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THE RISE AND DECLINE OF THE SWISS COMPANY  
NETWORK DURING THE 20<sup>TH</sup> CENTURY

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***Abstract:***

In this paper, we trace the evolution of the Swiss company network during the 20<sup>th</sup> century. Based on interlock data for a sample of the 110 largest Swiss companies for seven assorted points in the century (1910, 1929, 1937, 1957, 1980, 1990 and 2000), we show that a (relatively) closely-meshed network of interlocking directorates emerged in Switzerland in the early part of the century. Banks held a particularly central position in this network. A second period, lasting from the 1930s up to the end of the 1980s – was marked by the relative stability and the further integration of the ties between Swiss companies. During the 1990s, however, an unraveling set in, changing the topography of the network of interlocks considerably. Thus, banks moved away from their traditional pivotal position in the network, and the overall density of the network declined in a significant way.

In our paper, we explain this evolution by linking it to the particularities of the economic and political context of the Swiss economy during the three periods we have identified, i.e. the formative phase (1910-1937), the period of stability (1938-1980) and the period of decline (1980-2000). Furthermore, we try to show that this development was but one aspect of a more general transformation by which the traditionally closed and insider-oriented Swiss corporate governance system moved toward a system that was more shareholder-oriented and increasingly accessible to foreigners.

## ***Table of contents***

<b><i>Introduction</i></b>	<b>5</b>
<b><i>1. Interpreting intercorporate networks</i></b>	<b>6</b>
<b><i>2. Data, methods and descriptive results</i></b>	<b>8</b>
<b>2.1. General characteristics of the Swiss company network 1910-2000</b>	<b>10</b>
2.1.1. Inclusiveness and structure	10
2.1.2. Network density	12
2.1.3. Average geodesics and diameter	15
2.1.4. Actor centrality	16
2.1.5. Cohesive sub-groups: m-cores	19
<b><i>3. Interpretation</i></b>	<b>26</b>
<b>3.1. 1910-1930: The constitutive phase of a national company network</b>	<b>26</b>
3.1.1. The autonomisation of the Swiss business elite from German influence	27
3.1.2. From regional networks to a national inter-company network	29
<b>3.2. 1930-1980: The heyday of the “fortress of the Alps”</b>	<b>31</b>
3.2.1. The struggle against foreign influence	33
3.2.2. Insider domination of the firm	35
3.2.3. The role of banks	37
<b>3.3. 1980-: Internationalisation and shareholder value: the decline of organised capitalism</b>	<b>40</b>
3.3.1. Changing strategies of banks: investment banking and Allfinanz	40
3.3.2. Shareholder value orientation of Swiss companies: good corporate governance and interlocks	46
3.3.3. The company network between stability and change: disintegration or marginal restructuring?	50
<b><i>Conclusions</i></b>	<b>52</b>
<b><i>References</i></b>	<b>54</b>
<b><i>Sources:</i></b>	<b>58</b>
<b><i>Annex 1: Recapitulatory table of main results</i></b>	<b>60</b>
<b><i>Annex 2: Top ten companies according to different centrality measures</i></b>	<b>61</b>
<b><i>Annex 3: 2m-cores and list of abbreviations</i></b>	<b>65</b>

## **Introduction**

Capital and board membership ties between companies constitute a salient characteristic of a country's economic organisation and even more precisely of its corporate governance system. The characteristics of the company network in a given country can, therefore, be seen as an indicator of its mode of economic organisation. Thus, the existence of a dense company network is usually considered as one of several institutions that make up the institutional setting of an organised type of market capitalism (Höpner and Krempel 2003). The terminology by which such models of capitalism are designated varies from author to author. The most often used categories are coordinated market economies (CME) (Hall and Soskice 2001), non-liberal economies (Streeck 2001, Jackson 2001), and organised market economy (OME) (Gourevitch 2003). Notably owing to strict anti-trust regulation and highly developed financial markets, liberal market economies (LME), on the other hand, tend to be characterised by loose networks with relatively little intra-sectoral and bank-industry capital or interlock ties (Windolf and Nollert 2001).

An extensive debate has taken place among scholars in political economy and law over the so-called "convergence thesis". The "convergence thesis" states that CME countries are obliged, due to pressures stemming from liberalisation and deregulation of markets, to adapt their economic systems by adopting LME-style institutions. Scholars employ several indicators to prove or reject this thesis. Carroll and Fennema (2002) consider that interlocks involving executives and multiple ties between companies are the most significant markers of organised capitalism. They further deem that the changing properties of corporate networks clearly indicate a shift away from a "voice-based" corporate governance regime towards an Anglo-Saxon "exit-based" system. The distinction between exit and voice refers to the fact that in voice-based corporate governance regimes, credits play an important role in the financing of companies, which – contrary to financing through the financial markets – does not allow a creditor to withdraw its investment quickly should matters take a turn for the worse for the company. Creditors, mainly banks, have for this reason a strong incentive in monitoring the companies in which they invest. The central role of large universal banks in the functioning of the economy by means of lending to and monitoring of industrial companies represents a major feature of non-liberal models of corporate governance (Jackson 2001, De Jong 1997), and explains why, in such countries, the large banks generally occupy a central position in the intercorporate network (Stokman and Wasseur 1985). On the other hand, in "exit-based systems", which are largely based on capital market corporate finance, there exists a lesser need for monitoring and consequently for interlocks. Following this reasoning, changes in the structure and the quality of the company network can provide a significant indication of a general transformation in the corporate governance system.

In our analysis of the Swiss case, which is generally considered to be very close to the German "bank centered" corporate governance system, we paid particular attention to the position of banks in the network. With regards to the long-term evolution of the Swiss company network during the 20<sup>th</sup> century, our network analysis highlights the existence of three phases: 1) the emergence of a coherent national network between 1910 and 1930, 2) a phase of relative stability and consolidation (1930-1980), and 3) a phase of disintegration (1980-2000). More

precisely, the first phase of emergence of a national company network at the beginning of the 20<sup>th</sup> century largely corresponded to the consolidation of organised capitalism, which occurred at the end of the 19<sup>th</sup> century (for Switzerland, see Jost 1980, and Windolf 2005 for Germany). After this period of national integration, we witnessed the preservation of a rather stable and dense network, which prevailed and was even consolidated between 1930 and 1980, a period that we have called the heydays of the “fortress of the Alps”. At the other end of the time scale, we observed a fragmentation of the Swiss network from the 1980s on. This result confirms the findings for other countries such as the US (Davis and Mizruchi 1999) and Germany (Höpner and Krempel 2003, Beyer 2002), where trends towards network dissolution have also been discerned. This evolution seems to be closely linked to the internationalisation of the economy and the deregulation of financial markets.

The paper is structured as follows: we first give a brief summary of the most important theoretical interpretations of interlocking directorates. We subsequently specify the data and method we used for the analysis and expose the empirical results of the network analysis in order to depict the evolution of the network during the 20<sup>th</sup> century. In the third and longest part, we interpret the three phases of network creation, stability, and decline by using historical narratives.

## **1. Interpreting intercorporate networks**

Generally speaking, the company network can be seen as one of several economic institutions that allow economic actors to coordinate their interactions (Windolf and Nollert 2001). Therefore, we can reasonably expect that there would be cross-national differences in the structure of networks based on the degree of coordination of a particular market economy (CME vs. LME). Hence, the structure of the company network in a particular country is a useful indicator of its economic organisation and its corporate governance system, and changes in the network structure reveal adjustments in economic organisation.

Before analysing the evolution of the company network in Switzerland, it is worthwhile to take a more detailed look at the function of corporate interlocks. Many interpretations of the functions and the effects of interlocking directorships exist in the literature on the subject. Different theoretical schools have emphasised one or several of these functions. Scott (1985: 5-14), for instance, distinguished five models: 1) the finance capital model, 2) the coordination and control model, 3) the resource-dependence model, 4) the managerial model and 5) the class-cohesion model (see also Nollert 1998 for a synthetic presentation).

1) The “finance capital model” has a Marxist origin and is the oldest approach to interlocks (Scott 1985). Authors like Hilferding interpreted the concentration in industry and banking as an empire-building strategy around (but not necessarily by) banks and insurance companies. Each bank tries to create its sphere of influence among industrial companies. In this respect, the network would be heavily clustered around banks and other financial corporations. Each group of companies would further be expected to have few ties with other groups. Furthermore, the interlocks network would theoretically largely correspond to networks created by other ties between companies, such as indebtedness and capital participation. Also, ties would likely exist mainly between financial and non-financial firms and much less within industrial sectors.

2) The “coordination and control model” has, according to Scott (1985), two versions: a bank-control version and a family-control version. Scott differentiated the bank-control model from the finance capital model on the basis that the bank-control model explicitly states that banks are independent from industrial companies and are at the top of the decision-making hierarchy within a group of companies. The finance capital model, on the other hand, is rather founded on an idea of interdependence between banks and industry. In the bank-control model, interlocks are a means of control that allows banks to build up interest groups of firms, which are to serve the bank’s interests. This power derives from their quality both as lenders and as large shareholders. This thesis was defended in a radical form by Fitch and Oppenheimer (1970) who stated that some banks strip capital from industrial firms, which in the worse case scenario leads to the bankruptcy of the firm (Mizruchi 2004). Bank control, in a less radical view, can also be interpreted as simply guaranteeing efficient monitoring by resource providers (Mizruchi 1996). Windolf (2005) underscored that this function of control of the management by banks is particularly important in capital-intensive branches.

The bank control model would expectedly yield a similar structure of clustering as the finance capital model. However, it also predicts that ties between banks and industrial companies are directed from banks to industrial companies and thereby indicate the ascendancy of banks. The family-control version of this model states that not banks but rather families – through family trusts, foundations, etc. – are at the core of groups of corporations.

3) The “resource dependence model” emphasises the dependence of companies on resources such as capital, trading advantages and corporate information. Interlock ties are established in order to regulate company interdependence. According to Mizruchi (1996), they help to reduce uncertainty concerning the corporation’s environment (cooptation of directors) or to pacify relations with resource providers (resource dependence). The reason for interlocks lies not in domination but in a “community of interests” (Scott 1985: 9). Consequently, this model predicts a network without any clear structure, a low density, a high level of fragmentation, and a low level of centralisation.

4) The “managerial model” of interlocks takes as a starting point the fact that firms are ruled by managers who are autonomous from other stakeholders and especially from outside directors and shareholders. In this view, interlocks do not affect the corporate strategy but serve to increase the company’s “environmental scan” (Scott 1985: 10) and its prestige. Therefore, managers try to co-opt executives from large, prestigious companies to their boards. Interlocks are, hence, supposed to be directed from large companies to small ones or to exist among large ones. Again, there will be little structure in the network since ties do not respond to any clear strategic objective.

5) The “class-cohesion model” presents interlocks as an expression of cohesion within the ruling class and as a means by which this unity is maintained and furthered. Frequent meetings and acquaintance favour the conclusion of business deals and strengthen the cohesion of the class’ values and ethics. Interlocks are, therefore, a channel of communication and an avenue for the transmission of information. Windolf (2005) calls this function a self-control function of corporate interlocks, which is associated with managerially-run companies. As such, interlocks replace ownership as a mechanism of control and help to reduce opportunistic

behaviour by imposing a certain code of ethics on the members of the business elite. According to this model, we can expect the interlock network to be relatively dense with links between many companies. Also, we would anticipate the existence of an “inner circle” (Useem 1984) of multiple directors (“big linkers”) able to transcend inter-firm and sectoral rivalries and promote the interests of the whole business elite.

We can add a sixth explanation for the creation of interlocks i.e. a strategy for restricting competition, as expounded notably by Windolf (2005) and Windolf and Nollert (2001). Windolf (2005) found that in Germany in the late 19<sup>th</sup> century, interlocks led to cartel-like configurations within a given sector. More generally, Windolf and Nollert (2001: 53) stated that: “[...] Networks are not only an efficient instrument for controlling the “anarchy of the market”. In the extreme case, networks can eliminate competition completely (e.g. cartels)” (our translation). Mizruchi (1996) spoke of “collusion” in relation to this type of competition-restricting interlocks<sup>1</sup>.

Despite the fact that our data does not allow us to investigate all the hypotheses raised by these theories, we will use selected elements from these different models in order to interpret the Swiss company network. Even if we do not have data on directed ties, these models are useful in answering the question of the role of banks in the company network. We put forward the hypothesis that large banks have a dominant position in the Swiss company network and that they use this privileged position to monitor their investments. The banks’ dominant role and their credit monitoring are also suggested by other studies (Schreiner 1984, Rusterholz 1985, Windolf and Nollert 2001, Loderer and Peyer 2002).

In this paper, we analyse the evolution of the company network as a social infrastructure in which companies operate (Windolf 2005). We only look at the structure of the network and the position of companies within it in order to determine the social embeddedness of the companies. We limit ourselves to examining the interlocking directorates between the 100 largest Swiss firms for seven key years during the course of the 20<sup>th</sup> century. Capital ties are not considered. The main focus of the paper is to explain the evolution of the network through historical factors. Therefore, we do not scrutinise the network structure in depth but exploit simple measures of general network characteristics in order to dedicate more attention to the qualitative and interpretative analysis.

## **2. Data, methods and descriptive results**

In our analysis of the Swiss interlock network, we used a sample of the 100 largest Swiss companies for seven dates in the 20<sup>th</sup> century. We also took into account several criteria according to the economic sector in which the companies in our sample were active. As a consequence, the final sample includes approximately 115 firms. The choice of the seven dates was made so as to take into consideration different stages in the economic history of Switzerland. But it was also, in part, influenced by the availability of data. In fact, for most of the 20<sup>th</sup> century, information on board membership in Switzerland is not available systematically. Thus, a number of very different sources had to be used, many of which were

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<sup>1</sup> In addition to these more or less strategic reasons, Mizruchi (1996) suggests that sociological reasons may also explain the creation of overlapping board memberships. Thus, board membership provides directors with career opportunities, remuneration and prestige.

published at irregular intervals. We chose one date before World War I (1910), two dates in the Interwar Period (one before the Great Depression (1929) and one on the eve of World War II (1937)). For the post-war period we selected 1957, 1980, 1990 and 2000. Our study is the first analysis of the inter-firm networks in Switzerland that covers the entire 20<sup>th</sup> century.

The selection criteria that we utilised to establish the list of the largest Swiss firms for the seven years are different for the historical and the more recent periods. At the beginning of the 20<sup>th</sup> century, many of the largest firms were private companies (often family-held) and only very few companies were listed on the stock market. Consequently, market capitalisation was not a useful criterion to determine our sample. We, therefore, drew on a combination of indicators of company size in order to capture the whole array of large companies (for the methodology, see Dritsas et al. 1996: 181 ff.). For the financial sector, total of assets was the main criterion. Based on this stipulation we chose the ten largest insurance companies, ten banks and ten finance companies. We added three private and three cantonal banks. To this sample of the financial sector, we added the 50 industrial companies with the largest nominal capital, which is the best accounting indicator available for the historical period. Acknowledging the fact that many major firms operated on a very small capital basis, we included the 30 largest employers. The employers were selected according to the number of blue-collar workers in the firm since no figures are available for the total number of employees. The data on the number of blue-collar workers is available owing to the census of enterprises carried out by the Federal Statistical Office at regular intervals. Finally, we added three companies active in the transportation sector and five from the energy sector. A few other large companies were also included in order to capture the regional diversity of the Swiss economy (from the French-speaking part of Switzerland in particular). With the combination of these different criteria, we obtained a sample of approximately 120 firms for the four dates 1910, 1929, 1937 and 1957. After eliminating all the companies for which we had no or incomplete director data, we were left with 108 to 111 firms for our analysis.

For the most recent period, we chose our sample mainly on the criterion of market capitalisation (70 industrial and service), and we added the ten largest banks, the ten largest finance companies and ten largest insurers. For these companies the criterion was total of assets and net prime income, respectively. We also included the three largest cantonal banks and three large private banks<sup>2</sup> as well as three transportation companies and five companies active in the energy sector. Finally, we checked if based on turnover, any of the 20 largest companies or any of the 10 largest employers had been left out using the criterion of market capitalisation (especially private companies)<sup>3</sup>. This left us with a sample of approximately 116 companies. The somewhat smaller sample for the recent period is explained by the fact that there has been a strong concentration in most industrial sectors. Because of mergers and acquisitions, the number of large companies has generally dropped quite dramatically. The largest ones, however, increased spectacularly in size and the gap with smaller companies has grown. To give but one example, out of the five

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<sup>2</sup> Since financial figures are very scarce for private banks, we cannot be completely sure that we have been able to choose the largest ones.

<sup>3</sup> For a discussion of the selection criterion of turnover and a combination of different criteria, see Nollert 1998.

largest banks of 1929, only 2 remained in 2000. Also, data availability on board membership for the latest period was sometimes as imperfect as for the historical period, which left us with some companies for which no data on directors existed and which were thereby excluded. The samples for the contemporary period vary between 107 and 111. The main source for establishing this sample was the Top 500 ranking published first by the UBS and later by a financial newspaper (*Schweizerische Handelszeitung*).

We gathered interlock data by using publications such as stock exchange manuals, financial yearbooks and sometimes monographs about individual company and annual reports of firms (for more details on the sources, see David et al. 2005 and the sources at the end of the paper). For the more recent period, director data were largely derived from annual reports; however, not all companies publish annual reports. Furthermore, the Swiss corporate governance system is marked by a one-tier board system, not by a two-tier structure as in Germany. The board of directors (*conseil d'administration*) can either delegate management to professional managers who are not board members or run company business themselves. Especially at the beginning of the 20<sup>th</sup> century, Swiss boards often delegated the management of the company to one of their members (the *délégué* of the Board of Directors, BoD). This function of "*administrateur-délégué*" cumulates to an executive position and that of a member of the board. Such inside directors were, however, only a minority within the BoD. Given the indistinct boundaries between the board of directors and the management board and the lack of data, it was impossible to clearly distinguish between outside and inside directors. Therefore, our analysis is mainly based on undirected data (except for the largest banks).

## **2.1. General characteristics of the Swiss company network 1910-2000**

Inspired by the work of Mizuchi (1982), Scott and Griff (1984) and Windolf (2005), we analyse the Swiss company network from a historical long-term perspective. In this section, we provide a descriptive analysis of the main features of the Swiss company network during the 20<sup>th</sup> century. We considered different aspects of the Swiss corporate network. First of all, we used global measures to capture general features of the network (density, connectivity (average geodesics, average degree, etc.; see the table in Annex 1). We then evaluated the centrality of individual firms, paying particular attention to the position of banks. We also looked at coherent sub-graphs, by examining the m-cores in our data<sup>4</sup>.

### **2.1.1. Inclusiveness and structure**

A first finding concerns the *inclusiveness* (cf. Scott 2000: 70) of the network. For all dates in our analysis, the Swiss company network is constituted of a very large *major component*<sup>5</sup>, which includes between 86.1 and 93.7% of the firms in our sample (cf. table in Annex 1). This is a very large proportion of the companies, especially if we compare it to the German cross-shareholdings network where, in 1996, 60.0% of the 100 largest companies were connected and only 40.0% in 2000 (Höpner and Krempel 2003). The main component in Switzerland is particularly

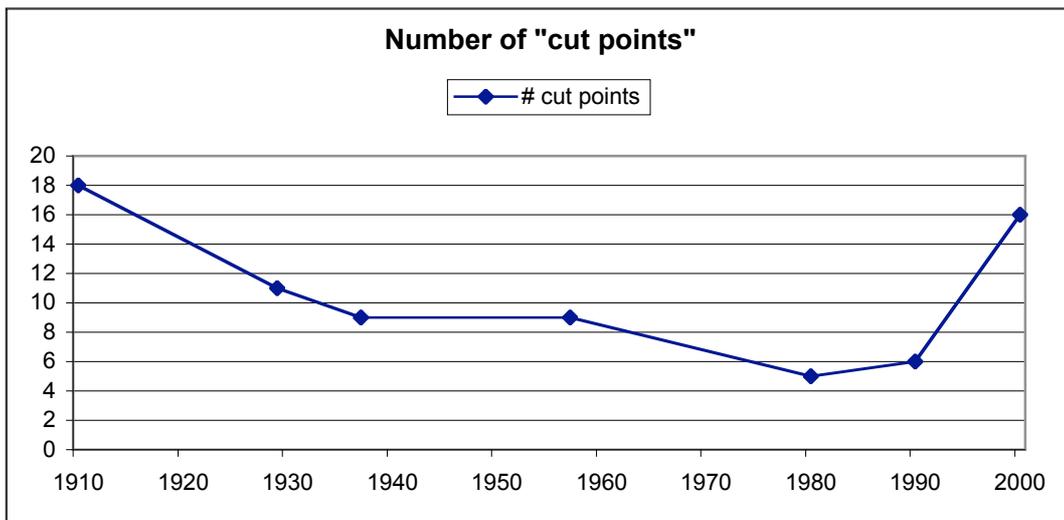
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<sup>4</sup> The recapitulatory table in annex 1 gives a complete view of the results quoted in the text.

<sup>5</sup> The major component of a network is its largest connected sub-graph, i.e. the largest group of connected companies.

densely connected, and its coherence is illustrated by the low number of *cut points*<sup>6</sup> for a very long time. Moreover, most of these cut points, when removed, did not cause the network to split into different components but just the number of isolated firms to increase. In fact, if we take a low number of cut points as a sign of a strong integration, the evolution of this number shows the existence of three phases: a phase of emergence of the network during the first decades of the 20<sup>th</sup> century, a phase of stability and further integration (1930 till 1980) and a phase of decomposition (after 1980) (cf. figure 1). Of course, the cross-sectional nature of our data, which takes into account only seven dates, does not allow us to identify precisely this periodisation.

Figure 1: Number of cut points in the Swiss company network



Source: own data basis (for more details, see text and sources)

Besides the giant component, the component analysis shows – except for 2000 - only isolated firms. That is, no components existed outside the main component. Again, this demonstrates the high inclusiveness of the Swiss company network during the entire 20<sup>th</sup> century (cf. table 1).

Table 1: Number of components

Year	1910	1929	1937	1957	1980	1990	2000
Number of components	16*	14*	14*	13*	8*	11*	15**
Number of connected firms (main component in % of N)	86.5	88.0	88.1	89.0	93.7	90.7	86.1

\*) All but one component are isolated firms

\*\*\*) 1 major component, 1 dyad and 13 isolated firms

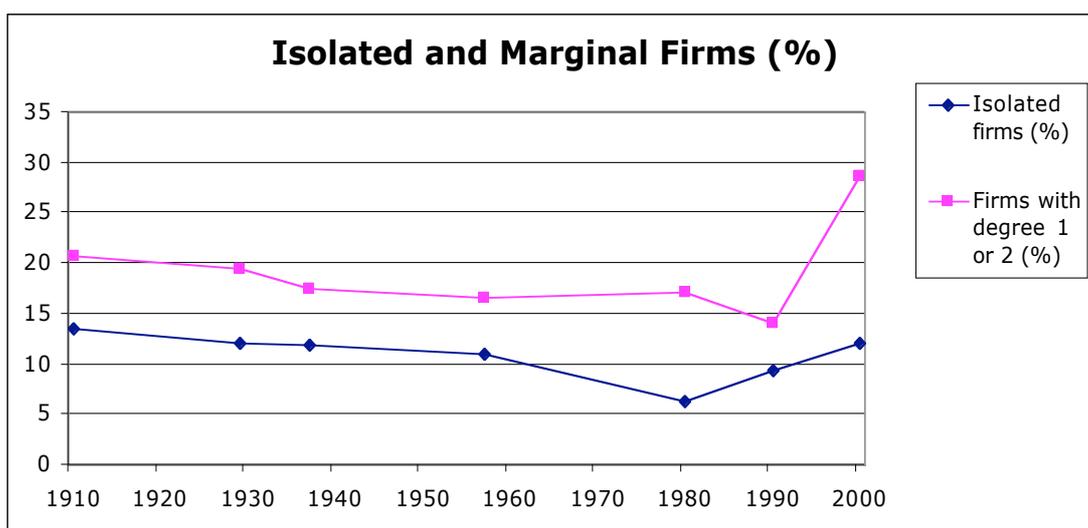
As a consequence of the high inclusiveness, the number of isolated firms is rather low but unstable during the observed period. In fact, the number of isolated companies decreased continually from 1910 up to 1980. In 1980, when the network

<sup>6</sup> A cut point is defined as a node (in our case a BoD) whose suppression causes the component to split into two or more sub-components.

reached its highest integration according to this yardstick, only 6.3% of the firms in our sample were isolated. From 1980 onwards, however, this proportion increased again, suggesting a loosening of ties between companies (cf. figure 2). In 2000 the number of isolated firms was still lower than it had been in 1910 (12.0% in 2000 against 13.5% in 1910), indicating that despite the relative disintegration of the network, a certain level of cohesion remained.

The number of marginal firms (defined as firms with one or two neighbours) reveals a similar trend towards an increased integration of the Swiss company network between 1910 and 1990, and a very clear disintegration after that date. The fact that the number of isolated firms grew from 1980 onwards but the number of marginal firms only from 1990 onwards, seems to indicate that the network started to disintegrate at its fringes, with less well-connected firms losing their ties first. From 1990 onwards, the number of marginal firms more than doubled (from 14.0% to 28.7%). The fact that more than a quarter of the firms in the sample had only one or two ties in 2000 clearly illustrates that changes in the company network during the last decade of the 20<sup>th</sup> century have been very extensive.

Figure 2: Isolated and marginal firms in the Swiss company network.



