# Corporate networks in small open economies:

# The cases of Switzerland and the Netherlands (1910-2010)

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**Abstract**

In this paper we compare the development of the Swiss and Dutch corporate networks in a long term perspective. Switzerland and the Netherlands share some important characteristics: an open economy, the importance of multinationals and the importance of the banking sector. The latter with different features though. We gathered data for the top 75 non-financial and top 25 financial companies in eight benchmark years during the 20th en 21st century. On the basis of density (and other general characteristics) of the networks we distinguish three main phases in their developments: a period of emergence (1910s-1930s), a period of consolidation (1950s-1980s) and a period of decline (1980s-2010s). We explain the developments by the notion of governance regimes at three levels: the legal framework, national business systems, and dominant ideology.

## 1. Comparing small countries in a historical perspective

In a seminal work, Katzenstein (1984 and 1985) has argued that small European states, largely because of the small size of their domestic market and the early extroversion of their economies, developed some specific traits to cope with their international environment: international liberalization, domestic compensation and flexible adjustment to fluctuations in international markets through corporatist institutions. Even if Katzenstein focused mainly on industrial policies, it is also plausible to identify specific characteristics of corporate governance mechanisms in small European states, which take their origins in their economic development (for more details, see David and Mach 2003 and 2006).

Katzenstein stressed that during the post-World War II period these countries favored a free trade policy orientation at the international level, because of the early extroversion of their economies and their dependence on exports and imports. But, and this is one of the central argument of Katzenstein, "the liberalism of the small European states is […] "embedded" in a set of policies of domestic compensation. Far reaching policies of international liberalization can lead to severe social dislocations. Domestic compensation reduces these dislocations and both permits and requires the adoption of flexible policies of industrial adjustment. Industrial adjustment is thus embedded in a broad array of political responses that link liberalization and compensation." (Katzenstein 1985: 78). Corporatist institutions and domestic compensation were two central elements to characterize the way small states cope at the domestic level with their structural position in the international environment. First, "accommodative arrangements", consociative democracies, negotiation, concertation, compromise, consensus, all of these terms refer to the central importance of the "cooperative dimension" among the political and economic elites of these small countries (for more details, see Katzenstein 1985: 87 ff.). Second, domestic compensation refers notably to the size of the public sector, social policies and expenditures and to the "industrial policies" followed by these countries to soften their adjustment to international market fluctuations. Of course these two dimensions should not be understood in a too functionalist way, because they are shaped by national economic, political and institutional characteristics (Mach 2006).

If we extend these two structural dimensions of corporatist institutions and domestic compensation more specifically to corporate governance mechanisms, it is plausible to identify a kind of "elective affinity" between the general functioning of small European economies and the characteristics of corporate governance mechanisms. Some authors have already made a similar statement about the correlation between the existence of corporatist institutions and the high density of interlocking directorships, but without trying to highlight the mechanisms, which may explain this parallelism. For example, Ziegler (1985: 280), in the concluding chapter of a comparative book on interlocking directorates, underlines that "there is some indication that these variations in intercorporate structure are associated with broader societal differences which have been discussed in the literature on corporatism. […] It is an interesting fact calling for further clarification that precisely those four countries having the least centralized networks of interlocking directorships (France, Great Britain, Italy and the USA) also show the weak forms of corporatism […].” Windolf and Nollert (2001) also stressed the fact that the characteristics of interlocking directorates (high density of cross-shareholdings and personal interlocking directorates) correlate with the structures of economic interests associations.

Two elements seem particularly important to explain the specificities of corporate governance mechanisms in small European states: the small size and the high degree of cohesion of the business community and the introduction of measures of “selective protectionism” (David and Mach 2003). First, small European states show a high density of intercorporate networks of the business elites. Schröter (1999), focusing on the degree of cartelization in small European economies, emphasized the same argument, by underlining the close links between economic elites of the small European states: “In each nations they developed a *manière de voir*, or what could be defined as a mentality as to the proper way of doing business, and a social consensus on how to proceed in economic matters. Such *manière de voir* very much included a role for the state, for as scholars have pointed out, in small nations “private and public sectors have had to find ways to collaborate” even more intensively than in a case of larger nations. Such collaboration encouraged economic concentration and cartelization. (…)” (Schröter 1999: 192). Schröter suggested the concept of “cooperative capitalism” in order to characterize the small developed European nations.

Second, these small European countries, despite their preference for a liberal trade order at the international level, also introduced various elements of “selective protectionism” (on this notion, see David and et. 2008) in order to reduce world markets pressures on specific economic sectors.[1] These forms of “selective protectionism” protected the export oriented sectors and their larger companies through the establishment of specific regulations concerning company law and financial markets. These characteristics, such as complex voting rights structures or takeover defenses, allowed the owners in small European economies to preserve an

[1] This argument has often been used to explain the “dualist structure” of small European economies, with on one side export oriented sectors, very competitive on international markets, and on the other side, sectors producing mainly for the domestic market, which are largely sheltered from international competitive pressures through subzidiation (agriculture or fishing industries), national technical norms or cartelization of domestic producers (see Müller 2008).

"insider control" over their large export oriented companies. These measures, by restricting the diffusion of ownership and the belonging to firms' boards, also contributed to the formation of dense networks. Moreover, these dense networks, which reinforced the cohesion of the economic elite, favoured the introduction of these measures.

In this perspective, the comparison of the Netherlands and Switzerland seems particularly interesting. According to Katzenstein, these two countries can be considered as "liberal corporatist countries", characterized by strong, internationally oriented business associations and a relatively decentralized and weak labour movement. In a recent article comparing the evolution of the corporate networks in the two countries in 1990 and 2000, Heemskerk and Schnyder (2008) put forward two interesting points, underlying the important similarities, but also some differences between Switzerland and the Netherlands. First, in line with the argument presented above, both countries had in 1990 dense and comprehensive corporate networks (see also Stokman and Wasseur 1985 for a comparison of the network in 1976 and Nollert 2005). Second, during the last decade of the 20$^{th}$ century, the decrease in interlocking was stronger in Switzerland than in the Netherlands. Differences in the role and functioning of financial institutions in the two countries explained part of this contrasting evolution during the 1990s: "Switzerland resembles the German system with a number of large and powerful universal banks that are active both in corporate lending and financial market transactions. No such system existed in the Netherlands, at least until the 1900s, and Dutch banks more closely resembled Anglo-Saxon banks, whose relationships with non-financial companies are more diffuse." (Heemskerk and Schnyder 2008: 45). Therefore, the disinvestment of banks from their role in industrial companies noticed in several developed countries during the 1990s (see Davis and Mizruchi 1999 for the US case and Beyer 2002 for Germany) had a more profound effect on the corporate network in Switzerland than in the Netherlands. However, these studies (Heemskerk and Schnyder 2008; Stokman and Wasseur 1985; Nollert 2005) which compare the corporate networks in these two countries tend to describe the state of corporate governance since the 1980s and neglect historical changes within national governance systems (see Herrigel 2007 for a similar argument). In this perspective, the first two decades of the 20th century seem particular important in the emergence of national corporate governance systems which will last until the two last decades of the 20th century (see for example Fear and

