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Beaten paths towards the transnational corporate elite

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Abstract
The transnationalization of economic activities has fundamentally altered the world. One of the consequences that has intrigued scholars is the formation of a transnational corporate elite. While the literature tends to focus on the topology of the transnational board interlock network, little is known about its driving mechanisms. This article asks the question: what are the trajectories that corporate elites follow in driving the expansion of this network? To answer this, the authors employ a novel approach that models the transnationalization of elites using their board appointment sequences. The findings show that there are six transnationalization trajectories corporate elites follow to expand the network. The authors argue that while the transnational elite network appears as a global social structure, its generating mechanisms are regionally organized. This corroborates earlier findings on the fragmentation of the global network of corporate control, but also provides insights into how this network was shaped over time.

Keywords
Corporate elites, elite networks, interlocking directorates, sequence analysis, transnational elite

Introduction
Although some suggest that we are now witnessing the end of the second wave of globalization (Schwartz, 2019), the outlook and orientation of the corporate elite have

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steadily and persistently shifted from the national to the transnational domain. This increasing transnationalization of corporate elites is evident in both the nationally diverse composition of corporate boards (Davoine and Ravasi, 2013; Van Veen and Marsman, 2008) and the growing and sturdy network of global board interlock ties (Heemskerk et al., 2016a, 2016b). The network of corporate interlocks has markedly transformed from national business communities to a more integrated global corporate elite network (Carroll et al., 2010; Fennema, 1982). Some scholars are more pronounced in their conclusions and argue that the global connections of the corporate elite are the cornerstone of a transnational capitalist class, with a clear international rather than national identification and therefore interest (Robinson, 2004; Robinson and Harris, 2000; Sklair, 2001). Recent studies however underscore that the global board interlock ties are not evenly distributed but rather centralized around a set of key nodes, and this network is divided into several cohesive communities (Heemskerk and Takes, 2016; Heemskerk et al., 2016b). However, this literature does not investigate why this is the case. These studies examine only the topology of the global board interlock network but not the driving mechanisms that build it.

Corporate elite transnationalization is largely created by individuals. When corporate directors receive international board appointments, they contribute to the expansion of the global corporate elite network through the board interlock ties they create. However, this temporal aspect of corporate elite transnationalization has received little attention so far as most studies investigate typologies of board interlock network snapshots at particular points in time (e.g. see a discussion of this issue in Burris and Staples, 2012; Valeeva et al., 2020). And while we know that the transnational board interlock network consists of multiple regional elite communities (Heemskerk and Takes, 2016; Heemskerk et al., 2016b), it remains unclear how individual corporate elite members dynamically create this network and contribute to network expansion in such a way that it leads to the formation of this particular network structure. Therefore, this article asks the question: what are the trajectories of transnationalization that corporate elites follow in driving the expansion of the global network of the corporate elite?

Our definition of corporate transnationalization is based on the conceptualization by Van Apeldoorn: at the heart of transnationalization is not the diminishing importance of national borders, but rather the ‘rise of relations across national borders and the constitution of actors that operate not “above” the national state, but in different national contexts simultaneously’ (Van Apeldoorn, 2014: 189). As such, this article analyses individuals who simultaneously obtain board-level positions in multiple national contexts. In a stylized, ‘truly’ globalized corporate elite, we would expect to see board appointments of these individuals and therefore international interlocking directorates formation without any particular preferential patterns. In this setting, a global labour market for corporate directors is at play that matches people with corporations across the globe. While this fits the idea of an ideal-typical market, the empirical literature on corporate elite networks instead finds that the global network of interlocking directorates is not random, but in fact structured along geographical and political divisions (e.g. Carroll et al., 2010; Heemskerk and Takes, 2016). We are therefore interested in the architecture of the patterns that transnational corporate elites create when they accumulate these international
board appointments. By uncovering these patterns, we aim to better understand how the transnational interlocking directorates network has been structuring over time.

For this study, we extract the data from Bureau van Dijk’s Orbis database. It covers the daily board appointments of 8201 transnational corporate directors having board appointments in 100 countries during 2000–2017. We apply sequence analysis techniques as a methodological strategy to uncover patterns in the global expansion of the corporate elite network. The results confirm that there are beaten paths, or similar transnationalization trajectories, that various regional elites follow. The revealed trajectories of the corporate elite transnationalization highlight that while from a distance the transnational corporate elite might seem well connected in a global network, its generating mechanisms still predominantly play out at a regional level and in particular along a few distinct beaten paths. As such, our work warns that the cohesion of the global corporate elite is easily overstated if one only looks at the overall network structure while disregarding the regional character of its generating mechanisms.

**Increasing transnational orientation of corporate elites**

The turn of corporations towards operating in multiple nation-states caused the formation of an international group of individuals, densely tied to these multinational corporations and profiting from their growing strength (Barnet and Muller, 1974). Transnational corporate elite networks began to emerge in the 1970s, as national elites started to expand board interlock networks among multinational corporations. One of the first empirical studies investigating the level of transnational interlocking between the largest world corporations was a book by Fennema (1982). This study shows that during the 1970s the number of ties crossing national borders significantly increased, and the transnational network had a strong North Atlantic corporate elite component. The follow-up study by Carroll and Fennema (2002), who evaluated the intensity of transnational interlocking a few decades later, shows that this board interlock network remained stable. Moreover, the empirical results confirm that a North Atlantic business system developed from the 1970s to the 1990s. Another seminal paper on transnational interlocks between global corporations is by Fennema and Schijf (1985), who analyse transnational financial participation of companies, revealing that the US-based companies took part financially in the majority of transnational actions. These earlier studies were aimed at seeking answers to big questions such as: does the transnational corporate elite exist, how has it been forming and strengthening, and along which geographical axes has it been developing?

