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From Presence to Influence: Gender, Nationality and Network Centrality of Corporate Directors

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Abstract

The enduring lack of diversity in the corporate elite continues to attract attention from scholars and practitioners. However, the issue of representation or ‘body count’ – in particular for women – tends to dominate the discussion and overshadows social-relational dimensions. Adopting a network perspective, this article investigates how gender and nationality interact with human and social capital (i.e., director capital), explaining why particular directors hold more influential positions in the corporate elite. Findings from Swiss data show that some specific aspects of human and social capital matter more than others for being an influential director and that, *ceteris paribus*, Swiss citizens benefit most from both sources of capital. The discussion engages with the implications of our findings on current approaches intended to increase the numbers of appointments of ‘diverse’ directors, and how these are expected to change the corporate elite and the related job market in the longer term.

Keywords: Corporate elite, Director capital, Foreign directors, Gender, Human capital, Influence, Nationality, Networks, Social capital, Women directors.

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INTRODUCTION

While demographic diversity in the workplace at large is increasing, diversity in the corporate elite in general and the director population in particular is still quite limited. Many governments – and in some cases large institutional shareholders – have tried to ‘correct’ for the lack of diversity in boardrooms, chiefly by instituting quotas or targets for women on public and corporate boards (Seierstad *et al.*, 2017a, 2017b; Maume *et al.*, 2019). However, the discussion about board diversity is dominated by the issue of board representation in terms of ‘body count’ and it is assumed that, when the numbers are right, the increased presence of non-traditional directors will lead to their equivalence in the director population, including network positions yielding critical benefits such as influence (Kogut *et al.*, 2014). It is assumed that time-limited labour market interventions such as policies or quotas lead to long-term changes in the career paths of corporate directors. In this article, this assumption is recast by investigating how demographics interact with human and social capital variables (i.e., director capital) in explaining why some directors hold more influential positions in the corporate elite, so as to understand the challenges of changing the director job market beyond the body count.

A number of articles investigate the qualifications of ‘non-typical’ or ‘diverse’ directors, paying close attention to the importance of human capital – particularly education – for professional trajectories (Singh *et al.*, 2008). However, findings about the decisiveness of human capital alone are not conclusive (Johnson *et al.*, 2013). Also, recent work in this journal about the effects of gender-based quotas in Norway shows that what is considered to be relevant human capital for directorships is context-dependent (Seierstad *et al.*, 2020). Furthermore, focusing on individual qualifications still constrains our engagement with the social-relational dimensions in a director’s profile. Thus, a supplemental challenge to forming more-diverse boards is to not only

appoint a qualified director but one whose voice matters and whose opinions will weigh on decision-making; in other words, a director with influence (Westphal and Milton, 2000). Overall, more work is needed to understand recent changes in the composition and workings of the corporate elite from a network perspective, both in terms of internationalisation and gender diversity (Heemskerk et al., 2016; Heemskerk and Fennema, 2014). This article posits that board diversity goes beyond the body count and that director influence is a crucial aspect to consider for leveraging the promises of board diversity and of the wider social objectives of diversifying the corporate elite and the afferent job market. Thus, in order to consider the effects of director influence, it is essential to extend our attention to the notion of social capital.

In contrast to human capital, the concept of social capital allows us to get a relational rather than an individual-centred perspective on how resourceful individuals are (Bourdieu, 1986). The value of directors' social capital and, correspondingly, their ability to derive advantages such as influence, is not only a function of the number of connections, but also depends on to whom they are linked (Bourdieu, 1986). The director population in a given country constitutes a social group – the corporate elite – that builds ties and exchanges resources throughout their professional career (Burt, 1978; Connelly and Van Slyke, 2012). This group encompasses directors and top managers of leading firms (Fitzsimmons and Callan, 2016; McDonald and Westphal, 2013; Useem, 1982). The literature on corporate board interconnections shows that they are connected through social relations and tend to form 'small worlds' (Kogut, 2012). However, this is not sufficient to indicate that they are more influential directors than others over time, as the counting of direct ties is reckoned to be a limited way to assess network outcomes such as influence (Borgatti, 2005; Boyd et al., 2017).

To investigate the contingencies that affect director influence, this article examines, for Switzerland, how aspects of social and human capital differently affect director influence of female versus male, and local versus foreign directors. The absence of quotas or legally enforced targets allows us to limit issues of endogeneity and capture the effect that gender diversity has on director influence, which can then be discussed with regard to how labour market interventions are expected to induce long-term change in the director population. The findings support the argument that influence is a function of higher endowments in director capital, but also that how much one benefits from higher endowments depends on demographic characteristics – in this case, being a local (male) director.

This article contributes to the literature on corporate elite diversity in several ways. First, it contributes to the scholarly conversation on diversity beyond the body count in the corporate elite (Bolton and Muzio, 2008; Elstad and Ladegard, 2010; Bolívar *et al.*, 2019) by taking a network perspective. Rather than using simulations (Kogut *et al.*, 2014), the article, starting from an intervention-free empirical example, questions whether a change in body count is sufficient to induce longer-term changes in the corporate elite and in the related niche, yet power-laden, labour market for directors. Second, the article contributes to this literature by exploring two dimensions of board diversity in the same study, namely, gender and national origin, the latter being seldom studied (Ruigrok *et al.*, 2007; van Veen and Marsman, 2008; Oxelheim *et al.*, 2013).

DIVERSITY AND INFLUENCE IN THE DIRECTOR POPULATION

Mizruchi and Bunting (1981) define influence as ‘leadership ability in situations of collective activity and as the ability to affect the outcomes of events’ (1981, p. 476). Useem (1979) builds upon the definition of influence, establishing the existence of an inner group in the corporate elite, and showing that being centrally positioned relates to influence (Adams *et al.*,

2010; Lester et al., 2008). This aligns with research in sociology, management and graph theory, where network centrality and influence are shown to be linked (Bonacich, 1987; Ibarra and Andrews, 1993; Padgett and Ansell, 1993; El-Khatib *et al.*, 2015). Influence and centrality are thus used interchangeably in the remainder of this article.