Kobrak 2006). In a comparison between the corporate networks in the United States and Germany between 1896 and 1938, Paul Windolf emphasized the importance of this period: In Germany, the corporate network was expanded after the First World War parallel to the increasing cartelization of the economy. In the Unites States, it was demolished step by step in the wake of the passage and enforcement of antitrust laws. These two historical lines of development—the strengthening of 'cooperative capitalism' on the one side, and the development of 'competitive capitalism', on the other—can be followed down to the present (Windolf 2009: XXX).

It is the reason why we decided to compare the evolution of the corporate networks in Switzerland and the Netherlands during the whole 20th century and the first decade of the 21st century. Therefore, this article departs from other studies on interlocking directorates. The studies on the evolution of corporate networks in a long-term perspective generally focus on one country (see for example Vasta and Rinaldi 2005 and 2010 on Italy). The articles which compare corporate networks tend to be restricted to one or two benchmarks (Stokman et al. 1985; Musacchio and Reid 2007). The two exceptions are the study of Paul Windolf (2009) on Germany and the United States between 1896 and 1938 and the article of Dritsas et al. (1996) on Austria, Greece and Sweden during the interwar period. But these two articles did not deal with the second half of the 20th century.

This long-term comparison is all the more interesting because the similarities which characterized Switzerland and the Netherlands at the end of the 20th century – economic openness; internationalization of the business – were present during the long 20th century. First, in comparison with large developed countries, such as France, the United Kingdom or the United States, Switzerland and the Netherlands displayed since the 19th century a high dependence on foreign markets which lasted until the end of the 20th century (Table 1).

**Table 1. Economic openness of the Netherlands and Switzerland in a comparative perspective (foreign trade in % of GDP)**

| | Goods | | | | Goods and service | | | |
|---|---|---|---|---|---|---|---|---|
| | 1913 | 1928 | 1938 | 1958 | 1974 | 1982 | 1990 | 1998 |
| Switzerland | 66 | 49 | 33 | 46 | 63 | 67 | 71 | 76 |
| Netherlands | 120 | 74 | 47 | 73 | 103 | 110 | 109 | 120 |
| France | 31 | 32 | 19 | 18 | 42 | 46 | 44 | 50 |
| United Kingdom | 60 | 49 | 29 | 35 | 59 | 51 | 50 | 54 |
| United States | 11 | 10 | 6 | 7 | 17 | 18 | 21 | 24 |

Source: Müller (2012)

Moreover, both countries were characterized by the importance of multinationals in their economy (table 2). On the eve of the First World War, Switzerland hosted thus 29 multinationals (Schröter 1993: 31). The importance of this internationalization seems to have appeared later (during the interwar period) in the Netherlands. In 2010, four Swiss financial enterprises are ranked among the top 50 financial transnational corporations and five non-financial societies among the world's top 100 non-financial transnational corporations. In the Netherlands, these numbers are, respectively, two and three (UNCTAD 2011.).

**Table 2. Outward Foreign Direct Investment stocks per capita (million of dollars at current prices)**

| | 1913 | 1938 | 1960 | 1975 | 1985 | 1995 | 2010 |
|---|---|---|---|---|---|---|---|
| Switzerland | 700 | 570 | 420 | 3500 | 7000 | 20237 | 118074 |
| Netherlands | 320 | 550 | 610 | 1460 | 3020 | 11148 | 53418 |
| France | 230 | 90 | 90 | 200 | 390 | 3516 | 24127 |
| United Kingdom | 440 | 480 | 240 | 660 | 1850 | 5201 | 27065 |
| United States | 40 | 90 | 180 | 580 | 1050 | 5190 | 15469 |

Source: 1913-1985: Bairoch 1990, p. 115; 1995-2010: FDI: UNCTAD, World Investment Report 2011 (www.unctad.org/wir); Population: 1995: http://unstats.un.org/unsd/demographic/products/dyb/DYBHist/HistTab01.pdf; 2011: http://unstats.un.org/unsd/demographic/products/socind/population.htm

There are however some differences. As underlined by Heemskerk and Schnyder (2008), the financial sector had very different features. Since the end of the 19th century, large Swiss banks could be described as universal banks and played a very important role in the Swiss economy (Guex et al. 2012). During the 19th century the Dutch banking sector had developed very differently. The Dutch banks were hardly involved in financing industry; instead they focused on trade financing. They started to play an important role in the financing of industrial growth only in the beginning of the 20th century.

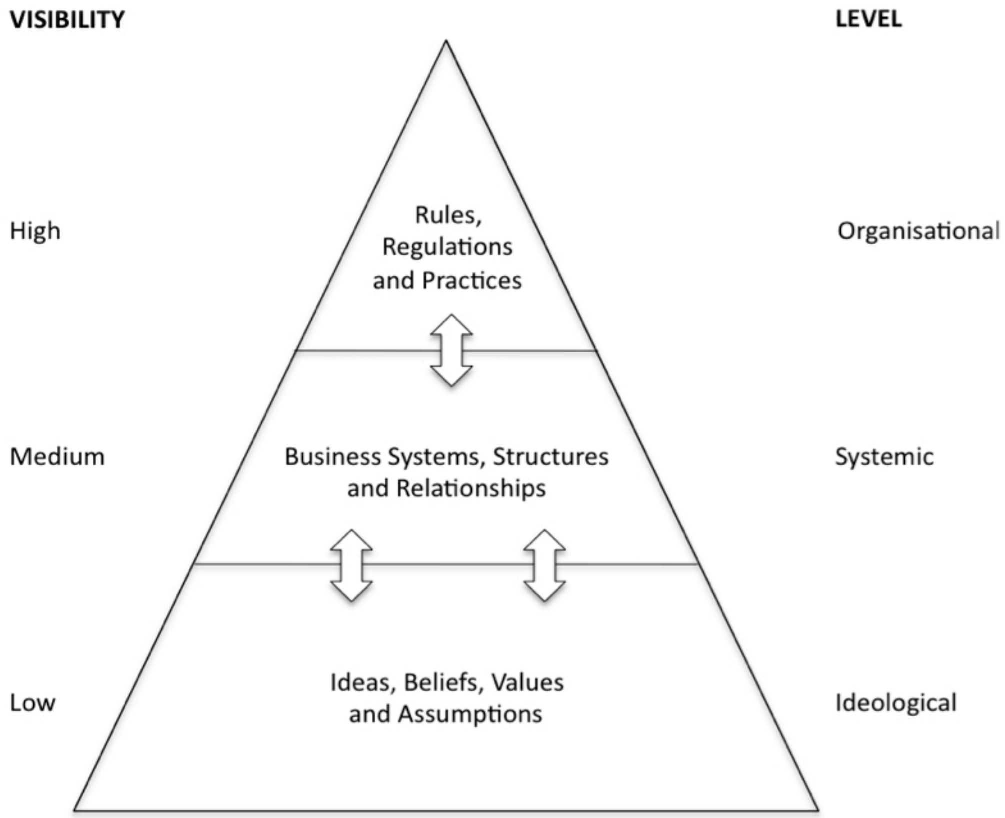
These differences could play an important role on the evolution of the corporate network of these two countries (already underlined for the 1990's by Heemskerk and Schnyder 2008). In the literature on interlocking directorates, two interpretations predominate on the role of banks in the corporate network (Scott 1985; Mizruchi 1996). First, 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. Second, class cohesion model emphasizes reciprocal relationships between banks and industry, where coordination, not dominance, is the prevailing mode of interaction: bank – industry ties are mutual rather than directed from the former to the latter. This 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.