Mapping the interlocking directorate networks at the transnational level became the central empirical approach in this literature. These ties have been considered the indicators of elite cohesion and have created possibilities for exercising political power of corporate elites, as shown by classical elite theorists (Domhoff, 1967; Mills, 1956; Useem, 1984). Ever since, scholars have pointed at the growing cohesion of these internationalizing elite members and the potential real-world consequences of the transnational corporate elite network establishment. Among these consequences are, for instance, coordinated political actions (Murray, 2014, 2017) or taking part in global policy-planning meetings (Carroll and Carson, 2003; Carroll and Sapinski, 2010; Nollert, 2005; Richardson et al., 2013).
In line with these questions about coordinated political actions, some scholars have also been wondering if the members of these internationalizing elites can be seen as a united group with an established common interest, or even thought of as a class. It led to the emergence of transnational class theory (Robinson, 2004; Robinson and Harris, 2000; Sklair, 2001), which has received a number of valid criticisms. One concern is that it is frequently based on anecdotal evidence rather than on rigorous empirical testing of key theoretical assumptions (see e.g. Embong, 2000; Nollert, 2005). Empirical studies on the transnationalization of corporate activities and the increasing number of transnational interlocks lead to mixed conclusions about the rise of the united transnational corporate elite, which can also legitimately be theorized as a class. Some scholars also doubted how significant the observed increase in transnational interlock tie numbers was. This resulted in the discussion between Carroll and Fennema and Kentor and Jang in *International Sociology* (Carroll and Fennema, 2002, 2004; Kentor and Jang, 2004, 2006). Both sides had contrasting opinions about the level of transnational interlocking and about the meaning of these ties for the formation of the transnational business community or even class.

While the earlier literature focused on seeking answers to questions about the rise and potential political power of the internationalizing elite members, there is another group of studies from the late 2000s that posed slightly different questions. These studies primarily focused on exploring the network structure and properties of the transnational board interlock network, with an aim to better understand its driving mechanisms, current organization, and potential transformations. For example, these papers investigated the stability of the board interlock network after the 2008 global financial crisis (Heemskerk et al., 2016a), the rise of the European corporate elite network and its composition (Heemskerk, 2013; Heemskerk et al., 2013), and the community structure of the transnational board interlock network (Heemskerk and Takes, 2016; Heemskerk et al., 2016b).

At the same time, other scholars point out that the majority of corporate directors forge their careers within nation-states, and their elite socialization and cohesion are still predominantly formed within national spaces. Bühlmann et al. (2013), for instance, show in their case study of the Swiss corporate elite that the emergence of the transnational elite has not replaced the significance of national ties; members of this newly forming transnational elite remain strongly tied to their national elite circles. The literature that studies career paths of corporate directors likewise finds little to no empirical evidence of increasing transnationalization of high-level corporate careers. For example, Koch et al. (2017) analyse career sequences of Forbes 100 CEOs and find that they predominantly climb the corporate ladder by changing positions within only one company. Even if there are some inter-corporate transitions, they mostly take place within one corporate sector (see also the review study of Vinkenburg and Weber, 2012). And in a similar study of CEOs, Hamori and Kakarika (2009) point out that career success and the time to tenure did not fit well with moving to the external labour market. This literature shows that most of the high-level corporate careers are constructed in a traditional way and transnational careers are rare.

All in all, we have only a piecemeal understanding of the corporate elite transnationalization process and in particular of the ways of how this transnational network
expansion is organized. What we know is that the transnational corporate elite network consists of a few network clusters (Heemskerk and Takes, 2016); the relationship between clusters can be explained by institutional and cultural relations between them (Heemskerk et al., 2016b); there is a historically strong core within this network (Van Der Pijl, 1984); parts of the network became denser over time (Van Apeldoorn, 2000); and some regional groups have been recently active in creating transnational ties with other parts of the network (De Graaff, 2020). However, most of these studies focus on static network snapshots of board interlock ties between corporations, and rarely investigate the dynamics behind the rise of specific network clusters. These inter-corporate transnational interlocks are formed by individual corporate elite members and their career-related transitions. By moving from one corporate board to another across the globe, they expand the transnational network of board interlocks and contribute to its strengthening. The question that naturally arises is: What are the trajectories of transnationalization that corporate elites follow in driving the expansion of the global network of the corporate elite?

To answer this question, we need an empirical approach that deviates from prior work, studying inter-corporate board interlock networks between a few hundred western corporations. Instead, we have created a relatively large global dataset of corporate director positions, affiliated with corporations located all over the world. In our empirical approach, we make no a priori assumptions about the structure of the transnational corporate elite network and start by exploring individual appointment sequences of transnational corporate directors. Applying sequence analysis techniques, we cluster ideal-typical transnationalization trajectories of these corporate elite members. This novel approach uncovers six main groups of trajectories or ‘beaten paths’, as we call them, that together create and expand the transnational space for corporate elites to connect.

We hypothesize that while the transnational corporate elite network might appear as a global social structure, its generating mechanisms are regionally organized. Based on our empirical findings, we show that the transnationalization of corporate elites is structured over a relatively small number of common trajectories with clearly defined directions. This implies that the cohesion of the global corporate elite is easily overstated if one only looks at the overall network structure while disregarding the regional character of its generating mechanisms.

**Data and methods**

**Data extraction steps**

The dataset was extracted from the Orbis Bureau van Dijk database in December 2017. Orbis contains data on about 200 million companies worldwide, collected from official country registrars. For each individual in the dataset, there is information about the history of corporate board appointments in the format ‘day-month-year’. We choose to include different types of board level positions in the analysis because national corporate governance systems vary significantly over the world. Some countries have one-tier boards while others have two-tier systems, and including a variety of board positions allows us to take into account these differences and increase the sample size, without
underestimating the positions within specific national contexts. We include in our sample individuals who obtain positions at boards of directors, executive boards, and supervisory boards.

The main focus of this article is on transnational corporate elite members and on how their sequences of appointments expand the global corporate elite network. We therefore start with the group of corporate directors who have current positions in at least two different countries by 2017. Because these individuals simultaneously hold positions in more than one country, they can be referred to as transnational corporate elite members: ‘transnationalists’ or ‘globalizers’ (Carroll, 2009; Sklair, 1997). For this set of transnational directors, we subsequently collected the history of their past corporate appointments for the period 2000–2017. This means that for each transnational corporate elite member in 2017, we have an individual sequence of previous appointments.

