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In search of a transnational capitalist class: Alternative methods for comparing director interlocks within and between nations and regions

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Abstract

Theorists of globalization have hypothesized the emergence of a transnational capitalist class that is becoming increasingly integrated across national borders. One method of evaluating this hypothesis has been to apply network analysis to study the frequency and pattern of transnational ties within global interlocking directorates. The results of such studies are mixed, both as regards the extent of transnational interlocking and its regional distribution. In an effort to resolve this ambiguity and advance the state of research in this area we undertake two main tasks. First, we submit the prevailing methodology used in such studies to a critical evaluation in which we identify and address some of its theoretical and methodological limitations. Second, we introduce and illustrate three alternative methods for assessing the extent and pattern of global interlocking directorates. Each method conceptualizes transnational interlocking in a slightly different manner and brings different aspects of the process into focus. Despite these differences, all four methods point to the conclusion that a transnational capitalist class is very far from being realized on a global scale. On the other hand, the combined evidence is much stronger and relatively consistent for the emergence of a more circumscribed transnational capitalist class, centered in the North Atlantic region, which has made significant strides in transcending national divisions within and between Europe and North America.

Keywords

Class, corporation, globalization, network, transnational

Across a range of disciplines, the concept of 'globalization' has gained increasing currency as a way of characterizing the distinctiveness of the contemporary era and anticipating the

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consequences of the growing interpenetration of national societies and the flattening of national differences. The process of globalization is understood as occurring along multiple dimensions: economic, political, cultural, technological, ecological, etc. At the heart of most theories of globalization, however, are processes of *economic* transformation – especially the rising power and reach of transnational corporations (TNCs) and the concomitant weakening of state-enforced constraints on the ability of large corporations to shift resources, reorganize production, and extract profits without concern for national borders or the consequences for national economies.

There is extensive research documenting many aspects of economic globalization, including the increase in international trade, financial flows, foreign direct investment, globally integrated production chains, technology transfers, and labor migration. However, one of the most provocative theses to emerge from the literature on economic globalization – a thesis with potentially sweeping social and political implications – has only recently begun to receive serious empirical scrutiny. This is the prediction that, as transnational corporations become increasingly global in their operations, the elites who own and control those corporations will also cease to be organized or divided along national lines. Instead, it is said, we are witnessing the formation of a 'transnational capitalist class' (TCC), whose social networks, affiliations, and identities will no longer be embedded primarily in the roles they occupy as citizens of specific nations (Robinson, 2004; Sklair, 2001). Among those at the top of the global economic pyramid, it is predicted that national identities will be displaced by (or subordinated to) a common transnational identity with a shared sense of economic interests and an enhanced capacity for unified political action. Were this to occur, the results could be dramatic, both in terms of increased opportunities for economic collusion among corporate elites and a further erosion of citizenship rights and the power of non-elites at the national level.

Much of the early literature on the emergence of a transnational capitalist class drew on a mixture of anecdotal evidence and theoretically informed speculation.[1] More rigorous empirical research on whether or not such a transformation in the global class structure is occurring, how far it has advanced, or the specific ways it manifests itself is still limited and cannot be said to have reached any definitive conclusions. Nevertheless, the thesis is theoretically plausible, substantively important, and has captured the imagination of numerous scholars who have contemplated the ultimate social and political consequences of globalization.

One of the most promising starting points for undertaking a more rigorous investigation of the emergence (or otherwise) of a TCC has been to extend to the global level one of the main methods that has been developed to study the social organization and cohesion of corporate elites at the national level. This is the use of network analysis to study interlocking directorates. By 'interlocking directorate' is meant the structure of interpersonal or interorganizational relations that is created whenever a director of one corporation sits on the governing board of another corporation. In advanced industrial countries like the United States, director interlocks are extensive – typically linking 85 to 90 percent of large firms and their directors into a single connected network, where the average number of links required to reach any firm or director from any other is only three or four (Davis et al., 2003).

Interlocking directorates have multiple causes and consequences, but one of the best documented features of interlock networks is the insight they provide into patterns of *cohesion* within the corporate community.[2] The place that individual firms or directors occupy within this network and the strength of their ties to other firms or directors have been shown to be aligned with similarities of social background, corporate strategy, and political behavior (Burris, 2005; Mizruchi, 1992, 1996; Useem, 1984). This is partly because the selection of corporate directors builds on preexisting social bonds, but also because social interaction within corporate boardrooms functions to

create or solidify shared identities and worldviews. The robustness of these patterns at the national level suggests that properties of global interlocking directorates – specifically, changes in the relative strength of transnational versus intra-national directorship ties – might also be used to assess the extent and pattern of any trend toward the emergence of a cohesive, transnational capitalist class.

As scholars who have pursued this line of research have acknowledged, evidence of a dense or growing network of transnational directorship ties does not of itself demonstrate the existence or emergence of a transnational capitalist class. At best, it only enhances the plausibility of transnational class formation by documenting structural patterns of association that may be interpreted either as traces or as facilitators of a broader spectrum of types of affiliation and forms of collective identity and behavior that might warrant the label of 'class' (Carroll and Fennema, 2002). Hence, although a definitive demonstration of the existence (or otherwise) of a transnational capitalist class will require more direct evidence on these other social, cultural, and political dimensions of class formation, studies of the network of transnational directorship ties have much to contribute to the larger, and profoundly challenging, question of the impact of globalization on class organization and class power in the 21st century.[3]

During the last decade several major studies have appeared that employ data on global interlocking directorates to assess the trend toward the emergence of a transnational capitalist class.[4] Among the most influential and widely cited of these are a study by Carroll and Fennema (2002) and a second by Kentor and Jang (2004). These two studies use different sampling strategies and reach conflicting conclusions about whether or how rapidly the corporate community is becoming more transnational in nature, leading to a heated exchange about the proper approach to the study of global interlocking directorates (Carroll and Fennema, 2004, 2006; Kentor and Jang, 2006). Carroll and Fennema (2002), using a stratified and purposely non-random sample of 176 firms, report only a slight increase in transnational interlocking between 1976 and 1996. Kentor and Jang (2006), using a non-stratified sample comprising the entire *Fortune* Global 500 firms, report a more dramatic increase between 1983 and 1998. Both studies report the highest number and greatest increase of transnational interlocks within Europe, with most of the remaining transnational ties occurring between European and North American firms. Both also report very few transnational interlocks maintained by firms based in Asia or other regions. Hence, it is fair to say that both studies fall short of documenting the existence of a transnational business community that is already fully global in scope, although they differ in their assessments of how rapidly we may be moving in this direction. Both agree that European economic integration has been accompanied by an increase in transnational interlocking among European firms, although they differ on whether or not they believe the shift in this direction has reached a plateau or is accelerating. And both direct our attention to trans-Atlantic ties as the most numerous transnational links outside Europe, raising the possibility that transnational interlocking is potentially broader than just a European phenomenon or trend.[5]

One point that has been obscured in the extensive debate between these two pairs of authors is that, sampling strategies aside, they are both in basic agreement about the appropriate method for studying global interlocking directorates. Both studies begin with large samples of the world's largest corporations and their boards of directors at two points in time. They compute the network of *firm-to-firm* director interlocks for these samples; they differentiate between those interlocks that link firms headquartered within the same nation versus those that link firms across national borders; then they assess the extent and pattern of any increase in the latter. With only a few exceptions (Carroll, 2009; Staples, 2006, 2007), the preponderance of other research in this area has followed some variant of this method.