## 2. A framework for comparing corporate networks in the long run

In order to compare the evolution of the corporate networks in Switzerland and the Netherlands during the 20th century, we propose the notion of governance regimes (Maclean 2002; Maclean et al. 2006). National governance regimes might be thought of as existing at three levels, each interrelated (see figure 1):

2.1. **Legal framework**: Legal institutions are important features of the governance regime (La Porta et al. 1999; for a critic of the "law and finance" approach, see Armour et al. 2009). In this article, we will in particular turn our attention to the legal measures of "selective protectionism".

Figure 1. Governance Regimes




Source: MacLean (2002).

2.2. **National Business systems**: This level includes the structure of the business system and the relationships between enterprises. It could be closely related to the five models which Scott's (1985) described in order to analyze the functions and effects of interlocking directorships: 1) financial capital model, 2) coordination and control model, 3) resource dependence model, 4) managerial model and 5) class-cohesion model (see also Mizruchi 1996). Concerning Switzerland and the Netherlands, two topics are particularly important: the role of the financial sector and the degree of internationalization of the enterprises.

2.3. **Dominant ideology**: Even if they are more difficult to circumscribe, underlying ideologies, beliefs and deeply held values among elite play an important role in the organization and structure of a national business system. Hall's (1993) concept of policy paradigm draws a distinction between different levels of beliefs. He sees a policy paradigm as a set of ideas, which structures a given field and which implies a hierarchy of policy goals as well as a causal theory on how different instruments allow one to achieve these goals. In fact, actors face considerable uncertainty not only concerning the outcomes of a certain political or economic action but also concerning the environment in which they interact (Hall 2005: 142ff). Cognitive constructs allow them to simplify the reality and help understand and interpret the societal reality. It is this causal theory, which will ultimately determine what policy position (or economic preference) an actor will adopt (on the importance of ideas on Swiss corporate governance, see Schnyder 2008).

Two points could be mentioned concerning the dominant ideology. First, the latter is very often stable and powerful. However, under critical circumstances a dominant ideology can be displaced by an heterodox discourse opening the way for policy change. In this sense, the decline of interlocking directorates at the end of the 20th century in some European countries was driven by the emergence of a (neo)liberal ideology among some elite (for Switzerland, see David et al. 2011). Second, networks, in particular of interlocking directorates play a very important role in the consolidation of a dominant ideology (Lehmbruch 2001: 42).

In Switzerland and the Netherlands, the dominant economic ideology during the 20th century displays two features: first, preferences for coordinated market regulation and, second, preferences for a liberal trade order at the international level and the introduction of elements of "selective protectionism"

## 3. Data, methods and descriptive results

In our analysis of the Swiss and Dutch interlocking network, we used a sample of the 100 largest companies for eight dates in the 20th century.[2] The choice of the eight dates was made so as to take into consideration different stages in the economic history of both countries. But it was also, in the case of Switzerland, influenced by the availability of data. In fact, for most of the 20th 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 published at irregular intervals. We chose one date before World War I (1910/1913), two dates in the Interwar Period (one before the Great Depression (1929/1928) and one on the eve of World War II

[2] Some network indicators (in particular density) are 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 the same size. By choosing a comparative sample of firms, we depart from Heemskerk and Schnyder 2008 who selected 106 firms for Switzerland and 250 for the Netherlands. The different size of the samples could imply some bias.

(1937/1938)). For the post-war period we selected 1957/1958, 1980/1978, 1990/1988, 2000/1988 and 2010/2003.

The selection criteria that we utilized to establish the list of the largest Swiss firms for the eight years are different for the historical and the more recent periods. At the beginning of the 20th 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 capitalization 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 20 largest companies. To the largest banks and insurance companies, we add the largest finance companies. We also 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 25 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. With the combination of these different criteria, we obtained a sample of approximately 110 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 100 firms for our analysis.

For the most recent period, we chose our sample mainly on the criterion of market capitalization (75 industrial and service), and we added the 20 largest banks, finance companies and 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[3] 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

[3] Since financial figures are very scarce for private banks, we cannot be completely sure that we have been able to choose the largest ones.

the criterion of market capitalization (especially private companies)[4]. This left us with a sample of approximately 105 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 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 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). 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$^{th}$ 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).

In contrast to Swiss firms, Dutch firms are characterized by a two-tier board system, consisting of an executive and a supervisory board. For each firm we collected the names of the executives and supervisors in the eight benchmark years.

[4] For a discussion of the selection criterion of turnover and a combination of different criteria, see Nollert 1998.

For each year we picked the top 50 listed Dutch firms and the top 25 listed and non-listed banks. The selection was made on the basis of total assets, except for the banks in the period up to 1958 in which period the selection was based on the nominal value of the equity capital. We excluded the companies active in tea, coffee, tobacco, sugar, and rubber mainly active in the former colony of Indonesia. These companies formed more or less a network of their own. This colonial network and its decline after the Second World War have already been described by Baudet and Fennema among others (Baudet and Fennema 1983).

We gathered interlock data using *Van Oss Effectenboek* for the first four benchmark years, and annual reports for the period 1978-2003. Information of the banks' boards was selected by the *Financieel Adresboek* for the period 1913-1958 and annual reports for the period 1963-2003.

