2.6 | 27 |
| | ASSR | 0.2 | 0.6 | 18 | 0.4 | 3.4 | 11 |
| | ALIM/CHIM | 0.5 | 0.0 | 21 | 0.5 | 1.2 | 14 |
| | MEM | 0.3 | 2.5 | 50 | 2.5 | 6.2 | 55 |
| | DIST | 1.8 | 0.9 | 20 | 0.4 | 0.0 | 18 |

Table 2 (Continued)

| Contributions of active categories | | 1980 | | | 2000 | | |
|------------------------------------|---------------------------|--------|--------|-----|--------|--------|-----|
| Variables | Categories | Axis 1 | Axis 2 | n | Axis 1 | Axis 2 | n |
| | Other sectors | – | – | | 0.2 | 0.7 | 13 |
| | TOTAL | 3.8 | 4.8 | 157 | 7.3 | 14.1 | 166 |
| Extra parliamentary commission | Yes comm. extrapar | 7.6 | 0.3 | 38 | 0.0 | 2.6 | 11 |
| | No comm. extrapar | 1.9 | 0.1 | 153 | 0.1 | 0.2 | 173 |
| | TOTAL | 9.5 | 0.4 | 191 | 0.1 | 2.8 | 184 |
| Active party membership | Yes party | 6.0 | 2.5 | 10 | – | – | – |
| | No party | 0.3 | 0.1 | 181 | – | – | – |
| | TOTAL | 6.3 | 2.6 | 191 | – | – | – |
| Interest group | Yes interest group | 6.0 | 0.1 | 19 | 0.1 | 5.4 | 12 |
| | No interest group | 0.7 | 0.0 | 172 | 0.0 | 0.4 | 172 |
| | TOTAL | 6.7 | 0.1 | 191 | 0.1 | 5.8 | 184 |
| Military grades | No military function | 4.9 | 0.1 | 83 | 6.0 | 1.8 | 112 |
| | Lieutenant/1st Lieutenant | 0.0 | 0.8 | 31 | 4.9 | 1.1 | 12 |
| | Captain | 3.5 | 0.5 | 37 | 0.3 | 3.5 | 18 |
| | Major | 0.0 | 1.6 | 15 | | | |
| | Colonel | 3.4 | 1.7 | 25 | 6.1 | 2.3 | 42 |
| | TOTAL | 11.9 | 4.7 | 191 | 17.3 | 8.6 | 184 |
| Educational level | Non-academic | 1.1 | 0.0 | 21 | 4.4 | 0.5 | 28 |
| | BA/MA | 0.8 | 12.3 | 59 | 2.2 | 5.4 | 86 |
| | PhD | 3.0 | 7.5 | 65 | 0.0 | 10.7 | 54 |
| | TOTAL | 5.0 | 19.9 | 145 | 6.7 | 16.6 | 168 |
| Educational discipline | Law | 10.4 | 6.5 | 52 | 0.1 | 6.3 | 37 |
| | Business studies | 1.5 | 1.3 | 25 | 2.0 | 0.6 | 49 |
| | Engineer | 1.2 | 18.5 | 31 | 10.9 | 9.3 | 40 |
| | Other education | 0.3 | 1.3 | 15 | 0.2 | 0.0 | 21 |
| | TOTAL | 13.4 | 27.6 | 123 | 13.3 | 16.1 | 147 |
| Place of university | ETHZ | 0.9 | 18.6 | 26 | 15.2 | 5.6 | 29 |
| | University of Zurich | 5.3 | 4.5 | 10 | 0.2 | 4.3 | 12 |
| | University of Berne | 2.6 | 1.6 | 12 | 0.1 | 3.1 | 10 |
| | Univestities SG & Ba | 0.0 | 3.9 | 15 | 0.0 | 4.6 | 21 |
| | Universities Romandes | 1.0 | 0.3 | 22 | 0.6 | 0.0 | 16 |
| | Total | 9.8 | 28.9 | 85 | 16.1 | 17.7 | 88 |
| MBA | Yes MBA | 0.3 | 1.9 | 10 | 0.5 | 1.3 | 32 |
| | No MBA | 0.0 | 0.1 | 181 | 2.5 | 0.3 | 152 |
| | TOTAL | 0.3 | 2.0 | 191 | 3.0 | 1.6 | 184 |

Table 2 (*Continued*)

| Contributions of active categories | | 1980 | | | 2000 | | |
|------------------------------------|-------------------|------------|------------|-----|------------|-----------|-----|
| Variables | Categories | Axis 1 | Axis 2 | n | Axis 1 | Axis 2 | n |
| Function | Executive | 1.4 | 0.2 | 113 | 0.1 | 1.1 | 106 |
| | Board | 2.0 | 0.3 | 78 | 0.1 | 1.5 | 78 |
| | TOTAL | 3.4 | 0.5 | 191 | 0.2 | 2.5 | 184 |
| Centrality company | Centrality top10 | <i>5.6</i> | <i>4.6</i> | 21 | 0.0 | 0.0 | 17 |
| | Centrality 20–50 | 2.0 | 0.4 | 66 | 6.9 | 0.7 | 61 |
| | Centrality 50 + | <i>4.8</i> | 0.2 | 104 | <i>4.2</i> | 0.4 | 106 |
| | TOTAL | 12.5 | 5.2 | 191 | 11.2 | 1.1 | 184 |
| Betweenness persons | Betweenness 1–20 | 6.0 | 1.1 | 20 | 1.4 | 1.0 | 20 |
| | Betweenness 20–50 | 3.9 | 0.1 | 30 | 2.7 | 1.7 | 30 |
| | Betweenness 50–90 | 0.3 | 0.1 | 40 | 1.5 | 1.1 | 40 |
| | Betweenness 90 + | 3.3 | 0.6 | 101 | 0.4 | 0.3 | 94 |
| | TOTAL | 13.5 | 1.8 | 191 | 6.0 | 4.0 | 184 |
| Nationality | Swiss | – | – | – | 2.7 | 1.6 | 142 |
| | Non-Swiss | – | – | – | 8.6 | 5.0 | 38 |
| | TOTAL | – | – | – | 11.3 | 6.6 | 180 |

Note:

Bold: categories > average contribution (for 1980: $100/13 = 7.69$; for 2000: $100/13 = 7.69$); *italics:* categories > average contribution (for 1980: $100/42 = 2.38$; for 2000: $100/42 = 2.38$).