Gender, nationality and influence

In recent years, research has discussed diversity beyond the body count and has investigated the importance of director influence on shaping new strategic decisions and firm performance. Research shows that women and persons with a non-Caucasian ethnic background tend to sit on boards or top management teams as tokens of the firm's goodwill to conform to stakeholders' expectations about diversity or to legislation (Cook and Glass, 2014; Smith and Parrotta, 2018). This leads to issues of meaningful inclusion and participation, and on related opportunity to influence decision-making (Walt et al., 2003).

Boards of directors have long been predominantly all male, and the persistence of the 'old (white) boys networks' can be captured in director network structures, which change very little over time (Gamba and Kleiner, 2001), reflecting the social phenomena homophily (McPherson and Smith-Lovin, 1987). With respect to nationality, in line with the tendencies of homophily, the majority of directors on boards of directors are locals (Oxelheim et al., 2013). Previous research also shows that majority-group members who are more central in a network are typically male (Ibarra, 1992; Mollica *et al.*, 2003). Moreover, demographically diverse directors are less likely to hold key network positions (Walt et al., 2003; Westphal and Milton, 2000), relating centrality in networks to influence (Ibarra, 1992; Stevenson and Radin, 2009).

Hypothesis H1a: Gender positively affects network centrality so that male directors are more centrally positioned in the national network of corporate directors.

Hypothesis H1b: Nationality positively affects network centrality so that local directors are more centrally positioned in the national network of directors.

Human capital, diversity and influence

A high level of human capital, that is to say the sum of skills and experience individuals accumulate throughout their careers through education and tenure, is crucial for director selection and peer recognition, as well as for the successful fulfilment of that role (Hillman and Dalziel, 2003; Johnson *et al.*, 2013). Directors' prior professional experience as managers and board members is a strong determinant of their level of human capital, and consequently of the level of knowledge and skills on how boards, firms and industries operate (Becker, 2009). Also, directors' level of education is positively correlated with firm-level innovation and innovative performance (Wincent, Anokhin and Örtqvist, 2010; Dalziel *et al.*, 2011): an increasing number of directors now hold university degrees, including a growing number of MBAs.

A limited body of work looks at the interactions between human capital and diversity. It is argued that 'non-traditional' directors need to have more capital than others to reach desirable positions, such as having a spotless curriculum vitae (see e.g. Singh *et al.*, 2008). This relates to a broader body of research about the different hurdles such as bias and stereotypes that, for example, women and non-white persons have to overcome in order to be considered as qualified candidates, and then later as equal participants in decision-making (Bilimoria and Piderit, 1994; Terjesen *et al.*, 2009). Moreover, research about managers suggests that, in terms of network advantage, men will benefit more than women from having higher human capital (Ibarra, 1997).

Furthermore, tokenism theory suggests that the outsider director demographic status would matter more for director influence than the human capital they bring with them (Bilimoria and Piderit, 1994; Terjesen et al., 2009; Torchia et al., 2011). While there is limited literature about foreigners on boards, it is here argued that their outsider status warrants similar reasoning.

Hypothesis H2a: Human capital positively moderates the effect of director gender (male) on network centrality.

Hypothesis H2b: Human capital positively moderates the effect of director nationality (local) on network centrality.

Social capital, diversity and influence

A growing body of work suggests that the capacity for access to valuable resources through one's network matters for directorships (Podolny and Baron, 1997; Withers *et al.*, 2012), and management research shows that social capital can play a critical role in obtaining them (Withers *et al.*, 2012; Johnson *et al.*, 2013; Hodigere and Bilimoria, 2015). Social capital is seen as an asset that one brings to a firm. For example, directors with ties to private equity deal partners increase the likelihood of such deals going through (Stuart and Yim, 2010). Furthermore, direct network ties improve the level of advice and counsel provided on strategic issues in the board (Westphal, 1999). Also, while the type of education matters for human capital, studying in a given higher education institution also fosters the development of directors' networks in the form of direct ties to former classmates (Adler and Kwon, 2002) or indirect ties resulting from their status as alumni (Certo, 2003), which can be activated to access resources or get information. Finally, government ties have value in terms of access to resources (Lester *et al.*, 2008; Adams *et al.*, 2010).

Moreover, even relative outsiders can be valued for their social capital (Kim and Cannella, 2008). For example, Masulis *et al.* (2012) find that foreign independent directors help improve the success rate of cross-border acquisitions in their home countries but, when such investments decrease, their presence is associated with poorer performing firms. Foreigners can thus bring in appreciated resources, yet are less likely to become central or influential among their peers. Further, the literature strongly suggests that the ability to acquire and leverage social capital is an unequal endeavour depending on the person's demographic characteristics, in particular gender but also race/ethnicity (Burt, 1998; Villesèche and Josserand, 2017; Westphal and Milton, 2000). This means that non-typical directors will experience constraints not only in the accumulation of social capital, but also in deriving benefits from their social capital so as to bestow influence.

Hypothesis H3a: Social capital positively moderates the effect of director gender (male) on network centrality.

Hypothesis H3b: Social capital positively moderates the effect of director nationality (local) on network centrality.

METHODS

Data

The formed hypotheses are tested with data about the director population in Switzerland. In Switzerland, gender diversity has not been a key concern, and quotas and related policies have repeatedly been blocked both in the political and corporate realms (Villesèche and Sinani, 2017). However, in contrast to other Western countries, top Swiss firms have a majority of foreign directors on their boards (van Veen et al., 2014). Switzerland is a small country but also a world-class player in today's economy, appearing in the top ten in Fortune Global 500, and attracting

international top talents with competitive wages in reputed firms. The case of Switzerland may thus not be representative of the international ‘realities’ of the corporate elite (Ruigrok et al., 2007). However, with a view to generating theoretical insights, this setting lets us examine director influence with minimal interference from policies that encourage or even constrain diversity on boards of directors, while constraints and advantages deriving from the social structure are still present. In other words, this quasi-absence of institutional pressure lets us avoid endogeneity issues. Notably, it allows us to empirically investigate the importance of ‘being a local’ – here, a Swiss national – in a context where locals do not constitute a numerical majority.