For each transnational corporate director, we create a sequence of board appointments during 2000–2017, preserving the order of events but ignoring the duration of time between appointments. For example, if an individual had an appointment in a French firm in January 2000, then this individual had an appointment in a Spanish company in January 2005 and finally, an appointment in a Belgian company in January 2010, the country-level sequence of this individual will be ‘France => Spain => Belgium’. By 2017, when the dataset was assembled, this individual simultaneously held all three positions. In this sense, this individual does not necessarily make career transitions between different corporations but rather expands the global network by participating in several board meetings over the world and accumulating these positions.

The sequence analysis is applied to explore the accumulation of board appointments by these transnational corporate directors. This approach has been widely used to detect similarities in career trajectories of individuals and has been also applied as a tool to explore class mobility strategies (e.g. Bühlmann, 2008, 2010; Bukodi et al., 2016; Toft, 2018). To uncover transition patterns at the macro-level, these country-level sequences were recoded to the region-level sequences, using the classification of the United Nations geoscheme available through the ‘countrycode’ package in R. Thus, the sequence ‘France => Spain => Belgium’ will become the sequence ‘Western Europe => Southern Europe => Western Europe’. We recode country sequences to region sequences to map the higher-level picture of the corporate elite transnationalization process. Classifying sequences with a larger number of sequence elements (i.e. countries or even cities) is computationally very expensive and rarely produces meaningful clustering results, open for interpretation. However, the country-level transitions are not completely ignored in this article, as they are described in detail in the Results section when we present the findings of the sequence classification. Thus, a sequence in this article is the sequence of board appointments of a transnational corporate elite member (that is, a person who in 2017 holds board-level positions in at least two countries). Sequence elements are regions; these elements change when an individual has an appointment in a different country. If a company has subsidiaries in different countries, each subsidiary has its own location. Even if corporate directors stay within one corporate group, by meeting at board meetings of subsidiary firms and holding positions there, these individuals still integrate with national elite communities and encounter local business environments.
We do not consider full career sequences of transnational corporate elite members. Rather, we investigate how those corporate elite members that are already integrated into the global network played a role in the expansion of that network, i.e. what paths they followed. Our aim is to describe the structure and directions of the corporate elite transnationalization process, and not to reconstruct all career steps on the way to becoming a transnational corporate elite member. The dataset that we use for the analysis consists of 8201 transnational corporate directors and their board appointments during 2000–2017. They altogether held positions in 11528 corporations, located in 100 countries and 16 regions. The majority of corporations in the sample are industrial, financial and insurance companies; the most frequent sectors are manufacturing, wholesale and retail trade, financial and insurance activities, information and communication. More detailed descriptive statistics of corporate sectors and company types are presented in the Appendix, Table A1 and Table A2.

**Constructing and classifying board appointment sequences**

As discussed above, the unit of analysis is the sequence of board appointments of corporate elite members who obtain transnational directorship positions in 2017. We group similar sequences to systematically understand what types of trajectories are common and, as a result, to understand the transnationalization dynamics of the corporate elite network.

Social sequences are usually classified using clustering algorithms in order to find groups of similar sequences (Abbott, 1995; Abbott and Forrest, 1986). Within a group, sequences should be as similar as possible. Clustering algorithms try to find groups that minimize dissimilarity (or maximize similarity) within a group. We do so by defining so-called costs that indicate, using a number, how dissimilar two sequences are. One sequence can be changed into another by transforming sequence elements, using insertion, deletion, and substitution costs. For each pair of sequences, it is possible to calculate the total cost of the sequence transformation and cluster them later in similar trajectories.

Assigning costs to social sequence transformations is a difficult step in social sequence analysis and should follow both theoretical and methodological considerations (Studer and Ritschard, 2016). There are three main strategies to assign costs, and each of them has specific limitations. First, the costs can be assigned to constant values. In this case, any transition from one sequence element to another sequence element has the same cost and the difference between transitions is neglected. For example, in the case of social mobility, moving from a low position in the social hierarchy to a high position would have the same cost as moving from a low position to another low position. Second, costs can be assigned based on theoretical assumptions and expert knowledge of a researcher. In the same social mobility example, moving from a low position to a high position would have a higher cost than moving from a low position to another low position because, based on theoretical and empirical observations, upward mobility is known to be less common. Third, costs can be assigned based on observed transition rates between sequence elements in the selected dataset of sequences. Transitions that happen often would have a lower cost than transitions that take place rarely, i.e. if in a studied dataset
of social mobility the transitions between low and high positions do not happen often, these transitions would be assigned higher costs. The first approach neglects the differences between sequence elements, while for the second strategy it is crucial to choose a theoretical framework that would be strong enough to assign costs for all the possible transitions in the dataset. Crucially, we do not make any assumptions in advance about transition costs between sequence elements and therefore use the latter approach, which is referred to as the ‘data-driven’ approach in the literature (Studer and Ritschard, 2016).

Using the data-driven approach, we assign costs based on observed occurrences of subsequences in our dataset, using the ‘TraMineR’ package in R (Gabadinho et al., 2011). The cost matrix has dimensions $n \times n$, where $n$ is the number of different sequence elements (regions, in our case) in the dataset. The element $(i, j)$ of the matrix is the cost of substituting region $i$ with region $j$. The substitution cost $SC(i, j)$ between regions $i$ and $j$ is obtained using the following equation:

$$SC(i, j) = cval - P(i, j) - P(j, i),$$

where $P(i, j)$ is the transition rate between regions $i$ and $j$ observed in the data, $cval$ is a constant value that is usually set to 2 (Gabadinho et al., 2011). Looking at all possible inter-regional transitions in the dataset, for each dyad of regions we thus assign a substitution cost that varies from 1 to 2. Transitions that have high costs indicate that these transitions take place less often in the observed dataset. For example, moving from Eastern Europe to Southern Africa will be considered more costly than moving from Eastern Europe to Western Europe. The reason is that the subsequence ‘Eastern Europe -> Western Europe’ happens more often in our dataset than the subsequence ‘Eastern Europe -> Southern Africa’. Insertion and deletion costs or indel costs are used for cases when, to transform one sequence into the other, we must add sequence elements to a sequence or delete elements from it. These costs are usually fixed at half of the maximum value in the cost matrix. Thus, indel costs are set to 1 because the maximum value in the cost matrix is 2, i.e. the case when $P(i, j) = P(j, i) = 0$.