## 3.1. General characteristics of the Swiss and Dutch company network 1910-2010

Inspired by the work of Mizruchi (1982), Scott and Griff (1984) and Windolf (2009), we analyze both networks from a historical long-term perspective. In this section, we provide a descriptive analysis of the main features of the networks during the 20th century. We considered different aspects. First of all, we used global measures to capture the general topography of the network (in particular density; for other indicators, such as connectivity, average geodesics, average degree, etc., see the table in Appendix I). We then evaluated the centrality of individual firms, paying particular attention to the position of banks.

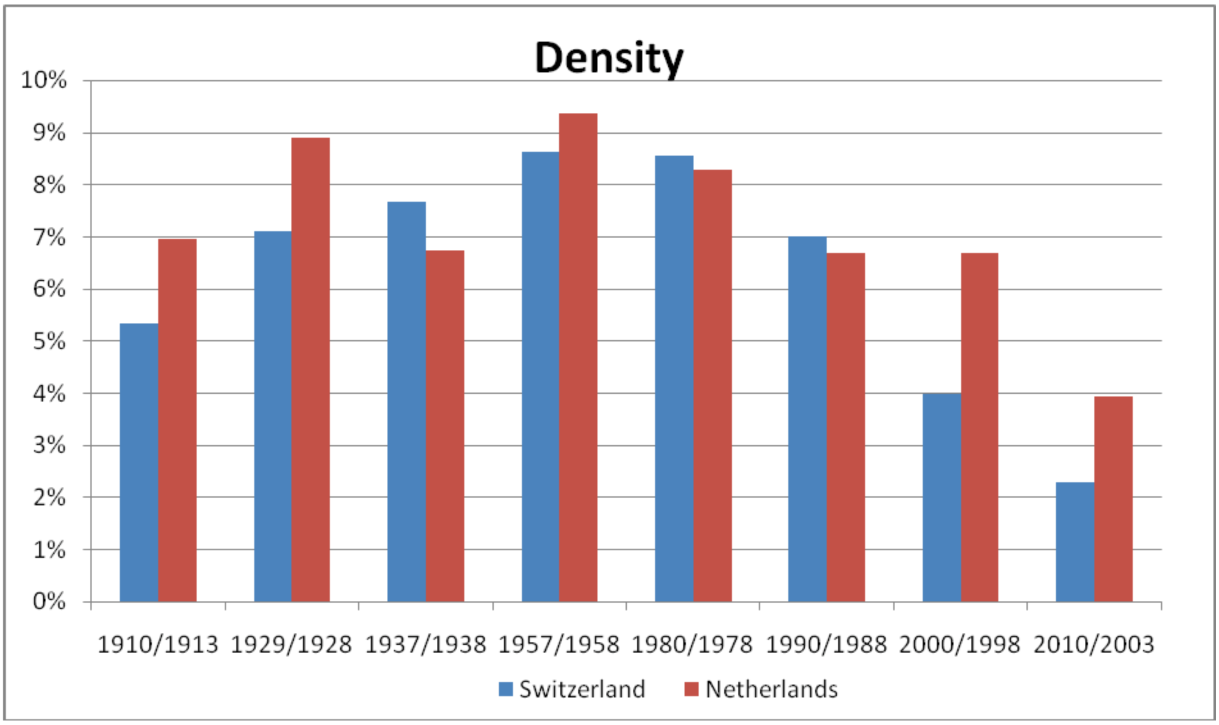
### *3.1.1. Network density*

We calculated the density measure for the whole network ("socio-centric density", Scott 2000). Density is a measure that captures the idea that more ties between firms causes a tighter and more cohesive structure. Overall *network density* measures the number of observed lines in the network as a proportion of the theoretical maximum of lines[5]. For example, a density of 0.051 means that 5.1% of all possible lines are present.

[5] i.e. n(n-1)/2, where n is the number of nodes in the network.

The evolution of the overall density of the Swiss corporate network visibly shows that the network grew markedly 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 until 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 1929 and 1980 from the phase prior to 1929 by the fact that the very 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 1937, 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.

Figure 1: Overall density of the Swiss and Dutch company network




More or less the same phases in the development of the Dutch corporate network can be distinguished. First, the 1910s and 1920s show the beginning of a network formation when density increased from 6.9% to 8.9%, but this development was interrupted by the 1930s, when density felt back to 6.8%. Then, in 1958 density reached its highest point (9.4%), after which it stabilized until the 1980s. Since the 1980s density has steadily declined to only 3.9% in 2003, the lowest point ever. Compared to the Swiss network, however, this decline of the corporate network went much slower. The 1990s showed a period of little change, and only in 2003 the network's density showed a significant decline.

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 until the 1930s, the phase of continuing integration and relative stability up to 1980, and the phase of decline after this date. In the analysis we will bear in mind two important differences between the two networks: the disruption in the development of the Dutch network in the 1930s and the slower pace of decline of the Dutch network in the 1990s.

### ***3.1.2. Actor centrality***

Apart from this general network characteristic, 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). *Degree centrality*, or Freeman degree, is the most intuitive and least sophisticated measure of actor centrality. It simply counts 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.

The Swiss network

The main conclusion concerning centrality is the dominance of the three largest banks until the last decade of the 20th century. From 1910 up to 1990, Crédit Suisse (CS), UBS and SBS continuously remained in the top ten[6]. It is interesting to observe that by 2010 none of the two largest banks (SBS and UBS merged in 1998) had kept its central position. These findings put forward the centrality of the banking sector in the Swiss economy and the decline in bank centrality during the last three decades. With the inclusion of these finance and insurance companies, the ranking of the most central companies in the sample shows, for the greatest part of the century, a very clear overrepresentation of the financial sector among the ten most central companies according to Freeman degree, betweenness and closeness centrality (see table 1 below, where firms of the financial sector are in grey, and Annex 2)**.** At the beginning of the 20th 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. These finance companies were created at the end of the 19th 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 mobilized over a long period of time before any returns could be generated. The size of some of these finance companies was substantial. These finance companies were important links between large banks and industrial companies (Paquier 2001). In Switzerland, the finance sector could thus not be restricted to large banks (see also Mazbouri 2005).