The data was obtained from BoardEx, a database containing the profiles of over 450,000 board members, top executives and senior managers. It consolidates public domain information regarding current and past positions, board appointments, age, experience in the sector, education, and demographic details such as age, nationality and gender. In BoardEx any two individuals are linked if they have been sitting together on a board or in a top management team. While this definition has not allowed us to establish the closeness or importance of the professional relationship of two directors, it was nevertheless possible to map out a web of relations that can be minimally categorised as weak links. Notably, these can yield access to novel information in the form of advice and business or career opportunities (Granovetter, 1983). It is acknowledged that the set up gives us limited ability to comment on causality, as is commonly the case in research involving social capital dimensions (Godechot, 2016).

The database consists of the cumulative director information in years 2000-2009 for the directors of the 50 largest Swiss companies featured in the SMI Expanded indexⁱ in 2009. Due to missing information, the sample was reduced to 45 firms. The base network consists of the ties between the 375 directors of these firms during years 2000-2009. This network matrix consists of node attributes of director characteristics such as gender, age, human and social capital variables

as well as other variables collected from BoardEx. In other words, information on the directors and their networks was used to investigate how director capital affects director influence in the 45 largest Swiss firms.

Descriptive results (see the online Appendix, table 1) show that 90% of the directors in the database are male – which is not surprising given that there are no quotas or official targets for gender balance in Switzerland – and that 52% of directors are foreigners, which is remarkable by international comparison. Of these directors, 74% are highly educated with at least a Master's degree. On average, each director in the sample sits on four quoted boards and six private boards.

Mean difference tests (see the online Appendix, tables 2 and 3) show that the few female directors are on average younger and have significantly more ties to foreign firms than male directors, who spend significantly longer time on boards and have more university ties than female directors. There are no significant differences between female and male directors in terms of director network size, level of education and the number of ties to Swiss firms and government, nor are there differences between the sizes of boards on which they sit. Foreign directors have on average significantly larger network sizes than Swiss directors and more ties to foreign firms as well as more government ties. In contrast, Swiss directors have significantly more ties to Swiss firms and spent longer time on boards than foreign directors. There are no significant differences between foreign and Swiss directors in age, education, ties to universities, nor are there differences in the size of boards they sit on. Finally, regarding multicollinearity (see the online Appendix, table 4), the number of quoted boards and the number of private boards correlated at 0.6. Thus, to avoid multicollinearity issues each variable is used in distinct regression models when applicable.

Dependent variable

Director *influence* was captured via a measure of relative centrality known as Bonacich eigenvector centrality (Bonacich, 1987): directors are as central to their networks as are their contacts. Eigenvector centrality is considered to be an ideal choice to capture network influence; it is comparable to other measures of influence proposed in the literature (for an extended discussion see e.g. Borgatti, 2005). Eigenvector centrality is measured as the number of contacts to which a director in our sample is connected, relative to the distances among these contacts. Information and resources in a network are not constrained to flow only in one direction or through direct ties; eigenvector centrality can thus represent the ease with which a director both diffuses and accesses resources compared to more peripheral board members. In analytical language, given an adjacency matrix A (such as the matrix of our director network), the eigenvector centrality of vertex i (denoted c_i) in this matrix, is given by $c_i = \sum_j A_{ij}(a + bc_j)$, where a and b are parameters (Bonacich, 1987).ⁱⁱ

In addition, we consider three alternative network centrality measures: k-core, closeness and betweenness (see the online Appendix, tables 5, 6 and 7). Overall, these measures show that although there are significantly fewer women than men in the Swiss boards of directors, a few of them can be as central as men. These same measures suggest that foreigners are well represented in the top closeness centrality scores but do not stand out either with regards to k-core or betweenness centrality scores. Thus, there is no clear pattern emerging from these alternative centrality measures. Besides, these measures are ‘simplistic’ in that each node’s centrality is determined independently from that of other nodes. In contrast, with eigenvector centrality each node’s centrality is determined relative to the centrality of other nodes. These results support the theory-based choice to work with eigenvector centrality to capture influence.

Independent variables

Demographic variables: *Gender* is a dummy using 1 for male and 0 for female directors. *Nationality* is a dummy using 1 for Swiss directors and 0 for foreign directors. These dummies capture the difference in the network influence of a male versus a female director and a Swiss versus a foreign director, respectively.

Human capital: *Education* is a dummy variable using 1 if the director has at least a Master's degree (i.e., four to five years of higher education) and 0 otherwise. Experience adding to a director's credentials is captured with *time on boards* as the total number of years the director has been serving on boards; the *number of quoted boards* and *the number of private boards* in which a director has served.

Social capital: *Ties to Swiss firms* is a count of the number of contacts a given director has in nationally incorporated firms, both quoted and private. A high number of ties to members of the corporate elite in firms of a given country denotes a high degree of local embeddedness, and thus can explain a more favourable network position (Lee, 2009).

Ties to foreign firms is a count of the number of contacts a given director has in firms incorporated outside of Switzerland, both quoted and private. A central, influential director is expected to have a significant international network. Indeed, the local and foreign networks are not mutually exclusive, but represent access to different types of resources (Davoine and Ravasi, 2013). This is in line with theoretical arguments about the need to have a diversified portfolio of ties across different social circles 'inside' and 'outside' (Maurer and Ebers, 2006) in order to avoid too high closure (Burt, 2001) and lock-in situations (Gargiulo and Benassi, 2000).

Ties to government and *ties to universities* are also important for directors' prominence (see for example Lester et al., 2008), and thus their position in the network.

Control variables

Age and *board size* matter for director network opportunities; older directors tend to have more experience and accumulate network ties over time, and directors that sit in large boards have the opportunity to create more connections and thus may have a larger network. Also, directors in top firms are likely to become directors in other leading organizations as this is the customary talent pool (Johnson et al., 2013). *Industry* is operationalised as a set of dummy variables based on the two-digit NACE code for whether firms belong to Mining & Construction, Manufacturing, Finance/Insurance/Real Estate, Services, Public Administration or Transportation/Communication. Services are our base industry in regression analysis given that this is the most represented industry in the sample.