After assigning costs to each operation (insertion, deletion, and substitution), the distance between all sequences in the dataset is calculated, applying an optimal matching algorithm (Blanchard et al., 2014). Optimal matching calculates the distance between two sequences as the cost to transform one into another using insertion, deletion, or substitution of elements in sequences. The result is the dissimilarity matrix between sequences which is used for clustering sequences into similar trajectories. For social sequence analysis, the Ward clustering algorithm is one of the most often used techniques that we also apply in this article (Martin et al., 2008).

Based on clustering goodness-of-fit measures, we present 35 clusters that together represent the structure of the full dataset. A meaningful understanding of the sequence clustering results requires interpretation, and this interpretation is typically not straightforward. This is a common issue in sequence analysis studies, applying the technique on large datasets, containing a large number of sequence states, as in our case. One of the possible ways to approach this problem is by investigating similarities in
sequence positions within each cluster and to group similar clusters in a set of typical transnationalization pathways. We refer to these higher-level transnationalization pathways as ‘beaten paths’. For example, if one cluster consists of positions starting in Western Europe and expanding to Northern America, another cluster consists of positions also starting in Western Europe but expanding to Southern America, and the third cluster consists of positions starting in Eastern Asian and expanding to Australia, we would group the first two clusters together into one beaten path while considering the latter cluster as a distinct path. Through this step of qualitative interpretation of each pair of clusters, we determine six beaten paths and describe each of them in a more nuanced way in the following section. Additionally, for each selected path we present a typical example of an individual, and describe their background, education, career transitions, and professional experiences. To present these individual vignettes, we use a variety of online sources such as corporate and business websites, LinkedIn profiles, and the Orbis Bureau van Dijk dataset.

Results

To begin with, Figure 1 shows the country-level distribution of corporate locations. The majority of corporations in our sample are located in the UK and the US, followed by other high-income European countries and countries from prominent regional centres such as Australia, India, Hong Kong, South Africa, China, and Canada. Figure 2 presents the distribution of distinct countries and regions in the sequences of transnational corporate directors. As we see, most individuals obtain board positions in two countries, and fewer individuals hold positions in three or more countries. However, the majority of these transnational corporate directors do hold positions in different regions. This
indicates that the current state of corporate elite transnationalization might have already moved above transitions taking place within geographic regions. These corporate directors, then, are flexible in moving not only beyond country-level but also beyond region-level borders on the way to build and expand the transnational corporate elite network. To understand these observations in light of theoretical discussions on the rise of the global corporate elite network and enhanced elite unity, we further classify individual sequences of transnational directors.

**Typical trajectories of corporate elite transnationalization**

To explore the pathways that transnational corporate elites follow to expand the transnational network, we cluster individual sequences of 8201 transnational corporate directors. The best clustering solution gives 35 clearly identifiable clusters, with about 200 individuals on average in each cluster. The visualization of all clusters is presented in Figure 3. As discussed in the Data and Methods section, meaningful interpretation of a large number of clusters is a known issue in social sequence analysis. Based on qualitative interpretation of types of firms and directors within each cluster and on the majority of specific regional sequence states within each cluster, we derive six beaten paths, or common transnationalization trajectories. These beaten paths are higher-level groupings of the identified 35 clusters.

**European path.** European corporate directors are densely interconnected within their regional borders. Staying within region and enhancing within-region ties is particularly
Figure 3a. Typical transnationalization trajectories of corporate directors: European path. Visualization of sequence clusters using the Ward clustering algorithm. Colour of positions indicates the region of corporate locations.
Figure 3b. Typical transnationalization trajectories of corporate directors: European, American, Asian, Oceanian, Caribbean paths. Visualization of sequence clusters using the Ward clustering algorithm. Colour of positions indicates the region of corporate locations.
Figure 3c. Typical transnationalization trajectories of corporate directors: Asian, African, Oceanian, European, Caribbean paths. Visualization of sequence clusters using the Ward clustering algorithm. Colour of positions indicates the region of corporate locations.
typical for Northern Europe (countries such as the UK, Ireland, Sweden, Denmark) and Southern Europe (Italy, Spain, Portugal). While there is probably a strong and cohesive network of the European corporate elite (Heemskerk, 2013), individuals holding positions on European corporate boards are also very well integrated into national business circles all across the globe. Among the most open to international professionals are corporations, located in Western Europe (Switzerland, the Netherlands, France, Belgium, Germany). Directors affiliated with companies located in these countries often expand their networks to boards of companies located in Northern America, Africa, and Asia. But the strongest connection of the European corporate elite is probably with the Northern American corporations, as has been shown in earlier works (e.g. Fennema, 1982; Fennema and Schijf, 1985; Van Der Pijl, 1984) and confirmed in more recent contributions on the global corporate elite network formation (e.g. Heemskerk and Takes, 2016). With the globalization of the corporations all over the world and the rise of new economies, the Euro-American connection does not lose its strength, and the corporate elites of these regions continue to expand this historically strong path by accumulating positions across the Atlantic.

One of the examples of an European interlocker that we find in our dataset, who is also well-connected with other national (and particularly American) corporate elites, is Mr Mathias Oliver Christian Döpfner. Döpfner is a German citizen, born in 1963. He studied musicology, German literature and theatrical arts in Frankfurt and Boston. He began his career as a journalist and editor in the 1980s, working in different German newspapers. In 1992, Döpfner was employed as an assistant to the CEO of Gruner + Jahr (a German publishing house). Döpfner started his position at Axel Springer (one of the largest European publishing houses, headquartered in Berlin) as editor-in-chief in 1998; in 2000 he became a member of the executive board of a company; and from 2002 he is a CEO and chairman of Axel Springer. He also occupies board positions in the subsidiaries of Axel Springer across Europe (e.g. Germany and Switzerland). During 2015–2018, Döpfner was a non-executive director of Vodafone (a British multinational telecommunications company). Within corporate America, he has had positions on boards of Warner Music Group (a multinational entertainment conglomerate), eMarketer (a market research company, acquired by Axel Springer in 2016) and Insider (an American online media company, also owned by Axel Springer). Lately, in 2018, Döpfner also joined the corporate board of Netflix (a streaming entertainment service company). He was a member of the board of trustees of the Aspen Institute in Berlin, a member of the steering committee of the Bilderberg Conference, and on boards of a number of non-governmental national and international organizations. The ties that Döpfner builds between European and North American corporate boards can be explained by his prominent network position within the European – and to be more precise – German corporate elite. He began climbing the career ladder within one corporation, but at the same time he has been building connections within corporate Europe. His prominent network position within Europe, together with relevant experience in the media and publishing industry, has contributed to new board positions across the Atlantic.