In this article we argue that the prevailing approach to the study of global interlocking directorates – particularly as it relates to the question of the emergence of a transnational capitalist class – is beset by theoretical and methodological limitations, and for this reason the results of these studies deserve reexamination. From a theoretical standpoint we argue that the prevailing practice of using *firms* rather than persons (e.g. directors, capitalists or corporate elites) as one's unit of analysis is ill suited for research that purports to investigate the structure and development of what is variously referred to as a transnational capitalist *class*, transnational corporate *elite*, or transnational business *community*. Rather than studying global interlocking directorates from the perspective of firm-to-firm ties, we favor either an approach that focuses on person-to-person (director-to-director) ties or a method that incorporates both persons and firms within a comprehensive conception of transnationality. From a methodological standpoint we argue that the prevailing practice of comparing the frequency of transnational corporate interlocks at two points in time is beset by unacknowledged biases and ignores the need for an empirically grounded and theoretically plausible *benchmark* to assess what level of transnational interlocking would reasonably qualify as evidence of a cohesive class, elite, or community. Finally, and more tentatively, we argue for the utility of a fourth approach to analyzing global interlocking directorates that is not limited to calculating the frequency or density of ties between types of actors, but also emphasizes path *distances* between actors after the manner in which these are studied in the literature on 'small-world' networks (Newman, 2000; Watts, 1999).

Reviewing the combined evidence from these four complementary methods of conceptualizing and measuring transnational interlocking directorates, we advance several conclusions about the extent and pattern of transnational interlocks within the global economy and their implications for the thesis of an emerging transnational capitalist class. On the one hand, all the evidence points to the conclusion that the emergence of a transnational capitalist class on a global scale is a very long way from being realized. On the other hand, the contrary argument that the preponderance of transnational interlocks are limited to Europe and can be viewed as little more than an artifact of the creation of the European Union and associated forms of European economic integration also fails to capture the extent and pattern of transnational ties. Instead, we argue that the data support the emergence of a more inclusive North Atlantic capitalist class incorporating both Europe and North America – at least insofar as the structural basis for such a class can be discerned from the pattern of transnational interlocking directorates.

The traditional approach to the study of global interlocking directorates

As a point of reference for the arguments that follow, we begin with a replication of the type of research that has dominated the study of global interlocking directorates. Shown in the two leftmost columns of Table 1 is the number of firm-to-firm director interlocks among the *Fortune* Global 500 largest corporations in 1998 and 2006, divided into domestic (intra-national) versus transnational interlocks and subdivided into regional categories. The data for 1998 are taken from Kentor and Jang (2004) and those for 2006 were collected by the authors.[6] The findings shown here are broadly consistent with previous studies. Domestic interlocks have declined as a share of the total while transnational interlocks have increased in frequency. The growth of transnational interlocks is particularly pronounced within Europe and between Europe and North America, whereas large corporations from Asia, as well as other regions not shown in the table (Latin America, Russia, the Middle East), are effectively isolated from the global interlock network. This suggests

Table 1. Number and density of firm-to-firm Ties among *Fortune* Global 500 firms in 1998 and 2006

	Number of ties		Density of ties	
	1998	2006	1998	2006
Total ties	1,097	1,068	.0088	.0086
Intra-national ties	916	761	.0372	.0388
Intra-national ties within Europe	257	320	.1077	.1388
Intra-national ties within North America	600	404	.0351	.0276
Intra-national ties within North Atlantic region[a]	857	724	.0438	.0427
Intra-national ties within Asia	46	33	.0092	.0125
Transnational ties	181	307	.0018	.0029
Transnational ties within Europe	88	161	.0074	.0123
Transnational ties within North America	14	18	.0058	.0054
Transnational ties within North Atlantic region[a]	165	284	.0034	.0057
Transnational ties within Asia	0	0	.0000	.0000
Transnational ties: Europe–North America	63	105	.0019	.0031
Transnational ties: Europe–Asia	3	6	.0001	.0003
Transnational ties: North America–Asia	3	6	.0001	.0003

[a]North Atlantic region refers to the combination of Europe and North America.

that the evidence for transnationalization thus far is more a manifestation of the process of European integration – or, perhaps, of the emergence of a North Atlantic ruling class (van der Pijl, 1984) – than it is of a TCC that is truly global in nature.

Although we consider these findings to be a significant advance over more anecdotal evidence, two methodological observations can be made concerning this traditional manner of analyzing global interlocking directorates. First, despite the considerable amount of ink that has already been spilt concerning the appropriate way of constructing a global sample of large corporations at multiple points in time (Carroll and Fennema, 2004, 2006; Kentor and Jang, 2006), there remain unacknowledged biases in this method of analysis that accentuate the apparent increase of transnational interlocks relative to domestic interlocks. These result from the fact that, as the global economy evolves from one in which the vast majority of the world's largest corporations are domiciled in a few hegemonic powers (e.g. the United States, Britain, France, Germany, and Japan) toward one in which an increasing number of nations are home to at least one or several giant firms, the random probability of domestic interlocks inherently declines, while the random probability of transnational interlocks inherently increases. For example, in 1998 there were no Irish firms among the *Fortune* Global 500, whereas in 2006 there was one: CRH. One thing we can say for certain is that that CRH cannot have had *any* intra-national interlocks within this sample, since there were no other Irish firms represented, while the entire remainder of the sample was available for the possibility of a transnational interlock. Conversely, the British or French or German firm that CRH may have replaced on the Global 500 list would have had numerous potential partners for a domestic interlock, but fewer opportunities for a transnational interlock.[7]

The consequences of such a dispersal of giant firms across a larger number of nations can be considerable. For example, a network of 100 firms divided equally among four nations will have a potential maximum of 3750 transnational interlocks and 1200 domestic interlocks (a ratio of slightly more than 3:1). A network of 100 firms divided equally among 10 nations will have a potential maximum of 4500 transnational interlocks and 450 domestic interlocks (a ratio of 10:1). Hence, if interlocks were formed purely by chance, the ratio of transnational to intra-national interlocks would be more than three times as great in the second sample. In the actual samples represented in Table 1 this bias is smaller but still substantial. Between 1998 and 2006 the maximum potential number of transnational interlocks within the *Fortune* Global 500 increased by roughly 4 percent, while the maximum potential number of domestic interlocks decreased by roughly 20 percent, meaning that *for sampling reasons alone* we would expect a 30 percent increase in the ratio of transnational to intra-national interlocks.