### 2.1.2. Network density

We then calculated the density measure for the whole network (“socio-centric density”, Scott 2000). Overall *network density* measures the number of observed lines in the network as a proportion of the theoretical maximum of lines<sup>7</sup>. The evolution of the overall density of the Swiss corporate network visibly shows that the network grew significantly denser between 1910 and 1929 (increased from 4.9% to 6.9%). After 1929, the integration seems to have continued at a somewhat slower pace. More precisely, between 1929 and 1937 the density remained fairly stable, but increased afterwards up to 1957 when it reached a peak. The density started to decline after 1957, and, at an accelerated pace after 1990. We distinguish the phase between 1930 and 1980 from the phase prior to 1929 by the fact that the very

<sup>7</sup> i.e.  $n(n-1)/2$ , where  $n$  is the number of nodes in the network.

marked augmentation in the density score between 1910 and 1929 can be interpreted as a phase of network formation that led for the first time to a genuine national company network. The phase after 1930, however, appears to be more the integration process of an existing network than a phase of emergence. After 1980, a process of decomposition set in, and it further accelerated after 1990. In 2000, the density of the network was lower than in 1910, indicating that the Swiss company network had disintegrated considerably during the last twenty years of the 20<sup>th</sup> century. In the remainder of this paper, we structure our analysis in accordance with the different phases of the network's evolution: the emergence of the national company network prior to the 1930s, the phase of continuing integration and relative stability up to 1980, and the phase of decline after this date.

If the density measurement generates interesting results, some qualifications need to be made regarding the significance and the comparability of this variable for different dates. Network density is influenced by two factors: the size of the network (i.e. number of firms in the sample) and the mean board size for each date. Therefore, it is problematic to compare the density of different networks (Scott 2000: 94). However, we are able to control the first bias, i.e. dependence on sample size since our samples have for all dates virtually the same size.

More importantly for our case is the second characteristic of the density measure, i.e. the fact that density strongly correlates with mean board size (cf. figures 3 and 4). As Scott (2000: 97) put it: “[...] having a large number of interlocks [is] less significant for those enterprises with large boards than it [is] for those with small boards”. Large boards increase the probability of links with other companies. Therefore it is not surprising that the years with a larger mean board size also showed a higher network density. Yet, a comparison of figures 3 and 4 reveals that between 1929 and 1937 the density of the network grew despite a decrease in the mean board size. Similarly, even though the mean board size increased between 1980 and 1990, the density declined. These changes are therefore even more significant and not linked to variations in board size.

Figure 3: Overall density of the Swiss company network

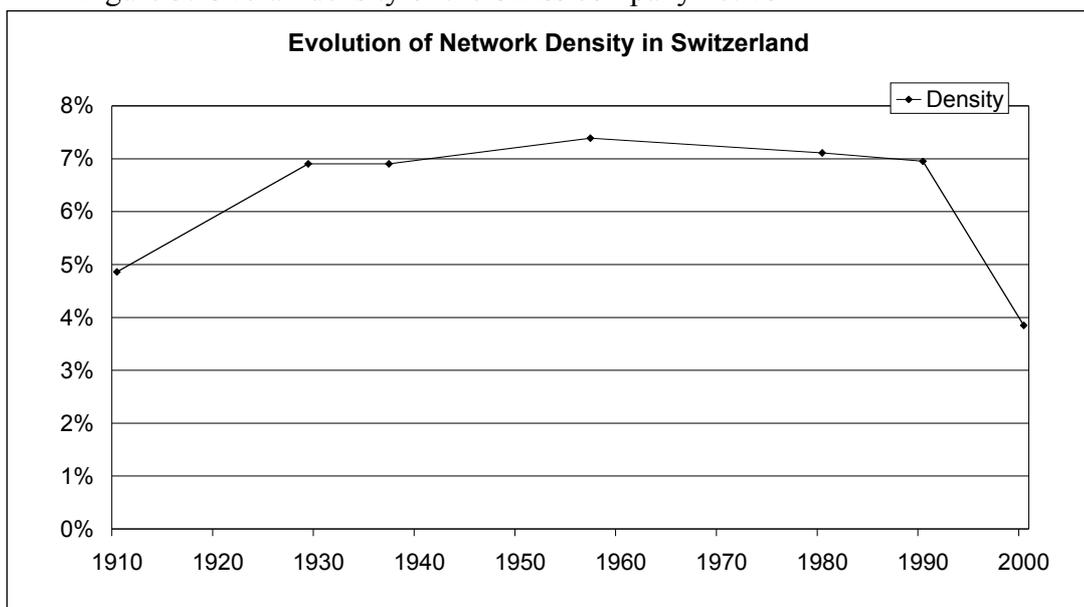
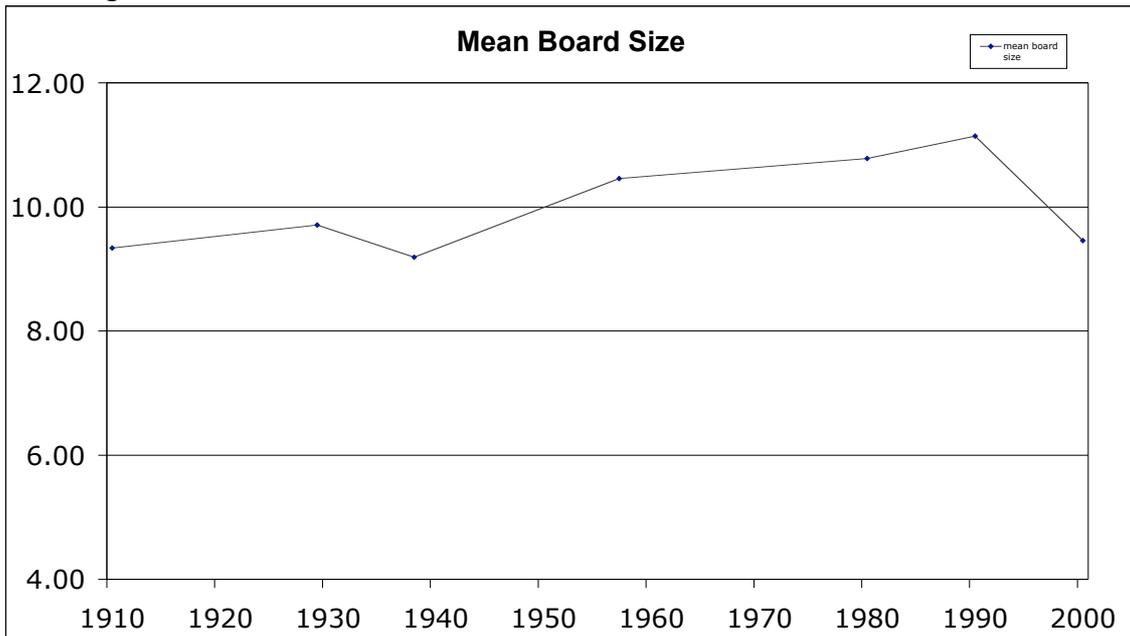
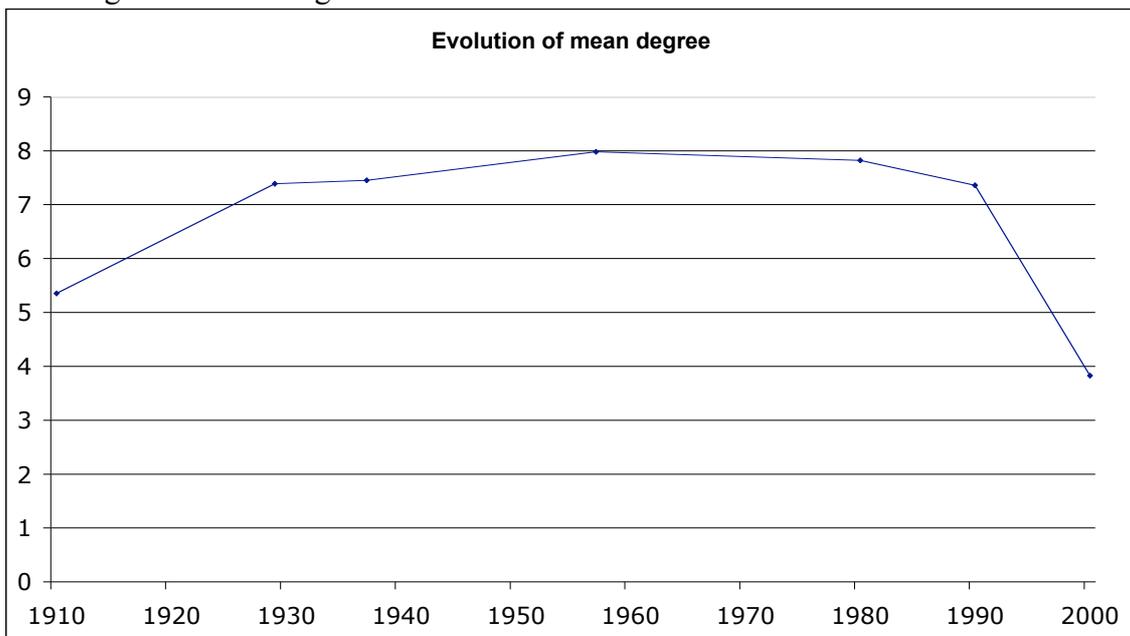


Figure 4: Mean board size



The *mean degree*<sup>8</sup> of a network is yet another measure of structural cohesion, and it can provide for better and easier comparison of networks of different sizes (De Nooy et al. 2005: 64). Figure 5 exhibits the evolution of this measure, which is very similar to the density measure. Again, the most significant changes occur between 1910 and 1929 and between 1990 and 2000. The intermediary phase appears to be a period of relative stability.

Figure 5: Mean degree

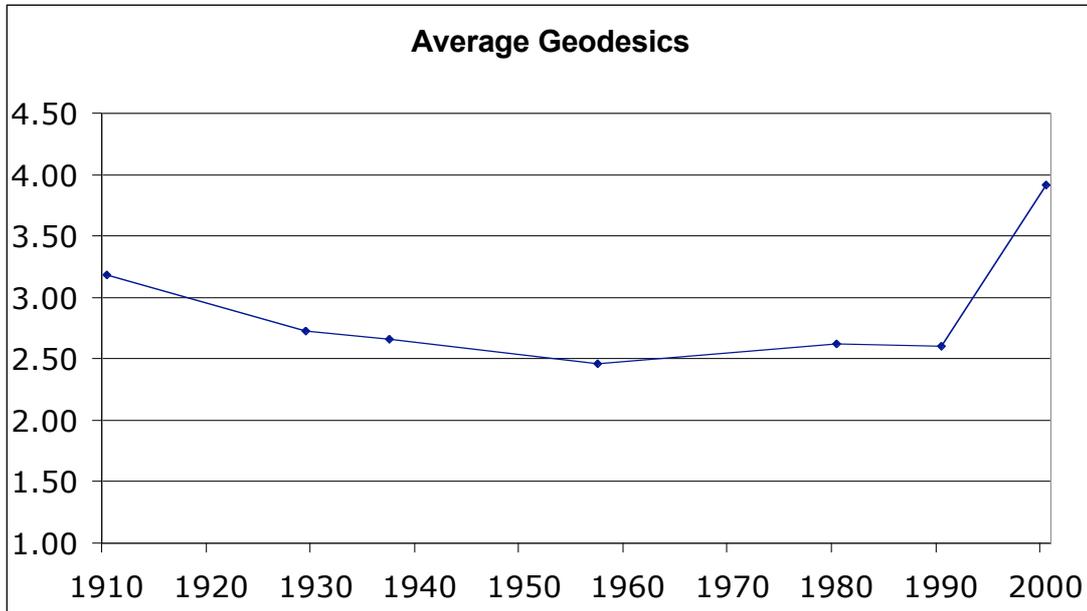


<sup>8</sup> The mean degree is defined as the mean of the sum of degrees of all nodes in the network.

**2.1.3. Average geodesics and diameter**

Another overall characteristic of the network is the average length of shortest paths between the nodes of the network (*average geodesics*). For instance, a geodesics of 3 between two firms indicates that the two firms can reach each other by a path through two other companies. This measurement is a useful indicator of the network’s structural characteristics and is important in answering questions linked to information flows within the network. Since 1910, the average shortest path length between the companies in our sample decreased steadily up to 1957 and increased slightly until 1990 (cf. figure 6). The decrease seems to have been accentuated between 1910 and 1929, thus supporting our distinction between the formative phase before 1930 and a phase of continuing but slower rate of consolidation between 1929 and 1980. Between 1990 and 2000, there was an important leap in this variable. This, again, clearly shows the significant decline in cohesion within the network during the last decade of the 20<sup>th</sup> century.

Figure 6: Average geodesics



The longest geodesics (“longest shortest” path) of the network, i.e. the length of the path between the two most distant nodes, gives us an indication of the size of the network, its so-called *diameter*. We find the most important changes to have occurred between 1910 and 1929, between 1937 and 1957, and between 1990 and 2000. Nonetheless, overall, the network’s diameter was fairly stable up to 1990.

Table 2: Diameter of the Swiss company network

	1910	1929	1937	1957	1980	1990	2000
Diameter	8	6	7	5	6	6	11

The measures discussed in this section demonstrate that the Swiss company network was highly integrated and stable throughout the 20<sup>th</sup> century. Similarly to the previous indicators, the only significant changes were observed between 1910 and 1929 and between 1990 and 2000. The transformations at the end of the 20<sup>th</sup> century were extremely important. The emergence of the network, on the other hand,

seems to have already been underway in 1910 since the network appears to have been quite well-integrated at that time.

#### **2.1.4. Actor centrality**

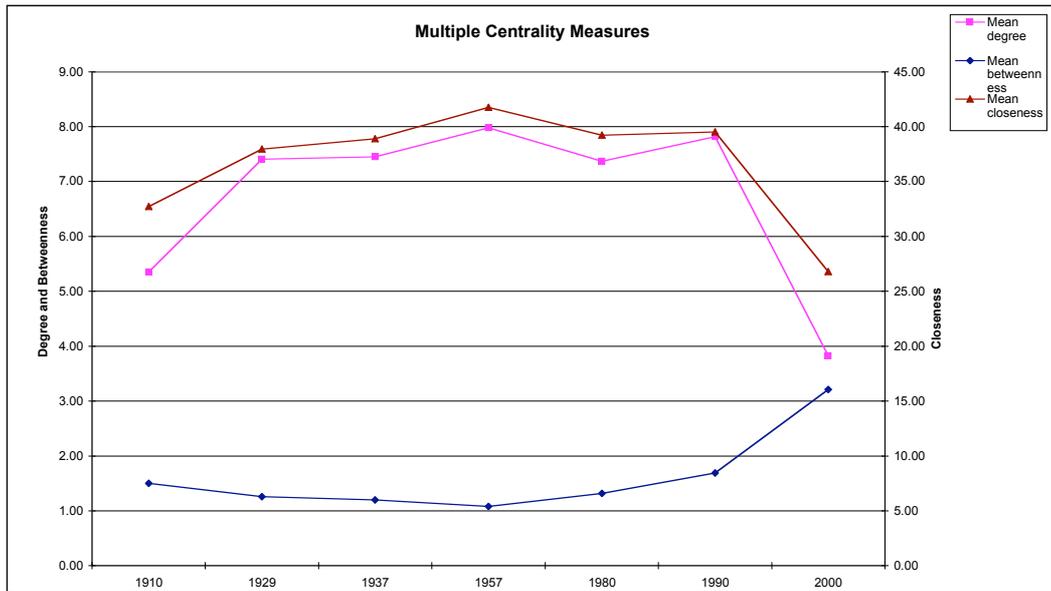
Apart from these general network characteristics, we also looked at the individual nodes in the network. We calculated three different centrality measures for the different dates, that is, Freeman degree, betweenness and closeness centrality (cf. Scott 2000: 85-87. cf. Annex 2 for the list of the ten most central companies for each date). *Degree centrality*, or Freeman degree, is the most intuitive and least sophisticated measure of actor centrality. It simply quantifies the number of ties a node has with other actors, or in other terms, the number of “neighbours”. Degree centrality is a local centrality measure since it does not take into account the centrality of the actors to which a node is linked. In other words, an actor can have many ties with its neighbours but still be at the periphery of the network as a whole. *Betweenness centrality* is a more sophisticated measure of centrality: it calculates for each node the number of shortest paths between any pair of nodes in the network that pass through this node. Therefore, it is a computation that is useful for measuring the “power” or control an actor has over information or communication flows. Finally, *closeness centrality* is based on the distance matrix of the network and is an indicator of how close one node is to all the other nodes in the network.

A comparison of the average of these different centrality measures offers illuminating insights. We found that mean degree and mean normalised<sup>9</sup> closeness centrality evolved in a similar way (see figure 7). Mean normalised betweenness centrality, however, followed a completely different path. In fact, we determined that during the period from 1910 to 1957 the two former measures increased continually, whereas betweenness decreased. This observation indicates that the growing integration of the network (number of ties) reduced individual firms’ control over information flows. At the other end of the period under consideration, we discovered that – despite the decomposition of the network between 1990 and 2000 – betweenness centrality augmented. This phenomenon can be explained by the fact that in a less dense network, the few companies that maintained a significant number of interlocks became more important as intermediaries between companies that no longer had any direct ties to each other.

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<sup>9</sup> We normalised the closeness and the betweenness measure in order to allow for a better comparability of the measures for the different years.

Figure 7: Multiple centrality measures



Another interesting point concerning centrality is that for the greatest part of the century, the ranking of the most central companies in the sample shows a very clear overrepresentation of the financial sector among the ten most central companies according to Freeman degree, betweenness and closeness centrality (see table 3 below, where firms of the financial sector are in grey, and Annex 2). At the beginning of the 20<sup>th</sup> century, this overrepresentation was mainly due to the existence of finance companies such as *Société Financière Franco-suisse pour l'industrie électrique*, *Motor-Columbus* and *Bank für elektrische Unternehmungen (Elektrobank)*. In 1910, six firms of the financial sector (four finance companies and two banks) were among the ten most central companies based on degree. According to measures of betweenness and closeness, we still found five financial companies in the top ten.

The centrality of the financial sector grew even stronger over the next 19 years: by 1929, seven of the ten most central companies according to degree were financial companies (3 banks, 2 insurers and 2 finance companies). For closeness there were five and for betweenness eight finance companies among these key companies. The overrepresentation of the financial sector reached its peak in 1937, when – according to all three centrality measures – seven of the top ten companies were from the financial sector.

From 1957 onwards, the dominance of the financial sector in the ranking of the most central companies began to slowly decline. In 1957, there were six financial corporations in the degree and betweenness ranking and five in the closeness ranking. By 1980, there were five financial companies in the top ten for all three measures, and by 1990, the centrality of financial corporations had further diminished: in all three rankings there were only four of them. Finally, in 2000, only three financial corporations were ranked among the ten most central companies according to degree, closeness and betweenness. We will explain this very clear decline in the importance of the financial sector in the interpretative part.

On the other hand, three large banks steadily dominated this ranking from 1929 up to 1990: *Crédit Suisse (CS)*, *UBS* and *SBS* continuously remained in the

top ten<sup>10</sup>. It is interesting to observe that by 2000 only CS had kept its central position. These findings confirm the centrality of the financial sector in the Swiss economy and more importantly, the decline in bank centrality during the last two decades of the 20<sup>th</sup> century.

Our findings confirm other studies of the Swiss company network (Schreiner 1984, Rusterholz 1985, Nollert 1998). Thus, Rusterholz (1985) has shown that banks occupied a very pivotal position in the Swiss company network in 1976<sup>11</sup>. However, he also concluded that the ties between the large banks and industry were mutual ties: large industrial companies not only received but also sent directors to large banks (Rusterholz 1985: 147). Yet, the fact that mutual ties existed also indicates that the transfer of a director to the board of another company did not necessarily denote the existence of a relationship of domination from the sending to the receiving company. Hertig (1998) also underscored the fact that ties between banks and industrial companies were often mutual ties, which signifies, at least according to him, that it is not the influence of banks that strictly determined elections to the board of a company.

Table 3: Top ten companies according to Freeman degree centrality

1910	1929	1937	1957	1980	1990	2000
CS 26	BBC 29	SBS 30	SBS 36	UBS 33	SBS 34	CS 16
CFF 22	Motor-Columbus 27	CS 24	UBS 35	Swissair 32	UBS 33	Rieter 12
Georg Fischer 21	SBS 25	BBC 24	Sulzer 31	BBC 31	Swissair 28	Sulzer 12
Elektrobank 19	Georg Fischer 22	Sulzer 23	CS 29	SBS 26	CS 22	Nestlé 11
Ges. für Anlagewerte 17	Elektrobank 22	Elektrobank 23	BBC 27	AIAG 26	Alusuisse 22	Holcim 10
Alioth 16	CS 22	Motor-Columbus 23	Georg Fischer 26	CS 24	BBC 19	Swissair 10
Motor-Columbus 14	UBS 20	Basler Leben 23	Motor-Columbus 24	Sulzer 22	Nestlé 18	Sulzer Medica 9
SBS 14	Winterthur 20	Georg Fischer 22	Swissair 24	Nestlé 20	Ciba-Geigy 18	Winterthur 9
SF franco-suisse pour l'ind. élect. 14	Sulzer 20	Rentenanstal 21	Winterthur Leben 18	Winterthur 20	Motor 17	Xstrata 9
NOK 14	Rentenanstal 20	SF Italo-Suisse 20	Rentenanstal, Ciba, AIAG 16	Motor-Columbus 20	Forbo 16	Dätwyler, Bâloise, GF, Sika, Scintilla 8

<sup>10</sup> Except for 1937 where UBS is missing among the top ten companies.

<sup>11</sup> Schreiner (1984: 88) also concludes that “La position dominante des grandes banques [...] apparaît bien comme étant celle d’un secteur financier (surtout bancaire), jouant le rôle de catalyseur en matière de flux d’information, d’organisation du réseau et de potentiel de contrôle au sein du noyau central de l’économie suisse”.

In order to be able to interpret the changes in the overall network characteristics and in the centrality of the financial sector, we need to identify more precisely to whom the financial companies were linked and which were those ties that disappeared at the end of the 20<sup>th</sup> century. Therefore, in the next section, we will look for regions of high coherence within the network so as to be able to isolate groups of companies that entertained privileged relations.

### **2.1.5. Cohesive sub-groups: *m*-cores**

One way of identifying cohesive structures within a network consists in examining the value of lines that link the nodes of the network. Sub-graphs composed of nodes that are tied to each other by multiple lines of value equal to or greater than *m* are usually called *m*-cores (cf. Scott 2000) or *m*-slices (de Nooy et al. 2005). Concretely, this means that we look at the number of directors that two companies share. This analysis allows us to identify groups of companies that are particularly closely tied to one another.

A theoretical justification for the interest in multiple ties can be found in Carroll and Fennema (2002), who distinguished between a control and monitoring function of interlocks and a function of communication and consensus building within the business elite. They differentiated between interlocks that involve executives (primary interlocks) and “secondary” interlocks, i.e. interlock ties created by outside directors<sup>12</sup>. Furthermore, they made a distinction between multiple interlocks (thick lines) and thin lines (only one shared director). Primary interlocks and thick lines indicate strong ties and close relations between two companies, which often involve a control dimension, whereas secondary and thin lines are less linked to a strategy of domination or control but rather serve as a communicative and integrative function of the business elite. Changes in the number and the structure of *m*-cores can, hence, be interpreted as a modification in the function of the network. Consequently, in this section, we look at multiple lines and at regions of particular cohesion as determined by the strength of ties. We will pay particular attention to the position of banks within these *m*-cores.

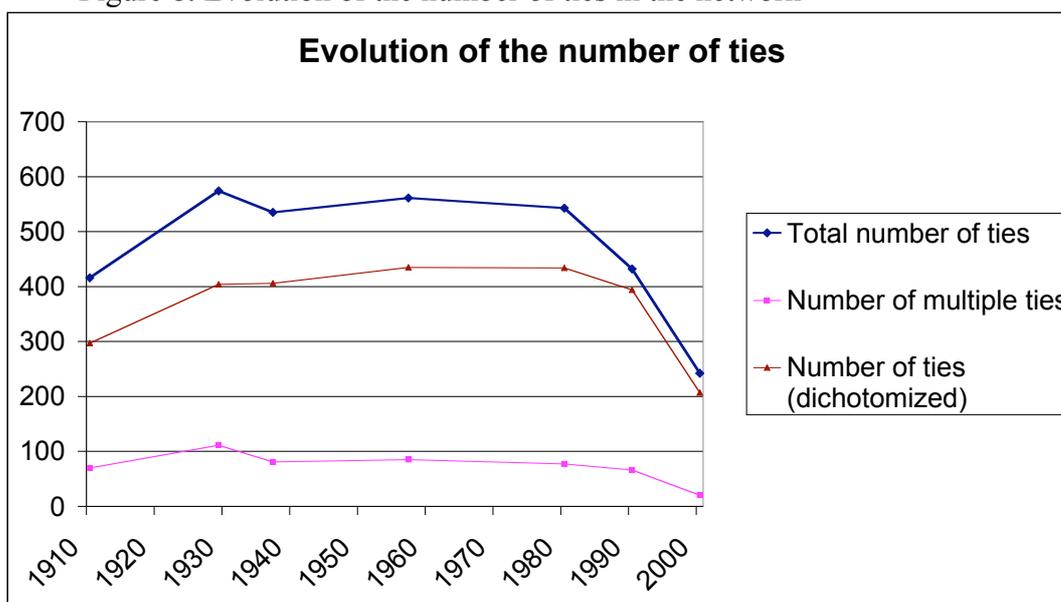
Generally speaking, the number of multiple ties reached its peak in 1929 and declined quite continuously thereafter (see figure 8). The number of dichotomised ties<sup>13</sup>, however, increased slightly until 1980. This contradictory evolution is not very marked, but still interesting from the point of view that it might indicate a changing function of ties, i.e. a moving away from a control towards a communication function. After 1990, however, both the number of multiple ties and the number of dichotomised ties plummeted in a very significant way, leading to a marked disintegration of the network.