**American path.** American corporate directors are central within the global network of transnational corporate activities and elites. The majority of these individuals have board
appointments in Northern America (mostly the US and Canada) and accumulate positions in corporations located in Europe, Oceania, and Asia. The American path can be additionally divided into the Northern American, Central American and Southern American fractions. Central and Southern American (e.g. Brazil, Peru, Chile) corporate elites are reciprocally connected with Western Europe (Switzerland, the Netherlands, France, Belgium, Germany) and Northern Europe (UK, Sweden, Ireland, Denmark), even though the number of these ties are lower in comparison with the ties formed by Northern American elites with the named European regions. Similar to European corporate directors, staying inside the region is a typical network expansion strategy for American corporate elite members: directors with positions at Southern American (Brazil, Peru, Chile) or Central American (Mexico) corporations often continue to accumulate positions within these countries and within the region. Even though we observe ties established by the transnational corporate directors among Latin American corporations, their number is relatively low, as has been confirmed by Cárdenas (2015, 2016) in his detailed studies of the Latin American national and transnational board interlocks. Latin American corporate elites are not strongly transnationally connected yet in comparison with European or Northern American elites but there is a potential for change with the growing number of within-region ties that Central and Southern American elites create with the globally dominant Northern American elites.

As one of the examples of this connection between Northern American and Latin American elites, we describe the case of Mr Enrique Francisco Jose Senior Hernández. He was born in 1943 and has more than 12 years’ experience as a board member of various Mexican and American companies. From the beginning of the 2000s, he was on the board of Coca-Cola Femsa in Mexico. Later, he was appointed to the boards of Cinemark and Univision Communications (both are American entertainment firms). Positions in the named American media companies were related to his previous experience of serving on the board of a Mexican media company – Grupo Televisa. During his career, Hernández was a financial advisor at Coca-Cola, General Electric, and Columbia Pictures, among others. In this example, the ties that Hernández creates between Latin American and Northern American firms could be explained by his relevant work experience in related sectors, and his education and networks in the US (his undergraduate degree and MBA are from Harvard University).

Asian path. The Asian corporate elite is spread across three main groups of clusters. The first group includes individuals with board positions in Southern Asia (corporations located in India, Sri Lanka, Bangladesh, Pakistan); the second includes South-Eastern Asian positions (Singapore, Malaysia, Indonesia, the Philippines, Thailand, Vietnam); and the third group consists of Eastern Asian countries (Hong Kong, China, Japan, South Korea, Taiwan). Among these clusters we also see a list of offshore financial centre countries (the Cayman Islands, the Virgin Islands, Curaçao, the Bahamas), which is a result of the corporate structuring, common to some firms, located in this region (e.g. a headquarters of Chinese tech giant Alibaba is in the Cayman Islands). Most Asian corporate boards are well integrated into the global corporate network: individuals holding positions in one of these Asian regions accept additional positions in European, American, Oceanian regions, and these Asian corporate boards are also becoming open to
individuals with international experiences. There is a strong regional elite cohesion within this region but at the same time we observe the growth of some regional economies (mostly Chinese) and their strengthening position within the transnational corporate elite network (Beaverstock, 2018; Hall, 2019; Pan et al., 2018). It is becoming more common for the largest Chinese firms to form board interlock ties with the largest corporations all across the globe and in this way to be integrated into the global corporate elite network (De Graaff, 2020; De Graaff and Valeeva, 2021).

This integration can be observed in the example of the board positions of Mr Baocai Zhang. Zhang was born in 1967, he graduated from Nankai University in China and has an EMBA degree. In our dataset, one of his first board appointments starts at the beginning of the 2000s in Yanzhou Coal, a Chinese coal mining company. Zhang was building his career in this firm for years: he joined Yanzhou’s predecessor in 1989, was appointed head of one of Yanzhou’s departments in 2002, and had his first directorship position in the company in 2006. Later, Zhang became a director of Yancoal Australia and played a key role in the acquisition of a number of mines across that country. While the majority of the board members of Yancoal Australia are Chinese, there are a few non-Chinese individuals on its board with concurrent positions in Australian companies. Consequent positions of Zhang were in Felix Resources and Gloucester Coal – Australian coal mining and exploration companies, acquired by Yancoal Australia. He was also involved in the potash exploration of Yanzhou in Canada in the 2010s. Zhang’s trajectory of the accumulation of transnational positions is related to his experience in the industry, and the acquisition strategy of a firm he was affiliated with before.

**African path.** The African corporate elite is mostly represented by individuals on boards of corporations located in South Africa, which in line with the literature on African interlock networks, mostly focusing on South African corporations as the key corporate actors in the region (Durbach and Parker, 2009; Senekal and Stemmet, 2019). Directors from companies located in Europe, Australia and New Zealand, Northern America, and Central and Western Asia are also on boards of the South African companies. These ties are reciprocal with Europe, Australia and New Zealand, and Northern America: South African corporate board members accumulate additional positions in these regions.

South African corporate boards are densely tied to Northern European (UK, Sweden, Ireland, Denmark) and Western European (Switzerland, the Netherlands, France, Belgium, Germany) corporations. Also, like most regions, the African region is densely interconnected inside the regional borders; however, companies located in the African region outside of South Africa rarely share directors with international companies.