Luckily, a bias of this magnitude is insufficient to explain away the main findings in Table 1, although it does magnify the apparent trend toward transnational interlocking and alter some details of the analysis. To remove this bias, we must abandon comparisons made in terms of raw numbers or proportions of interlocks and instead calculate the *density* of ties in relation to the maximum possible number of ties of a given kind. The results of such an analysis are presented in the two rightmost columns of Table 1. We shall not dwell on these findings in detail, but merely point to a few examples to illustrate disparity between the two methods. For instance, based on the raw numbers it would appear that domestic interlocks were declining between 1998 and 2006, whereas the density of such ties relative to the changing composition of the samples actually *increased* slightly. Transnational interlocks appear to have increased by about 70 percent, whereas the unbiased figure is more like 61 percent. European transnational ties appear to have increased by 83 percent, whereas the unbiased figure is more like 66 percent. On the other hand, the increase in transnational interlocks between Europe and North America was only slightly exaggerated by the raw counts because there was almost no change between the two years in the maximum possible number of such ties. Consequently, after correcting for the bias associated with differences between the two samples, the increase in the density of transnational interlocks within the North Atlantic region was slightly greater than the increase in the density of transnational ties within Europe alone. In sum, it does not appear that the failure to control for sample differences invalidates the main findings of the prevailing method of research on global interlocking directorates, but it has exaggerated the evidence for an increase in transnational interlocking, particularly within Europe.

This brings us to our second methodological observation regarding the prevailing approach to the study of global interlocking directorates. Whether the increase in transnational interlocking among the world's largest firms is accurately measured as 61 percent or 70 percent or some other number, what does this really tell us about whether or how far we have progressed toward the realization of a network structure that is consistent with the thesis of a transnational capitalist class (or a trans-European capitalist class or North Atlantic capitalist class)? Surely confirmation of the existence of a transnational capitalist class must also draw upon studies of other sorts of data, such as surveys and interviews, evidence on educational backgrounds, elite club memberships, marriage patterns, and participation in policy-planning organizations among corporate elites of different nations. But restricting our attention to studies of global interlocking directorates, what is noticeably absent from the existing research is any effort to demonstrate that the patterns or changes reported are not just 'large' or 'small' in some elusive intuitive sense, but can be characterized as near to or far from reaching some empirically grounded benchmark for transnational class formation. In seeking to address this problem, we would argue the data to construct such a benchmark

already exist in the unique case of a geographically dispersed and politically decentralized economy comprising hundreds of giant corporations, which, despite its large size, cultural diversity, and federal state structure, nevertheless has given rise to what can be described as a *single*, relatively cohesive capitalist class – namely, the United States. Judiciously applied, we believe that evidence on intra- versus inter-regional interlocking within the US economy can be used to assess whether the configuration of interlocks within the global economy is consistent with, or to what extent it has approached, a pattern that might be expected to exist if there were indeed a transnational capitalist class that was widely dispersed in space but not split along national lines.

A systematic comparison of US and global interlocking directorates exceeds the scope of the present paper. However, a review of the relevant literature and a few examples should suffice to demonstrate the utility and potential results of such a method. It is well established that interlocking directorates within the United States are denser *within* than between cities, states, or regions (Allen, 1978; Bearden and Mintz, 1985; Mintz and Schwartz, 1985; Mizruchi, 1982). As succinctly summarized by Kono et al. (1998: 865), 'the network of interlocking directorates is localized in space – consisting of "clusters" of corporations interlocked with other firms headquartered in their headquarters locale, which are in turn tied together by "bridges" formed by corporations interlocked nationally'. In other words, interlocking directorates have an inherent *spatial* character that exists independently of whether or not they are differentiated along *national* lines. This means that, even if the TCC were a fully developed reality, we would not expect parity between intra-national and transnational interlocks.

Based on our own analysis of the US *Fortune* 500 largest corporations in 2006, we found that the ratio of the densities of interlocks within and between states was roughly 3:1.[8] Analogous ratios computed from the data in Table 1 reveal that the ratio of national to transnational interlocks in 2006 was roughly 13:1 for the global economy as a whole, declining to 11:1 within Europe, and 5:1 within North America. Interestingly, the comparable ratio for the North Atlantic region (Europe and North America combined) was roughly 7.5:1 – suggesting that the thesis of a North Atlantic capitalist class may be at least as close to realization, and possibly more so, than that of a trans-European capitalist class, presumably because some European firms are even more likely to interlock with North American firms than they are with firms of other European nations. In either case, the US ratio of 3:1 – representing the enhanced likelihood of spatially proximate interlocks independently of national divisions – can be taken as a rough benchmark for the pattern of interlocking directorates that might be expected in a world (or region of the world) in which nationality no longer exercised an independent role in structuring the intercorporate network.

It is possible that this 3:1 ratio between national and transnational ties may be an overly demanding benchmark for the global economy. Language barriers and travel distances are greater within the global context and might encourage greater economy in the strategic creation of transnational ties without sacrificing much in terms of network cohesion. National variations in corporate governance might also influence the balance between local and bridging ties. For example, corporations in nations with large boards of directors might tolerate more redundancy in the retention of local ties. But such differences between the US and the global network should not be exaggerated. English has now become the lingua franca of international business (Carvajal, 2007). Intercontinental travel is now commonplace among business professionals. And there is a trend toward greater uniformity in principles of corporate governance among large firms worldwide (Carroll, 2010). Even so, the US benchmark of no more than three local ties for each bridging tie should be treated as no more than a rough estimate of the degree of spatial clustering that might be expected to persist independently of national divisions, rather than a strict threshold that must be reached if the pattern of director interlocks is to be judged consistent with realization of a TCC.[9]

Firm-to-firm ties versus director-to-director ties

Interlocking directorates are commonly analyzed from either of two main perspectives: as networks of firms linked through shared directors or as networks of directors linked through common board memberships. These two ways of viewing interlocking directorates are, in turn, associated with two main theoretical perspectives regarding the meaning and significance of directorship ties. The first conceptualizes interlocking directorates as *interorganizational* phenomena. Interlocks are created to serve the interests of corporations – for example, by reducing uncertainty in their access to markets, capital, and other resources, or serving as vehicles of interfirm control or cooptation. The second conceptualizes interlocking directorates as *intraclass* phenomena. Interlocks reflect the internal structure of the capitalist class, differentiated by social and kinship ties, and are created to serve the interests of capitalists – for example, by helping to shape a common class identity, transmitting and enforcing class norms, and enhancing the capacity for class action (Bearden and Mintz, 1987; Johnsen and Mintz, 1989; Kono et al., 1998; Mintz, 2002; Palmer and Barber, 2001; Palmer and Friedland, 1987; Palmer et al., 1986). This is not to suggest that there is a strict correspondence between theoretical perspective and research design. Intraclass theories have sometimes been used to generate hypotheses about firm-to-firm networks and interorganizational theories have sometimes been used to generate hypotheses about director-to-director networks. The best of this research, however, has always been careful to keep these two dimensions of interlocking directorates separate and to explicate where and how interorganizational dynamics might lead to intraclass effects or vice versa.