Estimation

Since our dependent variable (centrality) is a network variable, we estimate node-level regressions using the social network analysis software UCINET (Borgatti et al., 2018). UCINET node regressions are different from ordinary least squares regressions in that the actors in the network are not independent of each other; thus, the error terms and p-values are estimated using the random permutations method (Hanneman and Riddle, 2005). The method of social network analysis (SNA) is grounded in the formal sociology of Simmel and graph theory and supports the development of theory about relations and structural positions in networks. SNA has been previously used to generate insights about gender diversity in the corporate elite (Hawarden and Marsland, 2011; Hodigere and Bilimoria, 2015; Villesèche et al., 2021).

RESULTS

Table 1 reports results on hypotheses H1a and H1b about a main effect of gender and nationality on centrality. The results from Model 1 indicated that there is very weak evidence that

male directors are more central in the network compared to female directors ($b=0.081$, $p<0.10$). In contrast, the results in Model 2 showed that Swiss directors have a significantly higher eigenvector centrality than foreign directors ($b=0.37$, $p<0.001$). In Model 3, both gender and nationality were accounted for and the results further support that Swiss directors are more central ($b=0.36$, $p<0.001$). Given the composition of our sample, these results suggested that influence is not an ‘automatic’ outcome of a numerical majority/minority situation.

Insert Table 1 about here

Table 2 reports results for hypotheses H2a and H2bⁱⁱⁱ. Due to possible multicollinearity, the two hypotheses were tested separately for the number of quoted vs private board seats that a director holds. In Models 1 and 3, the coefficients of the interaction of human capital variables (*i.e., education, time on boards, number of private boards and number of quoted boards*) with the gender dummy were insignificant.^{iv} Thus, there was no significant difference on the impact of human capital variables on network centrality for men compared to women and no support for hypothesis H2a. In Models 2 and 4, the interaction effects indicated that Swiss directors are more centrally positioned than foreign directors whether they are sitting on quoted boards (Model 4, $b=0.35$; $p<0.01$) or on private boards (Model 2, $b=0.25$; $p<0.05$). Besides, there is limited evidence to indicate that Swiss directors with longer board experience are more centrally positioned than foreign directors (Model 4, $b=0.16$; $p<0.10$). Overall, these results suggested that, although foreign directors on average sit on more boards than Swiss directors (both quoted and private), they are less central in the director network. This indicates that influence is the outcome of more than just board presence and body count.

Insert Table 2 about here

Table 3 reports results for hypotheses H3a and H3b^v. Model 1 shows that male directors with more ties to Swiss firms are more central than female directors in the director network (Model 1, $b=0.47$, $p<0.05$). With respect to nationality, Model 2 shows that Swiss directors with more ties to Swiss firms are more central than foreign directors (Model 2, $b=0.24$; $p<0.01$). Furthermore, Swiss directors with more government ties are more central than foreign directors with government ties (Model 2, $b=0.18$; $p<0.01$). This provides support for hypotheses H3a and H3b.

Insert Table 3 about here

For control variables, our results showed that board size is highly significant ($p<0.001$). This confirms that working in larger firms provides the opportunity to meet more people, and particularly persons who are likely to become directors in other top firms. Moreover, in a follow-up analysis we controlled for *Director national origin* of non-Swiss directors based on the La Porta et al. (2008) classification of legal origin (British(1), French(2), German(3), Scandinavian(4)), i.e. a governance-cultural classification. This allowed ruling out that governance-cultural proximity plays a role in our data^{vi}.

CONCLUDING COMMENTS

This study investigates the relation between demographics, director capital and influence in the corporate elite. Results for the direct effect of gender and nationality on centrality show that there is only very weak evidence of gender differences, and that local (Swiss) directors are

significantly more central than foreigners. Results for the interaction models refine these insights and show that social capital contributes more to the centrality of local directors and men, and that human capital contributes more to the centrality of local directors while we do not detect an effect for men compared to women. This suggests that while there may be a relationship between increased presence and increased connectivity in the corporate elite (Kogut *et al.*, 2014), the body count is not sufficient to explain social-relational phenomena such as influence. Relatedly, this questions how much labour market interventions – which mainly focus on body count – can achieve with regards to changing the corporate elite and the afferent job market in the longer term. In what follows, the findings are discussed with regards to efforts to change the corporate elite and the related job market, and research avenues are reflected upon.

Demographics and director capital: a patchy relationship

This article contributes to research aiming to go beyond the body-count approach by showing that a change in demographics alone is insufficient to change the corporate elite. While it has been argued that there is a gradual ‘denationalization’ of the corporate elite in Switzerland (Davoine *et al.*, 2015) and elsewhere (Davoine and Ravasi, 2013; Djelic and Quack, 2003), Swiss directors hold more influence even if they are in a numerical minority. There is no evidence that this is the case for male vs female directors, contrary to our hypothesis based on previous research. A possible explanation is that, in the absence of institutional pressure, they are *not* hired as tokens.

This suggests that differences in social-relational outcomes (here influence) in a given employment group (here corporate directors) are not solely attributable to belonging to a numerical majority or minority. This is reminiscent of the ‘Teflon effect’ as coined by Simpson and Kumra (2016), i.e. that merit is not ‘sticking’ to women in the way it is sticking to men in

leadership position. This argument is extended here by showing that human and social capital stick best to male, local directors with regards to having influence.

Changing the corporate elite beyond the body count

The findings also show that network composition matters: notably, having a large number of ties to both Swiss and foreign firms plays out positively, rather than government ties or ties through educational institutions as hypothesised elsewhere (see e.g. Lester et al., 2008). Also, it matters to be a director in larger firms/boards. These findings question the thesis that there is an absence or decline of strong centres in national business elites (Heemskerk, 2007), and extend doubt to the capacity for current labour market interventions to change this. Indeed, the results overall show that an increase in body count cannot be directly related to increased influence (as a critical resource to impact decision-making) of non-traditional directors.