An example of South African and European transnational connection within this path can be represented by the case of Ms Thembalihle Hixonia Nyasulu. She was born in 1954 and studied in South Africa (she obtained a degree in social work and psychology) and the US (Executive Leadership Development Programme from the Hult International Business School). Nyasulu also attended the International Programme for Board Members at the Institute for Management Development in Switzerland. In the 2000s, she held board positions in large South African firms such as Nedbank (a bank), Sasol (an energy and chemical company), and Anglo Platinum (a mining company). Nyasulu had previous experience working for Unilever in different roles in the 1980s, and in 2007 she
joined the board of Unilever in the UK. In between these two distinct positions within Unilever, Nyasulu founded T.H. Nyasulu & Associates, a marketing company, and Ayavuna Women’s Investments, a women-controlled investment firm. During her career, she also had numerous high-level board positions at firms such as Vivo Energy (a British company that distributes Shell and Engen fuel brands in Africa), JPMorgan in South Africa, and the Development Bank of Southern Africa. Nyasulu’s transition from South African boards to the British Unilever can be explained by her previous work experience within this multinational firm and by her prominent network position within the national corporate elite circles. In addition, she has been well embedded in international business circles due to her relevant work and educational experiences and leadership positions. For instance, she was a founder of the Advisory Group formed by the World Economic Forum to set up a community of global chair persons.

Oceanian path. Corporate elite members from Australia and New Zealand are open to the majority of the world regions, which is explained by their geographical closeness to Asia and cultural proximity to Europe. Oceanian corporate directors often accumulate positions in companies located in European, South-Eastern and Eastern Asian, and Northern American regions. These flows are mutual: companies headquartered in Australia and New Zealand are open to accepting corporate directors from named regions on their boards and, moreover, most international corporations have Australian offices and operate from Oceania. The prominence of this region in the network of transnational elite flows is explained by the well-integrated position of Australia in the European and Northern American corporate networks (Alexander et al., 1994; Carroll and Alexander, 1999; Kiel and Nicholson, 2006).

Mr Stephen Garfield Kasnet is an example of an individual creating this connection between Oceanian firms and the Euro-American corporate world. He is an American national, he was born in 1945 and graduated from the University of Pennsylvania in political science. Kasnet was on the board of Rubicon in New Zealand, a forestry company, and has also been accumulating a large number of board and senior management positions during his career in firms such as Two Harbors Investment Corp and Silver Bay Realty Trust (American real estate firms), Columbia Laboratories (an American pharmaceuticals company), Tenon (a wood products company from New Zealand, Rubicon is a major shareholder), First Ipswich Bancorp (an American bank), and PIOglobal (a Russian real estate investment fund). During his career, he also held senior management positions in multiple American financial companies such as Pioneer Group, First Winthrop Corporation, Cabot, Cabot & Forbes, and many others. Most of his positions have been within corporate America. Kasnet is a big linker within the American corporate world and due to his high connectedness and rich work experience, he has also been creating ties between the American corporate boards and a few Oceanian firms.

Caribbean path. Finally, and interestingly, there is a distinct group of Caribbean countries (the Cayman Islands, Curaçao, the Virgin Islands) that obtain a recognizable position in the global network of corporate flows. The Caribbean region includes a large number of offshore financial centre countries and these locations are used by companies all over the world to create complex ownership chains and facilitate the evasion of corporate taxes
Eastern Asian companies (located in Hong Kong, China, Japan, South Korea), but also European and American firms are often connected with companies located in the Caribbean region and other offshore financial centre countries. For example, members of the S&P 500 index, which represents the largest publicly traded corporations in the US, can be legally based in so-called ‘domiciles of convenience’. These domiciles of convenience are the offshore financial centre countries such as Bermuda, the Cayman Islands, Jersey, Ireland, and Switzerland (Petry et al., 2021). While Chinese giants such as Alibaba or Tencent domicile their holding companies in the Cayman Islands to list their shares abroad, American firms such as Accenture and Medtronic shifted their legal domicile for tax reasons to Ireland (Fichtner and Heemskerk, 2020). These offshore financial centre countries make up the novel corporate locations used by corporate elites across the globe to incorporate companies and expand transnational networks of corporations.

As an example of an individual sequence within this path, we present the career trajectory of Ms Wan Ling Kung Martello. She is an American citizen of Filipino-Chinese descent. Martello was born in 1958 in the Philippines and was raised there. She graduated from the University of the Philippines (with a degree in business administration and accounting) and received her MBA in Management Information Systems from the University of Minnesota. Martello had board and senior management positions in multinational firms such as Walmart (an American retail firm), Nestlé (a Swiss food company), and Alibaba (a Chinese tech company) among a few others. Alibaba is headquartered in the Cayman Islands and, hence, Martello is one of the directors, forming the Caribbean path that connects this offshore financial centre country with Europe and the US. Martello began her corporate career in 1985 in Kraft Foods (an American food manufacturing and processing conglomerate) and obtained various financial and senior management positions later in Borden Foods (an American food and beverage firm) and NCH Marketing Services (an American media and marketing company). Her high-level positions in the largest world multinationals can be explained not only by previous work experience in the food and beverage business, but also by her origins and professional specialization in emerging markets. For instance, in Nestlé she is Executive Vice President and CEO of the Asia, Oceania and sub-Saharan Africa regions; in Walmart she was an executive vice president of global e-commerce for emerging markets.

**Directions of corporate elite pathways**

Clustering sequences and grouping these clusters in higher-level beaten paths gives an overview of the current state of the corporate elite transnationalization, as well as the directions in which it has been unfolding from the 2000s onwards.

Exploring trajectories of individual corporate directors also shows that most beaten paths are bidirectional, meaning that regions are reciprocally connected by sharing corporate elite members. This can lead us to the conclusion that there is one strong network of corporate elite ties in which individuals freely move from one country to another, and that there is no hierarchy of locations within this globalizing network. In addition, one can also conclude that if ties between certain regions are becoming more reciprocal over time, this might result in the formation of a united group of individuals, connected by
shared common interests. Some would even go further and make statements about the rising class consciousness of this transnationalizing group of individuals (Robinson, 2004; Robinson and Harris, 2000). But in our estimation, it would be slightly early to draw these kinds of conclusions. We have indeed found in our empirical investigation that some of the regions are connected reciprocally, but we argue that the unity of transnationalizing elite groups should not be overestimated for a few reasons.