The centrality of the financial sector grew even stronger over the next two decades: by 1929, eight of the ten most central companies were financial companies (4 banks, 2 insurers and 2 finance companies). The overrepresentation of the financial sector reached thus its peak in 1929. From 1937 onwards, the dominance of the financial sector in the ranking of the most central companies began to slowly decline. In 1937, there were seven financial corporations in the degree ranking and five in 1957. By 1980, there were five financial companies in the top ten and by 1990, the centrality of financial corporations had further diminished: there were only four of

[6] Except for 1937 where UBS (founded in 1912) is missing among the top ten companies.

them. Finally, in 2000, only two financial corporations were ranked and there two ten years later: two insurance companies and no banks

Table 1: Top ten Swiss companies according to Freeman degree centrality

| **1910** | **1929** | **1937** | **1957** | **1980** | **1990** | **2000** | **2010** |
|---|---|---|---|---|---|---|---|
| CS 25 | BBC 29 | SBS 32 | SBS 37 | UBS 36 | UBS 35 | CS 16 | Holderbank -Holcim 11 |
| Georg Fischer 22 | Motor-Columbus 27 | Rentenanstalt 27 | UBS 36 | Swissair 35 | SBS 31 | Swissair 15 | Nestlé 10 |
| Elektrobank 22 | SBS 25 | CS 26 | CS 35 | BBC 31 | Swissair 27 | Rieter 14 | Rieter 9 |
| CFF 22 | Georg Fischer 22 | BBC 24 | Sulzer 33 | SBS 30 | CS 23 | Nestlé 13 | Swiss-Re 8 |
| Ges. für Anlagewerte 17 | Elektrobank 22 | Elektrobank 24 | BBC 28 | CS 29 | Alusuisse (AIAG) 23 | Sulzer 13 | Syngenta 8 |
| Alioth 16 | UBS 22 | Motor-Columbus 24 | Georg Fischer 26 | AIAG 28 | BBC 21 | ABB 11 | Sika 8 |
| Motor-Columbus 16 | CS 21 | Sulzer 23 | Motor-Columbus 26 | Sulzer 24 | Nestlé 19 | Holderbank -Holcim 11 | Georg Fischer 8 |
| SBS 16 | Winterthur 21 | SF Italo-Suisse 22 | Swissair 25 | Winterthur 22 | Ciba-Geigy 19 | Winterthur 9 | Rentenanstalt 7 |
| SF franco-suisse pour l'ind. élect. 16 | Bank Leu 21 | Basler Leben 21 | Winterthur Leben 22 | Rieter 22 | Motor 18 | Sulzer medica 11 9 | Zürcher Ziegeleien-Conzzeta 7 |
| FM Beznau 15 | Rentenanstalt 20 | Georg Fischer 21 | AIAG 21 | Motor-Columbus 21<br>Nestlé 21 | Forbo 17 | Cstra Bâloise, GF, Sika, 10 | Adecco 7 |

The Dutch network

Before the First World War railway, tram, shipping, oil and mining companies were important sectors of the Dutch economy. This is reflected in the top 10 firms according to degree centrality. In 1913, six of them are shipping and oil companies, the other four are financial companies. The emergence of a national network between the 1910s and the 1920s was accompanied by an increasing role of banks. This is shown at the end of the 1920s when five banks are in the top 10 ranking. As we have seen calculating the density of the network, the 1930s formed an interruption in the Dutch network's development. This interruption is also shown by a diminishing degree of the most central banks (See top10 in 1938 compared to 1928). Only after the Second World War and more precisely since the 1960s the centrality of the financial sector increased significantly again. The banks still dominates the top 10 degree rankings of 1978, 1988 and 1998. However, their individual centrality has slowly declined since the 1980s. For example ABN Bank's degree diminished from 34 in 1978 to 24 in 1988. The degree of AMRO Bank shows a similar pattern, a decline from 33 to 27 between 1978 and 1988. After the merger between the two banks into ABN AMRO in 1990, its degree declined to 24 in 1998. In 2003 only three banks are left in the ranking. ABN AMRO is not one of them which marked a true change with the past as ABN AMRO and its predecessors were always overrepresented in the top 10 by degree centrality. Interestingly three service companies are in the ranking of 2003: air line company KLM, a grocery Ahold, and a publishing company Wolters. This reflects the general developments in the Netherlands, which showed a growing importance of services during the last thirty years.

Table 2: Top ten Dutch companies according to Freeman degree centrality

| **1913** | **1928** | **1938** | **1958** | **1978** | **1988** | **1998** | **2003** |
|---|---|---|---|---|---|---|---|
| Ned.-Am. Stoomvaart Mij (26) | Koninklijke Holl. Lloyd (31) | Koninklijke Paketvaart Mij (26) | Hoogovens (39) | ABN Bank (34) | NIB (28) | ABN AMRO (24) | KLM (14) |
| NHM (26) | NHM (31) | DNB (25) | STORK (29) | AMRO Bank (33) | AMRO Bank (27) | Hoogovens (22) | Royal Dutch Shell (13) |
| Stoomvaart Mij. Nederland (25) | Koninklijke Paketvaart Mij (28) | NHM (22) | NHM (29) | Hoogovens (23) | Hoogovens (24) | NIB (20) | HEINEKEN (12) |
| Royal | DNB (28) | Werkspoor | DNB (28) | Ogem | ABN Bank | AEGON | ING Groep |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dutch Shell (23) | | (21) | | Holding (22) | (24) | (18) | (12) |
| Koninklijke Holl. Lloyd (22) | Ned.-Am. Stoomvaart Mij (27) | Amsterdamsche Bank (21) | Ned.-Am. Stoomvaart Mij (27) | NIB (22) | AKZO NOBEL (23) | Ahold (17) | Ahold (11) |
| Amsterdamsche Bank (21) | Werkspoor (27) | Royal Dutch Shell (21) | AKU (25) | STORK (19) | STORK (21) | Royal Dutch Shell (17) | DNB (10) |
| DNB (21) | KNSM Groep (26) | Stoomvaart Mij. Nederland (20) | Royal Dutch Shell (24) | AKZO NOBEL (18) | Royal Dutch Shell (17) | HEINEKEN (16) | AEGON (10) |
| Koninklijke Paketvaart Mij (20) | Amsterdamsche Bank (26) | Wilton-Fijenoord (18) | Koninklijke Paketvaart Mij (24) | KLM (18) | WESSANEN (16) | STORK (16) | PAKHOED / VOPAK (9) |
| KNSM Groep (19) | Twentsche Bank (22) | Incasso Bank (18) | Stoomvaart Mij. Nederland (24) | Koninklijke Nijverdal - Ten Cate (17) | NMB (15) | ING Groep (15) | WOLTERS (9) |
| Robaver (18) | Nationale Bankvereeniging (21) | Twentsche Bank (18) | Twentsche Bank (24) | Pierson, Heldring & Pierson (17) | Heineken (14) | WOLTERS (14) | AKZO NOBEL (8) |
| 22.1 | 26.7 | 21.0 | 27.3 | 22.3 | 20.9 | 17.9 | 10.8 |