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<sup>12</sup> Our data does unfortunately not allow us to add the second dimension of Carroll and Fennema’s distinction between communication and control, i.e. lines implying an executive of a company (primary lines) vs. lines composed by non-executive directors (secondary lines).

<sup>13</sup> Dichotomised ties are derived from the adjacency matrix in which values larger than 0 have been replaced by 1, i.e. we only look at the presence or absence of ties between two nodes without considering their strength.

Figure 8: Evolution of the number of ties in the network



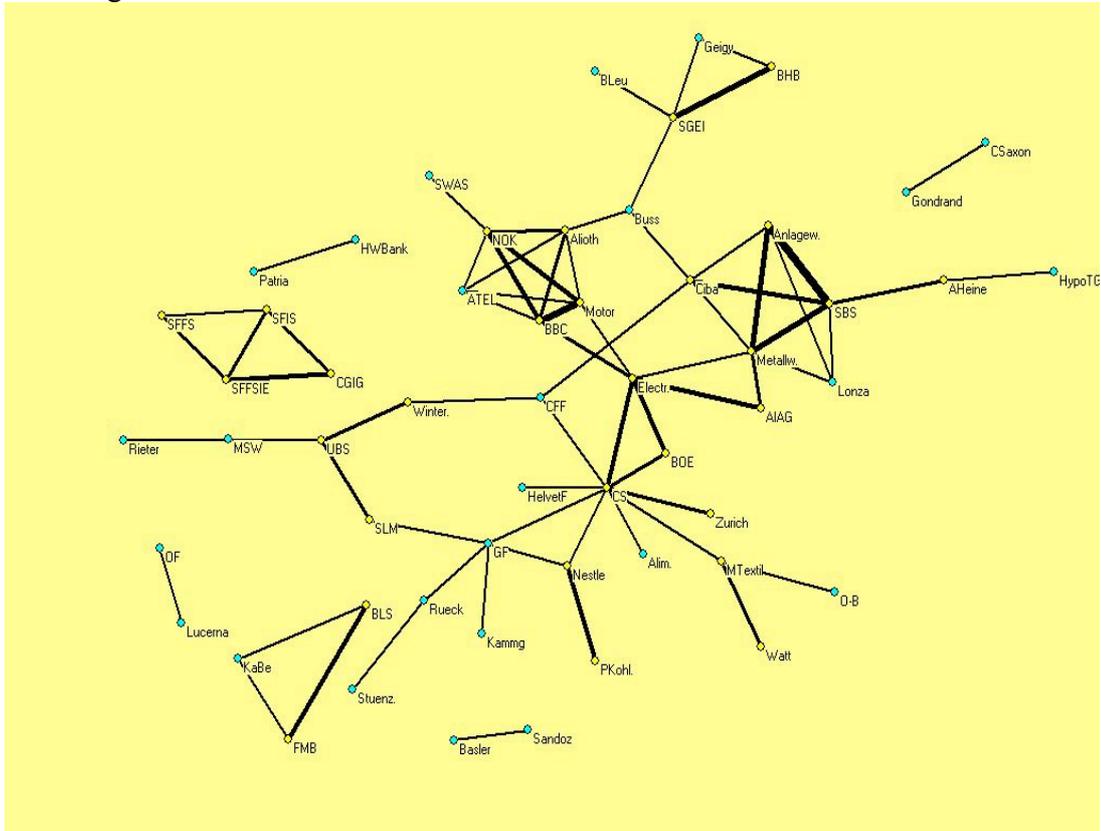
In any case, at the level of multiple ties, the network was, during the first half of the century, at its strongest. In fact, after 1910, the network grew denser not only at the level of simple ties but also with reference to multiple ties. The number of companies that are part of a 2m-core illustrates this point. In 1910, 55 companies in our sample were part of a 2m-core; in 1929 they were 62, and 63 in 1937. Subsequently, the number of companies integrated in a 2m-core started to decline (54 in 1957 and in 1980, 46 in 1990, and 28 in 2000, see Annex 3 for graphs on 2m-cores for each year). Having made these general observations, we will now identify the companies that were integrated into sub-graphs composed of multiple ties.

A first observation concerns the fact that large Swiss banks seem to have been integrated into a network of interlocks at different points in time. Thus, *Crédit Suisse* was in 1910 a very central actor in the 2m-core network. This bank had at that time nine ties with a strength factor of two or more. Therefore, already at this early date, CS constituted a *hub*, i.e. a node with high degree centrality in a relatively sparse network environment. It was at the centre of a star-like constellation, i.e. tied to a number of companies that had – at the level of the 2m-cores – for the most part no direct ties to one another (cf. figure 9). SBS was, in 1910, also relatively well-integrated in a 2m-core structure. This company had only five ties, but was, together with Ciba, Metallwerte and Anlagewerte, part of a *1-clique*<sup>14</sup> at level  $m=2$ .

The Bank of Winterthur, the ancestor of the UBS, on the other hand, had only three ties at level 2. The other banks in these m-cores were Basler Handelsbank and Berner Kantonalbank, which had two links; and Handwerkerbank, Thurgauische Hypothekbank and Bank Leu with only one. Therefore, *Crédit Suisse* appears to be the first bank that wove a network of interlocks with other firms, whereas most of the other banks were not so integrated in 1910.

<sup>14</sup> A  $n$ -clique is defined as a maximal and complete sub-graph, i.e. all nodes are linked to each other at a distance  $\leq n$  and no other nodes can be added that also fulfill this criterion. In our case, the four companies form a 1-clique, i.e. each company is directly tied to all the others.

Figure 9: 2m-cores in 1910



The centrality of banks, usually considered as one of the main features of European corporate governance system, was, thus, not yet a prominent feature of the Swiss company network. However, if we take into account finance companies and investment trusts (generally controlled by the largest banks), the financial sector clearly belonged to the heart of the network. More precisely, during the phase from 1910 up to 1957, close links existed between the two large banks CS and SBS with certain finance companies and investment trusts (*Bank für orientalische Eisenbahn*, *Elektrowatt* for CS, and *Gesellschaft für Anlagewerte* and *Gesellschaft für Metallwerte* for SBS). Historical conjectures explain the existence of these links: finance companies were created at the end of the 19<sup>th</sup> century to provide credits for industrial companies and in order to allow them to find domestic and foreign markets where they could sell their products. They were particularly important in the electrical sector where considerable investment was required and capital had to be mobilised over a long period of time before any returns could be generated. The size of some of these finance companies was substantial. On the eve of the First World War, *Elektrowatt*'s share capital was equivalent to that of the *Crédit Suisse*. These finance companies were important links between large banks and industrial companies (Paquier 2001), links that our data corroborate. The banks themselves founded some of the finance companies and investment trusts. *Gesellschaft für Anlagewerte*, for instance, which appears in fifth position in the 1910 freeman centrality ranking and which had a tie of strength seven with SBS, was founded by this same bank in 1907 (Mazbouri 2005).

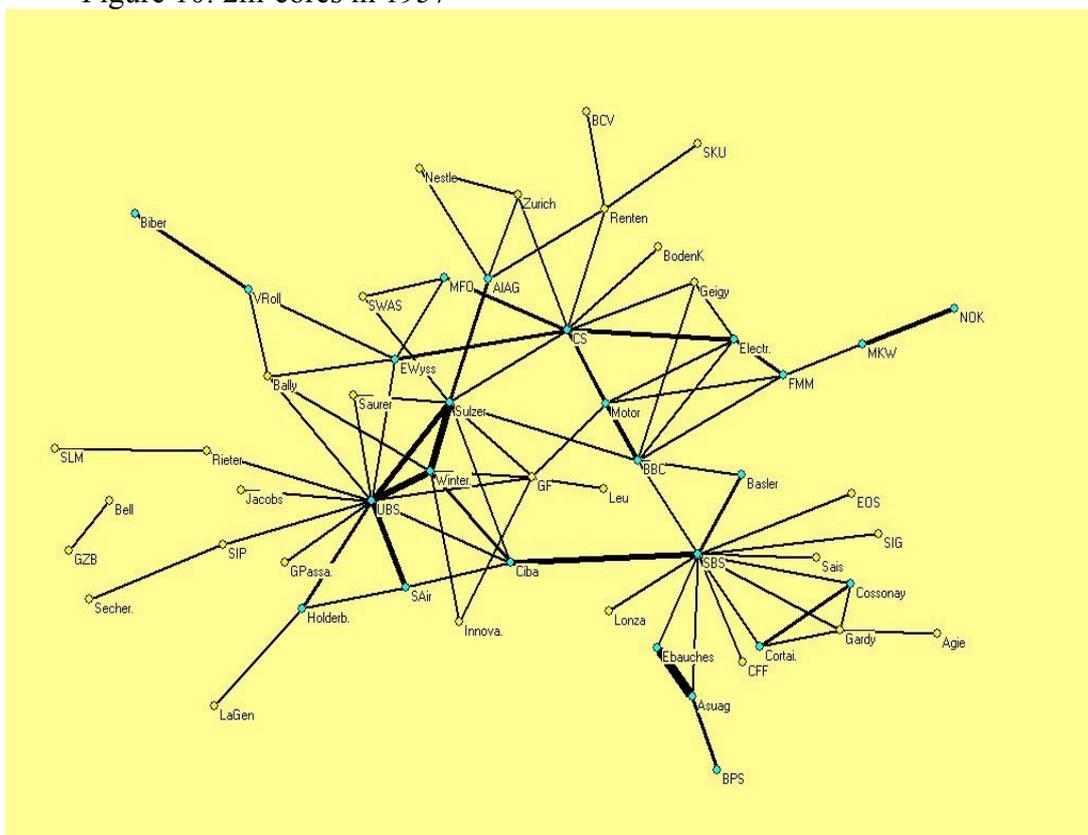
Some insurance companies also collaborated very closely with banks from the time of their foundation: the Crédit Suisse founded *Rentenanstalt* and the predecessor of the UBS – the *Bank in Winterthur* - set up *Winterthur Versicherung* (Rusterholz 1985; Jung 2000). This historical proximity is often expressed in the strength of ties: UBS had strong ties with *Winterthur Versicherung* up to the 1990s. UBS seems in fact to have been, for a long time, very regionally-oriented when it came to its ties with other companies. Thus, this bank had, in 1910, ties with *Winterthur Versicherung*, *Mechanische Seidenstoffweberei Winterthur* and *Schweizerische Lokomotiv- und Maschinenfabrik Winterthur (SLM)*. In 1929, two more companies from the city of Winterthur were tied at the level  $m = 2$  to UBS: *Sulzer* and *Hypothekarbank Winterthur*. The example of UBS shows that geographic proximity often played an important role in the formation of ties despite very internationally-oriented investment strategies (Perrenoud et al. 2002).

During the decades following 1910, the centrality of the three major banks increased continuously. In 1957, all three large banks, CS, SBS, UBS, were at the centre of a star-like  $m$ -core (cf. figure 10). UBS and SBS had also become very central according to their degree: within the  $2m$ -cores, both had 13 ties, and Crédit Suisse still had 9. This can largely be explained by the declining role of finance companies. The other banks that were integrated into these cores were incredibly marginal: four banks were in this sub-graph but had only one tie. Thus, between 1910 and 1957, the three major banks acquired very central positions in the network. On the other hand, there were few other banks besides the three major ones in the  $2m$ -cores in 1957 and those who did appear were marginal. This trend contrasts with the earlier dates when several banks were integrated in  $2m$ -core structures, some of them were even quite focal (Bank Leu had four links in 1929 and Eidgenössische Bank had four links in 1937)<sup>15</sup>.

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<sup>15</sup> In 1945, UBS acquired the Eidgenössische Bank. This takeover had an effect on the network. In fact, the four strong ties Eidgenössische Bank had in 1937 were partly maintained, partly eliminated by UBS. Thus, UBS had in 1937 no strong ties with Escher Wyss whereas Eidgenössische Bank had a tie of strength 2. In 1957, UBS had a new tie with this company, thus increasing its centrality. The strong link between Eidgenössische Bank and Rentenanstalt, on the other hand, was not maintained by the UBS after the takeover. Finally, both UBS and Eidgenössische Bank had a strong tie to Bally. This tie persisted after the takeover, but did not grow stronger.

Figure 10: 2m-cores in 1957



Between 1957 and 1980, the morphology of the network changed: we find that during this period, the three large banks moved closer together. This rapprochement is illustrated by the paths linking the bank's *ego-networks*<sup>16</sup>. In 1957, the ego-networks hardly overlapped, i.e. very few paths of length two existed between the banks. Thus, UBS was linked to CS through ties to Escher Wyss and Sulzer. UBS was also connected to SBS through its relations with Ciba. Between CS and SBS, on the other hand, there was no path consisting of only one intermediary (BBC). Concretely, this means that board members of the large banks rarely sat together on the board of a third company. This is an interesting finding, showing that at that time, banks had their sphere of influence with rather exclusive connections to certain companies. This finding might in part be explained by geographical reasons: UBS in particular seems to have had remarkably close ties with companies in the region of Winterthur.

By 1980, however, the number of such paths linking banks through one single intermediary had considerably increased: three paths existed between UBS and SBS, five between UBS and CS, and four between CS and SBS. This new trend signifies that board positions in industrial companies were not a privilege granted to one bank only and, conversely, that industrialists sat on the board of several banks at the same time. In other words, industrial companies had ties with several banks simultaneously. This shows that, in 1980, the Swiss banking sector did not function according to a *Hausbank*-system, where each bank had a rather exclusive sphere of

<sup>16</sup> An ego-network is the network composed of the ties of a node with its immediate neighbours and the ties between these neighbours.

influence as was apparently the case some twenty years earlier. The emergence of paths of length two between banks might in part be explained by the fact that up to 1957 the banks were often linked to industrial companies through the intermediary of finance companies. By 1957, and even more so by 1980, these indirect ties had been replaced by direct ties. In addition, the very high degree centrality of large banks demonstrates that their boards played a very important integrative role for the Swiss business elite.

Also, by 1980, links among industrial companies had become more numerous and stronger. The largest 2m-core in 1980 was therefore fairly dense and well-connected. The 2m-cores also had, in 1980, a genuine national character, meaning that all the largest companies, independent from their location, were integrated into one network, which means that geographical proximity no longer played an important role in creating interlocks. Therefore, in some respects, 1980 represented the apogee of the Swiss company network. Ties were numerous and strong. We find a very well-connected structure at the heart of the network. In fact, the three large banks, Swissair (the national Airline company), Sulzer, Winterthur, BBC, Ciba and Nestlé formed a 3m-core which contains even a 3m-1clique composed of Sulzer, Nestlé, CS and BBC (cf. figure 11). This subgraph thus displays a very high integration according to the number of ties and their strength. This extraordinarily dense and strongly-connected structure constituted the hard-core of the Swiss company network.

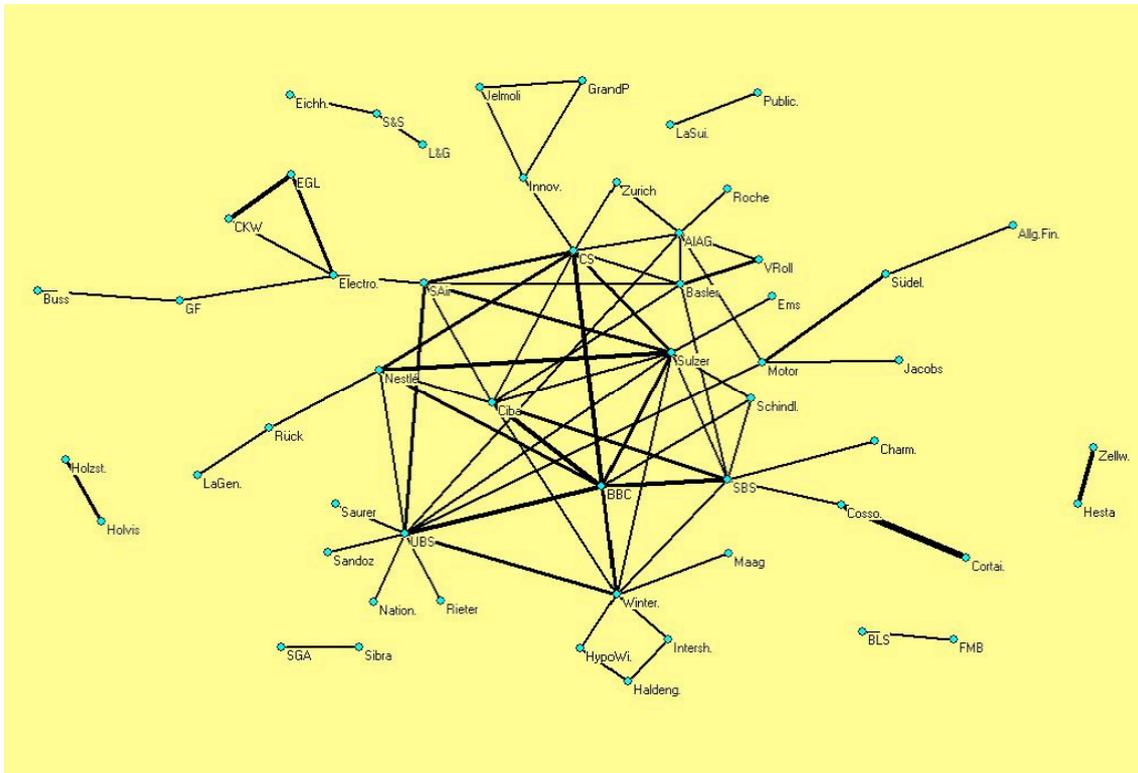


Figure 11: 2m-cores 1980

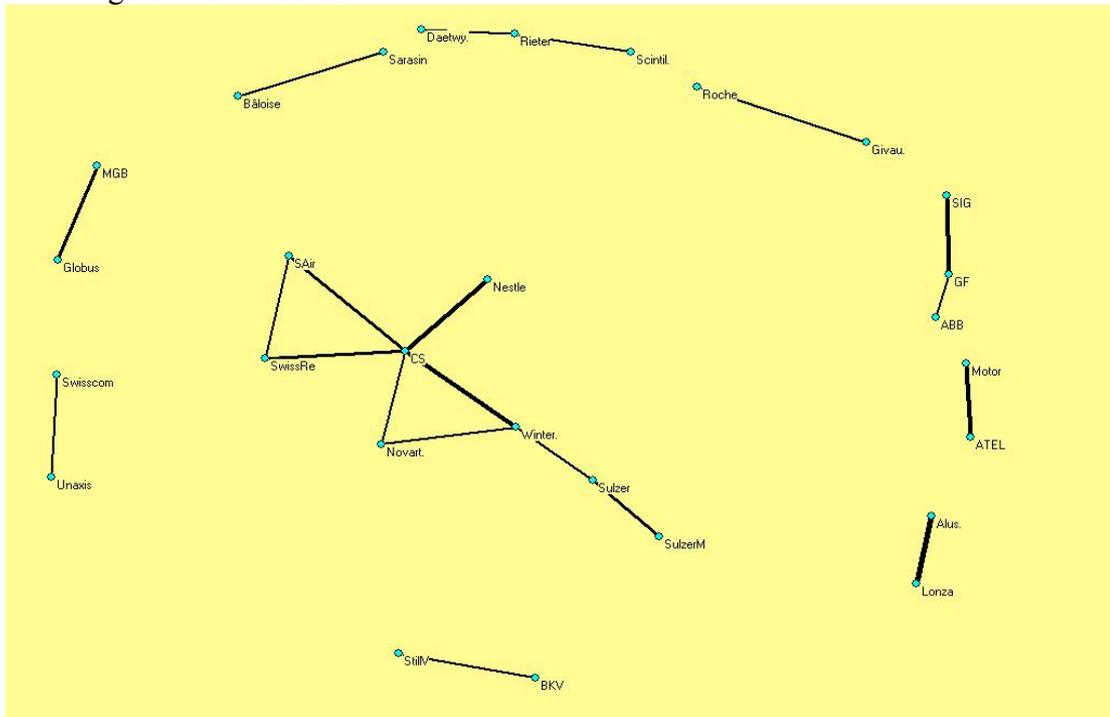
Twenty years later, in 2000, the network had dramatically changed: only 28 companies in our sample were part of a 2m-core and the largest m-core was

composed of only eight companies (cf. Figure 12). This sharply contrasts with the 54 companies that were part of a 2m-core in 1980 whereof 41 of the largest 2m-core.

With regards to the position of banks, we find that the new UBS (the offshoot of the merger between the old UBS and SBS) was absent from this 2m-core network. CS nonetheless maintained a quite central position (degree five) even though it was not comparable to its position in the network for the whole 20<sup>th</sup> century. The only other bank still left at the level of 2m-cores was Bank Sarasin, which had one tie. This new morphology of the 2m-cores clearly shows that during the 1990s, the Swiss company network underwent a phase of very pronounced decomposition. Especially the banks disinvested from their strong ties. But even industrial companies had much fewer links than before. ABB, formerly BBC, one of the most central companies throughout the 20<sup>th</sup> century, is a salient example of the disengagement of companies from interlocks. Between 1937 and 1980 this company had 7 or 8 ties at the level of  $m=2$ . After 1980, this number decreased very strikingly. Following the merger with the Swedish Asea in 1989, the new ABB was left with four links in the 2m-cores (1990) and in 2000, only one tie remained. The merger with a foreign company, which led among other things to a reshuffling of the board, largely explains this evolution.

In short, the analysis of m-cores confirms the findings of the cohesiveness measure that we presented in the previous sections. It clearly confirms the rise and decline of the Swiss company network but also of the centrality of the financial sector in general and of banks in particular. Moreover, it allows us to identify a transformation in the morphology of the network between 1957 and 1980, a phase that we considered to be stable. In fact, it appears that during this period, a very well-connected hard-core of the network emerged, which went beyond regional boundaries and brought the large Swiss banks closer together.

Figure 12: 2m-cores in 2000



### **3. Interpretation**

The general indicators of network cohesion, connectivity and actor centrality presented in the previous section indicate that there was indeed a phase of emergence of a national network between 1910 and 1929, as denoted by the very strong increase in network density and other measures of network cohesion. The next phase from 1930 up to 1980 was marked by a relative stability of the network, with some indicators showing further consolidation. Most indicators suggest that the network reached its most integrated point in approximately 1980 when density was very high and the number of isolated firms very low. From 1980 on, and even more so from 1990 onwards, the network started to disintegrate and by 2000, the Swiss company network had metamorphosed in a very significant manner: multiple ties were rare and the inclusiveness of the network had sharply declined.

In the following discussion, we scrutinize these three stages in the history of the Swiss company network and provide a qualitative interpretation for its evolution. We attempt to deduce which factors and elements influenced the development of the network. Because of the importance of banks in the network, we will pay particular attention to their role in its evolution.

#### **3.1. 1910-1930: The constitutive phase of a national company network**

As we have shown above, the period from 1910 to the 1930s was characterised by an increasing integration of Swiss companies in the national network. During this period, network density increased by 2.0% from 4.9% to 6.9%. Also, the number of isolated firms decreased (from 13.5% to 11.9%) and the number of marginal firms declined as well (20.7% in 1910 and 19.4 in 1929). Consequently, the proportion of connected firms grew from 86.5% to 88.0%. The fragmentation of the network decreased accordingly (from 25.3% to 22.7%), and the average shortest path dropped from 3.2 in 1910 to 2.7 in 1929.

Therefore, a greater number of companies were connected, and they had more numerous ties. In fact, the mean degree increased from 5.4 to 7.4 ties. The sum of degrees of the top ten companies expanded from 177 to 226 over these nineteen years.

How can this evolution towards a denser network be explained? Our hypothesis is that in the years following the First World War the Swiss economy became more fully integrated internally and at the same time increasingly independent from external influence. The reduction in foreign influence was due in particular to the retreat of German financial and industrial firms from Switzerland because of the desolate and precarious situation of the German economy after the First World War. The involuntary retreat of German businessmen accompanied the efforts of the Swiss business elite to introduce defense mechanisms against foreigners, such as a limitation on the number of board seats that foreigners could hold. This gave the Swiss financial sector the opportunity to tighten its links with other Swiss firms. The Swiss “financial place”, which had been favoured by Swiss neutrality in the First World War, became internationally important in the 1920s.

Other sectors, notably the export industry, had also profited from the war. Apart from a short after-war-depression in 1921-22, the period that we call the

constitutive phase of the Swiss company network corresponded to a period of economic growth. In these years, coordination between Swiss firms expanded; in addition to a denser network of interlocking directorates, cartels and trusts were also consolidated.

Another trend on the firm level needs to be underlined: a number of industrial firms opened up to the public in these years. Previously organized as partnerships, they were now transformed into stock corporations. In general, this led to the establishment of a board composed not only of the traditional partners or of the representatives of the founding families, but also of outside directors. In certain cases (e.g. Georg Fischer) the families lost their influence to the banks that now acceded to board seats.

In some instances, crises triggered the opening up of the firm. After the war, a number of firms that found themselves in financial difficulty (like Roche or Nestlé) were saved by bankers, who sometimes then became board members. In addition to providing a description of the evolution of the network, we also have to investigate its function. In particular, we will try to determine whether network ties served as a means for the banks to control the economy and monitor credits.