As referred to in the introduction, recent work in this journal suggests that a consequence of quota laws can be an expansion of what is considered to be qualifying director capital (Seierstad et al., 2020). However, from this study in a context without such laws, and despite assessing a variety of sources for human and social capital, some forms of capital matter more than others and the same ‘quantity’ of capital does not equally benefit directors having different demographics. This suggests that, for labour market interventions that are not expected to be permanent, requirements for diversity should include but not be limited to consideration about demographics. This also means that changing the corporate elite needs to be addressed from various angles: not only employment, but also governance and/or networking approaches. This aligns with previous findings that outsider status at the individual level is reinforced by the lower value or actionability of one’s social network (Bolíbar et al., 2019). Such recursive phenomena may further delay not only the equal consideration of female and other non-typical candidates for

directorship in a male-dominated corporate elite (Bolton and Muzio, 2008), but also their structural and social possibilities of weighing in on decision-making and being directors that *matter*.

Limitations and research avenues

While the theoretical insights about the relationship between demographics, director capital and influence are broadly relevant, the empirical results about Switzerland may be best transferrable to countries with similar characteristics (size; economic attractiveness; director population composition) such as Luxembourg, Hong Kong, Korea or the Netherlands. Also, as women are in a strong minority in our sample, this may hamper the ability to detect significant effects. Relatedly, we could not explore the interaction effects between gender and nationality due to the very small number of Swiss women directors in our sample. Further research could also seek to account for local embeddedness, as some foreigners may be born, raised and educated locally, as well as for recruitment mode, as some directors may be entering the board through mergers and acquisitions rather than through the labour market. Moreover, this study does not account for the role of informal networks, which tend to be gendered (Heemskerk, 2007; Villesèche and Josserand, 2017) and could thus further amplify or decrease detected effects. Also, future research can extend these insights through multi-country studies, or by comparing different time brackets in countries that have implemented targets or quotas. Moreover, the findings suggest that even top firms in a leading economy such as Switzerland are very locally embedded when looking at influence rather than only at ‘numerical’ diversity or at board interlocks, which could lead to governance and performance issues when such companies are operating internationally and need the related input.

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ENDNOTES

ⁱ The SMI Expanded comprises the SMI and the SMIM and hence the 50 most highly capitalised securities in the Swiss equity market. It represents about 95% of the capitalisation of the freely tradable shares of the Swiss equity market and is calculated both as a performance index and as a price index (SIX Swiss Exchange website, 2016).

ⁱⁱ The value of a is used to normalise the measure and the value of b is an attenuation factor giving the measure of dependence of each vertex’s centrality on the centralities of the vertices to which it is adjacent. The normalisation parameter is automatically selected so that the square root of the sum of squares of the vertex centralities is the size of the network (that is, the Euclidean norm of the vector equals the number of vertices). The value of beta is automatically set to $0.995/\max$ eigenvalue.

ⁱⁱⁱ Table 2 displays results for models that include interaction effects only. The full regression table is available in the online Appendix as Table 8.

^{iv} Regressions including each measure of human capital were run separately and the results held, in that the interaction effects were insignificant. These results are available upon request.

^v Table 3 displays results for models that include interaction effects only. The full regression table is available in the online Appendix as Table 9.

^{vi} The results are available upon request.

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Table 1. Regression results for gender and nationality

Demographics			
Model:	1	2	3
Gender – Male (H1a)	0.081† (0.066)		0.07 (0.106)
Nationality – Swiss (H1b)		0.37*** (0.000)	0.36*** (0.000)
Control Variables			
Age	-0.06 (0.856)	-0.03 (0.692)	-0.04 (0.779)
Board Size	0.44*** (0.000)	0.50*** (0.000)	0.50*** (0.000)
Mining & Construction	0.06 (0.149)	0.09† (0.066)	0.087† (0.074)
Manufacturing	0.002 (0.486)	0.03 (0.355)	0.03 (0.339)
Transport & Communication	0.02 (0.347)	0.07 (0.157)	0.07 (0.141)
Finance/Insurance/Real Estate	-0.2 (1.000)	-0.23 (1.000)	-0.24 (1.000)
Public Administration	-0.03 (0.686)	0.014 (0.378)	0.015 (0.366)
Intercept	0.008 (1.000)	-0.009 (1.000)	-0.013 (1.000)
Random Seeds	595	658	355

Standardised coefficients are reported, p-values in parentheses

Significance indications: *** p < .001; ** p < .01; * p < .05; † p < .10

Table 2. Regression results for human capital

	Human Capital - Private firms		Human Capital - Quoted firms	
	1	2	3	4
Gender - Male	0.11 (0.150)		0.12 (0.130)	
Nationality - Swiss		0.09*** (0.000)		0.03*** (0.000)
Time on Board	0.19 (0.134)	-0.08 (0.779)	0.19 (0.131)	-0.09 (0.811)
Nr Quoted boards			0.08 (0.300)	0.04 (0.263)
Nr Private boards	-0.03 (0.566)	-0.02 (0.586)		
Education MSc +	0.17† (0.091)	0.11† (0.059)	0.16 (0.107)	0.10† (0.080)
<i>Gender-Male x Time on Board (H2a)</i>	-0.11 (0.754)		-0.1 (0.757)	
<i>Gender-Male x Nr Private boards (H2a)</i>	0.01 (0.477)			
<i>Gender-Male x Education MSc + (H2a)</i>	-0.03 (0.601)		-0.02 (0.563)	
<i>Gender-Male x Nr Quoted boards (H2a)</i>			-0.06 (0.641)	
<i>Nationality -Swiss x Time on Board (H2a)</i>		0.12 (0.159)		0.16† (0.095)
<i>Nationality -Swiss x Nr Private boards (H2a)</i>		0.25* (0.011)		
<i>Nationality -Swiss x Education MSc + (H2a)</i>		0.06 (0.333)		0.005 (0.485)
<i>Nationality -Swiss x Nr Quoted boards (H2a)</i>				0.35** (0.002)
Control Variable				
Age	-0.08 (0.861)	-0.02 (0.661)	-0.08 (0.875)	-0.05 (0.771)
Board Size	0.45*** (0.000)	0.49*** (0.000)	0.43*** (0.000)	0.46*** (0.000)
Mining & Construction	0.05 (0.203)	0.03 (0.279)	0.05 (0.208)	0.01 (0.400)
Manufacturing	-0.003 (0.515)	0.01 (0.425)	-0.03 (0.506)	-0.03 (0.668)
Transport & Communication	0.01 (0.407)	0.04 (0.289)	0.02 (0.389)	0.034 (0.301)
Finance/Insurance/Real Estate	-0.2 (0.987)	-0.21 (0.997)	-0.2 (0.999)	-0.22 (1.000)
Public administration	-0.02 (0.592)	0.02 (0.348)	-0.016 (0.589)	0.03 (0.442)
Intercept	-0.01 (1.000)	-0.011 (0.999)	-0.001 (0.999)	-0.003 (1.000)
R-square	0.22	0.37	0.4	0.35
Random seeds	799	1000	894	462