The general indicators of network cohesion and actor centrality presented in the previous section put forward two points. First, it is possible to distinguish three periods in the evolution of the Swiss and Dutch networks. There was indeed a phase of emergence of both national networks between the 1910s and 1920s, as denoted by the very strong increase in network density and other measures of network cohesion. The second phase from 1930s up to 1980s was marked by a relative stability of the networks, 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. One striking difference appeared however: the Dutch network showed an interruption in the 1930s whereas the Swiss network consolidated further. From 1980 on, and even more so from 1990 onwards, the network started to disintegrate and by 2010, the Swiss company network had metamorphosed in a very significant manner: multiple ties

were rare and the inclusiveness of the network had sharply declined. The Dutch network also started disintegrating in the 1980s but at a much slower pace and with a real metamorphose only in 2003. Second, the different indicators of centrally show that the finance sector played a very important role during the whole period.
In the following discussion, we scrutinize these three stages in the history of the Swiss and Dutch company networks 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.

## 4. Explaining the evolution of the networks

### 4.1. Emergence of a national network (1910s-1930s)

During this period, national corporate networks emerged in both countries. Several interrelated factors contributed to this evolution. First, the increasing involvement of national banks in financing industry; second, the shift from regional networks to a national inter-company network; third, the growing size of firms and, in particular, the huge increase in the number of public listed companies. The Depression of the 1930's marked a sharp difference between the evolution of the corporate networks in Switzerland and in the Netherlands. In the former country, the network was marked by stability (and even a further consolidation) whereas in the latter the network showed an interruption during this period. This contrasting evolution can be explained by the very different role of the banks in the financing of industry and more generally, in the relations between the finance sector and the industrial sectors.

A. Switzerland

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.

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 for example the result of collaboration between AEG (a German company form the energy sector), *Deutsche Bank* and *Crédit Suisse*. 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 characterize 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 (Guex et al 2011). 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 20th 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 characterized by the manifest instability of the international financial layout. Owing to these trump cards, the Swiss financial centre was able to specialize 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.

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. On the one hand, the number of public listed companies increased considerably during the thirs third of the 20th century (See Lüpold 2008). On the other hand, in 1910, there existed some regional networks (Basle, Zurich, Winterthur; Geneva), often dominated by clusters of family firms (for Basle, see Sarasin 1998). During the interwar period, these regional networks did not completely disappear but began to be interrelated at the national level. 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 (See David et al. 2009). Moreover, the density of the network is also related to the way competition is regulated: corporate network, cartel and trust are institutional forms in which market actors can coordinate their actions and control competition in the market (Windolf 2006 and 2009). The period 1910-1920, and in particular World War I, gave a great impulse to the creation of cartels in Switzerland: almost as many cartels were formed during this period as during the period 1840-1910 (David et al. 2011). The cartelisation of the economy thus paralleled the densification of the corporate network after 1910 (for case studies, see Cortat 2009 and 2010).

During the 1930's, even if some of the large banks and some export industries were hit by the Great depression (Müller 2010), the intercoporate network did not shrink. Several reasons explain the further consolidation of the network. First, the process of concentration within the banking sector during the 1930's and the increasing coordination among the finance sector led to a slow growth of the intrasectoral density within this sector (David et al. 2009). Second, during the 1930's, the Swiss industry relied less on external finance (issuing of corporate bonds; bank loans) and more on self-financing (Golay 1941; Lüpold 2008). However, the activities of bankers on non-bank boards was not restricted to monitor the firms for which they issued securities. The dividend policy - the major banks, as the main responsible for the Swiss stock exchanges, had a genuine interest in keeping the share price of major companies at stable (but not necessarily high) levels – and more important the Swiss proxy voting system[7] explained why the reduction of the transactions between the finance sector and the industrial sectors did not lead to a diminution of the density of the network as in the Netherlands. Third, some industrial sectors even intensified their ties with banks. The watch and clock industry experienced indeed a major crisis during the 1920s and 30s, which made necessary the intervention of banks and of the state. In turn, this intervention led to a strong cartelization of this industry during the 1930's (Boillat & Noyer 2009; Perrenoud 1997). The increase in interlock ties with banks and within the watch industry between 1929 and 1937 reflects this trend.

B. The Netherlands

In the sample year 1913 the national network was relatively unrelated, but in the following decade it became highly interconnected. This development can be explained by the expanding economy combined with a modernization of the Dutch banking sector. At the end of the 19th century industrial firms were still relatively small, compared to Germany or the US, due to a small home market and relatively late industrialization. However, the economy of the Netherlands started to flourish since 1890, and large-scale industrial companies emerged. The number of public listed companies increased considerably. Companies that needed large amounts of capital, such as shipping, railway and tram companies, dominated the exchange list in this period. However the small and medium-sized companies were still in the vast majority. In the beginning of the 20th century small scaled business and a large presence of family firms typified Dutch business. Another characteristic of Dutch business was its regional specialization. For example the textile industry in the eastern part of the Netherlands was a very important business. Its firms, mostly family owned, were the largest firms measured in workforce at the beginning of the 20th century

[7] 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. 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 them full power of attorney, 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).

(Sluyterman 2005). Another important part was the Zaan region, north of Amsterdam, where many family-owned firms active in the food sector could be found. Similar to the textile industry, business in general was dominated by clusters of family firms. These regional networks started to become more interrelated on a national level.. Around the turn of the century, when the world economy greatly expanded, Dutch enterprises perceived a threat that foreign competition would want to purchase their shares. The liberals, who were in power at the time, were critical of state intervention, and a policy of free trade and laissez faire prevailed. The Dutch economy was very open, which was reflected in high export and import figures. As a result Dutch firms started to adopt takeover defenses. The first know one was adopted in 1898 by Koninklijke Olie (Jonker and Van Zanden 2007). Between 1900 and 1914 the use of takeover defenses was however few and far between. In other words, takeover defenses were isolated incidents. After the First World War its use increased rapidly, however. During the war Dutch nationalism revived and also the fear that German firms would use Dutch firms to rebuild their former position in the Netherlands (Tekenbroek 1923). Another reason for an increase in the use of takeover defenses was the concentration wave that hit Dutch business during and directly after the war (Sluyterman 2005). In other words, takeover defenses were adopted to resist foreign as well as domestic threats.