### ***3.1.1. The autonomisation of the Swiss business elite from German influence***

The increasing integration of Swiss firms into a national network is partly related to the autonomisation of the Swiss business elite from German influence after World War I. The composition of the boards of Swiss enterprises highlights their growing autonomy vis-à-vis their northern neighbour: the number of foreign (above all: German and French) directors in Swiss firms declined. For example, in 1910, almost half of the directors of Elektrobank, one of the major corporations in Switzerland, were Germans. In 1929, only one German, but four members of the *Crédit Suisse* sat on the board of Elektrobank. Other examples of firms originally founded by foreigners or with the help of substantial amounts of foreign capital are Nestlé (NASCMC), AIAG, BBC. These firms were increasingly perceived as Swiss firms as reflected by the retreat of foreign members from the boards.

Economic factors largely explain the diminution of foreign directors. Before the First World War, finance companies tended to mostly collaborate with foreign industrial firms. Elektrobank was the result of collaboration between AEG (a German company from the energy sector), *Deutsche Bank* and *Crédit Suisse*. The *Société franco-suisse pour l'industrie électrique*, as its name indicates, was a joint-venture between French firms (*Schneider*, *Banque de Paris et des Pays-Bas*) and Swiss banks (*Union financière de Genève*, *Crédit Suisse*)<sup>17</sup>. After the First World War, due to precarious monetary conditions, German firms and banks were forced to sever the links with these financial firms, and the latter began to team up increasingly with Swiss industrial enterprises. Segreto (1992) coined the expression “from made in Germany to made in Switzerland” to characterise this shift.

In this new situation, Swiss banks, in particular *Crédit Suisse*, played a central role. In contrast to the difficulties experienced by German and French financial institutions in the aftermath of the First World War, the 1920s marked the rise of the Swiss financial sector as a leading actor on the international scene. A comparison

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<sup>17</sup> On these different finance companies during the period 1890-1914, see Hertner 1987.

illustrates this evolution: whereas, before World War I, the assets of the seven major Swiss banks accounted for only 26% of those of the German banks, the proportion had doubled by 1928 – the cumulated assets of the eight major Swiss banks amounted to 52% of that of the five largest German banks. The Swiss banking centre had three major trump cards. First of all, capital was attracted by rather non-constraining circumstances, such as a tax system in favour of the holders of capital and bank secrecy, which had existed since the beginning of the 20<sup>th</sup> century but had been further consolidated by the adoption of the Federal Law on Banks in 1934. Secondly, Swiss banks benefited from political stability and neutrality, circumstances that facilitated the inflow of foreign capital. Lastly, the Swiss franc's stability played a non-negligible role at a time characterised by the manifest instability of the international financial layout. Owing to these trump cards, the Swiss financial centre was able to specialise in asset management and the “transit” of international capital: the capital arriving from abroad was in large portion reinvested by the banks outside Switzerland (Guex 2003; Perrenoud et al. 2002).

Another factor that bolstered the diminution of foreign directors were regulations to maintain control of Swiss firms in national hands. After the First World War, such regulations were introduced into company law. Thus, in 1919, an amendment of the Swiss Code of Obligations (CO) instituted a clause that demanded that the majority of board members be Swiss residents and that at least one board member be a Swiss citizen. The aim of this regulation was to avoid the *Ueberfremdung* (“overforeignisation”, the fact or the feeling of being swamped by foreigners) of Switzerland and to preserve the national character of Swiss companies (cf. Lüpold 2004 for a detailed discussion). The First World War had been an important event in the promulgation of this debate: the war reinforced the threat of Switzerland being invaded by foreigners and its economy controlled by foreign capital and directors. The regulation of 1919 aimed at preventing the fraudulent foundation of Swiss firms by German companies, which tried to circumvent restrictions laid upon firms located in Germany by the provisions of the peace treaties. Yet, in the course of the debates leading up to the revision of the CO in 1936, it was widely accepted that the 1919 prescriptions had largely remained ineffective as they had been unable to stop the wave of creations of sham firms and financial holdings with the aid of Swiss frontmen (cf. e.g. Stenographic Bulletin of the National Council 1934: 266f.). Still, the new nationality rules of 1919, which were maintained in the new Stock Corporation Law of 1936, resulted in the replacement of many foreign board members by Swiss frontmen. This had far-reaching implications on the company network: the number of Swiss directors increased and, given the small size of the business elite, boosted the creation of interlocks. This regulatory measure thereby largely explains the growth in network integration between 1910 and 1929.

The result of this autonomisation was a network dominated by Swiss directors. In 1931, Giovanoli emphasised the weak proportion of foreigners: “Only 145 out of 1870 board seats are occupied by foreigners. This is in deed a very weak proportion.” (our translation, Giovanoli 1931: 92)<sup>18</sup>. Despite all these changes, economic relations between Switzerland and Germany remained close (Unabhängige Expertenkommission 2002).

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<sup>18</sup> “Parmi les 1870 sièges aux Conseils d’administration, 145 seulement sont occupés par des étrangers. C’est donc là une très faible proportion.” (Giovanoli 1931: 92).

### **3.1.2. From regional networks to a national inter-company network**

A second explanatory factor for growing network integration between 1910 and 1929 is linked to a more general trend in the Swiss economy, i.e. the growing size of companies and the spreading out from the local level. To give an example, at the beginning of the century, groups of companies seem to have existed based on geographical proximity. The ego-networks of SBS and UBS support this thesis: both these banks had strong ties with companies from the city where they were incorporated, SBS in Basel and UBS in Winterthur<sup>19</sup>. Some of these historical ties persisted up until the latest period, but the importance of geographical proximity seems to have decreased over time. The traditional thick line between UBS and Winterthur Versicherung, for instance, was replaced during the 1990s by a thick line between CS and Winterthur.

Moreover, some institutions played a significant role in the integration of regional elites at the national level during the interwar period. This was the case for both the powerful peak business associations and the Swiss National Bank.

One important aspect of the company network is its influence on the national political sphere. In fact, several authors consider that intercorporate network structures have an impact on the political influence of business interests. Thus, big linkers – i.e. directors that occupy several seats on the boards of the largest companies - are considered to constitute an “inner circle” of the business elite, which is politically very influential and defends not only interests of one single company but of the business elite as a social group (Useem 1984). Big linkers favour, hence, the aggregation of different business interests. This aggregation of interests is furthered by the existence of formal business associations. In Switzerland, this was the case of the powerful peak business associations (especially the Swiss Federation of Trade and Industry - Vorort - and the Swiss Bankers Association, SBA), which played an important role in the integration of regional elites at the national level during the interwar period and as structure of aggregation for the interests of the emerging national business elite.

In Switzerland, the presence of business representatives in the committee of the powerful and politically very active business associations is an important means to exert political influence. Therefore, the links between the large companies and these business associations are an interesting indicator of the cohesion of the business elite and its links to the political sphere. The presence of big linkers in the Parliament is another way by which political influence is exerted, which we do not consider in this paper.

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<sup>19</sup> In Basel, the local firm network was supported by a family network. In fact, the most important families from Basle (the Patriciat and Teig families) founded these companies during the nineteenth century. These families distinguished themselves from the other groups of the city by their economic wealth and their political influence. They were able to maintain their leadership through marriage within their own ranks. A historian spoke of “social endogamy”. Through marriage, the most important enterprises in Basle were linked together (Sarasin 1998). However, this group was not closed. Already, in 1910, but increasingly during the interwar period, outsiders sat on the boards of some of the most important firms of this Basle network. These individuals did not come from within this Patriciat group but belonged to a new elite of professional managers. Moreover, this regional network had also an international dimension. In fact close ties existed with the French region of Alsace and with Germany. This indicates the high degree of extroversion of the Swiss economy already on the eve of World War I (see David et al. 2005 and Mazbouri 2005).

The directory committees of the two most important peak associations (the Vorort and the SBA) were an important place of social integration and the most influential business leaders, who generally held several mandates on the boards of directors of the largest Swiss companies were represented in these committees. Table 4 below shows, however, that the position of the business associations within the network has changed in the 20<sup>th</sup> century. In fact, as for the network as a whole, we can distinguish a period of increased integration of the association from a period of disintegration.

Table 4: Mandates of members of the executive committee of the most important business associations on boards of Swiss companies

	1910		1929		1937		1957		1980		1990		2000	
	Degree (D) <sup>20</sup>	Ø <sup>21</sup>	D	Ø	D	Ø	D	Ø	D	Ø	D	Ø	D	Ø
SBA	16	2.00	29	2.42	32	2.91	22	1.83	20	1.67	11	0.79	8	0.62
Vorort	7	1.40	15	3.00	21	3.00	24	2.40	16	1.78	9	0.90	10	0.63

The evolution of the centrality of the two peak associations largely follows the evolution of firm centrality, i.e. during the first half of the 20<sup>th</sup> century the number of ties increased in an important way (from 16 in 1910 to 32 in 1937 for SBA and from 7 in 1910 to 21 in 1937 for the Vorort). After, 1937, however, their centrality entered in to a phase of continuing decline. The number of mandates per committee member already reached its peak in 1937 (with an average of around three mandates per committee member), and declined steadily since that date, which is earlier than in the case of companies for which the mean centrality measure increased until 1957 (cf. above section 2.1.4).

The Swiss National Bank (*Banque Nationale Suisse*, BNS), created in 1907, also served as sphere of business elite integration. If included in the sample, the directory committee of the Central bank would have had the highest degree of centrality in 1929<sup>22</sup>. This centrality was due to the above-average board size (40). A recent study has shown that in 1920 and 1940 the board members of the BNS came from the financial sector (35%), from the industrial sector (export industry and from the SME, handicrafts, small industry), and the representative of the agricultural sector, as well as from the political sphere, in particular from cantonal governments (see Guex 1993 and Sancey 2004). This latter presence can be explained by the fact that the Swiss National Bank was a joint-stock company with public and private shareholders, the majority of the shares being held by the cantons. The Swiss National Bank helped thus to integrate regional elites at the national level (David et al. 2005). For our analysis, however, we have excluded the BNS from our sample because of its particular status and the explicit policy of integrating all relevant sectors on its board. Sociologically speaking, however, it had an important impact on the cohesion of the national business elite.

<sup>20</sup> Freeman degree centrality of the committee (non dichotomised), i.e. total number of ties with the companies in our sample.

<sup>21</sup> Average number of mandates per committee member

<sup>22</sup> It is interesting to note that in the 1990s the Swiss National Bank still had the highest centrality by degree (Nollert 1998: 42).

The density of the network is also related to the way competition is regulated, as underlined by Windolf (2005: 11): “The corporate network, the cartel, and the trust are three various institutional forms in which market actors can coordinate their actions and control competition in the market”. In Germany, unlike in the United States, cartels formed by German companies became fairly stable because the government gave them a legal framework in which to exist. During the interwar period, the density of corporate networks increased alongside the increasing cartelisation of the economy (Windolf 2005). The evolution in Switzerland was similar to the German case. Historically, the early organisation of economic interests during the second half of the 19<sup>th</sup> century went hand-in-hand with the formation of cartels between private companies. The first cartels were created during the world depression of the end of the 19<sup>th</sup> century, simultaneously with the introduction of protectionist measures for different economic sectors. After the end of the world depression, cartels were not only increasingly tolerated but also strengthened and consolidated by several decisions of the Swiss Federal Court (Gruner 1960). The period 1910-1920, and in particular World War I, gave a new impulse to the creation of cartels. Almost as many cartels were formed during this period as during the period 1840-1910 (David et al. forthcoming). The cartelisation of the economy thus paralleled the densification of the corporate network after 1910.

During this first phase, the company network fulfilled several functions. The bank-monitoring thesis has certainly an undeniable relevance for explaining the emergence of the network. In fact, banks were created during the latter half of the 19<sup>th</sup> century in order to permit the financing of industrial and infrastructure projects. Consequently, their ties with the industrial sector were from the outset tight. The credits accorded by banks to industrial companies gave them the legitimacy to claim a seat on the board. However, as Jackson (2001) and Höpner and Krempel (2003) noticed for Germany, the importance of external bank financing for the economy should not be overstated. Most investments were probably financed through retained earnings and not through credits. Furthermore, the links between banks and industry were often mutual ones, which contradict the hypothesis of pure bank dominance (Mazbouri 2005).

More importantly than the bank-monitoring thesis is the fact that during the first decades of the 20<sup>th</sup> century, the Swiss business elite started to emancipate itself from foreign influence. The traumatising consequences of the First World War contributed to a perceived necessity of protecting Swiss companies from foreign influence. The battle against these influences was often waged under the slogan of “*Ueberfremdung*”. The network of board overlaps was thus the logical result of a process by which foreign directors were replaced by Swiss directors. Interlocks were a logical conclusion to this evolution since the size of the Swiss business elite was inadequate. Therefore, during this phase, the function – or at least the effect – of the network seems to have been one of augmenting the social cohesion of the business elite, which would confirm the “class cohesion model” cited by Scott (1985).

### **3.2. 1930-1980: The heyday of the “fortress of the Alps”**

As we have shown in the previous section, by 1930, a quite concentrated and encompassing national company network had emerged. During the following decades, the process of network integration continued. In fact, network characteristics all indicate that between 1937 and 1980 the network grew even

denser and became more integrated. Concretely, the number of isolated firms decreased between 1937 and 1980 from 11.9% to a mere 6.3%. The fragmentation of the network dropped consequently from 22.5% in 1937 to 12.3% in 1980. Finally, the density of the network increased from 6.9% in 1937 to 7.1% in 1980.

From 1937 to 1957, we find evidence of continuing integration of the network: the density grew from 6.9% to 7.4% and the number of connected firms from 88.1% to 89.0%. Between 1957 and 1980, on the other hand, the network did not become denser but rather more inclusive: the percentage of connected firms increased by 5.5%. This trend indicates that during the period between 1957 and 1980, mostly peripheral firms were incorporated into the network while the ties of the “core companies” remained stable. In fact, overall network density remained virtually constant between these two dates; density within the main component, however, declined from 9.3% in 1957 to 8.3% in 1980. Therefore, this phase can be distinguished from the one prior to 1929 in that it did not correspond to a phase of emergence but to a phase during which the network structure evolved from an already quite dense network, especially at its core.

In short, from the 1930s at the latest, the Swiss economy was characterised by a fairly coherent network that integrated its business elite at the national level. During the later half of the 1930s, the legitimacy of board interlocks was put into question for the first time. The Social Democratic Party, in particular, demanded that the number of seats held by any single director be limited to ten. The socialists attempted to introduce this clause in the new Stock Corporation Law adopted by the federal Parliament in 1936. They reasoned that a director who held more than 10 seats could not accomplish his control function properly (cf. Stenographic Bulletin of the National Council 1934: 335ff). However, the clause did not stand a chance of passing the right-wing dominated Parliament. The bourgeois deputies argued against this clause by comparing it to prohibiting a father from having more than ten children. Consequently, no restriction on the number or the nature of interlocks among firms was introduced in the new stock corporation law<sup>23</sup>. Besides the absence of a limitation on the number of mandates, the absence of anti-trust legislation in effect allowed interlocks among competitors. Under the new Stock Corporation Law, the corporate network could thereby develop unhindered.

Criticism of the growing concentration of the network did not abate during the period from 1930 up to 1980. In addition to censuring mandate cumulation, certain Social Democratic thinkers analysed and criticised the interlocks within industrial sectors and between banks and the industry. In various publications, the author “Pollux” (also known as Georges Bähler) condemned trust-like overlaps between companies and in particular the domination of the Swiss economy by the financial sector (Pollux 1944). Even liberal jurists on the right frowned on the interweavement of Swiss companies. In 1966, an expert of the Swiss federal government noted in his very critical report on a possible reform of the Swiss Stock Corporation Law that

„Inheritance and marriage in the business community and the linkage of similar interest have made that a relatively small circle of people occupy the board seats

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<sup>23</sup> This contrasts with the German case, where the number of seats was restricted at the beginning of the 1930s (Windolf 2005).

in the important companies.”<sup>24</sup> (Gautschi 1966: 194, our translation. For a detailed analysis of this unpublished report, see Schnyder et al. 2005)

However, besides social aspects such as family ties, the concentration of the business elite had several practical functions, one of which was the struggle against the *Ueberfremdung* of the Swiss economy.

### **3.2.1. The struggle against foreign influence**

As mentioned above, the preservation of a form of national control over Swiss companies had been a very important preoccupation of Swiss politicians and businessmen since the early 20<sup>th</sup> century. The slogan of the danger of economic *Ueberfremdung* through foreign investment in equity capital of Swiss firms became – despite the decree of 1919 through which the representation of foreigners on the boards of Swiss companies was restricted – more and more widespread (see Lüpold 2004: 49). This latent fear was periodically accentuated by international political or economic events. Thus, the end of the Second World War and the creation of the European common market saw the inflow of foreign – notably US American – investments in Europe, and in Switzerland in particular. In the 1970s, the inflow of petrodollars also generated fears of the “sell out” of the Swiss economy to foreigners. Considering that the network could also serve to avoid foreign control over Swiss firms, it comes as no surprise that the integration of the Swiss company network progressed during the period from 1957 to 1980.

The amplified interest in Switzerland on the part of foreign investors provoked a threat of a takeover by American companies, which hovered over Swiss firms during the second half of the 1950s. Thus, in 1959, the takeover of a British aluminium company by an American firm pushed AIAG, the largest Swiss aluminium producer, to adopt restrictions on the transferability of its shares. Several other large companies – active in different sectors – followed the example of AIAG between 1959 and 1961 and introduced registered shares with limited transferability (Lüpold 2004). This legal instrument, called *Vinkulierung*, was a key instrument against foreign influence. It allowed a company’s management and/or board of directors to refuse voting rights to buyers of registered shares if they did not conform with the criteria of the company (Kaufmann and Kunz 1991). Most often, one of these criteria was the investor’s nationality, but it was also a useful means to protect oneself against domestic competitors. Therefore, *Vinkulierung* can be considered as a Controlling-Minority Structure (CMS, Bebchuk et al. 2000), i.e. a mechanism that permitted control over a company while holding only a small fraction of its equity. This system of arbitrary refusal of voting rights led international observers to apply the term “fortress of the Alps” to the Swiss economy (Monks and Minow 1995).

The perceived threat of foreign infiltration not only had an impact on the capital structure of Swiss firms, but it also intensified the sentiment of a need to unite against the bailout of the Swiss economy. This escalation favoured further national control over Swiss firms and accentuated corporate interlocking’s function as one of several instruments to achieve this goal.

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<sup>24</sup> “Vererbung und Heirat in Unternehmerkreisen und die Verflechtung gleichartiger Interessen haben bewirkt, dass ein relativ kleiner Kreis von Personen die Verwaltungsratspositionen in den bedeutenden Unternehmungen besetzt.“

The feeling of a “community of destiny” among the business elite is illustrated by a gentlemen’s agreement concluded in 1961 between the Swiss Bankers Association and industrial companies. According to this agreement, banks agreed to refuse selling registered shares of Swiss companies to buyers who did not respond to the companies’ criteria for shareholders. This usually meant that banks would not sell registered shares to foreigners (cf. Lüpold 2004). Banks did, at first glance, gain nothing from this agreement. By engaging themselves not to provide shares to certain costumers, they renounced a part of their profits. This deed shows that the bank-control thesis of Fitch and Oppenheimer (1970) does not hold for Switzerland. In fact, these two authors consider that banks control the companies on whose board of directors they sit and, more importantly, that banks use this power to further their own interests regardless of the companies’ interests (cf. Scott 1985). In the case of the 1961 gentlemen’s agreement, the banks clearly followed another interest than their immediate economic self-interest. As such, the example of the 1961 agreement points to the prevalence of the national character of the economy as a major interest of all economic actors, which prevailed over the individual interest of the company (e.g. the banks’ revenues from financial market transactions are reduced). This idea is explicitly expressed in the agreement of 1961:

“The Board of directors of the Swiss Bankers’ Association considers that it is the duty of the Swiss banks to assist the industry in its endeavors when its in accordance with the *superior national interest*. (...) When it appears from the files or when the circumstances allow to admit that the buyer of registered shares (with limited transferability) does not fulfill the conditions defined by the company in question – and known to the banks – for the inscription in the stock ledger, the banks and other institutions active in security trading, do not execute the purchasing order” (our translation).” (Arrangement relatif au transfert d’actions nominatives liées émises par diverses sociétés suisses de l’Association suisse des banquiers, le 6 avril 1961, emphasis added; cf. Lüpold 2004) <sup>25</sup>.

Private agreements of self-regulation, such as the gentlemen’s agreement of 1961, were an important means of economic regulation in Switzerland (see Mach et al. 2006, forthcoming). One direct effect of the use of instruments of self-regulation was the possibility of preserving the confidential character of the agreement but at the same time, of privately regulating issues that would otherwise possibly have been addressed by the state. The latter would have implied the politisation of the issue and its handling by the Federal Parliament. The business community feared such a politisation mostly because it would have allowed the left to influence the regulation of the domain in question.

In order for these agreements to be respected, each actor had to be able to trust the other parties to the agreement and to believe in some sort of an efficient control mechanism that would ensure abidance to the deal. In fact, self-regulation was very much dependent on the disciplining force of social norms and business ethics, notably through comprehensive and representative business associations. Links

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<sup>25</sup> “[Le] Conseil d’administration [de l’ASB] estime qu’il est, [...] du devoir des banques suisses d’appuyer l’industrie dans ses efforts lorsque c’est conforme à *l’intérêt national supérieur*. [...] Lorsqu’il ressort du dossier ou lorsque les circonstances permettent d’admettre que le donneur d’ordre d’actions nominatives liées ne remplit pas les conditions - connues des banques - imposées par la société en cause pour l’inscription dans le registre des actions, les banques ainsi que les autres maisons pratiquant le commerce de titres, ne devront pas exécuter cet ordre d’achat.”

through common board membership constituted one manner in which trust in the commitments of business partners was enhanced. Carroll and Fennema (2002) stated that interlocks are not only devices of power and control, but contribute also to the creation of trust between companies and within the corporate elite (see also Tomasic and Bottomley 1991 and Useem 1984). Therefore, cohesive networks promote trust and the willingness to collaborate. Furthermore, Mizruchi (1992) showed that interlocks are an important means by which political cohesion among the business elite is encouraged. Davis and Mizruchi (1999) underlined that if interlocks and bank centrality are not the result of a conscious strategy in order to “establish a social infrastructure for political cohesion, [...] these relations nonetheless promote cohesion fortuitously”. Bank boards have above all a prominent effect on cohesion: “bank boards provide a mechanism for political and governance cohesion among the corporate elite [...]” (Davis and Mizruchi 1999: 220).

The conclusion of the 1961 agreement illustrates the cohesion and the community of interests of the business elite in Switzerland. During the negotiations over the 1961 agreement, the participants in the negotiations had relatively close ties with one another as shown by our data basis for 1957. Thus, Alfred Schaefer, the representative of UBS in the Swiss Bankers Association (SBA) – the main actor behind the agreement – sat on the board of Bally, a shoe producer. The SBA invited M. Jenny to the negotiations in order to represent this same company. Schäfer also occupied a position on the board of Glaro. Both these companies, Bally and Glaro, signed the agreement (Lüpold 2004). On the other hand, Max Staehelin who represented Ciba – a pharmaceutical firm that also agreed to the accord – sat at the same time on the board of SBS, another large bank and member of SBA. Thus, several of the people involved in the elaboration of the agreement were personally acquainted through shared board membership and a common interest. The interlocks network can be viewed as a social infrastructure that helped to increase trust, align interests and achieve a coherence of values among the business elite. The company network was one crucial means by which the cohesion of the business elite and solidarity between companies was promoted and by which members of the elite were socialised to a certain code of ethics (cf. the class-cohesion model mentioned by Scott 1985, see also Windolf 2005 for the socialisation function of interlock networks).

Sprouting from a fear of foreign infiltration, the Swiss economy introduced selective protectionist measures from the end of the Second World War up to the 1990s in order to preserve the Swiss character of large Swiss corporations, and despite its dependence on international markets for exports and imports. This occurrence may seem paradoxical since the Swiss economy, and especially large Swiss companies, were very much oriented towards international markets (David and Mach 2004). At their home base, however, Swiss companies were hermetically sealed against foreign influence. The company network was but one instrument that helped to limit foreign influence on Swiss companies and to avoid takeovers by foreigners.

### ***3.2.2. Insider domination of the firm***

Besides protecting against foreign influence, the interlock network also served a more general purpose, that is, to reinforce the position of insiders against

outsiders<sup>26</sup>. The circle of insiders in the Swiss economy was for a long time extremely concentrated and constituted of managers, multiple directors, historical shareholders (blockholders) – often linked to the founding families – and bankers. This group of insiders was represented not only on the boards of Swiss companies, but also in the business associations and in the Federal Parliament<sup>27</sup>. These actors formed a coherent social group with shared values and a shared conception of the firm. This common conception of the company referred to the concept of the interest of the company (*Unternehmensinteresse*) and implied – despite the fact that the legitimate interests of multiple stakeholder groups was acknowledged – a rather authoritarian and exclusive view of the distribution of power within the company. This is illustrated by a quotation from Max Huber, a “big linker” during the interwar period:

„It is in the nature of the stock corporation that [...] only a small part of the shareholders can exercise a continuing and decisive influence on the course of the company [...]. Like the army, the economy is - even in a democratic political system - based on an authoritarian and hierarchical principle.“ (quoted in Pollux 1944: 44, our translation)<sup>28</sup>.