First, the results of the sequence clustering confirm the presence of a strong core of the transnational corporate elite, concentrated around Europe and Northern America, even though it might be currently under transformation, as this path is expanding and taking new directions. The findings show that European or American corporate elite members are also tied to corporate elites operating in Asia, Africa or Oceania, and are not exclusively connected with each other. We see this, for instance, in the cases of Ms Thembalihle Hixonia Nyasulu or Ms Wan Ling Kung Martello presented above. Even though they have rather different career profiles, these directors connect national elites outside of the Euro-American core with European or Northern American corporations. If we relate this finding to the debates about the emergence of a united transnational business community, concentrated mostly around European and American corporations (e.g. Carroll and Fennema, 2002, 2004; Kentor and Jang, 2004, 2006 in the pages of this journal), we may conclude that if this core exists, its borders are currently opening up. However, as we have demonstrated through a relatively small number of individual examples, the possibility to enter this core still depends on a variety of factors, such as: relevant education, international experience, embeddedness in national elite networks. This leads us to conclude that in order to enter the core, a national corporate elite member should be in possession of some of these relevant characteristics.

Second, while we observe bidirectionality of ties at the global scale (that might imply horizontality of relations among world regions and lead us to false conclusions about elite unity), in fact the transnational corporate elite network remains structured over regional axes. The regional paths that we have uncovered are strongly determined by positions of national elite communities. These paths have directions: in some cases, these paths are bidirectional, while in others they are directed towards specific central locations. Moreover, within each region there is a small number of countries or cities that obtain the central position in attracting international corporate directors. London in the UK is one of the examples of such a crossway for the European corporate pathways. This finding on the regional composition of the transnational elite network shows that this network consists of distinct regional elite fractions rather than one united global business community.

Finally, the results of the sequence clustering shed light on the level of the transnational elite fragmentation. We have uncovered that between-regional transitions are taking place, even though there are also within-regional clusters of ties among national elites in almost any world region. In the case of some regions, we can already talk about one strongly connected and possibly united elite (e.g. the European corporate elite that has been already extensively investigated in Heemskerk [2013] and Van Apeldoorn [2000] and shown to be highly cohesive), while in other cases it might be difficult to draw conclusions about the level of within-regional unity (e.g. Asian corporate elites remain divided, and consist of multiple powerful players, all bridging with the
Euro-American core). Because almost within each region we observe a large number of these within-region transitions, it might be too early to speak of an equally connected global corporate elite network. But it is not too early to speak about regionally clustered areas of this globalizing network that transcend national – but not so often regional – borders.

**Conclusion and discussion**

Our goal has been to better understand the ongoing process of corporate elite transnationalization and uncover directions of its generating mechanisms, taking the micro-level perspective of corporate directors’ appointments. We asked what are the typical trajectories that corporate elite members follow on their way to expand the transnational network of corporate elite ties. Our empirical contribution lies predominantly in our novel data-driven approach, using a large-scale temporal dataset, and the application of sequence analysis techniques to explore the behavioural patterns of transnational corporate elite members. Our theoretical contribution lies in putting at centre stage the micro-level behavioural patterns of corporate directors that drive corporate elite network expansion. In doing so, we aimed to contribute to long-standing theoretical questions on the nature of the transnational corporate elite network, its composition and ongoing transformations, and regional inequality among different corporate elite fractions.

The findings reveal that corporate elites are indeed moving to a transnational plane, although this transition is not random but highly structured. There are six identifiable beaten paths that cross the corporate world and these paths are characterized by specific directions. We find that the majority of the transnational corporate elite connections remains concentrated in Europe and Northern America but the network increasingly expands to other regions as well. For instance, these are the groups of Asian countries that attract corporate elites and activities and have a potential to transform into new global business centres. The high level of regional clustering we uncovered indicates that the transnational corporate elite network is still organized along distinct regional communities, and while some individual directors are making the borders more blurry by accumulating inter-regional positions, there is a long way towards a completely globalized corporate elite. These findings confirm that the transnational corporate elite network remains fragmented, even though there is an ongoing emergence of inter-regional ties.

Our study has a number of limitations that can be addressed in future studies. First, while we observe some higher-level properties of the transnational paths that corporate elites follow, the actual predictors of individual corporate transitions are omitted from the analysis. In some cases these transnational ties are created as a result of individual reasons of corporate directors – for example, an individual accepts a position in a country with more developed institutions or in a company offering higher remuneration. In other cases, transitions will be the result of corporate decision – for instance, an individual is appointed to be a board member of a new company, formed after the merger and acquisition. Differentiating these causes has not yet been done in detail, even though we briefly explain some of these potential causes in our selected examples of individual directors. Doing so in a more qualitative and systematic manner could provide new insights into
the distinct transnationalization strategies of national businesses communities. Second, notwithstanding the unique nature of our dataset, we have not yet been able to full career paths. With a growing number of open and rich datasets on corporate activities, future studies could be able to explore changes in the relative positions of specific countries and regions, taking a variety of corporate, individual and country-level characteristics into account. Using additional information, it could be possible to ask why some national corporate elites are open to accepting others and seem to be more integrated into global business, while other elite groups remain highly interconnected in their regional borders and rarely accept outsiders on corporate boards. These differences might be explained by institutional characteristics of countries, the importance of certain sectors in the economy, cultural and language openness, or historical connections between different regions. As such we hope that our work can be a stepping stone towards an exciting new research agenda.

The key question that remains open is on the nature of the investigated elite group. If these individual corporate elite members accumulate positions across the globe, are they also transnational in their elite interests and, possibly, behaviour and actions? Or, if we observe within-region similarities in the network building patterns, are they still highly influenced by their national elite communities, and are they therefore strongly embedded in national elite networks? Our work has shed light on the current structure of this elite group network and its recent transformations but is not able to answer the question about the level of transnational orientation of these individuals. In the interpretation of the results, we speculated on the potential meaning of specific network-level observations for the rise of an entirely globalized group with a determined common interest. We conclude that this elite group remains clustered over multiple regional communities, which may have implications for the level of elite unity, but the question of to what extent they have become transnational in their interests and actions remains in need of further investigation.