During the 19th century the Dutch banking sector had developed differently from neighboring countries such as Belgium and Germany. The Dutch banks were hardly involved in financing industry; instead they focused on trade financing. When Dutch business increasingly started to demand long term credits to be able to finance growth in the beginning of the 20th century, the banks transformed from mere trade financiers into commercial banks and they became more closely connected with industrial firms. The closer relation between banks and business was reflected in an increase in bankers on the boards of industrial companies (Jonker 1989). The commercial banks increased in scale by concentration. The concentration wave started in 1911 when Rotterdamsche Bank merged with Deposito en Administratie Bank into Robaver. Since then five commercial banks dominated the Dutch banking sector: Robaver, Amsterdamsche Bank, Twentsche Bank, Nederlandsche Handel-Maatschappij (NHM) and the Incasso Bank. They developed close relations with Dutch industry as can be seen in the high degree centrality of these banks (see table 2).

The decline in the cohesiveness of the Dutch network in the 1930s can be explained by the reaction of the banks to the banking crisis of 1921-1922. After the banking crisis the Dutch banks returned to trade financing again; they became reluctant to finance industry in any case until the 1960s. The interlocks between banks and business diminished, reflected in a decline in the number of board seats by bankers. So, the period of modernization of the banking sector had been short-lived. Then, the stock market crash in 1929 was the starting point of a severe depression during the 1930s. As a result of both developments, the Dutch network became less dense and cohesive during the 1930s.

### 4.2. The consolidation of the network (1950s-1980s)

During this period, the Dutch corporate network peaked again and remained relatively cohesive until the 1980s whereas in Switzerland the consolidation of the network, which began during the 1930's, went on further.

#### A. Switzerland

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 (for more details, see Schnyder et al. 2005, p. 31 and f.). 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. The preservation of a form of national control over Swiss companies had indeed been a very important preoccupation of Swiss politicians and businessmen since World War I. The fear of the danger of economic *Ueberfremdung* through foreign investment in Swiss firms was accentuated by the Second World War and the creation of the European common market, which saw the inflow of foreign – notably US American – investments in Europe, and in Switzerland in particular. Since the beginning of the Second World War, an increasing number of Swiss firms began to introduce registered shares with limited transferability, practice which was codified by a gentlemen's agreement concluded in 1961 between the Swiss Bankers Association and industrial companies (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.

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). 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).

B. The Netherlands

The development of the Dutch corporate network after the Second World War coincided with a period of economic recovery, in which commercial banks started to play an important role again. Government, employers and employees worked closely together to rebuild the Dutch economy. While in the 1950s firms funded activities mainly through internal financing, in the 1960s they turned more often to banks. The banks started to finance firms in the form of long term loans (De Jong, Roell, Westerhuis 2010). During the 1960s and 1970s Dutch production and financial companies had formed tightly connected arrangements, in which the financial companies occupied central positions. In 1964, two banks AMRO Bank and ABN Bank were formed by mergers[8] and since then they formed most of the connections with other companies. For example, in 1978, AMRO Bank and ABN Bank had a degree centrality of 34 and 33 respectively. In general, these two decades were

[8] Twentsche Bank and Nederlandsche Handel-Maatschappij merged into ABN Bank, and Amsterdamsche Bank and Rotterdamsche Bank into AMRO Bank.

characterized by a strong interlocking network centered on a few major banks (Helmers 1975).

After the Second World War, although the use of takeover defenses was still relatively uncommon, it was expanding. Several firms used priority shares, reserving exclusive voting rights on specific decisions for a restricted group of shareholders. Many family firms going public used this mechanism to retain family control over the selection of board members. We know that in the 1950s and 1960s many exchange-listed companies were family firms, with substantial blockholdings by family members, leading to substantial shareholder influence in those firms. Non-voting share certificates were also widely used: firms placed underlying shares with voting and dividend rights in a trust office (*administratiekantoor*), which retained the voting power and issued non-voting share certificates passing only the dividend rights to investors (De Jong et al 2010). In the 1970s the power of the executives, compared to that of other stakeholders such as employees and shareholders, was further enhanced. In 1971, the Dutch government imposed the structured regime (*structuurregime*) on large companies. Large Dutch firms were obliged to adopt a system of two tiers: an executive and a supervisory board. Members of the supervisory board were nominated on the basis of cooptation. These could be former directors of the executive board as well. Consequently reputation was critical for getting important positions. This development combined with the growing number and types of takeover defenses protected the boards from outsiders (De Jong et al 2010).

### 4.3. The disintegration of the network (1980- )

The disintegration of the network can partly be explained by a major reorganization of the economic structure and the business strategies of prominent economic actors, in particular of banks. 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 and in a lesser extent in the Netherlands as well.

Although the decreasing involvement of banks in industrial companies played a major role in the decline of the networks in Switzerland and in the Netherlands, it does not fully explain all the changes. Indeed, the number of ties between industrial companies also declined, as a result of a deep transformation of the governance system in these two countries during the last two decades of the 20th century and the first of the 21st century. As in other European countries, Swiss and Dutch companies started to orient their strategies more and more towards the satisfaction of minority shareholder interests.

Third, the growing internationalization of Dutch and Swiss firms implied also that greater numbers of foreigners came to sit on the board of these firms. These foreign directors were less integrated within the national business elite and would, therefore, hold fewer mandates with Dutch and Swiss companies.

If the structural factors are similar to explain the decline of the corporate networks, the chronology of this decomposition is different: the Swiss network began its decline earlier than the network in the Netherlands. One of the explanation seems to be that Swiss companies have liberalized their corporate governance practices earlier than in the Netherlands (Schnyder and Heemskerk 2008 ; Schnyder 2011).

A. Switzerland

The disintegration process began at the end of the 1970's and accelerated since the 1990's. Swiss banks diminished drastically their interlocking with other Swiss enterprises due to the securitization of corporate finance, their strategy of bancassurance and their expansion into foreign markets (Larsson et al. 2011). At the same time, due to the pressure of financial markets and the arrival of "corporate raiders", Swiss companies started to orient their strategies more and more towards the satisfaction of minority shareholder interests. In particular, they departed from the Vinkulierung practice adopted during the Golden Age of economic growth, by abolishing voting right distortions and multiple shares categories (Schnyder 2008). Finally, the increasing internationalization of Swiss firms led to the appointment of foreign managers and members of the board: in 2010, more than one third of the members of the board of the 100 largest Swiss firms are foreigners (Mach et al. 2011).

B. The Netherlands

The disintegration process that had slowly set in at the end of the 1970s and 1980s stabilized during the 1990s. Ultimately, only in 2003 the corporate network really started to disintegrate. Dutch business became more internationally oriented especially since the early 1970, with foreign sales steadily increasing. So, internationalization became an important growth strategy for firms (De Jong, Sluyterman, Westerhuis 2011). Also, since the 1980s capitals markets have become more global and shareholders have become more vocal. These developments put pressure on firms to increase shareholder rights. As a result the use of takeover defenses has decreased since 1993 (De Jong, Roell, Westerhuis 2010). Another result was that the boards of Dutch firms became more international in composition. Interestingly, the large Dutch banks, though, were relatively late in appointing foreigners in their boards compared to non-financial firms (Westerhuis 2008).