This explains in part the willingness of insiders to maintain control over the company and to exclude from information flows and from decision-making minority interests, such as employees, minority shareholders, the state, and the public at large. The concept of the interest of the company as supreme interest within the firm was close to the German theory of the “*Unternehmen an sich*” (company in itself), which stated that the company, as an organic being, had an interest of its own that went beyond the sum of the interests of all stakeholders. In Switzerland, however, legal experts generally underlined that the theory of the *Unternehmensinteresse* was not equal to the theory of the *Unternehmen an sich*. The fact that this former term was nowhere clearly defined and that it was actually the supreme interest that had to guide the companies’ decisions was thus often interpreted as such. Some legal scholars after the Second World War (see for instance Gautschi 1966, Bär 1959), who supported the idea of a “shareholder democracy”, radically opposed this view of the firm. Gautschi (1966) in his unpublished report to the federal administration also underscored the authoritarian tendencies of the Swiss Stock Corporation Law of 1936, which reflected and strengthened existing power relations. Even though his analysis of authoritarianism in the Swiss firm is questionable on several points (cf. Schnyder et al. 2005), it is undeniable that an insider model of the firm supported by a highly cohesive business elite prevailed for the greatest part of the 20<sup>th</sup> century (for more details, Schnyder et al. 2006).

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<sup>26</sup> We use the terms “insider” and “outsider” in order to distinguish those who have access to information and decision-making within the firm (directors, managers, historical shareholder) from those who have an interest in the company but are excluded from these flows (minority shareholders, workers etc.). This designation should be differentiated from the terms “inside director” (i.e. manager who is at the same time member of the board) and “outside directors”.

<sup>27</sup> Several multiple directors in our sample were at the same time member of the directorial committee of the major business associations and/or member of Parliament.

<sup>28</sup> “Es liegt im Wesen der Aktiengesellschaft, dass [...] nur ein sehr kleiner Teil der Aktionäre einen fortlaufenden und bestimmenden Einfluss auf den Gang der Gesellschaft ausüben kann [...]. Wie das Heer, so ist auch die Wirtschaft [...] selbst in einem demokratischen Staatswesen, autoritär und hierarchisch aufgebaut.“

The group of insiders further performed an important function with relation to capital. Thus, Lambelet (1993) spoke of a “hard core” of shareholders (mainly families and banks through proxy votes), who held relatively large stakes in industrial firms and helped to protect them against hostile takeovers. These investments in the share capital of industrial firms were usually made from a long-term perspective (“patient capital”) and did not respond to a preoccupation with profit maximisation. Lambelet (1993) emphasised that banks, in their role as shareholders of industrial firms, and large historical blockholders did not push to maximise their profitability and were satisfied with a minimal dividend, far below the dividend that would have realistically corresponded to the actual profits of the company.

This example as well as the gentlemen’s agreement of 1961 show that the Swiss economy was ruled during the most part of the 20<sup>th</sup> century by a logic of coordination between groups of actors to achieve not only economic but also more general goals (e.g. maintaining the Swiss character of a corporation). Thus, the existence of a dense company network coalesced with a shared conception of the firm among the Swiss business elite, who played up the central role of insiders while excluding minority actors (minority shareholders and workers) from internal decision-making processes within the firm.

### **3.2.3. The role of banks**

In order to fully understand the structure of the Swiss network, it is critical to discuss the role of banks in this network and more specifically the links between banks and industrial companies. A look at the number of mandates held by the CEO and the chairman of the major Swiss banks shows how their involvement in industrial companies evolved over time and notably how important it was during the period from 1929 to 1990 (Table 5). The “out degree” of banks appears to quite closely follow the general evolution of the network as we described it in part 2. The expansion of the mean degree reached a peak in 1980, then started to decline dramatically after that date.

Table 5: Out-degree of the three largest Swiss banks: Number of directed ties to companies in our sample created by CEO and Chairmen of the Board

		1910	1929	1937	1957	1980	1990	2000
UBS	CB	N/A	6	6	8	9	7	0
	CEO	N/A	3	3	4	7	2	0
SBS	CB	5	8	8	7	5	4	-
	CEO	3	5	4	5	-**	3	-
CS	CB	3	2	2	6	4	6	2
	CEO	6	10*	5	5	6	4	2
<b>Total</b>		17	34	28	35	31	26	4
<b>Mean per person</b>		4.25	4.86	4.67	5.83	6.20	4.33	1

\* Two delegated directors

\*\* At that time SBS had no permanent general management

Source: our data basis

Several reasons explain the high degree of connections between the large banks and other companies. As outlined above, links between banks and industrial companies are considered in the bank-control model as guaranteeing the lenders a certain control over the companies in which they invest (bank control thesis; Scott 1985). Yet, in Switzerland, bank – industry ties were often mutual so that the thesis of bank-control does not seem to aptly or completely pertain to the Swiss case. There is an additional reason that may in part explain the presence of banks on the board of industrial companies. The cooptation of bank representatives on boards of industrial companies allowed the company to integrate banks which held important numbers of proxy votes through clients who deposited their shares in the bank, as underlined by Gautschi (1966: 194): “Representatives of banks are less often integrated [in the board of industrial companies] for their importance as lenders than because of the fact that they control voting rights of clients with shares deposited with the banks or voting rights of investment funds they control”<sup>29</sup>. This view is supported by the conclusion of a report of the Federal Anti-Trust Commission on the power of banks: „Zu einer Vertretung im Verwaltungsrat kann eine Bank dank ihrer Stimmrechte aus Depotaktien gekommen sein“ (Anti-Trust Commission 1979: 89)<sup>30</sup>.

In fact, during the annual general meeting the depositary bank usually exercised the voting rights belonging to shares that were deposited in bank depots. The owner of the shares had the possibility to give the bank voting instructions before every annual general meeting (AGM). Yet, clients often contented themselves with giving a “general procuration”, which dispensed banks from demanding instructions before every AGM. Having bankers on the board could, therefore, also help to align the banks’ interests with that of the managers and guarantee the insiders a majority of votes during the annual meeting. The proxy voting system was considered for a long time to be the instrument *par excellence* by which an elite of bankers and directors of industrial companies controlled the Swiss economy (Abt 1995). The proxy voting system was not, until 1992, regulated by any public regulation but based on custom. The first quasi-legal basis for the use of proxy votes was laid down in 1967 when the Swiss Bankers Association adopted a directive concerning this instrument. This directive explicitly stated that the bank should in general vote in favor of the proposals of the board of directors. If a client of the bank wanted his voting rights to be exercised against the board of directors, the bank could refuse to represent him and abstain from voting. This latter clause was changed only in 1980 with the adoption of a new directive of the SBA (cf. Mach et al. 2006 forthcoming). The fact that banks used their proxy votes virtually always in favour of the propositions of the board of directors shows how strong the proximity of interests between banks and industrial companies was (Steinmann 1989: 93)<sup>31</sup>.

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<sup>29</sup> „[...] Bankenvertreter [werden] seltener auf Grund von Kreditgewährung als auf Grund der Stimmkraft von Depotkunden oder verwalteten Anlagefonds beigezogen.“

<sup>30</sup> In fact, the Anti-Trust Commission found a link between the number of shares deposited in a bank and its access to the board of the company in question. The Anti-Trust Commission stated that „[La Commission des cartels a] été frappée par le fait que les dépôts sous forme de titres de sociétés dans lesquelles les grandes banques ont des participations ou des sièges au conseil d’administration sont en moyenne de 20% plus nombreux que dans les autres cas“ (Federal Anti-Trust Commission 1979:180).

<sup>31</sup> The example of the proxy voting directives not only shows the proximity of interests between banks and industrial companies, but also the importance of self-regulation in the Swiss economy.

The examples of the gentlemen's agreement of 1961 and the proxy voting directives of the SBA seem to indicate that banks often acted in favour of the companies in which they held board seats and did not always pursue their own interests. This is an important finding in the sense that it explains why – despite the centrality of banks in the network – the bank-control model seems to be too radical a view to characterise the Swiss case. Also, contrary to the predictions of the finance capital model, Swiss banks did not appear to double their interlock ties with other mechanisms of control<sup>32</sup>. The Swiss Federal Anti-Trust Commission stated in its report that there was little evidence for the combination of banks' capital ties, the use of proxy votes and their representation on the board of industrial companies as a strategy of “conglomerate concentration” (*concentration conglomerale*). During the 1970s and 1980s, the power of banks was at the centre of a large public debate in which the banks were largely criticised, mainly by the left and the trade unions, for their excessive influence in industrial companies. However, as underlined above, the influence of the large banks was clearly exaggerated (Tanner 1994). Hertig (1998) supposed that Swiss bankers, even though represented on the boards of industrial companies, did not have much sway on company decisions. In fact, he noted that usually there was not one single banker on the board of a large company but several bankers from different banks. This practice in effect neutralised the possible hegemony of an individual bank on the company.

Moreover, as noted above, there are reasons to believe that Swiss industrial companies did not rely to any considerable extent on bank loans as a means of financing. In fact, the possibility to create hidden reserves almost at will owing to very lax accounting rules allowed them to finance the largest part of their activities through retained earnings, which granted the company a certain independence from banks.

Be that as it may, along with the possibility to refuse any buyer of registered shares (*Vinkulierung*)<sup>33</sup>, the absence of disclosure requirements for financial figures and the ability to create hidden reserves at will, the cooptation of board members representing important portions of voting rights gave the board of directors virtually absolute control over the company. Minority shareholders and employees, on the other hand, were almost completely excluded from information flows and had very few instruments at their disposal to influence the decision-making process within the company. Therefore, for the Swiss case, it is more appropriate to speak of “insider-control” than of “bank-control”. In fact, the insider control and the bulk-heading of Swiss firms against outside influence was one of the central features of Swiss organised capitalism during the largest part of the 20<sup>th</sup> century, only eroding away during the 1990s. In short, the interlocking network among Swiss companies, notably between industrial companies and banks, primarily served the purpose of insider control, i.e. protecting Swiss firms from unwanted influence either by foreigners or more generally by outsiders.

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Again, the absence of formal rules favoured the adoption of self-regulation mechanisms by a highly disciplined business community. The interlocking network contributed precisely to achieve this discipline by creating a coherent and integrated business elite.

<sup>32</sup> Large Swiss banks did not appear to hold major stocks in industrial companies (Anti-Trust Commission 1979). This constitutes an important difference from the German situation where the large universal banks used to hold important stakes in industrial companies (Höpner and Krempel 2003).

<sup>33</sup> Which was formally supported by the banks with the Gentlemen's agreement of 1961.

In conclusion, the reason for the consolidation of the network from the end of the 1930s to 1980 was based on one paramount factor: a desirability to avoid outsiders' influence on decision-making within the firm. Several categories of outsiders were considered to be a threat to the company: foreign investors, minority shareholders, workers, the government and political parties from the left. The perceived threat of a loss of autonomy by the business elite augmented their willingness to adopt efficient self-regulation mechanisms of insider control. Interlocks were one means by which political cohesion and trust among the members of the elite was fortified, making such mechanisms efficient. The cooptation of historical shareholders and banks allowed management to control the majority of voting rights at the general annual meeting. As a result, one major event of Swiss economic life from the end of the Second World War up to the 1990s was – despite its dependence on international markets for exports and imports – the introduction by a very cohesive business community of selective protectionist measures aimed at preserving the Swiss character of large corporations (David and Mach 2004).

### **3.3. 1980-: Internationalisation and shareholder value: the decline of organised capitalism**

The period from 1980 to 2000 is characterised by a very pronounced decomposition of the Swiss company network. Thus, the inclusiveness of the network dropped from 93.7% of connected firms in 1980 to 86.1% in 2000. The number of marginal firms increased from 17.1% to 28.7% over the same period. The network fragmentation (proportion of firms that cannot reach each other) grew from 12.3% in 1980 to 17.9% in 1990 and 25.9% in 2000. The total number of ties of 543 in 1980 dropped to 432 in 1990 and reached 242 in 2000. This is reflected in the mean degree (the average of the number of ties per board of directors), which was 7.8 in 1980 and only 3.8 in 2000.

The very clear decline in network integration from 1980 on, and especially from 1990 onwards, is to a considerable extent due to the decreasing involvement of banks in industrial companies, an involvement that had constituted the backbone of the Swiss company network for the greatest part of the 20<sup>th</sup> century. However, the altered position of banks in the network does not fully explain all the changes. In fact, the number of ties between industrial companies also declined. Therefore, we also need to look for explanations of the weakening of industry-industry ties. We argue that this outcome was a corollary of the increasing shareholder value orientation of Swiss firms.

#### **3.3.1. *Changing strategies of banks: investment banking and Allfinanz***

The disinvestment of banks from their role in industrial companies is a feature that has been observed in several countries (cf. Davis and Mizruchi 1999 for the US case and Beyer 2002 and Höpner and Krempel 2003 for the German case), and has been particularly pronounced in Switzerland as well. If we examine the two large banks UBS and SBS, we discover that together they had 59 ties in 1980 and 67 in 1990 but only five in 2000 in the aftermath of the two banks' merger. More generally, the sum of degrees of the financial companies in the top ten ranking according to degree centrality visibly points to the decline of the financial sector: in

1957, the sum of degrees was 158; in 1980, it was 123, and in 1990, 106. During the 1990s, however, this number plummeted to reach only 25 in 2000. This trend very clearly demonstrates the extent of the transformation of the Swiss corporate network during the last decade of the 20<sup>th</sup> century.

The concentration within the banking sector is one factor that explains the decreasing number of bank ties with other companies. Thus, the example of UBS and SBS illustrates the fact that ties disappeared because boards of companies with many ties were merged into one single board, which naturally reduced the total number of ties. The Swiss Popular Bank (BPS) provides us with another such instance. It had a degree of nine in the 1990 network, but after being taken over by CS during the 1990s, the strength of BPS's ties with other companies did not increase as some of these were redundant with CS's ties. Other BPS ties were simply abandoned.

However, it would be misleading to consider the very clear decline in bank ties simply as an effect of this concentration. The most important explanatory factor is a conscious strategic choice of disengagement from industrial companies on the part of the banks. The decline in the centrality of Swiss banks can be seen as one aspect of a larger transformation process within the banking industry. All major Swiss banks have undertaken considerable strategic re-orientations during the last twenty or so years, a strategy closely linked to the effects of globalisation and financial deregulation, which deeply affected the banks' activities (Mizruchi et Davis 1999, see also Plihon 1999).

Three important causes for the transformations that led banks to change their strategies can be identified: first, the securitisation of corporate finance, second, an increased competition among financial corporations from different branches, and third, increased international competition within the banking industry. These three changes in the economic and regulatory environment of banks entailed three key responses from banks: the securitisation of financial intermediation (which induced the largest banks to develop their investment banking activities), the expansion of banking activity into the insurance business, and the expansion of banks into foreign markets and a modification of the activities linked to this expansion. In the following sections, we will discuss these three transformations and their effects on the Swiss company network.

### ***Securitisation of corporate finance and of financial intermediation***

The most important factor that pushed banks to adopt new strategies is what one could call the "securitisation" of corporate finance. In effect, banks drew more and more on securities rather than on credits as means of financial intermediation. This trend pertained to the financing of bank endeavors (emission of shares by the bank itself) and bank investment activities in shares of other companies as well. This shift modified the nature of financial intermediation. Plihon (1999) thus appropriately speaks of a passage from balance-sheet intermediation to market intermediation.

This reorientation was also connected to the credit business' loss of potential. Large listed companies increasingly financed their activities directly over the capital market or by creating their own bank (in-house banking). The expansion of direct financing is illustrated in an impressive way by the evolution of the capital market in Switzerland (cf. table 6). Industrial companies were no longer as dependent on

financial intermediaries as they might have been in the past (Plihon 1999). The loss of borrowers (and thus of clients) reduced the interest incomes of banks and pushed them to look for more profitable avenues, such as investment banking and asset management (Plihon 1999, Davis and Mizruchi 1999).

Table 6: Evolution of market capitalisation in Switzerland as percent of GDP (1975-1999)

	1975	1980	1985	1990	1995	1996	1997	1998	1999
Market capitalisation	30	42	91	69	130	136	225	260	268

Source: OECD Financial market trends (various issues)

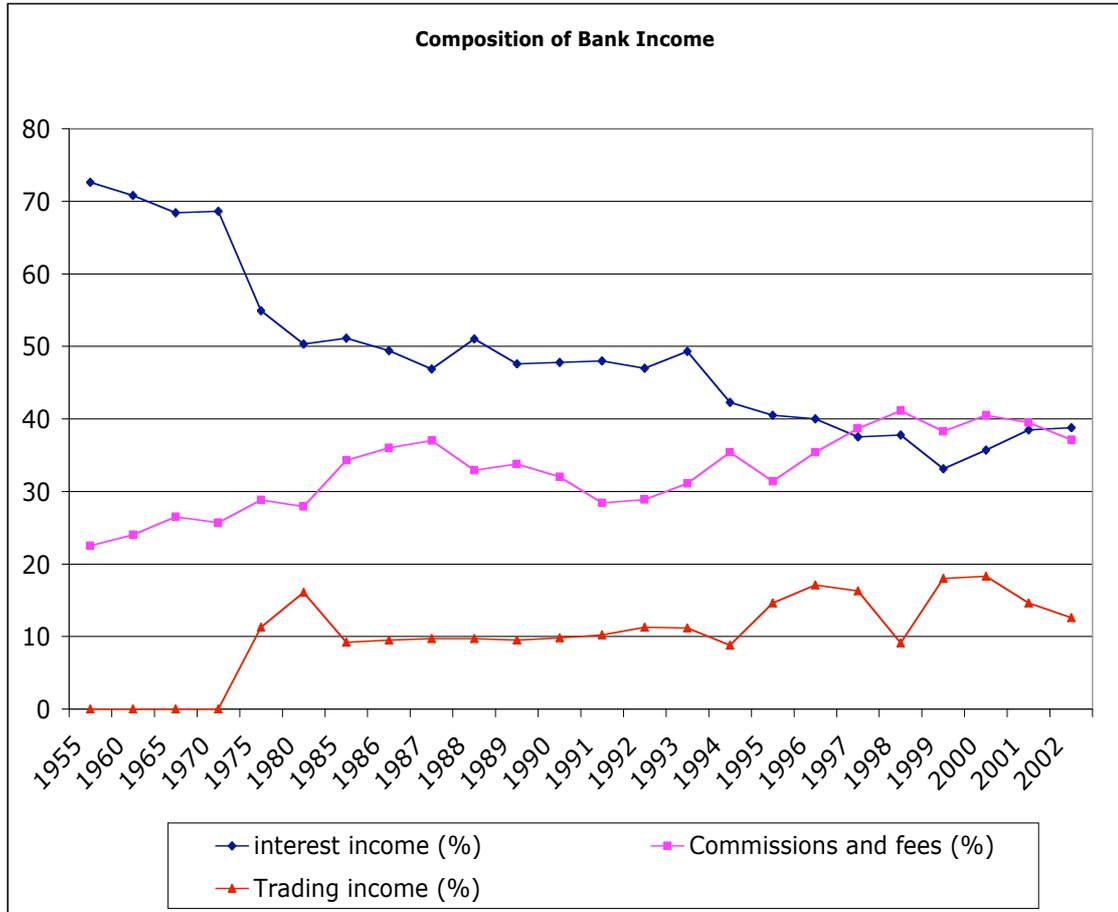
The strategic reorientation of banks is reflected in their balance-sheets: greater amounts of income was derived from capital market operations since the relative part of revenues from interests declined as shown by the figures reported in figure 13. In 1955, 72.6% of the income of Swiss banks was composed of interest income. Fee and commission income, on the other hand, solely made up 22.5% of the income. In 1980, 50.3% of total revenues were interest income, against 27.9% fee and commission income and 16% trading income. By 2000, this repartition of revenues had considerably changed: only 35.7% of the income was derived from interest but 40.5% was earned through fees and commissions and 18.3% through trading. Fee and commission income and trading income had, thus, become the most important sources of revenue for Swiss banks.

This reorientation is not a Swiss particularity but seems to constitute a general trend in the banking sector. Thus, Davis and Mizruchi show a similar evolution in the US between 1982 and 1994:

“For many banks, the upturn did not result from a large-scale return of corporate borrowers but, rather, from a shift away from pursuing net interest income (revenues from lending funds at a higher interest rates than it costs to acquire them) and toward fee-based businesses (e.g. securities underwriting, advisory work, money management). The notable success stories among commercial banks were precisely those that came to look most like investment banks, such as J.P. Morgan and Bankers Trust New York.” (Davis and Mizruchi 1999: 220)

We will analyse the impact of this strategic reorientation on the Swiss company network later on in this section.

Figure 13: The evolution of income of Swiss banks (in % of total income)



Source: Swiss National Bank (annual reports)

**Bancassurance or Allfinanz strategies**

Another important strategic change in bank activities was the adoption by many institutions of a bancassurance strategy (*Allfinanzstrategie*). Bancassurance designates the strategy of banks to extend their activities to insurance services. More generally, *Allfinanz* is a strategy where financial services that were formerly offered by different branches are combined into a package of services (Ravara 1999). This new approach was a response to increased competition from insurance companies in the banking sector. As a matter of fact, during the early 1980s, Swiss insurance companies faced problems concerning the saturation of the domestic market with accident and property insurance as well as increased competitive pressure in deregulated markets. Therefore, these companies started to look for new growth opportunities outside their traditional domain of activities. Insurance companies started in the 1980s to offer products such as investment funds, mortgage credits and other products traditionally offered by banks. Insurance companies had, due to tax advantages and lower prescriptions concerning the coverage of liabilities by their own capital, a certain advantage over banks. This expansion of insurers into the domain of banks first led to cut-throat competition between the two sectors (Ravara 1999).

In addition, regulatory changes concerning company pension plans and tax advantages for non-compulsory pension plans were introduced in 1985 and created incentives for households to invest money in investment vehicles. This amplified the already-existing competition between banks and insurance companies for this new market potential even further. The early orientation of insurance companies in this kind of provision plans gave them an advantage over the banks and increasing numbers of private households preferred to entrust their savings to insurance companies rather than to banks (Ravara 1999). Also, the tax advantages permitted in life-insurance contracts furthered the attractiveness of insurance contracts as opposed to bank investments (Schaub 1992). This cash drain of public funds – among other factors – provoked banks to expand their services into this sphere. Banks started to offer insurance-like services, notably life-insurance and saving plans linked to old-age provisions (Schaub 1992). Thus, in 1983, UBS created its own life-insurance company, a company called “SBG Leben”; in 1989, Crédit Suisse created a subsidiary company “CS Life”, which became a specialist in life-insurance matters, .

Later the competition between banks and insurance companies gave way to more cooperative strategies. Hence, CS first collaborated and then acquired (in 1997) the Winterthur insurance company in order to further develop its bankassurance strategy. This collaboration and takeover were actually reflected in the network. Earlier, SBS and the Zürich insurance group started a joint venture in 1992 in order to develop their life-insurance business (Schaub 1992). And, UBS collaborated with Rentenanstalt, Switzerland’s largest life-insurer.

In short, increased competition from companies in other sectors was one important factor that put pressure on the prices of financial services and that pushed financial corporations to more efficiently employ existing channels of distribution and infrastructure – such as selling insurance products at the banks’ counter – and to develop new markets. The convergence of the banking and the insurance sectors was one strategy used to achieve this goal (Ravara 1999).

The strategic reorientation of banks and insurance companies can be expected to have had an impact on the structure of the company network. On the one hand, it led to closer cooperation between banks and insurance companies, and later to joint ventures and mergers, which, of course, implied a concentration in the financial sector. On the other hand, collaboration between firms as joint ventures could even have had a reinforcing effect on network integration within the financial sector. However, a more important effect on the network was the fact that the reorientation of banks towards the life-insurance business further decreased the importance of loans in the balance sheet of banks and, hence, their incentives to be involved in the industrial sector.

### ***Expansion into foreign markets***

Competition not only increased at the domestic level between different branches of the financial sector, but also on the international scene between banks from different countries. Deregulation of international financial markets, and especially European integration, with the creation of the Single European Market, increased competition between financial corporations in a crucial way.

In order to stay competitive at the international level and to become “global players”, Swiss banks needed to achieve a critical size, which was not feasible

through internal growth alone. Therefore, acquisitions, mergers and strategic alliances abroad became important instruments in the banks' new outlook (Schaub 1992: 243). Swiss banks expanded their activities abroad at the end of the 1980s and the early 1990s, especially in the investment banking sector, through acquisitions of foreign banks. At the end of the 1980s, *Crédit Suisse* acquired First Boston and SBS purchased O'Conner Associates and Warburg. Furthermore, in 1991, UBS bought the Chase Investors Management Corps, a large U.S. asset management company. *Crédit Suisse* did the same in 1990 by acquiring 80% of the voting rights in BEA Associates Inc. These acquisitions allowed the two banks to become important players in the domain of derivative products and in investment banking. A consequence of the growing internationalisation of banks' activities was the increasing number of foreign managers and directors. As we will show below, this had a direct impact on the domestic network.

### ***Consequences of the strategic reorientation of banks for the domestic company network***

One consequence of the strategic reorientation of major Swiss banks was a decreasing willingness of banks to entertain close ties with industrial companies. In the investment banking sector, close ties to industrial firms is generally perceived as a problem of conflicting interests, which of course puts into question the credibility of the bank. Consequently, the more Swiss banks expanded their activities into investment banking, the less they were disposed to be represented on the boards of industrial companies. Again, this evolution has been observed in the US as well:

“Their move away from traditional lending toward fee-based business has led commercial banks increasingly to resemble investment banks. As commercial banks' modes of operation approach those of investment banks, their board structures have followed suit.” (Davis and Mizruchi 1999: 236).

Another impact on the network stems from the decreasing importance of credits as a means of financial intermediation. With the declining role of credits, the banks will see lesser need in being represented on the board of directors of industrial companies. The retreat of banks from the boards of industrial companies becomes very clear when looking at the number of seats held by the CEO and the Chairman of the three largest Swiss banks during the last twenty years (Table 7 below). Again, we witness a very clear decline of board positions held by bankers during the latter part of the century.