Of these two perspectives on interlocking directorates, the intraclass approach more readily lends itself to exploring the kinds of issues raised by the emergence of a transnational capitalist class. Social classes, including the TCC (if and when it comes to exist), inherently comprise *persons* and social relations among persons. Nevertheless, as previously noted, almost all of the existing research on global interlocking directorates is restricted to firm-to-firm ties rather than person-to-person ties. Intuitively, these two networks might seem to be mirror images of one another; however, extensive evidence demonstrates the dangers of attempting to extrapolate structural properties or outcomes from one network to the other (Bearden and Mintz, 1987; Breiger, 1974; Burris, 2001). This does not mean that evidence on firm-to-firm ties is not valuable in its own right or that it does not provide some insight into trends or patterns of *intercorporate* integration and coordination in the global economy. But, if one is interested in transnational *class* formation and the *interpersonal* relations that facilitate transnational class identity and class cohesion, then the preferred approach would surely be to study the structure and evolution of person-to-person (director-to-director) networks.

From a theoretical standpoint, we suspect that most researchers who have studied global interlocking directorates to evaluate trends toward the emergence of a TCC would not disagree with this statement. In practical terms, however, analyzing patterns of intra-national versus transnational ties within the director-to-director network requires an immensely greater investment in data collection than an analogous study of the firm-to-firm network. Assigning nationality to a firm is typically a simple matter of ascertaining the location of its corporate headquarters – information that is readily available from standard sources and needs to be collected for only several hundred cases. Assigning nationality (i.e. citizenship) to directors typically requires extensive detective work, using numerous reference and online sources, and must be done for a sample that numbers in the thousands. Nevertheless, we believe that such data are indispensable and that to continue to advance empirical claims about the emergence of a transnational capitalist class without any information on the nationality of the persons who comprise that class is a questionable practice at best.

Table 2. Number and density of ties among *Fortune* Global 500 firms and directors in 2006

	Number of ties		Density of ties	
	Firms	Directors	Firms	Directors
Total ties	1068	47,264	.0086	.0029
Intra-national ties	761	39,420	.0388	.0166
Intra-national ties among Europeans	320	15,080	.1388	.0381
Intra-national ties among North Americans	404	11,496	.0276	.0081
Intra-national ties among North Atlantic actors[a]	724	26,576	.0427	.0146
Intra-national ties among Asians	33	11,854	.0125	.0216
Transnational ties	307	7844	.0029	.0006
Transnational ties among Europeans	161	3199	.0123	.0017
Transnational ties among North Americans	18	631	.0054	.0016
Transnational ties among North Atlantic actors[a]	284	6141	.0057	.0010
Transnational ties among Asians	0	31	.0000	.0001
Transnational ties: European–North American	105	2311	.0031	.0006
Transnational ties: European–Asian	6	363	.0003	.0001
Transnational ties: North American–Asian	6	311	.0003	.0001

[a]North Atlantic region refers to the combination of Europe and North America.

In Table 2 we present the results of a study of director-to-director ties within the *Fortune* Global 500 largest corporations in 2006. To facilitate comparison, we also reproduce here the number and density of firm-to-firm interlocks for 2006 from Table 1. Because no researcher has gathered data on the citizenship of Global 500 directors for a prior year, and because attempting to go back and collect such information eight or ten years after the fact poses near insuperable obstacles, we are unable to analyze changes in the director-to-director network across time. Our discussion will therefore be limited to explicating patterns of transnationality in the director-to-director network within and between regions of the world and comparisons with analogous patterns in the firm-to-firm network.

The first thing that will be noticed about the data presented in Table 2 is that the density of director-to-director ties is usually much lower than the density of firm-to-firm ties. This is to be expected given the much greater size of the director-to-director network and is consistent with prior studies of interlocking directorates. Another fact worth mentioning is that the director-to-director network is only indirectly affected by the potential bias that we discussed in relation to the firm-to-firm network. For example, the fact that there is only one Irish firm in the sample does not inexorably constrain the number of board ties that an Irish director can have with other Irish citizens relative to his or her opportunities for ties with non-Irish citizens. That will depend on the size of different corporate boards and the number of Irish citizens on the boards of both Irish and non-Irish firms. However, on the assumption that a majority of directors of a firm headquartered in a certain country will typically be citizens of that same country, there will be a strong correlation between the national distribution of firms by headquarters and the national distribution of directors by citizenship, so the same logic applies in a weaker sense. In Table 2 we have provided both raw numbers of board ties and densities of board ties relative to the maximum potential number of ties of each type given the composition of the sample. On balance, we favor the density measure and will frame our discussion in those terms.

Table 3. Ratio of the density of intra-national ties to the density of transnational ties among *Fortune* Global 500 firms and directors in 2006

	Firms	Directors
Entire global economy	13.16	29.76
Europe	11.26	22.41
North America	5.11	5.06
North Atlantic region[a]	7.49	14.60

[a]North Atlantic region refers to the combination of Europe and North America.

A more revealing metric than either raw counts or densities of transnational directorship ties is the *ratio* between intra-national and transnational tie densities, both globally and within specific regions. These are crucial because we are interested in the *relative* strength or balance between directorship ties that facilitate national class cohesion versus those that facilitate transnational class cohesion. A number of these key ratios are presented in Table 3. With only one exception, the ratios of intra-national to transnational ties for the director-to-director network are roughly twice as large as the comparable ratios for the firm-to-firm network. That exception is the North American region, where by either measure transnational ties weigh more heavily in the overall composition of interlocking directorates.[10] Does this mean that the evidence on director ties provides weaker support for the TCC thesis than analogous evidence on firm ties?