Standardised coefficients are reported, p-values in parentheses
Significance indications: *** p < .001; ** p < .01; * p < .05; † p < .10

Table 3. Regression results for social capital

	Social Capital	
	1	2
Gender - Male	0.03 (0.321)	
Nationality - Swiss		0.23*** (0.003)
Nr of Linked Swiss Firms	-0.17 (0.802)	0.13† (0.072)
Nr of Linked Foreign Firms	0.1 (0.273)	0.23** (0.009)
Government ties	0.04 (0.345)	-0.05 (0.775)
University ties	0.04 (0.385)	-0.02 (0.569)
<i>Gender – Male x Ties Swiss Firms (H3a)</i>	0.47* (0.019)	
<i>Gender – Male x Ties Foreign Firms (H3a)</i>	0.03 (0.429)	
<i>Gender – Male x Government Ties (H3a)</i>	-0.05 (0.640)	
<i>Gender – Male x University Ties (H3a)</i>	-0.002 (0.508)	
<i>Nationality – Swiss x Ties Swiss Firms (H3b)</i>		0.24** (0.010)
<i>Nationality – Swiss x Ties Foreign Firms (H3b)</i>		0.08 (0.133)
<i>Nationality – Swiss x Government Ties (H3b)</i>		0.18** (0.006)
<i>Nationality – Swiss x University Ties (H3b)</i>		0.03 (0.333)
Age	-0.06 (0.825)	-0.06 (0.835)
Board Size	0.39*** (0.000)	0.39*** (0.000)
Mining & Construction	0.07 (0.136)	0.08† (0.100)
Manufacturing	0.03 (0.369)	0.04 (0.276)
Transport & Communication	0.03 (0.343)	0.04 (0.277)
Finance/Insurance/Real Estate	-0.15 (0.998)	-0.16 (0.999)
Public administration	-0.02 (0.630)	-0.003 (0.486)
Intercept	0.007 (0.999)	-0.002 (0.998)
R-square	0.28	0.46
Random seeds	637	707

Standardised coefficients are reported, p-values in parentheses
Significance indications: *** p < .001; ** p < .01; * p < .05; † p < .10

APPENDIX

Table 1. Summary statistics¹

Variable	Obs	Mean	Std. Dev.	Min	Max
Gender - Female	375	0.090666	0.2875181	0	1
Nationality - Swiss	375	0.48	0.5002673	0	1
Age	375	59.29333	8.07315	32	83
Education - Master&Up	375	0.7386667	0.4399481	0	1
Time on Board	375	7.3168	6.880769	0.2	43.9
Nr of Quoted Boards	375	3.954667	3.605636	1	21
Nr of Private Boards	375	6.048	6.700853	0	62
Ties in Swiss Firms	375	272.0827	587.0314	1	5452
Ties in Foreign Firms	375	587.5573	884.6396	0	4546
Government ties	375	27.76	113.0493	0	1264
University ties	375	123.408	284.9764	0	2316
Board Size	375	12.152	5.72786	3	28

¹ ¹ We remind the reader that these are aggregated numbers correspond to the period 2000-2009, which explains why the maximum value of some variables can seem high. For example, the maximum value of 62 seats of private boards means that one of the directors in our sample has cumulated 62 seats over their director career as reported in BoardEx, thus these are not all simultaneous directorships.

Table 2. Results of t-tests for mean differences between male and female directors

	Mean for Female	Mean for Male	P-Value Mean diff=0
Director Network Size	488.14	377	0.1145
Age	53.18	59.87	0.00***
Education - Master&Up	0.6764706	0.744868	0.3881
Time on Board	5.008	7.54	0.0401*
Nr of Quoted Boards	2.79	4.07	0.0489*
Nr of Private Boards	4.24	6.83	0.0474*
Ties in Swiss Firms	129.85	286.24	0.1387
Ties in Foreign Firms	880.97	558.3	0.0424*
Government ties	20.11	28.52	0.6799
University ties	117	192	0.0694*
Board Size	12.76	12.09	0.5138

Significance indications: *** $p < .001$; ** $p < .01$; * $p < .05$

Table 3. Results of t-test for mean differences between Swiss and foreign directors

	Mean Foreign	Mean Swiss	P-Value Mean diff=0
Director Network Size	481.6974	284.65	0***
Age	59.69744	58.85556	0.3137
Education - Master&Up	0.7076923	0.7722222	0.1562
Time on Board	6.26	8.461667	0.0019***
Nr of Quoted Boards	4.871795	2.961111	0***
Nr of Private Boards	7.389744	4.594444	0***
Ties in Swiss Firms	187.2205	364.0167	0.0034**
Ties in Foreign Firms	883.7128	266.7222	0***
Government ties	40.27179	14.20556	0.0255*
University ties	144.159	100.9278	0.1424
Board Size	12.5641	11.70556	0.1473