The presence of bankers on boards of industrial companies allowed these companies to entertain close ties with important lenders. Several studies have shown that industrial companies often co-opt bankers on their boards when they need external capital or when they face financial problems (resource dependence thesis, see Mizruchi and Brewster 1988). Hence, with the decreasing importance of bank loans for industrial companies and for bank income, an important incentive for creating interlocks disappeared on “both sides”.

Furthermore, the increasing global orientation of large Swiss banks and the declining importance of the national market might also explain the decreasing insertion of Swiss banks into the national network. One aspect of this transformation was that greater numbers of foreigners came to sit on the board of Swiss banks. These foreign directors were less integrated within the Swiss business elite and

would, therefore, hold fewer mandates with Swiss companies. In fact, sociological factors, such as friendship ties or acquaintance through shared experiences such as university studies or armed forces service had in the past played a non-negligible role in explaining the cooptation of certain directors on the board of Swiss companies (cf. for a discussion of such factors Mizruchi 1996). Foreign directors lacked such a sociological insertion in the Swiss business elite and therefore were expected to have fewer chances to be co-opted on a board.

Table 7: Board seats held by CEOs and chairmen of large Swiss banks<sup>34</sup>

		1980	1985	1990	1995	2000
UBS	CB	19	8	13	6	1
	CEO	18	15	5	4	2
SBS	CB	8	8	7	7	-
	CEO	-*	-*	6	10	-
CS	CB	10	11	8	8	5
	CEO	12	14	6	1	7
<b>Total</b>		67	56	45	36	15

Source: Registre des administrateurs (various years).

\* At that time, SBS had no permanent general manager.

All these factors imply that banks and industrial companies no longer considered interlocks between the banking and the industrial sectors as desirable or advantageous. However, not only the links between the financial and the industrial sectors weakened but also the links between industrial companies themselves. Therefore, the changing strategies of banks provide just one part of the story, the other part being the increasing shareholder value orientation of Swiss companies.

### 3.3.2. Shareholder value orientation of Swiss companies: good corporate governance and interlocks

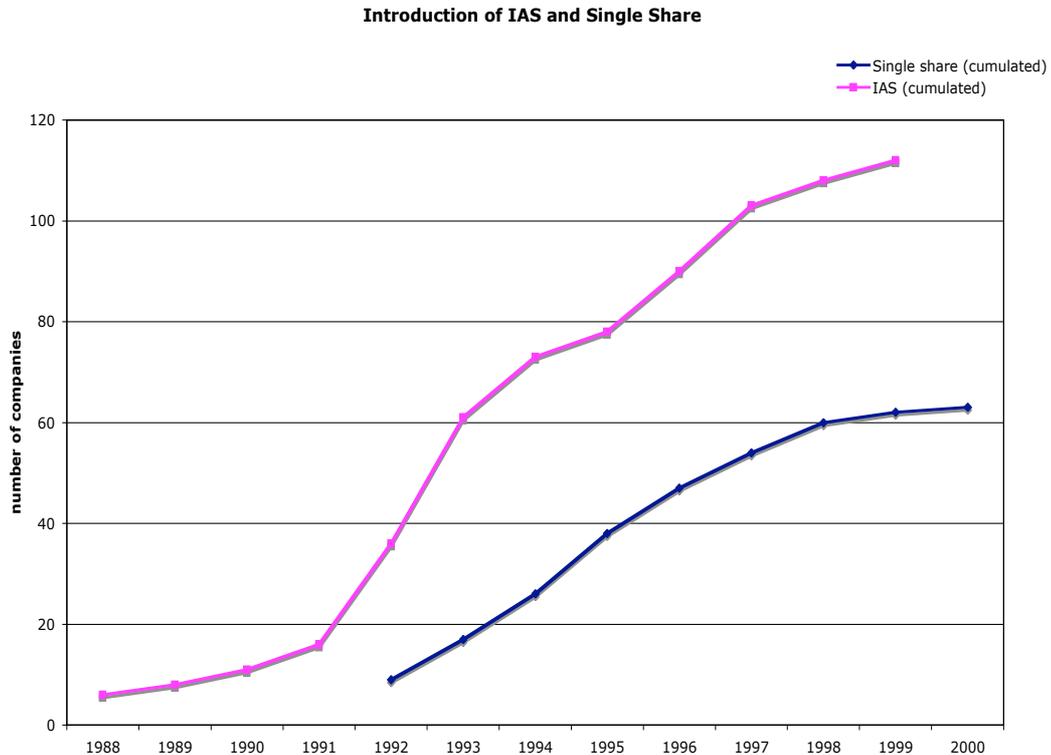
As in other European countries, Swiss companies started recently to orient their strategies more and more towards the satisfaction of minority shareholder interests. This is illustrated by increased transparency, simplification of the capital structure and the distribution of an increased part of the profits to shareholders. The use of international accounting standards is one aspect of a growing commitment to transparency. The abolishment of voting right distortions and multiple share categories as well as the increasing amount of dividend payouts and share buybacks are other important aspects of the new strategic orientation of firms.

Figure 14 illustrates this evolution for two important aspects of corporate governance, i.e. the introduction of International Accounting Standards (IAS, now IFRS for international financial and reporting standards) and the adoption of a single share. The figure shows that the number of Swiss companies that apply IAS accounting rules and that have simplified their capital structure (which often went together with a diminution or abolition of *Vinkulierung* measures) has increased in a very significant way. These changes are the expression of a profound modification in the practices of Swiss companies, placing more emphasis on transparency and

<sup>34</sup> Contrary to table 4 above, this table takes into account all mandates of the CEOs and chairmen, not only those of the companies in our sample.

abandoning their traditional mechanisms of control (Vinkulierung and different categories of shares). In fact, the shareholder view of the company replaces evermore the traditional insider view.

Figure 14: Number of Swiss companies applying IAS rules and having introduced a single share category during the 1990s



Sources: Single share: Burkhalter 2001, Kunz 1997, IAS: KPMG 2002.

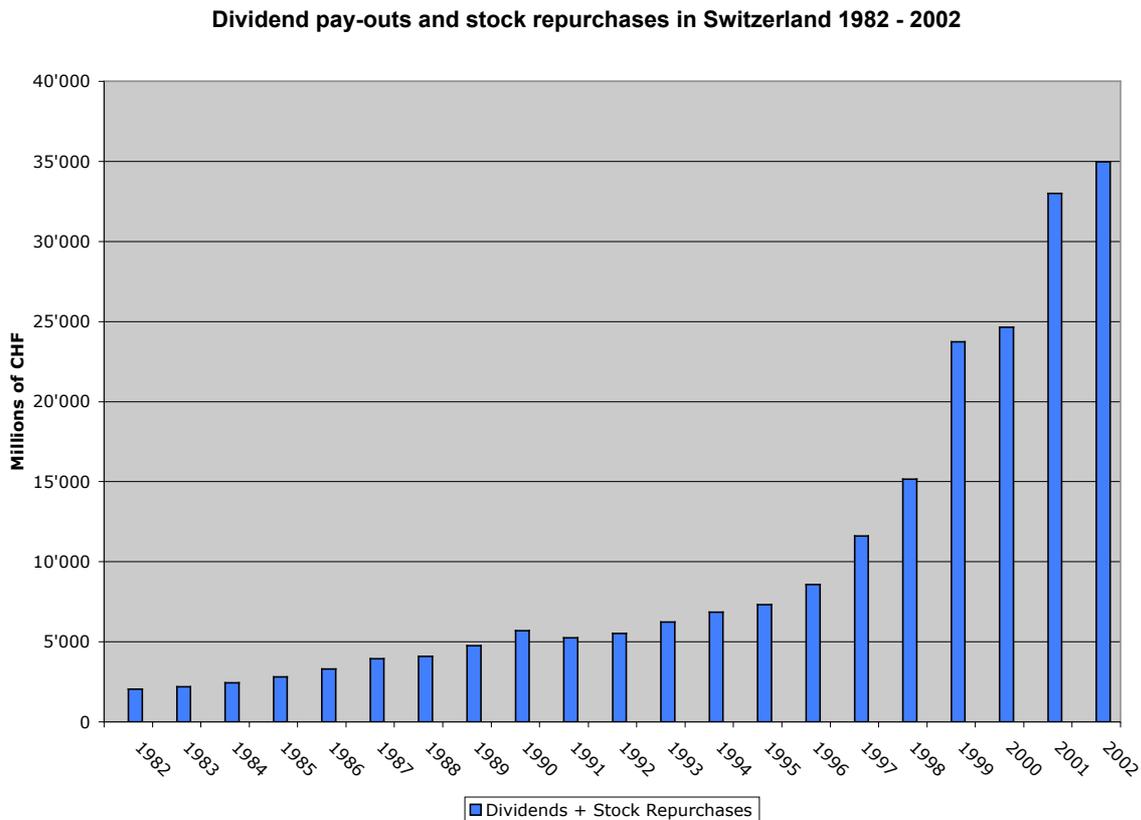
Transparency and the creation of shareholder value have become the paramount aims of large companies. The shareholder value ideology equally affected industrial and financial corporations. Lukas Mühlemann (1995), the future CEO of Crédit Suisse (and former senior manager of McKinsey Switzerland) made, in 1995, an unmistakable commitment to the shareholder value idea:

„From the shareholder’s point of view, performance means price increase and dividend payouts. And the conditions for this are short-, medium- and long-term income growth and a return on equity, which includes a substantial premium exceeding the risk free income. This is the task of the management, when it achieves this, it is well apprised, commended and hopefully well paid.” (Mühlemann 1995: 1047, our translation)<sup>35</sup>.

<sup>35</sup> “Performance aus Aktionärssicht wiederum heisst Kurssteigerung und Dividende. Und die Voraussetzungen dafür sind kurz-, mittel- und langfristig wachsende Erträge und eine Eigenkapitalrendite, welche eine substantielle Prämie über den risikofreien Ertrag hinaus beinhaltet. Das ist das, was das Management zu liefern hat, und wenn es das tut, wird es gut beurteilt, gelobt und hoffentlich gut bezahlt.“

The evolution of dividend payouts and share repurchases in figure 15 shows that Mühlemann was not the only Swiss manager adhering to this view (see also NZZ 1996). Increased dividend payouts are a clear sign of the increased shareholder value orientation of firms since they constitute a redistribution of value added in favour of shareholders. Share buybacks are a more ambiguous instrument since they only favour shareholder value when there are no more profitable investment opportunities available. Be that as it may, the fact is that a growing part of value-added created by Swiss corporations is redistributed to shareholders rather than reinvested as retained earnings in the company's activities.

Figure 15: Dividend payouts and stock repurchases



Source: Vontobel Equity Research (several years).

Several aspects of a shareholder-oriented corporate strategy affect directly the coherence of the domestic company network. Shareholder activists called for a reduction in the size of boards of directors because large boards were considered to be inefficient. This demand seems to have had an impact on the actual board size of Swiss firms: the mean board size decreased from 11.14 in 1990 to 9.46 in 2000. This reduction in the number of positions reduced the possibilities of interlocks.

Another factor that contributed to the reduction in the number of interlocks was the growing professionalisation of boards. It is widely believed that the board members of large boards should invest a considerable amount of time in their mandate. Therefore, any one person should only hold a limited number of board seats, thereby reducing the opportunities for interlocks even further. The

professionalisation of the role of board director is reflected in the Swiss Stock Corporation Law of 1992, where, for the first time, the non-delegable duties of the board of directors are defined (Code of Obligations art. 716a).

The new shareholder orientation of Swiss companies implies a shift away from the traditional, closed corporate governance system towards a more Anglo-Saxon configuration. As we stated in the first part of this paper, the Anglo-Saxon liberal model views entanglement between companies as a sign of crony capitalism. Therefore, companies that want to attract investors on the capital markets will be inclined to reduce their ties with other companies in order to convince investors of their commitment to a liberal model of capitalism<sup>36</sup>.

A last factor that explains the decreasing number of interlocks and that is partly linked to the shareholder value strategy is the concentration process in different sectors of the Swiss economy. We have already mentioned the example of the merger between UBS and SBS into the new UBS in 1998, which quite considerably reduced the number of ties entertained by this company. The same holds true for the merger between Ciba-Geigy and Sandoz into Novartis: whereas Ciba-Geigy and Sandoz cumulated 29 ties in 1990, the new company Novartis had in 2000 merely four ties with other companies. This very clear decline in the number of ties is too significant to be only explained by the mathematical effect of a reduction in board positions on the number of possible ties. In fact, companies that were implicated in mergers during the 1990s were always eager to restructure in order to increase profitability. This is an obvious commitment to the creation of shareholder value. The companies created through a merger are therefore among those who are most apt to please shareholders' interests, and as such, it is not surprising that they dramatically cut their ties with other companies.

Finally, another reason for the declining number of interlocks between Swiss companies derives from the growing transnationalisation of the corporate network. Thus, Kentor and Jang (2004) showed an increasing overlap of boards of the world's largest companies. Even though their data and analysis present some problems<sup>37</sup>, their findings indicate that large Swiss firms were among the best integrated in the transnational network of the top 500 fortune companies in 1998<sup>38</sup>. Carroll and

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<sup>36</sup> A contrary evolution could be caused by the fact that shareholder activists also demand that the majority of board members be outside directors. This would naturally increase the incentives to recruit directors from other companies and therefore push up the number of interlocks. However, the call for outside directors is mostly directed at the representation of shareholders on the board, and the mutual interlocks between firms is equally criticised by shareholder activists.

<sup>37</sup> See Carroll and Fennema (2004) for a detailed criticism. Carroll and Fennema do not contest Kentor and Jang's findings for 1998, but question first and foremost the viability and completeness of their data for 1983. Besides problems of data quality, Kentor and Jang (2004) claim that the domestic corporate network in certain countries grew much denser during the period they analysed, which is not only inconsistent with findings for the US, Canada, France and Germany, but also with our own data for Switzerland. Thus, Kentor and Jang (2004: 361) find an increase in interlocks between the Swiss firms in their sample from 2 in 1983 to 12 in 1998. This finding is very questionable given the changes we found for the 1980s and 1990s and is probably due to an underestimation of the number of interlocks in 1983.

<sup>38</sup> The sample of the 500 largest corporations based on revenue comprised 9 Swiss companies in 1983 and 11 Swiss companies in 1998. The most central Swiss company in 1998, the Swiss-Swedish ABB, was the company with the most transnational interlocks (13) (Kentor and Jang 2004: 366). In total, Swiss companies had 24 international ties in 1998, compared to 4 in 1983. Yet, this latter figure might be underestimated due to incomplete data (Carroll and Fennema 2004).

Fennema's (2002) more prudent study of 176 large companies also points to the growing integration of Swiss firms in the transnational corporate network. If they find little growth of transnational ties between 1976 and 1996, they still demonstrate that within Europe, ties between companies grew denser. Moreover, Swiss companies seem to have been much better integrated in 1996 than twenty years previously. Thus, they state that – as Dutch and French firms – Swiss companies doubled their transnational ties between 1976 and 1996 (Carroll and Fennema 2002: 402 and 410). They hold the view that the (modest) progress in the integration of the transnational network does not automatically imply a fragmentation of national networks. However, their claim is based on an analysis of ties between companies from the same country in their sample, i.e. the largest companies of each country. For instance, there are country clusters among German firms in their sample, i.e. the German companies within the core of the transnational network are heavily mutually interlocked. Yet, if the most central Swiss firms in the transnational network (i.e. those with three or more ties to the top 176 companies: BBC (later ABB) and Credit Swiss and Novartis<sup>39</sup>) are linked to one another, our analysis suggests that this stability of ties between the largest companies does not allow one to draw conclusions for the network as a whole. In fact, the stability of these ties between the largest Swiss companies did not necessarily mean that relations to other, smaller Swiss companies remained stable as well. On the contrary, the growing importance of the interlocking network between large, international companies resulted in the decreasing importance of the domestic network. Hence, large firms retreated from the boards of other Swiss firms that were considered less crucial than their ties to the largest Swiss companies and other transnational corporations.

### ***3.3.3. The company network between stability and change: disintegration or marginal restructuring?***

As we have mentioned above, the decomposition of the network between 1990 and 2000 seems to have been astoundingly far-reaching. However, Nollert (2002) put the accent on continuity rather than change during the last decade of the 20<sup>th</sup> century. In his analysis of Swiss interlocking and cross participations networks between 1994 and 1997, he concluded that despite much disentanglement, the network did not alter dramatically. More precisely, he underlined that the concentration among the largest Swiss companies led to new entanglements, implying an increase in the density and the centralisation of the network. Nollert's findings apply in particular to the ownership network but less so to the network of interlocks, even though he stated that financial corporations remained central in the directors' network as well. He concluded that in the case of Switzerland and the Netherlands,

“The disintegration and the reconfiguration, which I mentioned suggest that the networks in the two countries changed substantially since the benchmark year (1994).

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<sup>39</sup> ABB was linked in 1996 to British Petroleum, Philips, IBM and Shell. Crédit Suisse – besides its links with ABB and Novartis) was connected to Shell and BASF. Novartis, finally, had links with British Telecom, Daimler-Benz and Shell. In 1976, on the other hand, Swiss firms were not integrated in the main component of the core companies: only BBC had a tie to a non-Swiss core company (Fiat) and was linked to a Swiss Bank, which was also in the core (Carroll and Fennema 2002: 411-412).

[However], this change does not imply structural breaks but at the most marginal restructurations of the network (...)." (Nollert 2002: 505, our translation).

However, the increasing number of ties in the ownership network was – according to Nollert – partially due to the emergence of institutional investors such as Martin Ebner's BZ Bank, which held large stakes in several major companies and used them in order to obtain a seat on the board of directors. In our view, the emergence of new financial intermediaries constituted a major qualitative change in the links between Swiss companies, which was capable of affecting the functioning of the economy, even though it did not appear as a change in the network analysis. The presence of representatives of investment funds, such as Ebner's BZ Bank who defended a rigorous pro-shareholder policy and who utilised their position on the board to push for shareholder-oriented reforms, had nothing in common with the traditional representation of other insiders (especially large banks) with whom one communicated interests and ideas. This evolution signifies an important qualitative transformation in the organisation of the economy, which cannot be reduced to a mere "marginal restructuring" of the network. Therefore, we consider that the changes in the Swiss company network were stupendously far-reaching. The shifting position of banks and the financial sector in general, which virtually vanished from the top ten rankings of centrality scores, and the emergence of new actors indicate a changing functioning of the Swiss economy.

If we do not agree with Nollert's argument concerning the extent of change, we do share his conclusion that the network kept some of its characteristics. In fact, certain indicators show more continuity than change in the structure of the network. Thus, the proportion of connected firms was, in 2000, still very important (86.1%), and the fragmentation of the network was rather limited: a quarter of the companies in our sample could not reach each other through interlock ties. Therefore, our results stressing the decomposition of the network have to be somewhat nuanced.

One possible interpretation for the persistence of a quite dense and cohesive company network in 2000 - despite the very marked decrease in the number of interlocks - was given by Carroll and Fennema (2002). As shown above, these authors argued that interlocks can be set apart based on the strength of ties. Thin lines mean one common director, and thick lines imply more than one director. According to Carroll and Fennema (2002), thick lines reveal a dimension of control, whereas thin lines serve the purpose of communication rather than control. The distinction between thin and thick lines offers an noteworthy explanation for the transformation of the network in Switzerland.

We have shown that the number of multiple ties have decreased in a very important way since 1980, whereas simple ties, even though they declined as well, appear to have remained quite common among Swiss companies. Therefore, we can interpret the changes in the Swiss network not so much as a complete disintegration, but rather as a weakening of its control function. Fewer and fewer ties took the shape of thick lines, and control thereby became a secondary facet of the network. This sparser network, however, could still fulfill the communication function.

This interpretation is corroborated by the "small world statistics". The so-called small world phenomenon has been formalised by Watts and Strogatz (1998). It specifies that even in a relatively sparse and large network, and despite a high degree of local clustering, the average distance between nodes can be very low. The

phenomenon is due to the fact that nodes in a local cluster are connected to nodes outside this cluster by a small number of intermediaries (Kogut and Walker 2001: 321). For the company network, the small world structure signifies that information can spread rapidly through the network since there are “shortcuts” between clusters of firms.

The small world statistics for the Swiss company network for the three dates 1980, 1990 and 2000, are reported in table 8 below. The conditions for a small world are given, when the observed average path length is close to the path length in a random network of the same size and with the same number of ties, but the observed clustering coefficient is significantly higher than the random clustering coefficient. The random statistics are calculated as  $L_{\text{random}} \approx \ln(n) / \ln(k)$  and  $C_{\text{random}} \approx k/n$ , where  $k$  is the average number of ties per node (mean degree) and  $n$  the number of nodes.

Table 7: Small world statistics for the Swiss company network

Year	Path length (L) <sup>40</sup>		Clustering (C) <sup>41</sup>	
	Actual	Random	Actual	Random
1980	2.63	2.35	.413	.068
1990	2.61	2.34	.402	.069
2000	3.92	3.48	.407	.035

We find that for all three dates, the Swiss company network can be considered a small world structure. Therefore, even after the significant decline in network integration during the 1990s, the network’s capacity to constitute an infrastructure for information flows persisted. As Kogut and Walker (2001) noted for the German case, this shows that even large and dispersed networks can remain stable despite the disappearance of an important part of the ties. They consider the small world effect to be a focal point for convergence in company networks exposed to pressures stemming from globalisation (Kogut and Walker 2001: 331). This means that a company network disintegrates up to a certain point, but does not lose all its characteristics concerning information flows. In fact, small world features appear to quite robustly withstand the decomposition of ties. This seems to have been the case for Switzerland as well.

Nonetheless, the network’s stability with regards to certain features, notably its communicational function, should not lead us to underestimate the depth of the transformation. The disintegration of the network during the 1990s was especially significant and interlocks became a more dodgy means of control over companies since most of the multiple ties disappeared. These changes in themselves constituted an adaptation of one of the central institutions of Swiss capitalism that had an impact on the functioning of the economy as a whole.

## Conclusions

Our analysis of the long-term evolution of the Swiss company network shows that in the early part of the century, a process of increased network integration emerged and was linked to the rise of “organised capitalism” at the end of the 19<sup>th</sup>

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<sup>40</sup> Average path length between connected firms.

<sup>41</sup> Clustering coefficient for main component.

century (Jost 1980 and Mazbouri 2005). As a consequence, the network was already quite well-integrated and connected by 1910. However, it is only in the aftermath of World War I that a genuine national inter-company network emerged. This historical event increasingly induced Swiss companies to emancipate themselves from foreign influence (especially German), thereby solidifying the internal cohesion of the Swiss business elite and promoting a denser interlocks network. From 1929 until 1980, the integration of the network proceeded steadily. The late 1980s, however, represented a critical juncture in network evolution. In fact, the last ten years of the century saw a stupendous decline in the density of the company network. The most important phenomena during this period were the changing strategies of the banks, which reduced their involvement in industrial companies, and the increasing use of financial markets by companies.

In sum, we identified three distinct phases in the evolution of the Swiss interlock network: firstly, a phase of emergence and integration of a national network, secondly, a long phase of relative stability and consolidation, and finally a phase of decomposition. The evidence relating to the second phase, supposedly a period of stability, is mixed. Several indicators point to the stability of the network, but at varying paces of network integration. The 1960s and 1970s seem to have seen an especially significant period of reinforcement of ties between companies, a development that we explained in terms of the threat of foreign influence over Swiss corporations. The m-core analysis suggests that between the end of the 1950s and 1980, a very cohesive hard core of the network materialised around the large boards of directors of the three major banks. In fact, up to 1957, the three major banks seemed to have had exclusive and privileged ties with different companies, whereas by 1980 they appear to have had strong ties only with the same companies. However, further qualitative analysis would be necessary to determine more precisely the structure of sub-graphs and the role of banks in these groups.

Our analysis indicates first and foremost that the company network is a dynamic structure that is permanently shaped, entertained and reshaped by social actors' behaviour and influenced by political and economic decisions. Changes in the corporate network are not a recent phenomenon linked to a unique historical conjuncture (globalisation) but have always been a central characteristic of the dynamic nature of the corporate network, even during periods of relative stability. The transformations in the network structure after 1990 were very far-reaching even though the networks' capacity to serve as infrastructure for information flows seems to have remained in place. We interpret this significant decomposition of the network as the harbinger of a more general revolution in the Swiss economy, i.e. the emergence of a liberal, exit-based, rather than a voice-based, corporate governance system.

With regards to the role of banks, we have to provide some nuance relating to the hypothesis of a bank-dominated system. We showed that, in the case of Switzerland, bank monitoring seems to have played a secondary role and that other reasons appeared more vital in explaining the centrality of banks. One element favouring this conclusion is the fact that not only were bankers represented on the boards of industrial companies, but industrialists also had seats on the boards of banks. These mutual interlocks would indicate that bank control was not the major rationale for interlocks but that they were rather the product of sociological or other conjectures. The bank-control hypothesis is also challenged by the fact that we

found in our qualitative analysis of the historical context several examples of banks acting not in their own immediate economic interest, but in the interest of the Swiss economy as a whole, as perceived, naturally, by the business elite (gentlemen's agreement of 1961 and proxy votes). The class-cohesion model thus proves a better fit for the Swiss company network, notably because the business elite was rather small. However, our analysis needs, of course, to be supplemented by a detailed analysis of the role of the network's "big linkers" if we are to determine if class-cohesion is a useful model to explain the Swiss case.