This conclusion need not follow, since, as we have already noted, there is no reason to assume an equivalence between the structural properties of the firm-to-firm network and those of the director-to-director network. The only way to decide what substantive meaning should be given to these findings is by comparing each network with its appropriate benchmark. But here we must concede that attempting to use data on the US director network to establish an appropriate benchmark for what these ratios might be in a world in which director-to-director ties were independent of nationality but still influenced by spatial proximity is more problematic than constructing the comparable benchmark for the firm-to-firm network. Place of residence among directors in the US network is not analogous to citizenship in the global network in the same way that state or region of headquarters location among US firms is analogous to nation of headquarters location for global firms. Many corporate directors maintain multiples residences or change their place of residence numerous times over their lives, often in connection with changes in employment, so residence is not a durable attribute of individual directors in the same way that citizenship tends to be. Other possible indicators, such as directors' place of birth or place of primary employment are beset by problems of their own.

Using state of residence to measure the 'spatial location' of directors of the US *Fortune* 500 largest corporations, we estimated a ratio of 5:1 between the density of within-state director-to-director ties and the density of between-state director-to-director ties – a figure that is higher, but not quite twice as high, as the comparable ratio for the firm-to-firm network. For the reasons stated above, we cannot make any strong claims for the precision of this estimate as a benchmark for comparing the densities of intra-national versus transnational director-to-director ties within the global network. Nevertheless, it should be sufficiently precise to suggest that the ratio of intra-national to transnational ties would indeed be considerably higher for directors than for firms, assuming a world in which the greater density of intra-national ties was purely an artifact of spatial proximity and not of national divisions per se. Therefore, we should not necessarily conclude that the evidence on director-to-director ties provides any weaker support for the TCC thesis that the evidence on firm-to-firm ties.

The surest conclusion we can draw from Table 3 is that the *relative* ratios of intra-national to transnational ties across regions of the world economy are roughly commensurate, whether measured at the director level or the firm level. This is by no means a 'non-finding' with respect to the new evidence presented on the director-to-director network. As noted earlier, there is nothing inevitable about the similarity of these patterns for the two networks. And the correspondence is far from perfect. Nevertheless, it is fair to say that, regardless of whether the interlocking directorates are studied at the firm or the director level, the ratio of domestic to transnational ties across the *entire* world economy is far higher than what we would expect if the TCC were a reality on a global scale. Only within the restricted region of North America does the prevalence of transnational interlocking approach what we might expect if national borders were of little consequence for the pattern of directorship ties. But this region consists of only three countries – the US, Canada, and Mexico – where the hegemonic nation provides 90 percent of all firms and 88 percent of all directors in the sample, and should therefore be viewed as an idiosyncratic case. Evidence of a transnational capitalist class appears somewhat stronger for Europe than for the global economy as a whole, but not dramatically so. Most interesting is the fact that, whether measured by firm-to-firm ties or director-to-director ties, the relative density of transnational interlocks to national interlocks (the inverse of the ratios in Table 3) is higher across the North Atlantic region than it is for Europe viewed in isolation. This bolsters the thesis that the further evolution of what van der Pijl (1984) called the 'making of an Atlantic ruling class' – a political and economic project that has waxed and waned but whose roots go back to the early decades of the 20th century – is arguably the best example of a capitalist class (or class fraction) that has partly transcended divisions based on nationality. However important the formation of the European Union and related trends toward European integration may be, this suggests that the implications of these new developments for transnational capitalist class formation must be understood in relation to a much longer historical context that predates the current academic fascination with globalization.

Analyzing transnational ties simultaneously in terms of firms and directors

Although we have argued that evidence on director-to-director ties is better suited to evaluating the TCC thesis and provides a valuable check on the findings of research based on firm-to-firm ties, neither of these approaches is without its limitations. Shouldn't a French citizen sitting on the board of a British firm be treated as evidence of transnationalism whether or not that director creates a tie between the British firm and a non-British firm that is part of the sample? Is a firm-to-firm interlock between two Canadian corporations really an intra-national interlock if the person who creates that tie is a US citizen? And is a director-to-director tie between two German citizens really an intra-national tie if that link occurs on the board of a Swiss corporation? Restricting attention to either firm-to-firm ties or director-to-director ties inevitably fails to capture important evidence of transnationalism and likely misrepresents the contours taken by that transnationalism (Staples, 2006). Moreover, both firm-to-firm ties and director-to-director ties reduce transnationalism to a configuration of dyads, whereas many corporate boards provide venues in which citizens of three, four, or more nations come together, which is surely an important dimension of advancing transnationalism. Each of these examples points to the value of analyzing global interlocking directorates from the perspective of the entire director-to-firm network, or what is known as the two-mode 'affiliation matrix', rather than limiting the analysis to one-mode, firm-to-firm or director-to-director matrices.[11]

Table 4. Number of nations represented on the boards of *Fortune* Global 500 firms: Percentage distribution by region in 2006

	Number of nations represented			
	One	Two	Three	Four +
European firms (*N* = 176)	24%	20%	20%	34%
North American firms (*N* = 190)	51%	29%	14%	6%
Asian firms (*N* = 112)	86%	9%	1%	4%
Entire global economy (*N* = 498)	49%	22%	13%	16%

As an example of how much data on transnational links can be lost when the two-mode affiliation matrix is reduced to a one-mode matrix, consider the following example. In the 2006 sample there were 171 directors who formed transnational ties between firms; however, there were another 478 directors – nearly three times as many – who were citizens of one nation and directors of firms headquartered in another nation without forming any firm-to-firm interlocks. Many, but not all, of the latter would be captured in the director-to-director network, although data on the national context in which their ties were formed would still be lost. These 478 directors are a diverse group that resists any easy generalizations. Some are directors of firms in their home country that were not large enough to qualify for the Global 500. Others are retired executives or directors of firms in their country of origin. Some are retired government officials with economic or foreign policy experience or connections. Some are career executives who worked their way up the managerial ladders of subsidiaries of foreign-owned firms. And still others are simply rich investors with shareholdings in foreign-based corporations.

As mentioned previously, analyzing transnational ties from the standpoint of the entire director-to-firm network allows for the identification not only of transnational dyads, but of triads, quads, and larger multinational assemblages. Table 4 shows the number of nations whose citizens are represented on the boards of large corporations, both for the global economy as a whole and for specific regions. By this yardstick, European corporations exhibit a degree of transnationalism that is unmatched by firms in other regions – something that was not so apparent when transnationalism was measured purely at the dyadic level. A majority of European corporations have citizens of three or more nations represented on their boards and more than a third have citizens of four or more nations. North American corporations are a distant second on this dimension of transnationalism; nevertheless, roughly one-fifth have citizens of three or more nations represented on their boards.