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## Appendix I: Main characteristics of the Swiss and Dutch corporate networks

| **Switzerland** | **1910** | **1929** | **1937** | **1957** | **1980** | **1990** | **2000** | **2010** |
|---|---|---|---|---|---|---|---|---|
| **Size and Structure** | | | | | | | | |
| Number of firms | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100* |
| Number of marginal firms (M) | 23 | 22 | 15 | 17 | 12 | 19 | 29 | 37 |
| M as % of tot. Number of firms | 23 | 22 | 15 | 17 | 12 | 19 | 29 | 37 |
| Isolated firms (I) | 15 | 10 | 11 | 9 | 6 | 9 | 11 | 24 |
| I as % of tot. Number of firms | 15 | 10 | 11 | 9 | 6 | 9 | 11 | 24 |
| I and M as % of tot. Number of firms | 38 | 32 | 26 | 26 | 18 | 28 | 40 | 61 |
| % of firms in main component | 82 | 90 | 89 | 91 | 94 | 88 | 82 | 70 |
| Number of component | 17 | 11 | 12 | 10 | 7 | 11 | 15 | 28 |
| **Ties** | | | | | | | | |
| Total number of lines | 267 | 356 | 384 | 432 | 428 | 351 | 199 | 115 |
| Number of lines with value > 1 | 73 | 99 | 78 | 90 | 92 | 63 | 21 | 9 |
| Number of firms in 2m-cores | 59 | 61 | 61 | 55 | 57 | 43 | 28 | 16 |
| Density | 5,340% | 7,120% | 7,680% | 8,640% | 8,560% | 7,020% | 3,980% | 2,300% |
| **Centrality/Cohesiveness** | | | | | | | | |
| Diameter | 8 | 6 | 5 | 6 | 5 | 6 | 9 | 11 |
| Average distance | 3 | 2,77 | 2,49 | 2,45 | 2,45 | 2,62 | 3,68 | 4,28 |
| Average degree | 5,34 | 7,12 | 7,68 | 8,64 | 8,56 | 7,02 | 3,98 | 2,3 |
| Degree centrality | 5,393 | 7,19 | 7,758 | 8,727 | 8,646 | 7,091 | 4,02 | 2,32 |
| Closeness centrality | 23,447 | 30,41 | 32,728 | 34,923 | 36,9 | 30,6 | 19,1 | 11,1 |
| Betweenness centrality | 1,371 | 1,46 | 1,2 | 1,227 | 1,313 | 1,281 | 1,84 | 1,63 |
| **Directors** | | | | | | | | |
| Number of directors | 734 | 729 | 702 | 774 | 842 | 780 | 781 | 823 |
| Number of interlocker (number of directors in 2m-cores) | 103 | 110 | 104 | 103 | 101 | 75 | 44 | 17 |

* 24 BQSF+ASSR ; 76 INDUS

| Netherlands | 1913 | 1928 | 1938 | 1958 | 1978 | 1988 | 1998 | 2003 |
|---|---|---|---|---|---|---|---|---|
| **Size and Structure** | | | | | | | | |
| Number of firms | 100 | 100 | 100 | 100 | 100 | 100 | 97 | 90 |
| Number of marginal firms (M) | 22 | 15 | 17 | 14 | 24 | 17 | 20 | 30 |
| M as % of tot. Number of firms | 22 | 15 | 17 | 14 | 24 | 17 | 20,62 | 33,33 |
| Isolated firms (I) | 14 | 8 | 15 | 11 | 2 | 12 | 6 | 15 |
| I as % of tot. Number of firms | 14 | 8 | 15 | 11 | 2 | 12 | 6,19 | 16,67 |
| I and M as % of tot. Number of firms | 36 | 23 | 32 | 25 | 26 | 29 | 26,80 | 50,00 |
| % of firms in main component | 86 | 90 | 81 | 87 | 98 | 88 | 91,75 | 76,67 |
| Number of component | 15 | 10 | 18 | 13 | 3 | 13 | 8 | 19 |
| **Ties** | | | | | | | | |
| Total number of lines | 344 | 348 | 334 | 464 | 410 | 331 | 312 | 158 |
| Number of lines with value > 1 | 73 | 97 | 70 | 108 | 50 | 47 | 38 | 10 |
| Number of firms in 2m-cores | 63 | 80 | 67 | 75 | 77 | 71 | 74,23 | 34,44 |
| Density | 6,95% | 8,90% | 6,75% | 9,37% | 8,28% | 0,07 | 6,70% | 3,95% |
| **Centrality/Cohesiveness** | | | | | | | | |
| Diameter | 8 | 5 | 6 | 5 | 6 | 5 | 5 | 8 |
| Average distance | 2,82 | 2,38 | 2,74 | 2,31 | 2,58 | 2,54 | 2,67 | 3,39 |
| Average degree | 6,88 | 8,9 | 6,68 | 9,28 | 8,2 | 6,62 | 6,43 | 3,51 |
| Degree centrality | 6,95 | 8,99 | 6,75 | 9,37 | 8,28 | 6,69 | 6,7 | 3,95 |
| Closeness centrality | 27,46 | 35,01 | 25,09 | 33,78 | 38,39 | 31,26 | 32,36 | 18,2 |
| Betweenness centrality | 1,37 | 1,14 | 1,16 | 1,01 | 1,55 | 1,22 | 1,47 | 1,59 |
| **Directors** | | | | | | | | |
| Number of directors | 642 | 734 | 724 | 816 | 879 | 876 | 750 | 723 |
| Number of interlocker (2 or more seats) | 139 | 156 | 127 | 157 | 160 | 155 | 129 | 83 |
| % interlockers | 21,65 | 21,25 | 17,54 | 19,24 | 18,20 | 17,69 | 17,20 | 11,48 |
| **Average board size** | | | | | | | | |
| Total (100 firms) | 8,87 | 10,39 | 9,63 | 11,21 | 11,56 | 11,21 | 9,95 | 8,42 |
| 25 financial firms | 10,32 | 15,24 | 12,20 | 14,36 | 14,28 | 15,12 | 12,77 | 13,40 |
| 75 non-financial firms | 8,39 | 8,77 | 8,77 | 10,16 | 10,65 | 9,91 | 9,12 | 8,55 |