## References

- Abt H. 1995. Auf der Suche nach einer neuen Balance der Macht. Forderung nach einem neuen Typ des unabhängigen Verwaltungsrates, *L'Expert comptable suisse* 95(12): 1021-1028.
- Bär R. 1959. Grundprobleme des Minderheitenschutzes in der Aktiengesellschaft, *Zeitschrift des Bernischen Jursitenvereins*, pp. 369ff.
- Bebchuk, L., R. Kraakman and G. Triantis 2000. Stock Pyramids, Cross-Ownership, and Dual Class Equity: The Creation and Agency Costs of Separating Control From Cash Flow Rights, in R. Morck (ed.), *Concentrated Corporate Ownership*, Cambridge, 445-460.
- Beyer J. 2002. Deutschland AG a.D: Deutsche Bank, Allianz und das Verflechtungszentrum grosser deutscher Unternehmen. *MPIfG Working Paper* 2.
- Burkhalter T. 2001. Einheitsaktien ihre Einführung und Existenz im Lichte der Diskussion um Corporate Governance, in *Schweizer Schriften zum Handels- und Wirtschaftsrecht*, Zürich: Schulthess.
- Carroll W. and M. Fennema 2002. Is There a Transnational Business Community? *International Sociology* 17: 393-419.
- Carroll W. and M. Fennema 2004. Problems in the Study of the Transnational Business Community: A Reply to Kentor and Jang. *International Sociology* 19: 369-378.
- Commission fédérale des cartels (Anti-Trust commission) 1979. *Die Konzentration im schweizerischen Bankgewerbe*, Bern.
- David, T., Lüpold M., G. Schnyder and A. Mach 2005. The Structure and Geography of Company Networks in Switzerland during the Interwar Period, paper presented at the Xth Symposium of Economic History, *Network analysis in Economic History* (Bellaterra, Spain January 27-29 2005).
- David T., Mach A. 2004. The Specificity of Corporate Governance in Small States: Institutionalisation and Questioning of Ownership Restrictions in Switzerland and Sweden. in R. Aguilera and M. Federowicz (eds.), *Corporate Governance in a Changing Economic and Political Environment. Trajectories of Institutional Change on the European Continent*, London: Palgrave, 220-46.
- David T., Mach A., Straumann T. 2006 forthcoming. The Questioning of Selective Protectionism in Switzerland during the 1990s: Cartel Law Reform and Corporate Governance Changes, in M. Müller and M. T Mylyntaus (eds.). *Globalisation and De-globalisation: The Impact on the Economic Policy and Performance of Small European Countries*. Bern: Lang.

- Davis G. and M. Mizruchi 1999. The Money Center Cannot Hold: Commercial Banks in the U.S. System of Corporate Governance, *Administrative Science Quarterly* 44: 215-239.
- Dritsas, M., Eigner P. and J. Ottosson 1996. 'Big Business' Networks in three Interwar Economies: Austria, Greece and Sweden, *Financial History Review* 3: 175-195.
- Fitch R. and M. Oppenheimer 1970. Who Rules the Corporations?, *Socialist Revolution* (4) 73-108, (5) 61-114, (6) 33-94.
- Gautschi, G. 1966. Bericht und Vorschläge zu einer Revision des Schweizerischen Aktienrechts von 1936, Zürich (unpublished report, Archives Fédérales E 4110 (B) 1989/197, vol. 32).
- Giovanoli, F. 1931. Les tantièmes et les Conseils d'administration des sociétés anonymes suisses, *Revue syndicale suisse*: 81-95.
- Gourevitch P. 2003. Corporate Governance. Global Markets, National Politics, in M. Kahler and D. Lake (eds.). *Governance in a Global Economy*. Princeton and Oxford: Princeton University Press, 305-331.
- Gruner E. 1960. Die Handels- und Gewerbefreiheit und die Staatsordnung von 1874 – 1914, *Wirtschaft und Recht*: 149-155.
- Guex, S. 1993. *La politique monétaire et financière de la Confédération suisse 1900-1920*, Lausanne : Payot.
- Guex S. 2003. La politique de la Banque nationale suisse (1907-1939): modèles, références, spécificités, in O. Feiertag and M. Margairaz (eds), *Politiques et pratiques des banques d'émission en Europe (XVII-XX siècle)*, Paris: Albin Michel, 526-548.
- Hall P. and D. Soskice 2001. *Varieties of capitalism: the institutional foundations of comparative advantage*. Oxford: Oxford University Press.
- Hertig G. 1998. Lenders as a Force in Corporate Governance. Criteria and Practical Examples for Switzerland, in K. Hopt et al. (eds.). *Comparative Corporate Governance*, Oxford: Clarendon Press, 809-835.
- Hertner, P. 1987. Les sociétés financières suisses et le développement de l'industrie électrique jusqu'à la Première Guerre mondiale, in F. Cardot (ed.), *Un siècle d'électricité dans le monde*, Paris: PUF, 341-355.
- Höpner M. and L. Krempel 2003. The Politics of the German Company Network, *MPIfG Working Paper* 9.
- Jackson G. 2001. The Origins of Nonliberal Corporate Governance in Germany and Japan, in W. Streeck and K. Yamamura (eds.). *The Origins of Nonliberal Capitalism. Germany and Japan in Comparison*, Ithaca/London: Cornell University Press, 121-70.
- De Jong H. 1997. The Governance Structure and Performance of Large European Corporations, *Journal of Management and Governance*: 5-27.
- Jost U. 1980. Aperçus théoriques des relations entre l'Etat, l'économie et le capital entre 1870 et 1913. Le cas de la Suisse, *Bulletin du département d'histoire économique, Université de Genève* 10.
- Jung J. 2000. *Von der Schweizerischen Kreditanstalt zur Credit Suisse Group. Eine Bankengeschichte*, Zürich: NZZ Verlag.
- Kaufmann H. and B. Kunz 1991. *Shareholder Restrictions in Switzerland*, Zurich: Bank Julius Bär.
- KPMG. 2002. *Accounting and Business in Switzerland*.

- Kunz R. 1997. Vereinfachung der Grundkapitalstruktur und Liquidität der Beteiligungspapiere, *Finanzmarkt und Portfolio Management* 11: 35-50.
- Kury, P. 2003. *Über Fremde reden. Überfremdungsdiskurs und Ausgrenzung in der Schweiz 1900-1945*, Zürich: Chronos.
- Kentor J. and Y. Jang 2004. Yes, There Is a (Growing) Transnational Business Community: A Study of Global Interlocking Directorates 1983-98, *International Sociology* 19: 355-368.
- Kogut B. and G. Walker 2001. The Small World of Germany and the Durability of National Networks, *American Sociological Review* 66: 317-35.
- Loderer C. and U. Peyer 2002. Board Overlap, Seat Accumulation and Share Prices, *European Financial Management*, 8 (2): 165-192.
- Lambelet J.-C. 1993. *L'économie suisse. Un essai d'interprétation et de synthèse*, Paris; Genève: Economica.
- Lüpold M. 2004. Schutz vor wirtschaftlicher Ueberfremdung oder Abwehr unfreundlicher Übernahmen? Die Vinkulierung von Namenaktien in der Praxis der Unternehmen und die Veränderungen des rechtlichen Rahmens 1929-1961, Unpublished Lizentiatsarbeit, University of Zurich.
- Mach A., David T., Schnyder G. and M. Lüpold 2006 forthcoming. Transformations de l'autorégulation et (re)régulation publique en matière de gouvernement d'entreprise en Suisse (1980-2002), *Swiss Political Science Review*.
- Mazbouri, M. 2005. *L'émergence de la place financière suisse, 1890-1913. Itinéraire d'un grand banquier*, Lausanne: Antipode.
- Mizruchi M.S. 2004. Berle and Means Revisited: The Governance and Power of Large U.S. Corporations, *Theory and Society* 33: 579-617.
- Mizruchi M.S. 1996. What Do Interlocks Do? An Analysis, Critique, and Assessment of Research on Interlocking Directorates, *Annual Review of Sociology* 22: 271-298.
- Mizruchi M.S. 1992. *The Structure of Corporate Political Action: Interfirm Relations and their Consequences*, Cambridge, Mass.: Harvard University Press.
- Mizruchi M.S. 1982. *The American Corporate Network, 1904-1974*, Beverly Hills: Sage.
- Mizruchi M.S., Brewster S.L. 1988. A Longitudinal Study of the Formation of Interlocking Directorates, *Administrative Science Quarterly* 33: 194-210.
- Mühlemann L. 1995. Wertsteigerungskonzepte zur Performance-Beurteilung des Managements. *L'Expert comptable suisse* 95(12): 1047-1050.
- Monks R. and N. Minow 1995. *Corporate Governance*, Cambridge: Cambridge University Press.
- Nollert M. 2002. *Unternehmensverflechtungen in Westeuropa. Nationale und transnationale Netzwerke von Unternehmen und multiplen Direktoren*, Habilitation. Universität Zürich.
- Nollert M. 1998. Interlocking Directorates in Switzerland: A Network Analysis, *Swiss Journal of Sociology* 24: 31-58.
- De Nooy W., Mrvar A., Batagelj V. 2005. *Exploratory Social Network Analysis with Pajek*, Cambridge: Cambridge University Press.
- NZZ. 1996. *Shareholder Value*, Zurich: Verlag NZZ.

- Paquier S. 2001. Swiss Holding Companies from the Mid-Nineteenth Century to the Early 1930s: the Forerunners and Subsequent Waves of Creations, *Financial History Review* 8: 163-182.
- Perrenoud M. et al. 2002. *La place financière et les banques suisses à l'époque du national-socialisme les relations des grandes banques avec l'Allemagne (1931-1946)*, Lausanne/Zurich: Payot/Chronos.
- Plihon D. 1999. Les banques: nouveaux enjeux, nouvelles stratégies, in *Les études de la Documentation française. Economie*, Paris: La Documentation française.
- Pollux. 1944. *Trusts in der Schweiz. Die schweizerische Politik im Schlepptau der Hochfinanz*, Zurich.
- Ravara C. 1999. *Allfinanz. Nicht neu, aber mit Zukunft*, Zurich: Credit Suisse.
- Rusterholz P. 1985. The Banks in the Centre: Integration in Decentralized Switzerland, in F. Stokman, R. Ziegler, J. Scott (eds.). *Networks of Corporate Power*, Cambridge: Polity Press, 131-147.
- Sancey, Y. 2004. *Un capitalisme de Gentlemen. Emergence et consolidation de l'autorégulation bancaire en Suisse et en Angleterre (1914-1960)*, Thèse de doctorat. Université de Lausanne.
- Schaub V. 1992. *Konzernpolitik im Schweizer Bankbereich. Eine Darstellung der Determinanten und Ausgestaltungsmöglichkeiten unter Berücksichtigung ausgewählter Schweizer Bankkonzerne*, Bern: Haupt.
- Schnyder G., Mach A., and M. Lüpold 2005. Le «Rapport Gautschi»: Epreuve de force entre deux visions contradictoires de l'entreprise, *Traverse Revue d'histoire* 3, 140-150.
- Schnyder G., Mach A., David T., and M. Lüpold 2006 forthcoming. The Clash of Paradigms: Switzerland's Long March towards a Shareholder-Oriented Conception of the Firm, in J.-J. Friboulet and D. Isakov (éds.). *Le gouvernement d'entreprise en Suisse, Dynamiques externes et stratégies internes*, Fribourg: Schulthess.
- Schreiner J.-P. 1984. Le capital financier et le réseau des liaisons personnelles entre les principales sociétés en Suisse, *Revue d'économie industrielle* 29: 78-95.
- Scott J. 1985. Theoretical Framework and Research Design, in F. Stokman, R. Ziegler, J. Scott (eds.). *Networks of Corporate Power a Comparative Analysis of ten Countries*, Cambridge: Polity Press, 1-19.
- Scott J. 2000. *Social Network Analysis. A Handbook*, London, Thousand Oaks, New Dheli: Sage Publications.
- Scott J, and C. Griff 1984. *Directors of Industry: the British Corporate Network, 1904-1976*, Cambridge: Polity Press.
- Segreto L. 1992. Du Made in Germany au Made in Switzerland. Les sociétés financières suisses pour l'industrie électrique dans l'entre-deux-guerres, in M. Trédé (ed.) *Electricité et électrification dans le monde*, Paris: PUF, 347-367.
- Steinmann M. 1989. *Präventive Abwehrmaßnahmen zur Verhinderung unfreundlicher Übernahmen mit Mitteln des Aktienrechts*, Grösch: Verlag Rüegger.
- Stokman F. and F. Wasseur 1985. National Networks in 1976: A Structural Comparison, in F. Stokman, R. Ziegler, J. Scott (eds.). *Networks of corporate power: a comparative analysis of ten countries*, Cambridge: Polity Press, 20-44.

- Streeck W. 2001. Introduction: Explorations into the Origins of Nonliberal Capitalism in Germany and Japan, in W. Streeck and K. Yamamura (eds.). *The Origins of Nonliberal Capitalism. Germany and Japan in Comparison*, Ithaca/London: Cornell University Press, 1-38.
- Tanner J. 1994. 'Macht der Banken': analytisches Konzept oder politischer Topos? Zum Bedeutungswandel einer kontroversen Kategorie, in A. Ernst et al. (eds.) *Kontinuität und Krise. Sozialer Wandel als Lernprozess*, Zurich: Chronos.
- Tomasic R. and S. Bottomley 1991. *The Fiduciary Duties of Directors in Listed Public Companies*, Canberra: Centre for National Corporate Law Research.
- Unabhängige Expertenkommission Schweiz – zweiter Weltkrieg 2002. *Die Schweiz, der Nationalsozialismus und der Zweite Weltkrieg. Schlussbericht*. Zürich: Chronos.
- Useem M. 1984. *The Inner Circle: Large corporations and the Rise of Business Political Activity in the US and UK*, New York: Oxford University Press.
- Vontobel Equity Research (various years). *Aktienmarkt Schweiz. Emissionstätigkeit*, Zurich.
- Watts D.J. 1999. Networks, Dynamics, and the Small-World Phenomenon, *American Journal of Sociology* 105: 493-527.
- Watts D.J. and S. Strogatz 1998. Collective Dynamics of "Small World" Dynamics, *Nature* 393: 440-2.
- Windolf P. 2005. The Emergence of Corporate Networks in Germany and the United States 1896 – 1938, *Working Paper*.
- Windolf, P. and M. Nollert (2001). Institutionen, Interessen, Netzwerke: Unternehmensverflechtung im internationalen Vergleich, *Politische Vierteljahresschrift* 42: 51-78.

### **Sources:**

#### *List of the 100 largest companies*

1910:

“Einige Grossunternehmen der schweizerischen Industrie mit Ausschluss allfälliger im Ausland befindlicher Filialen“, in: *Zeitschrift für schweizerische Statistik* 1912: 657-660.

1929:

Eidg. Betriebszählung/Fabrikstatistik vom 22.8.29: BAR E 7201 1988/62; BAR E 7202; BAR E 7203 1987/122; BAR E 7204 1987/182.

1937:

Eidgenössische Fabrikzählung vom 16.9.1937: BAR E 7201 1988/62, BAR E 7202 1980/133, BAR E 7203 1987/122, BAR E 7204 1987/182.

1957:

Kompass Schweiz. 1958. Informationswerk der Schweizer Wirtschaft. 8. Ed. 1958. Hg. Von Max E. Neuenschwander-Hesse. Zürich.

Fabrikstatistik 19.Sept. 1957: BAR E 7201 1988/62, E 7172 B 1967/142, E 7204 1987/182.

1980:

UBS (1980). *Les principales entreprises suisses*.

1990:

UBS (1990). *Les principales entreprises suisses*.

2000:

Handelszeitung und Finanzrundschau AG (2000). *Handelszeitung Top 2000. Die grössten Industrie-, Handels- und Dienstleistungsunternehmen, Banken und Versicherungen der Schweiz*.

*Financial data and names of directors:*

Banque Commerciale de Bâle, Ed. (1929). *Manuel des Valeurs cotées aux Bourses Suisses*, Basel.

Credit Suisse, Ed. (1911). *Vade-mecum des Bourses de Zurich/Bâle/Genève/Lausanne/Berne/Neuchâtel/St-Gall/Coire 1910-11*, Zürich.

Credit Suisse, Ed. (1927). *Vade-mecum des Bourses de Zurich/Bâle/Genève/Lausanne/Berne/Neuchâtel/St-Gall/Coire 1926/27*, Zürich.

Crédit Suisse, Ed. (1930). *Vade-mecum des Bourses de Zurich/Bâle/Genève/Lausanne/Berne/Neuchâtel/St-Gall/Coire 1929/30*, Zürich.

Finanz-Jahrbuch, Ed. (1910). *Schweizerisches Finanz-Jahrbuch 1910*, Bern, Kompass Schweiz.

Orell Füssli Verlag AG (various years). *Registre des administrateurs*, Zurich: Orell Füssli.

Orell Füssli Verlag AG (2000/2, mise à jour 27.4.2000). *Le CD-Rom de l'économie suisse*, Zurich: Orell Füssli.

Steiger, J., Ed. (1930). *Schweizerisches Finanz-Jahrbuch 1929*, Bern.

Töndury, H., Ed. (1938). *Schweizerisches Finanz-Jahrbuch 1938*, Bern.

Ragionenbuch (1907). *Schweizerisches Ragionenbuch. Verzeichnis der im Schweizer. Handelsregister eingetragenen Firmen*, Zürich.

Ragionenbuch (1929). *Schweizerisches Ragionenbuch. Verzeichnis der im Schweizer. Handelsregister eingetragenen Firmen*, Zürich.

Ragionenbuch (1937). *Schweizerisches Ragionenbuch. Verzeichnis der im Schweizer. Handelsregister eingetragenen Firmen*, Zürich.

*Schweizerisches Finanz-Jahrbuch 1955/1960* (red. E. Frehner), Zürich 1960: Daten von 1957.

*Manuel des Bourses Suisses*, 19. éd., Lausanne 1961.

**Annex 1: Recapitulatory table of main results**

<b>A. Size and structure of network</b>	1910	1929	1937	1957	1980	1990	2000
Number of companies (N)	111	108	109	109	111	107	108
Number of connected firms (in % of N)	86.49	87.96	88.07	89.00	93.69	90.65	86.11
Isolated firms (%)	13.51	12.04	11.93	11.00	6.31	9.35	12.04
Degree 1-2 (%)	20.72	19.44	17.43	16.51	17.12	14.01	28.70
<b>B. Ties</b>							
Number of ties	416	552	535	561	543	432	242
Number of multiple ties	70	98	81	85	77	66	20
Number of ties (dichotomized)	297	399	406	435	434	394	207
Density (%)	4.86	6.90	6.90	7.39	7.11	6.95	3.58
Density within main component (%)	6.51	8.86	8.90	9.34	8.26	8.46	4.82
<b>C. Main characteristics</b>							
Mean board size	9.34	9.71	9.19	10.46	10.78	11.14	9.46
Diameter	8	6	7	5	6	6	11
Average geodesics	3.19	2.73	2.66	2.46	2.63	2.61	3.92
Mean degree	5.35	7.39	7.45	7.98	7.82	7.36	3.83
Mean normalised Betweenness <sup>42</sup>	1.50	1.26	1.20	1.08	1.32	1.69	3.21
Mean normalized Closeness <sup>4344</sup>	32.72	37.96	38.91	41.76	39.22	39.53	26.77
Clustering coefficient	.53	.44	.48	.45	.42	.40	.41
Fragmentation (%)	25.30	22.70	22.50	20.90	12.30	17.90	25.90

Year	ASSR	BQ et SF	Energy/T ransports	INDS	SER	Total
<b>1910</b>	8	25	8	70	-	111
<b>1929</b>	8	25	8	67	-	108
<b>1938</b>	8	25	8	68	-	109
<b>1957</b>	8	22	8	71	-	109
<b>1980</b>	10	19	8	55	19	111
<b>1990</b>	9	18	9	55	16	107
<b>2000</b>	8	17	5	58	20	108

<sup>42</sup> “The normalized betweenness centrality is the betweenness divided by the maximum possible betweenness expressed as a percentage” (Borgatti et al. 2002).

<sup>43</sup> Within main component.

<sup>44</sup> “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).

**Annex 2: Top ten companies according to different centrality measures**

1910

<b>Freeman degree centrality</b>	<b>Freeman betweenness</b>	<b>Freeman closeness</b>
Crédit Suisse (CS) 26	CFF 16.58	CFF 46.341
CFF 22	CS 11.95	Crédit Suisse (CS) 46.117
Georg Fischer AG 21	Société Financière Franco-Suisse pour l'Industrie El. 9.12	Ges. für Anlagewerte 45.024
Bank für e l. Unternehmungen (Elektrobank) 19	Ges. für Anlagewerte 8.71	Bank für e l. Unternehmungen 43.379
Ges. Für Anlagewerte 17	Georg Fischer 8.12	Georg Fischer 42.986
Alioth 16	FMB 7.52	Motor-Columbus 42.601
Motor-Columbus 14	Alioth 6.96	SBS 41.850
SBS 14	Cossonay 6.09	NOK 41.850
Société financière franco-suisse pour l'ind. Élect. 14	Bank für e l. Unternehmungen 5.35	Alioth 41.667
NOK 14	Eidgenössische Bank 5.12	Ciba, BBC 40.948

1929

<b>Degree</b>	<b>Betweenness</b>	<b>Closeness</b>
BBC (Holding) 29	SBS 7.93	BBC (Holding) 53.073
Motor-Columbus 27	Elektrobank 6.97	Motor-Columbus 52.198
SBS 25	BBC 6.88	Georg Fischer 50.00
Georg Fischer 22	CS 6.77	SBS 50.00
Bank für e l. Unternehmungen (Elektrobank) 22	Motor-Columbus 6.28	Elektrobank 48.718
CS 22	Comptoire d'escompte 5.99	Bank Leu 47.50
UBS 20	Bank für orientalische Eisenbahn 5.86	Sulzer 47.264
Winterthur 20	Bank Leu 4.76	Nestlé 46.798
Sulzer 20	CFF 4.51	CS 46.798
Bank Leu, Rentenanstalt 19	Rentenanstalt 4.41	KW Laufenburg 46.569

1937

Degree	Betweenness	Closeness
SBS 30	SBS 9.23	SBS 53.073
CS 24	ASUAG 6.25	BBC 51.630
BBC (Holding) 24	CS 6.20	Sulzer 50.802
Sulzer 23	Rentenanstalt 6.20	Elektrobank 50.802
Bank für e l . Unternehmungen 23	Basler Leben 6.15	CS 50.265
Motor-Columbus 23	CFF 5.73	Georg Fischer 50.27
Basler Leben 23	Société financière italo- suisse 5.45	Motor-Columbus 49.74
Georg Fischer 22	UBS 5.42	Rentenanstalt 49.48
Rentenanstalt 21	Elektrobank 5.04	Société financière italo- suisse 48.22
Société Financière Italo- Suisse 20	Sulzer 5.01	Basler Leben 48.22

1957

Degree	Betweenness	Closeness
SBS 36	SBS 12.21	SBS 57.49
UBS 35	UBS 9.95	Sulzer 56.14
Sulzer 31	Sulzer 7.31	UBS 54.86
CS 29	Georg Fischer 6.68	Georg Fischer 54.24
BBC 27	CS 6.40	BBC 54.24
Georg Fischer 26	Swissair 5.61	CS 52.75
Motor-Columbus 24	Basler Leben 4.96	Motor-Columbus 52.46
Swissair 24	BBC 3.86	CFF 50.00
Winterthur Leben 18	Bank Leu 3.63	Ciba 50.00
Rentenanstalt, Ciba, AIAG 16	Motor-Columbus 3.58	Basel Leben, AIAG 49.74

**1980**

<b>Degree</b>	<b>Betweenness</b>	<b>Closeness</b>
<b>UBS 33</b>	Swissair 14.06	Swissair 56.67
Swissair 32	<b>UBS 11.51</b>	BBC 53.40
BBC 31	<b>CS 6.42</b>	<b>UBS 53.13</b>
Alusuisse 26	BBC 6.22	Alusuisse 51.78
<b>SBS 26</b>	<b>SBS 6.10</b>	<b>CS 50.00</b>
<b>CS 24</b>	Alusuisse 5.45	Sulzer 49.76
Sulzer 22	CKW 4.41	<b>SBS 49.76</b>
<b>Winterthur 20</b>	<b>Helvetia 4.413</b>	<b>Winterthur 49.76</b>
<b>Motor 20</b>	<b>Motor 3.81</b>	Nestlé 48.80
Nestlé 20	Sibra 3.67	<b>Motor 47.89</b>