It should be emphasized that the multinationalism exhibited by European boards is *not* just an artifact of European economic integration. Roughly 38 percent of non-nationals on European boards come from outside Europe and 29 percent come from North America alone. Conversely, 76 percent of non-nationals on North American boards come from Europe alone. Many more North Americans sit on European boards than vice versa (144 versus 83). Thus, while European corporate boards provide crucial settings for transnational mixing, the mixing that occurs there is by no means strictly intra-European in terms of the directors involved. Quite frequently what might appear as intra-European transnationalism is more accurately described as North Atlantic transnationalism. These findings are analogous to those that have been reported in the research on US interlocking directorates, which shows that the boards of large banks were the most important sites for the formation of directorship ties, but that bankers themselves were not particularly central to this process (Bearden and Mintz, 1987).

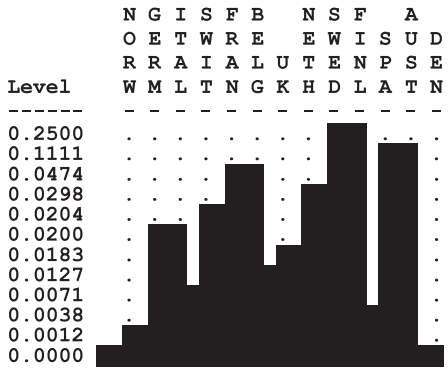

Figure 1. Hierarchical clustering of European nations by density of firm-to-firm interlocks in 2006.

Restricting the analysis of global interlocking directorates to one-mode networks not only misses important evidence or dimensions of transnationalism, but often conveys a misleading image of the meaning of transnational ties. For example, one of the key objectives of research on global interlocking directorates is to identify patterns of clustering within the interlock network – that is, regions of greater or lesser density in the links among nations. As an illustration of how one-mode networks can easily convey a distorted image of these patterns, we present in Figure 1 a hierarchical clustering of European nations in terms of the density of their firm-to-firm ties. The clustering algorithm used here begins by joining the two nations with the highest density of firm-to-firm interlocks, which it then treats as a single entity with a new profile of interlock densities equal to the average of its members. This process is then repeated until all nations have been assigned to a cluster and all clusters have been consolidated into larger ones.

Generally, the results suggest patterns of clustering that reflect such factors as geographic proximity, cultural affinity, or shared language. For example, the densest cluster is formed by Sweden and Finland, which is then joined by the Netherlands. France and Belgium form another relatively dense cluster, which is then joined by Switzerland. But note that the second densest cluster in terms of firm-to-firm interlocks is between Spain and Austria. These countries share neither geographic proximity nor any other obvious attribute that might lead us to expect a pronounced transnational bond (unless one wants to count their common rule by branches of the Habsburg monarchy in the 16th century). Only when we turn from the limited data of the firm-to-firm network to the more complete data of the director-to-firm network is the mystery explained. On the board of Austria's largest oil company (OMV) sit two Abu Dhabi business elites (Murtadha Al Hashemi and Mohammed Al Kaily), both of whom also hold seats on the board of Spain's second largest oil company (CESPA). Given the relatively limited number of Austrian and Spanish firms among the *Fortune* Global 500, these two ties are enough to create a relatively high density of firm-to-firm linking. But, of course, the situation represented here is not what we are likely to imagine when presented with evidence of a high density of firm-to-firm interlocks between Spain and Austria, nor should it be taken as simply another expression of the process of European economic integration. Alternatively, from the standpoint the director-to-director network, the directorships of the two Abu Dhabi corporate elites will appear simply as a double *intra*-national tie between two citizens of the United Arab Emirates, which equally fails to capture the transnational complexity of the situation.

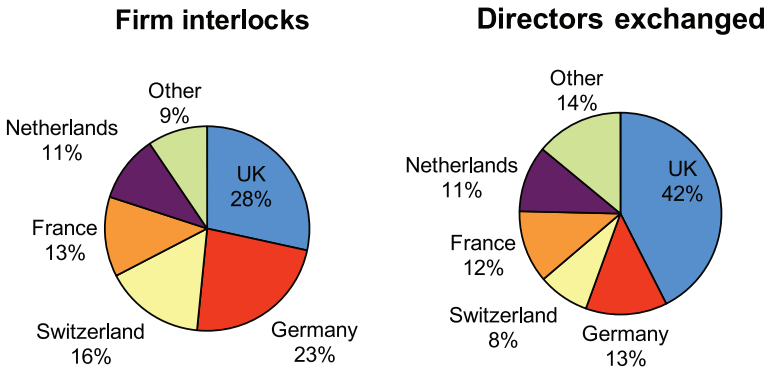

Figure 2. Comparison between firm-to-firm interlocks and directors exchanged between US and Europe in 2006.

Potential distortions of this sort are not just isolated instances. Insofar as the prevalence of transnational interlocks between Europe and North America suggests that the North Atlantic theatre might present a strong case for the formation of a regional TCC, disaggregating these data to reveal the contours of North Atlantic integration is an important topic for further research. In Figure 2 we present the results of a simple analysis of this kind. The pie chart on the left shows the distribution of firm-to-firm interlocks between US firms and those of the major European powers. Note that the UK and Germany each account for roughly one-fourth of the ties between US and European firms, followed by Switzerland, France, and the Netherlands. In the pie chart on the right we examine the larger picture of all directors exchanged between the United States and Europe – that is, all US citizens serving on the boards of European firms and all European citizens serving on the boards of US firms. The most striking difference revealed by the second method of measuring and disaggregating the multiple paths that link US corporate elites with those of Europe is that the share of US–UK links increases to more than two-fifths of the total, while the combined US–German and US–Swiss links decline by more than half.[12] Each method is accurate in what it purports to measure, but we would argue that the second presents a more plausible and compelling representation of the forces at work in the making of a North Atlantic capitalist class – one that accentuates the historic tie between the US and British capitalist classes as an essential bridge upon which the formation of a broader North Atlantic capitalist class crucially depends.[13]

Small-world analysis of global interlocking directorates

Despite their differences, all of the methods of analyzing global interlocking directorates discussed thus far share one thing in common: they all investigate patterns of cohesion by calculating the frequency or density of certain kinds of ties within a network. There is, however, another approach for analyzing the structure of networks that is gaining in popularity and that addresses the question of network cohesion from an entirely different direction. This approach is known as 'small-world' analysis and its focus is less on the density of ties in a network than on the configuration of ties that facilitates relatively short path *distances* between the nodes of a network (Newman, 2000; Watts, 1999). Small-world analysis emerged in an effort to make sense of the fact that many networks with a low density of ties and high levels of local clustering nevertheless exhibit, on average, surprisingly short path distances between nodes. This phenomenon is captured in the popular concept

of 'six degrees of separation', which alludes to the high probability, even in a very large and relatively sparse social network, of being able to reach any person from any other person through six or fewer interpersonal links.