Significance indications: *** $p < .001$, ** $p < .01$, * $p < .05$

Table 4. Correlations table

	1	2	3	4	5	6	7	8	9	10	11
1 Time on Board	1.00										
2 Nr of Quoted Boards	0.12*	1.00									
3 Nr of Private Boards	0.13*	0.56*	1.00								
4 Board Size	-0.02	0.13*	0.14*	1.00							
5 Age	0.37*	0.21*	0.10*	-0.03	1.00						
6 Nationality - Swiss	0.16*	-0.27*	-0.21*	-0.08	-0.05	1.00					
7 Gender - Female	0.11*	0.10*	0.11*	-0.03	0.23*	0.04	1.00				
8 Education - Master&Up	0.07	0.10	-0.02	-0.03	-0.05	0.07	0.04	1.00			
9 Nr of Linked Swiss Firms	-0.02	-0.01	-0.02	0.09	-0.01	0.15*	0.08	0.08	1.00		
10 Nr of Linked Foreign Firms	-0.07	0.41*	0.15*	0.17*	0.08	-0.35*	-0.11*	0.09	-0.30*	1.00	
11 Government ties	0.02	0.15*	0.04	0.04	0.17*	-0.12*	0.02	0.04	-0.04	0.28*	1.00
12 University ties	-0.01	-0.01	-0.04	0.00	-0.05	-0.08	-0.08	0.19*	0.06	0.43*	0.09

Note: We mark with a star (*) all correlations significant at 1% significance level ($p < 0.01$).

Table 5. K-core scores

k-core	Gender		Nationality		Total
	<i>Male</i>	<i>Female</i>	<i>Foreign</i>	<i>Swiss</i>	
5	13	4	12	5	17
6	2	0	1	1	2
7	32	0	14	18	32
8	26	3	21	8	29
9	22	2	11	13	24
10	23	2	10	15	25
11	6	1	3	4	7
12	24	2	17	9	26
13	21	4	12	13	25
14	98	10	56	52	108
15	34	4	11	27	38
16	2	0	1	1	2
17	2	0	2	0	2
18	36	2	24	14	38
Total	341	34	195	180	375

Table 5 shows the *k-core* results between male and female directors and Swiss and foreign directors, respectively. Measuring K-core scores helps identify small interlinked core areas in a network. A node is included in the K-core if it is linked to at least k other nodes in the network. A k-core is a maximal group of nodes that are connected to at least k other nodes in the group. The data shows that although in our population there are clearly fewer female than male directors, and slightly fewer Swiss than foreign than directors, the majority of directors in each of these categories is linked to at least 14 other respective directors², i.e. they have a k-core score of 14. Further t-tests³ confirm that there is no significant difference in the k-core between female and male directors, or between Swiss and foreign directors, respectively.

² For instance, in Table 5, the majority of female directors (10 female directors) is linked to 14 male directors, while the majority of the male directors (98 directors) are linked to 14 other female directors. Thus K-core-ness is 14.

³ These t-tests are available upon request.

Table 6. Closeness centrality scores

Closeness	Gender		Nationality		Total
	<i>Male</i>	<i>Female</i>	<i>Foreign</i>	<i>Swiss</i>	
762-861	63	3	10	56	66
862-961	120	16	74	62	136
962-1061	72	5	49	28	77
1062-1161	54	7	40	21	61
1162-1361	21	3	17	7	24
1362-	5	0	5	0	5
Total	335	34	195	174	369

Table 6 shows the *closeness centrality* results with respect to directors' gender and nationality. A node that has a high measure of *closeness* centrality has the shortest paths to the other nodes in the network. Thus, this measure shows which nodes pass on and receive communications more quickly than anybody else in a given group. Therefore, nodes on the edge of a network attached to few other entities have a lower measure of closeness centrality. The results show that 25 male and 3 female directors, and 22 foreigners and 7 Swiss directors, respectively, have the highest closeness centrality scores. In turn, there are 63 male and 3 female directors and 10 foreigners and 56 Swiss directors with the lowest closeness centrality scores. Women and foreigners thus do not appear to be isolated in terms of their position in the network formed by all directors in our population.

Table 7. Betweenness centrality scores

Betweenness	Gender		Nationality		Total
	<i>Male</i>	<i>Female</i>	<i>Foreign</i>	<i>Swiss</i>	
0-299	221	27	159	89	248
300-599	54	6	20	40	60
600-899	34	0	8	26	34
900-1199	16	0	4	12	16
1200-1499	4	0	2	2	4
1500-1799	7	1	2	6	8
1800-2099	2	0	0	2	2
2100-2399	1	0	0	1	1
2400-	1	0	0	1	1
Total	340	34	195	179	374

Table 7 shows the *betweenness centrality* results. Betweenness centrality is a measure of the number of paths that pass through each node. This measure helps identify nodes (*i.e.* directors) with the ability to control information flow between different parts of the network. These nodes are also known as gatekeeper nodes. Gatekeepers may have many paths that run through them and that allow them to channel information to most of the other members in the network. Alternatively, gatekeepers may also have few paths that run through them, but still play a powerful communication role if they exist between different network clusters. The results show that there is no clear indication that males or Swiss national dominate the director network in terms of betweenness centrality. Indeed, only a handful directors (15 male and 1 female and 12 Swiss and 4 foreign directors) have more than a thousand paths running through them, which classifies them as gatekeeper nodes in our network. In contrast, the majority of all directors have less than 300 paths running through them, out of which 18 directors have between 1-10 paths running through them.