**1990**

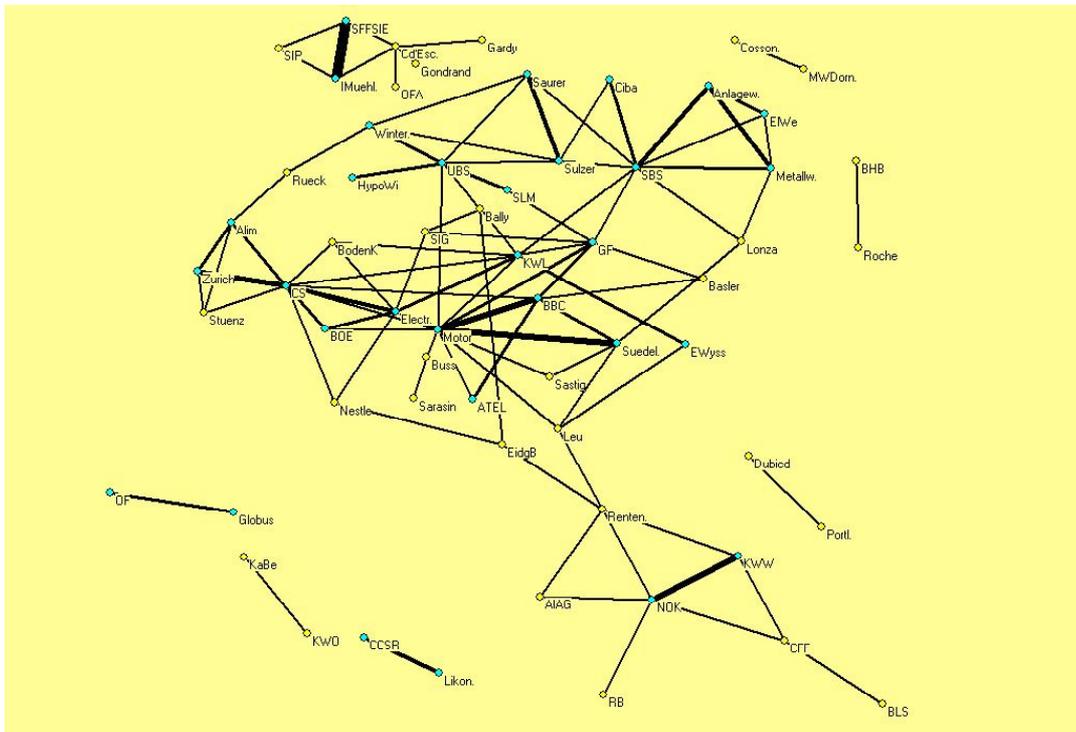
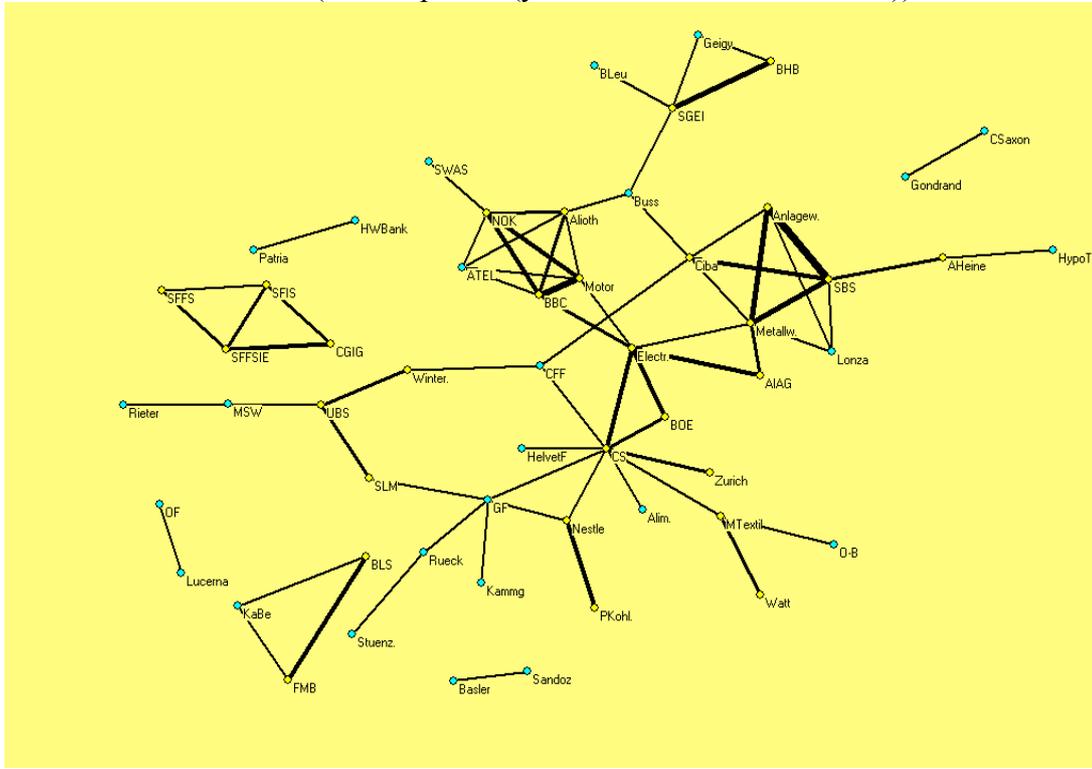
<b>Degree</b>	<b>Betweenness</b>	<b>Closeness</b>
<b>SBS 34</b>	<b>SBS 12.88</b>	<b>SBS 54.55</b>
<b>UBS 33</b>	Swissair 10.76	Swissair 53.93
Swissair 28	<b>UBS 9.74</b>	<b>UBS 53.04</b>
<b>CS 22</b>	<b>CS 5.91</b>	Alusuisse 50.53
Alusuisse 22	Ascom 3.91	<b>CS 50.53</b>
BBC 19	<b>Bank Leu 3.61</b>	Nestlé 49.49
Nestlé 18	Crossair 3.54	Cibal-Geigy 48.98
Ciba-Geigy 18	Sika 3.45	BBC 48.73
<b>Motor 17</b>	Danzas 3.16	Sulzer 47.291
Forbo 16	Electrowatt 3.16	<b>Winterthur,</b> von Roll 47.291

2000

Degree	Betweenness	Closeness
CS 16	CS 12.87	CS 38.17
Rieter 12	Dätwyler 11.43	Holcim 36.80
Sulzer 12	Sulzer 9.88	Sulzer 36.08
Nestlé 11	Holcim 9.73	Think Tools 34.59
Holcim 10	Unaxis 8.74	Rieter 34.07
Swissair 10	Private Equity 9.40	Sulzer Medica 34.07
Sulzer Medica 9	Von Roll 8.35	Swissair 33.82
Winterthur 9	Rieter 8.33	Xstrata 33.70
Xstrata 9	ABB 6.83	Bâloise 33.33
ABB 9	Zellweger Luwa 6.69	Ciba SC 33.09

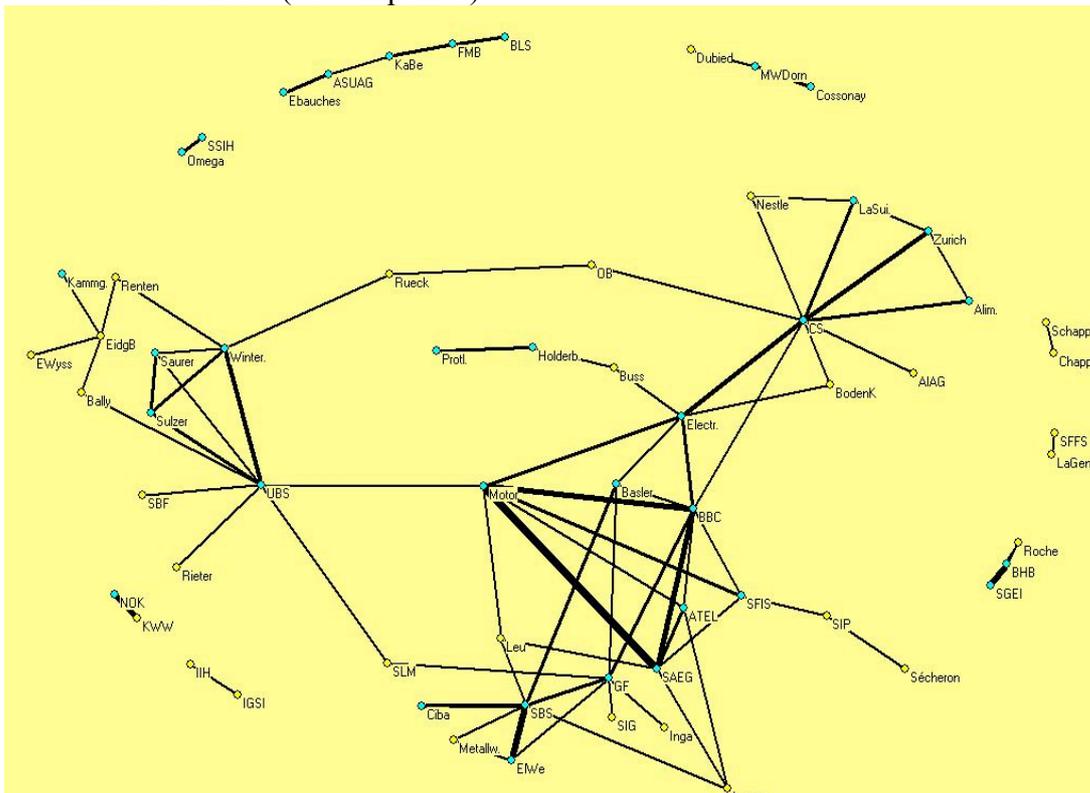
### Annex 3: 2m-cores and list of abbreviations

2m-cores in 1910 (55 companies (yellow vertices = in 3m-core))

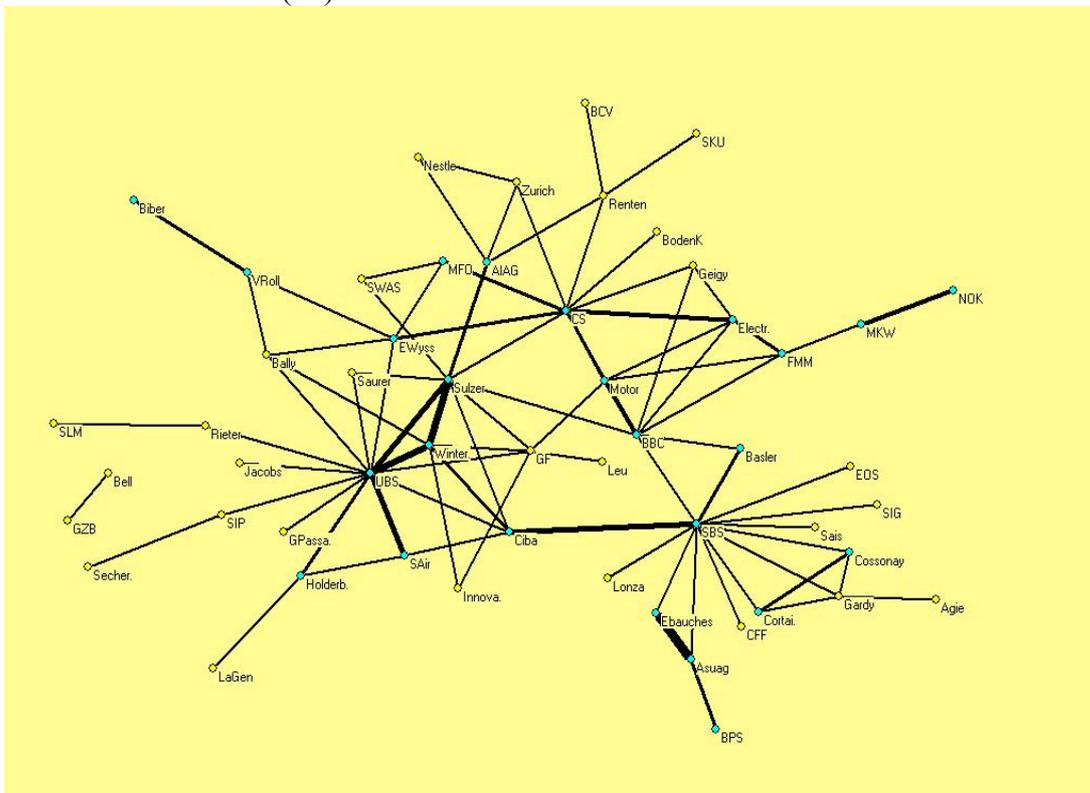


2m-cores in 1929 (62 companies)

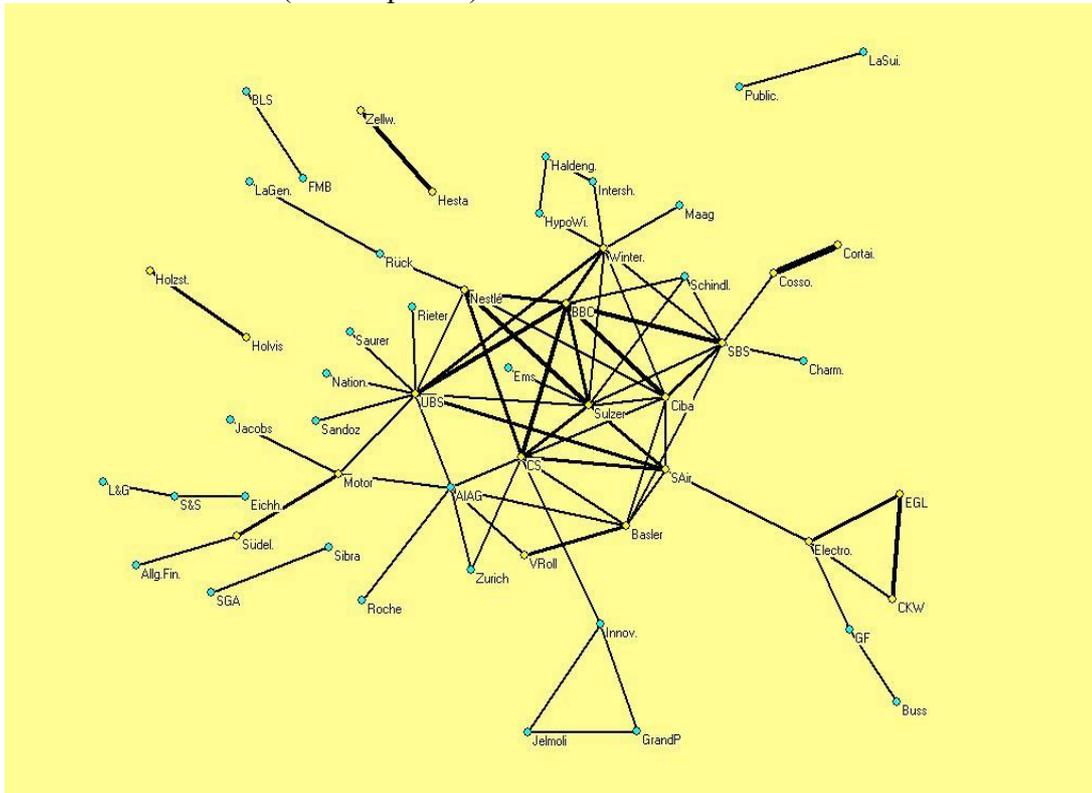
2m-cores 1937 (63 companies)



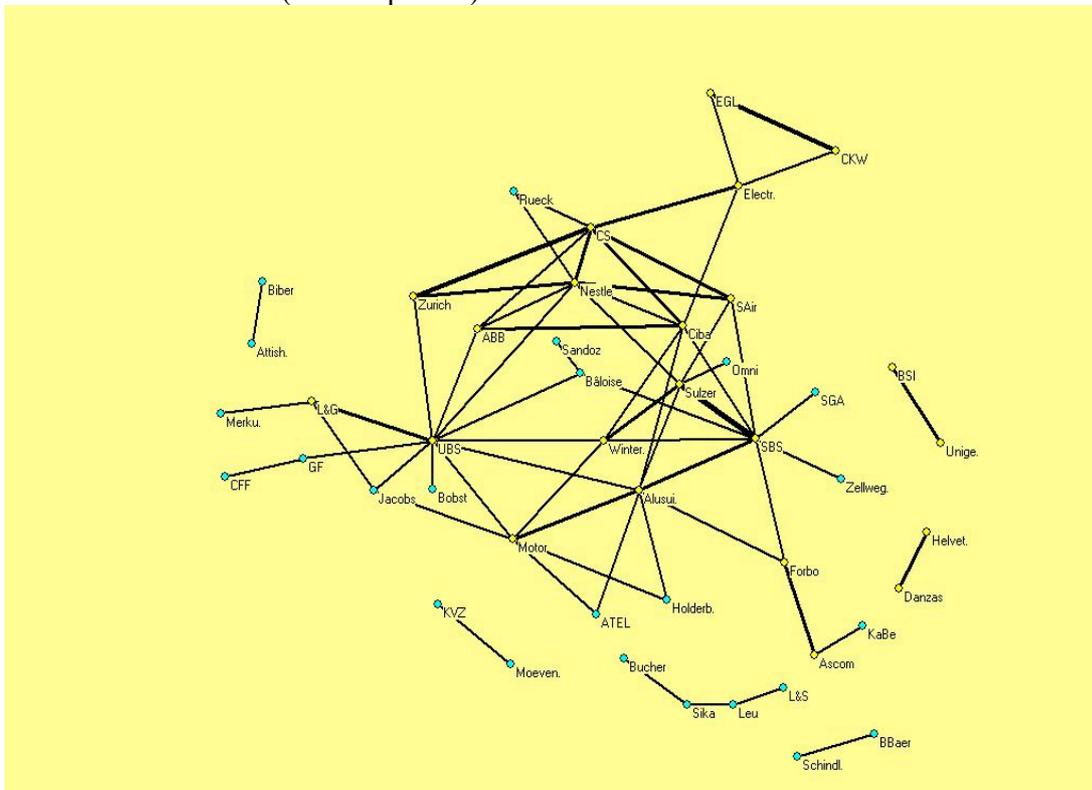
2m-cores 1957 (54)



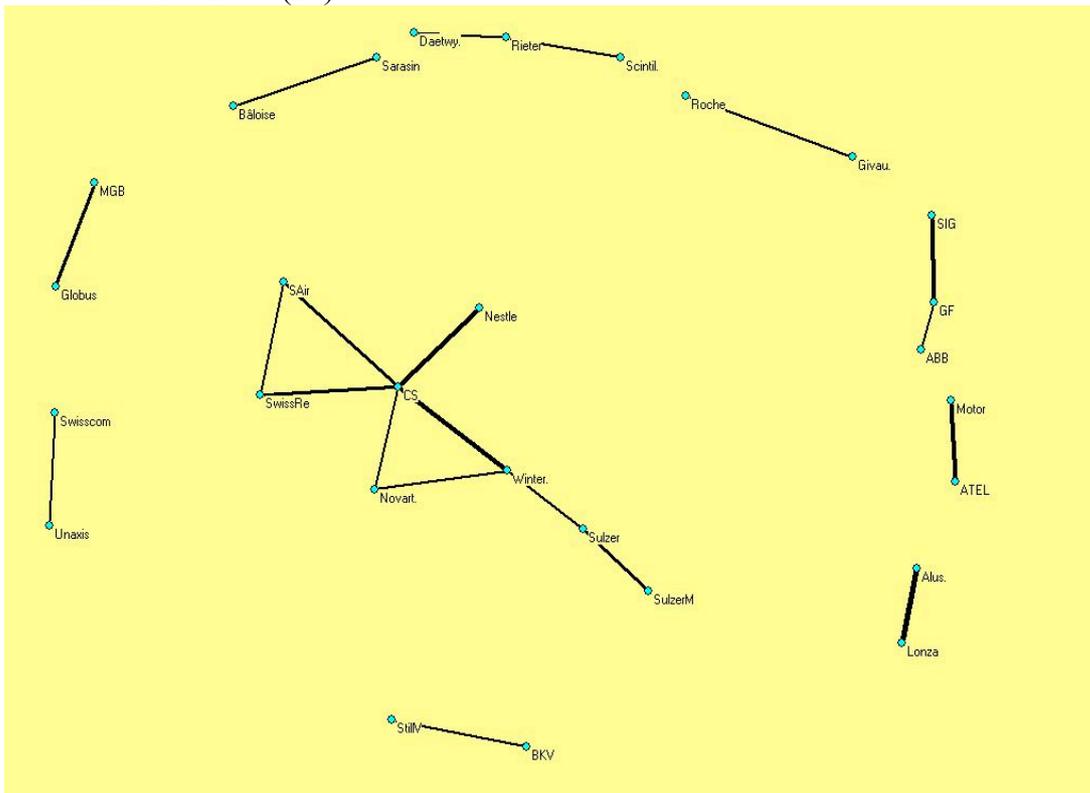
2m-cores 1980 (54 companies)



2m-cores 1990 (46 companies)



2m-cores 2000 (28)



List of abbreviations:

ABB	Asea Brown Boveri Ltd.	Kammg	Vereinigte Kammgarnspinnereien Schaffhausen und Derendingen
Agie	Agie SA	L&G	Landis&Gyr (Holding) AG
Aheine	Arnold Heine Stickerei	LaGen	La Genevoise assurance
AIAG	Aluminium-Industrie Aktiengesellschaft	LaSui	La Suisse assurance
Alim.	Alimentana	Lonza	Lonza Group AG
Alioth	Alioth	Lucerna	Lucerna
Allg.Fin	Allgemeine Finanzgesellschaft	Maag	Maag Holding AG
Alus.	Alusuisse	Metallw.	Gesellschaft für Metallwerte
Anlagew	Anlagewerte	MFO	Maschinenfabrik Oerlikon
ASUAG	Allgemeine Gesellschaft der schweizerischen Uhrenindustrie AG	MGB	Migros Genossenschafts-Bund
ATEL	Aare-Tessin AG für Elektrizität	MKW	Maggia-Kraftwerke
Bally	Bally Schuhfabriken	Motor	Motor-Columbus AG
Bâloise	Bâloise Holding AG	MSW	Mechanische Seidenstoffweberei Winterthur
Basler	Basler Versicherungs AG	Mtextil	Moskauer Textil-Manufaktur
BBC	Brown Boverie & Cie.	Nation.	Schweizerische National-Versicherungsgesellschaft
BCV	Banque cantonale vaudoise	Nestlé	Nestlé AG
Bell	Bell AG Basel	NOK	Nordostschweizerische Kraftwerke
BHB	Basler Handelsbank	Novart.	Novartis AG
Biber	Biber-Holding	O-B	Werkzeugmaschinenfabrik Oerlikon-Bührle AG
BKW	Berner Kraftwerke	OF	Art. Institut Orell Füssli AG (since 1974 Orell Füssli Graphische Betriebe AG)
Bleu	Bank Leu	Patria	Patria Versicherungen
BLS	Bern-Lötschberg-Simplon Bahn	Pkohl	Peter Kohler
BodenK	Bodenkreditanstalt	Public.	Publicitas
BOE	Bank für orientalische Eisenbahnen	Rieter	Rieter Holding AG
BPS	Banque populaire suisse	Roche	Roche Holding AG
Buss	Buss AG	Rück	Schweizerische Rückversicherungsgesellschaft
CFF	Chemins de fer fédéraux	S&S	Sprecher&Schuh
CGIG	Compagnie Genevoise de l'Industrie de Gaz	Sair	Swissair ( SAirGroup)
Cham.	Cham Industrie-Holding AG	Sais	Oel- und Fettwerke Sais
Ciba	Ciba AG	Sandoz	Sandoz AG
CKW	Centralschweizer Kraftwerke	Sarasin	Bank Sarasin & Cie
Cortai.	Cortailod	Saurer	Saurer AG
Cosso.	Câbleries et Tréfileries de Cossonay	SBS	Société de banques suisses
CS	Crédit Suisse	Schindl.	Schindler Afzüge AG / Schindler Holding AG
CSaxon	Conserves Saxon	Scintil.	Scintilla AG
Daetwy.	Daetwyler AG	Secher.	S.A. des Ateliers Sécheron
Ebauches	Ebauches SA	SFFS	Société Financière Franco-Suisse
EGL	Elektrizitätsgesellschaft Laufenburg	SFFSIE	Société Financière Franco-Suisse pour l'Industrie Electrique
Eichh.	Eichhof Brauerei	SFIS	Société Financière Italo-Suisse
Electr.	Electrowatt AG	SGA	Société générale d'affiche
Electro.	Electrowatt AG	SGEI	Schw. Ges. für Elektrische Industrie

Ems	Ems Chemie	Sibra	Sibra Holding AG
EOS	Energie Ouest Suisse	SIG	SIG Schweizerische Industrie-Gesellschaft Holding AG
Ewyss	Eschwer-Wyss AG	SIP	Société des instruments de physique
FMB	Forces motrices bernoises	SKU	Schw. Käseunion
FMM	Forces motrices de Mauvoisin	SLM	Schweizerische Lokomotiv- und Maschinenfabrik Winterthur
Gardy	Appareillages Gardy	StilV	Sillhalter Vision AG
Geigy	Geigy AG	Stuenz.	Seidenindustrie (Stünzi)
GF	Georg Fischer AG	Südel.	Südelektra Holding AG
Givau.	Givaudan SA	Sulzer	Gebrüder Sulzer AG
Globus	Magazine zum Globus AG	SulzerM	Sulzer Medica
Gondrand	Transports Gondrand	SWAS	Schw. Waggons- und Aufzügefabrik Schlieren
Gpassa.	Magasins au Grand Passage SA	Swisscom	Swisscom AG
GrandP	Magasins au Grand Passage SA	SwissRe	Schweizerische Rückversicherungs-Gesellschaft
GZB	Genossenschaftliche Zentralbank	UBS	Union de banques suisses
Haldeng.	Brauerei Haldengut	Unaxis	Unaxis Holding AG
HelvetF	Helvetia Feuer	Vroll	Von Roll Holding AG
Hesta	Hesta AG	Watt	Watt AG
Holderb.	Holderbank AG	Winter.	Schweizerischen Unfallversicherungs-Aktiengesellschaft in Winterthur
Holvis	Holvis AG	Zellw.	Zellweger AG
Holzst.	Gesellschaft für Holzstoffbereitung	Zurich	Zürich Versicherung / Zurich Financial Services
HWBank	Handwerkerbank		
HypoTG	Thurgauische Hypothekbank		
HypoWi.	Hypothekbank in Winterthur		
Innova.	Grands magasins innovation SA		
Intersh.	Intershop Group		
Jacobs	Jacobs Süswaren		
Jelmoli	Jelmoli Holding AG		
KaBe	Kantonalbank von Bern		