The key insight of small-world analysis is that the average path distance within a network depends less on the absolute density of ties than it does on the balance between clustering and bridging ties. When an appropriate balance exists, it is possible for the average path distance to be only marginally greater than would occur if the network were purely random – that is, not segmented into clusters. As applied to director interlock research, the phenomenon of clustering reflects the grouping of directors onto boards and the propensity of boards to be segregated along national lines, whereas bridging reflects the existence of inter-board and transnational ties. Affiliation networks, of which interlocking directorates are one example, typically exhibit small-world properties, but they may do so in varying degrees. What is attractive about small-world analysis is that it provides us with a single, intuitively straightforward, summary measure – the average length of the shortest path (also known as the average 'geodesic') between all pairs of actors in a network – as a way of assessing net effect of specific combinations of clustering and bridging ties throughout the network. What is less attractive about small-world analysis is that superficially similar average geodesics can conceal fundamental differences in the structural properties or causal mechanisms that characterize different social networks, so we are reluctant to recommend small-world analysis as a standalone method and more inclined to see it as an alternative approach that might either add to our confidence in the results of other methods or point to anomalies that require further research.

In Table 5 we present some of the main parameters of small-world analysis for the US *Fortune* 500 largest firms in 2006 together with equivalent results for the Global 500 firms and specific regions within the global economy. As previously, the data on the US interlocking directorate are intended to provide a benchmark for assessing the cohesion of the transnational networks. Because Europe and the North Atlantic region have previously been identified as areas of pronounced transnationalism, we will focus our discussion primarily on those regions.

The first column of Table 5 presents the percentage of the nodes in the network that belong to the main component. This is the largest subgroup for which some path (of whatever length) can be found connecting all of its members. The other parameters are calculated for the main component. The average degree is just the average number of ties of each node, which provides a measure of the density of the network. Other things being equal, the higher the average degree, the more paths there are traversing the network and the shorter the average path distance between actors. The clustering coefficient measures the extent to which ties within local regions of the network turn inward on themselves rather than spreading out in a more random fashion. Other things being equal, the higher the clustering coefficient, the greater the redundancy of paths between actors, the fewer bridges there are between local regions of the network, and the higher the average path distance. But what is most crucial for the small-world phenomenon is the number and strategic location of bridging ties between clusters. The latter is difficult to measure directly, but we know that only a few percent of bridging ties, if properly placed, will cause the average geodesic (shown in the last column) to shrink to a very small number.

Comparing the US *Fortune* 500 network with the Global 500 network for either firms or directors reveals dramatic differences in their small-world properties. Most important, 90 percent of US firms and 89 percent of US directors are included in the main component of the network. By comparison, only 71 percent of either Global 500 firms or directors are included in the main component. This means that nearly 30 percent of all Global 500 firms and directors are completely isolated from the core of the network. Moreover, in neither case is there any smaller component that includes as much as 1 percent of the network, so those 30 percent of firms and directors are

Table 5. Small-world properties of US, global, European, and North Atlantic interlocking directorates in 2006

	Pct in main component	Average degree	Clustering coefficient	Average geodesic
US firms (*N* = 493)	90.1%	6.4	0.18	3.75
Global firms (*N* = 498)	71.3%	5.9	0.24	3.97
European firms (*N* = 176)	85.2%	6.4	0.29	3.34
North Atlantic firms[a] (*N* = 366)	89.1%	6.2	0.17	3.73
US directors (*N* = 4219)	89.4%	13.7	0.88	4.57
Global directors (*N* = 5738)	70.5%	17.1	0.91	5.01
European directors (N = 2155)	81.6%	18.3	0.92	4.18
North Atlantic directors[a] (*N* = 4061)	87.1%	16.8	0.90	4.56

[a]North Atlantic region refers to the combination of Europe and North America.

not only isolated from the core but also from one another. This means that roughly *half* of all pairs of actors among Global 500 firms or directors have an *infinite* path distance between them. This fact alone renders all other parameters in the table essentially superfluous. The Global 500 network is *not* a small world in the same sense as the US network.

The European network suffers from less extreme fragmentation. Roughly 85 percent of firms and 82 percent of directors are included in the main component. And, as with the Global 500 network, there are no other components that include as many as 1 percent of the nodes. These percentages fall short of the equivalent figures for the US network but might plausibly be considered on a trajectory toward convergence. Clustering is higher in the European network, especially among firms, but the average geodesics for the European network are slightly smaller than for the US network – suggesting that bridging ties are strategically well placed. Hence, the image we get of the European interlock network is mixed: there are substantially more isolates in the European network, but, among those firms or directors that are connected to the main component, the average path distances between them are relatively small.

Turning to the North Atlantic network, we find an example of an interlocking directorate that compares very closely with that of the US benchmark. Roughly 89 percent of North Atlantic firms are included in the main component, compared with 90 percent for the United States; and roughly 87 percent of North Atlantic directors are included in the main component, compared with 89 percent for the United States. Clustering coefficients are virtually identical as are the average geodesics. As mentioned previously, an equivalence of small-world parameters can conceal important variation in the finer details of network structure, but the results shown here nevertheless reinforce our earlier findings that the North Atlantic region yields the strongest evidence of a capitalist class that has substantially transcended national divisions.

Summary and conclusion

Network analysis of transnational ties within global interlocking directorates has emerged as a widely used method for evaluating theoretical expectations regarding the emergence of a transnational capitalist class. In this article we have presented a critical evaluation and extension of the research in this area. The prevailing method in this research has been to trace the growth of transnational ties within the firm-to-firm interlock network. Studies employing this method have made important contributions in opening the hypothesis of an emerging TCC to more rigorous

empirical investigation. Nevertheless, we consider the existing research on firm-to-firm interlocks to be limited for both methodological and theoretical reasons.

Methodologically, we have argued for the need for closer attention to the potential biases that can arise in comparing samples of global corporations at multiple points in time. Our research suggests that such biases have likely exaggerated the evidence for an increase in transnational interlocking, particularly within Europe. Nevertheless, many of the general patterns revealed in prior studies hold up well even after correcting for such biases. We have also argued for the value of seeking to establish an empirical benchmark for evaluating how near or far we may be from achieving a pattern of transnational interlocking that is consistent with the existence of a TCC and have given several examples of how regional differentiation within the US interlocking directorate might be used to construct such a benchmark.