Table 8. Regression results for human capital

Model	Human Capital – Private firms			Human Capital – Quoted firms		
	1	2	3	4	5	6
Gender – Male	0.05 (0.174)	0.11 (0.150)		0.05 (0.179)	0.12 (0.130)	
Nationality – Swiss	0.37*** (0.000)		0.09*** (0.000)	0.39*** (0.000)		0.03*** (0.000)
Time on Boards	0.003 (0.482)	0.19 (0.134)	-0.08 (0.779)	0.001 (0.489)	0.19 (0.131)	-0.09 (0.811)
Nr Quoted Boards				0.13** (0.017)	0.08 (0.300)	0.04 (0.263)
Nr Private Boards	0.06 (0.169)	-0.03 (0.566)	-0.02 (0.586)			
Education MSc+	0.13*** (0.009)	0.17† (0.091)	0.11† (0.059)	0.11** (0.021)	0.16 (0.107)	0.10† (0.080)
<i>Gender – Male x Time on Boards (H2a)</i>		-0.11 (0.754)			-0.1 (0.757)	
<i>Gender – Male x Nr Private Boards (H2a)</i>		0.01 (0.477)				
<i>Gender – Male x Education MS + (H2a)</i>		-0.03 (0.601)			-0.02 (0.563)	
<i>Gender – Male x Nr Quoted Boards (H2a)</i>					-0.06 (0.641)	
<i>Nationality – Swiss x Time on Boards (H2b)</i>			0.12 (0.159)			0.16† (0.095)
<i>Nationality – Swiss x Nr Private Boards (H2b)</i>			0.25* (0.011)			
<i>Nationality – Swiss x Education MSc+ (H2b)</i>			0.06 (0.333)			0.005 (0.485)
<i>Nationality – Swiss x Nr Quoted Boards (H2b)</i>						0.35** (0.002)
Control Variables						
Age	-0.04 (0.740)	-0.08 (0.861)	-0.02 (0.661)	-0.06 (0.828)	-0.08 (0.875)	-0.05 (0.771)
Board Size	0.50*** (0.000)	0.45*** (0.000)	0.49*** (0.000)	0.48*** (0.000)	0.43*** (0.000)	0.46*** (0.000)
Mining & Construction	0.08† (0.097)	0.05 (0.203)	0.03 (0.279)	0.07 (0.105)	0.05 (0.208)	0.01 (0.400)
Manufacturing	0.04 (0.290)	-0.003 (0.515)	0.01 (0.425)	0.03 (0.350)	-0.03 (0.506)	-0.03 (0.668)
Transport & Communication	0.07 (0.152)	0.01 (0.407)	0.04 (0.289)	0.07 (0.126)	0.02 (0.389)	0.034 (0.301)
Finance/Insurance/Real Estate	-0.23 (1.000)	-0.2 (0.987)	-0.21 (0.997)	-0.22 (1.000)	-0.2 (0.999)	-0.22 (1.000)
Public Administration	0.03 (0.270)	-0.02 (0.592)	0.02 (0.348)	-0.02 (0.276)	-0.016 (0.589)	0.03 (0.442)
Intercept	-0.02 (1.000)	-0.01 (1.000)	-0.011 (0.999)	-0.018 (1.000)	-0.001 (0.999)	-0.003 (1.000)
Random seeds	535	799	1000	427	894	462

Standardized coefficients are reported, p-values in parentheses

Significance indications: *** p < .001; ** p < .01; * p < .05; † p < .10

Table 9. Regression results for social capital and full model

	Social Capital			FULL MODEL	
	1	2	3	4	5
Gender - Male	0.07† (0.096)	0.03 (0.321)		0.06 (0.142)	0.06 (0.140)
Nationality - Swiss	0.40*** (0.000)		0.23*** (0.003)	0.39*** (0.000)	0.40*** (0.000)
Time on Boards				0.037 (0.273)	0.04 (0.267)
Nr Quoted Boards					0.05 (0.242)
Nr Private Boards				0.04 (0.253)	
Education MSc+				0.07† (0.097)	0.07 (0.116)
Control Variables					
Nr of Linked Swiss Firms	0.27*** (0.000)	-0.17 (0.802)	0.13† (0.072)	0.27*** (0.000)	0.27*** (0.000)
Nr of Linked Foreign Firms	0.28*** (0.001)	0.1 (0.273)	0.23** (0.009)	0.27** (0.002)	0.25** (0.005)
Government Ties	-0.0004 (0.467)	0.04 (0.345)	-0.05 (0.775)	-0.001 (0.479)	-0.002 (0.469)
University Ties	0.005 (0.447)	0.04 (0.385)	-0.02 (0.569)	-0.004 (0.504)	0.003 (0.463)
<i>Gender – Male x Ties Swiss Firms (H3a)</i>		0.47* (0.019)			
<i>Gender – Male x Ties Foreign Firms (H3a)</i>		0.03 (0.429)			
<i>Gender – Male x Government Ties (H3a)</i>		-0.05 (0.640)			
<i>Gender – Male x University Ties (H3a)</i>		-0.002 (0.508)			
<i>Nationality – Swiss x Ties Swiss Firms (H3b)</i>			0.24** (0.010)		
<i>Nationality – Swiss x Ties Foreign Firms (H3b)</i>			0.08 (0.133)		
<i>Nationality – Swiss x Government Ties (H3b)</i>			0.18** (0.006)		
<i>Nationality – Swiss x University Ties (H3b)</i>			0.03 (0.333)		
Age	-0.06 (0.838)	-0.06 (0.825)	-0.06 (0.835)	-0.07 (0.854)	-0.07 (0.868)
Board Size	0.42*** (0.000)	0.39*** (0.000)	0.39*** (0.000)	0.42*** (0.000)	0.42*** (0.000)
Mining & Construction	0.08† (0.080)	0.07 (0.136)	0.08† (0.100)	0.08† (0.094)	0.08† (0.099)
Manufacturing	0.06 (0.205)	0.03 (0.369)	0.04 (0.276)	0.06 (0.202)	0.05 (0.233)
Transport & Communication	0.06 (0.182)	0.03 (0.343)	0.04 (0.277)	0.07 (0.173)	0.06 (0.170)
Finance/Insurance/Real Estate	-0.18 (1.000)	-0.15 (0.998)	-0.16 (0.999)	-0.17 (1.000)	-0.18 (1.000)
Public Administration	0.02 (0.356)	-0.02 (0.630)	-0.003 (0.486)	0.02 (0.302)	0.02 (0.316)
Intercept	-0.017 (1.000)	0.007 (0.999)	-0.002 (0.998)	-0.02 (1.000)	-0.018 (1.000)
Random Seeds	619	637	707	129	33

Standardized coefficients are reported, p-values in parentheses

Significance indications: *** p < .001; ** p < .01; * p < .05; † p < .10