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1. www.bvdinfo.com

References


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**Résumé**

La transnationalisation des activités économiques a fondamentalement modifié le monde. L’une des conséquences qui a intrigué les chercheurs est la formation d’une élite corporative transnationale. Alors que la littérature a tendance à se concentrer sur la topologie du réseau transnational de verrouillage des cartes, on sait peu de choses sur ses mécanismes d’entraînement. Cet article pose la question : quelles sont les trajectoires que suivent les élites patronales pour conduire l’expansion de ce réseau ? Pour répondre à cette question, les auteurs utilisent une approche originale qui modélise la transnationalisation des élites à l’aide de leurs séquences de nomination au conseil d’administration. Les résultats montrent qu’il existe six trajectoires de...
transnationalisation suivies par les élites des entreprises pour étendre le réseau. Les auteurs soutiennent que si le réseau d’élite transnational apparaît comme une structure sociale mondiale, ses mécanismes de génération sont organisés au niveau régional. Cela corrobore les conclusions antérieures sur la fragmentation du réseau mondial de contrôle des entreprises, mais donne également un aperçu de la façon dont ce réseau a été façonné au fil du temps.

**Mots-clés**

Élites d’entreprise, réseaux d’élites, directions imbriquées, analyse de séquences, élite transnationale

**Resumen**

La transnacionalización de las actividades económicas ha alterado fundamentalmente el mundo. Una de las consecuencias que ha intrigado a los académicos es la formación de una élite empresarial transnacional. Si bien la literatura tiende a centrase en la topología de la red de interbloqueo de juntas transnacionales, se sabe poco sobre sus mecanismos impulsores. Este artículo plantea la pregunta: ¿Cuáles son las trayectorias que siguen las élites corporativas para impulsar la expansión de esta red? Para responder a esto, los autores emplean un enfoque novedoso que modela la transnacionalización de las élites utilizando sus secuencias de nombramientos en la junta. Los hallazgos muestran que hay seis trayectorias de transnacionalización que siguen las élites corporativas para expandir la red. Los autores argumentan que si bien la red de élites transnacionales aparece como una estructura social global, sus mecanismos de generación están organizados regionalmente. Esto corrobora hallazgos anteriores sobre la fragmentación de la red global de control corporativo, pero también proporciona información sobre cómo se formó esta red a lo largo del tiempo.

**Palabras clave**

Élites corporativas, redes de élite, direcciones interconectadas, análisis de secuencias, élite transnacional

**Appendix**

Table A1. Entity types of firms, where transnational corporate directors hold positions ($N = 11528$ firms).

<table>
<thead>
<tr>
<th>Type entity</th>
<th>Number of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial company</td>
<td>9392</td>
</tr>
<tr>
<td>Financial company</td>
<td>795</td>
</tr>
<tr>
<td>Insurance company</td>
<td>623</td>
</tr>
<tr>
<td>Bank</td>
<td>451</td>
</tr>
<tr>
<td>Mutual and pension fund/Nominee/Trust/Trustee</td>
<td>172</td>
</tr>
<tr>
<td>Foundation/Research institute</td>
<td>43</td>
</tr>
<tr>
<td>Private equity firm</td>
<td>36</td>
</tr>
<tr>
<td>Venture capital</td>
<td>10</td>
</tr>
<tr>
<td>Public authority/State/Government</td>
<td>6</td>
</tr>
</tbody>
</table>
Table A2. NACE codes of firms, where transnational corporate directors hold positions \((N = 11528\) firms).

<table>
<thead>
<tr>
<th>NACE code</th>
<th>NACE code interpretation</th>
<th>Number of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Manufacturing</td>
<td>3323</td>
</tr>
<tr>
<td>G</td>
<td>Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles</td>
<td>1919</td>
</tr>
<tr>
<td>K</td>
<td>Financial and Insurance Activities</td>
<td>1907</td>
</tr>
<tr>
<td>J</td>
<td>Information and Communication</td>
<td>791</td>
</tr>
<tr>
<td>M</td>
<td>Professional, Scientific and Technical Activities</td>
<td>710</td>
</tr>
<tr>
<td>H</td>
<td>Transportation and Storage</td>
<td>529</td>
</tr>
<tr>
<td>N</td>
<td>Administrative and Support Service Activities</td>
<td>483</td>
</tr>
<tr>
<td>B</td>
<td>Mining and Quarrying</td>
<td>320</td>
</tr>
<tr>
<td>D</td>
<td>Electricity, Gas, Steam and Air Conditioning Supply</td>
<td>313</td>
</tr>
<tr>
<td>F</td>
<td>Construction</td>
<td>239</td>
</tr>
<tr>
<td>L</td>
<td>Real Estate Activities</td>
<td>169</td>
</tr>
<tr>
<td>I</td>
<td>Accommodation and Food Service Activities</td>
<td>127</td>
</tr>
<tr>
<td>S</td>
<td>Other Service Activities</td>
<td>112</td>
</tr>
<tr>
<td>Q</td>
<td>Human Health and Social Work Activities</td>
<td>105</td>
</tr>
<tr>
<td>R</td>
<td>Arts, Entertainment and Recreation</td>
<td>78</td>
</tr>
<tr>
<td>A</td>
<td>Agriculture, Forestry and Fishing</td>
<td>52</td>
</tr>
<tr>
<td>E</td>
<td>Water Supply, Sewerage, Waste Management and Remediation Activities</td>
<td>48</td>
</tr>
<tr>
<td>P</td>
<td>Education</td>
<td>30</td>
</tr>
<tr>
<td>O</td>
<td>Public Administration and Defence, Compulsory Social Security</td>
<td>15</td>
</tr>
<tr>
<td>T</td>
<td>Activities of Households as Employers; Undifferentiated Goods and Services Producing</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Activities of Households for Own Use</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td></td>
<td>256</td>
</tr>
</tbody>
</table>

Source: NACE (Statistical Classification of Economic Activities in the European Community), rev. 2 (2008), level-1 codes are used.