Theoretically, we have questioned the appropriateness of using firm-to-firm interlocks for the purpose of evaluating processes of transnational *class* formation and have proposed and explored two main alternative methods. The first examines the pattern of transnational ties within the director-to-director network. The second examines transnational ties in the director-to-firm affiliation network – that is, all instances in which a citizen of one nation serves on the board of a firm headquartered in another nation, regardless of whether this exchange results in a firm-to-firm or person-to-person interlock. The broad portrait of global interlocking directorates revealed by these alternative methods is not radically different from that encountered in the traditional research on firm-to-firm ties. However, significant divergences and new insights do appear when one delves into finer grained patterns that characterize the global interlocking directorate. Because of the unavailability of the necessary data, one line of research we were not able to pursue was to compare patterns in the director-to-director or director-to-firm networks across time. This, we believe, should be a priority for future research.

Finally, we have introduced a fourth method – small-world analysis – that departs more radically from the logic of the other three. Whereas the first three methods measure transnational cohesiveness in the global interlocking directorate through the frequency or density of certain types of directorship ties, small-world analysis investigates cohesion in terms of the average path distance between all actors within the network. Although small-world analysis is less useful for analyzing fine grained patterns within the global interlocking directorate, we believe that its conceptualization of cohesion is theoretically compelling and sufficiently different from that employed by other methods to be able to provide a validity check on the findings of those methods and, potentially, to reveal previously undisclosed patterns in the data.

Substantively, all of the methods we have explored converge on the conclusion that the emergence of a transnational capitalist class as a truly global phenomenon is a very long way from realization and probably unlikely for the foreseeable future. On the other hand, there are regions in the global economy where the evidence is much stronger for the emergence of a supra-national capitalist class that has gone a considerable way toward transcending national divisions. Whereas skeptics of the TCC thesis might argue that most of the evidence for transnationalism is confined to Europe and largely an artifact of the formation of the European Union and associated processes of European economic integration, our research suggests that the regional locus of transnational class formation is more accurately described as the North Atlantic region rather than Europe alone.[14] By most measures, transnational interlocking among North Atlantic corporations and directors is comparable to or stronger than that of Europe in isolation.

Analyzing patterns of transnational interlocking directorates is only a first step toward evaluating the TCC thesis, whether at the global or the regional level. At most, transnational interlocks can only establish the *plausibility* of the TCC thesis and identify specific regions of the global economy that are worthy of more detailed examination or specific firms or directors who may be pivotal in

this process and deserve closer scrutiny. More complete evidence for or against the TCC thesis will require a much richer range of data on additional sources of class cohesion – for example, kinship relations, educational backgrounds, club memberships, non-corporate organizational affiliations, etc. Based on the results of our research, however, we would argue that the most fertile arena in which to pursue these investigations would be the North Atlantic region, where the evidence on transnational interlocking directorates is more strongly supportive of the TCC thesis than it is for any other region or for the global economy as a whole.

Funding

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Notes

1. Notable exceptions are Fennema's (1982) pioneering network analysis of transnational corporate interlocks in the 1970s and the work of Gill (1990) and van der Pijl (1984), both of whom use historical or narrative evidence in a way that exceeds what might be described as 'anecdotal' or 'speculative'. But none of these authors argue for the creation of a transnational capitalist class on a truly global scale.
2. As we use the term, 'cohesion' has both a subjective and an objective dimension. It refers equally to similarities of social identity and similarities of social behavior. Both types of cohesion have been shown to be enhanced by or correlated with director interlocking.
3. One further caveat should be mentioned concerning the use of evidence on directorship ties to adjudicate questions of capitalist class formation. Strictly speaking, directors of the largest global corporations are more accurately described as 'corporate elites' than as members of a 'capitalist class', even though the great majority fit both categories equally well (Carroll, 2010: 6). Some corporate directors are mainly advisors and technocrats (lawyers, consultants, former politicians, etc.) rather than capitalists in the strict sense – that is, owners of large accumulations of corporate wealth. And some leading capitalists do not serve as directors of major corporations, either because they are owners of privately held firms or because they are passive investors who do not participate directly in corporate governance. The terms 'transnational corporate elite' and 'transnational capitalist class' are often used interchangeably in the literature, and there is sufficient overlap that any conclusions one might reach about the former are likely to apply to the latter, but there is also some slippage between the concepts that should be acknowledged.
4. For a more complete review of the literature in this research area, see the excellent essay by Nollert (2005) as well as the introduction to Carroll (2010).
5. Carroll (2010), in a replication and extension of his 2002 study with Fennema, reports a more pronounced increase in the proportion of transnational interlocks between 1996 and 2006, roughly comparable to the earlier findings of Kentor and Jang (2004). However, this is more the result of a decline in the number of intra-national interlocks than an increase in the number of transnational interlocks. Otherwise, the findings of Carroll (2010) are generally similar to those of the two seminal studies summarized above. Direct comparisons between Carroll's findings and those of other studies (this one included) are not possible because of his practice of oversampling among financial firms.
6. Because two firms were taken over between the time that the *Fortune* Global 500 list was published and our data were collected, our sample for the 2006 Global 500 consists of 498 firms.
7. This bias is presumably weaker in the study by Carroll and Fennema (2002). Sixty percent of their sample is immune to this bias because it is stratified by nation, with equal numbers of firms from each nation in both years. But 40 percent is stratified only by region; hence, changes in the national distribution of the largest firms within these regions will produce the same problem.
8. We also computed an analogous metric for multi-state regions (Northeast, Midwest, South, and West) and got an almost identical ratio of 3:1 between local and non-local ties.
9. We should also keep in mind that some TCC theorists envision a transitional period in which remnants of national capitalist classes will persist even after the consolidation of a TCC as the hegemonic class

fraction (Carroll, 2010; Robinson, 2004). In that situation we would expect an aggregate ratio of national to transnational ties substantially greater than 3:1.

10. This is because the North American component of the sample is so heavily dominated by US directors. Hence, the maximum potential number of transnational ties within North America is very limited and a small number of such ties is sufficient to yield a relatively high density. When North America is combined with Europe to form the North Atlantic region, the potential number of transnational ties increases substantially and the density measure becomes less sensitive to variations of a few ties.
11. One-mode networks of either firms or directors are the preferred data for analyzing interlocking directorates. Because they are symmetrical and consist of only one type of actor, they facilitate techniques of mathematical analysis and graphical representation that are difficult to replicate with two-mode data. We are not arguing, therefore, that one-mode analyses should be abandoned – only that there are numerous instances in which returning to the more complete two-mode affiliation matrix can provide additional information or finer detail on the structure of interlocking directorates.
12. The distribution of director-to-director ties between US citizens and those of European nations shows roughly the same percentage of the ties occurring between the US and UK (43%) but a slightly larger percentage of ties between the US and Germany (18%). This is partly due to the comparatively large size of German corporate boards, which average over 20 directors. This means that each US citizen on a German board creates a larger number of director-to-director ties as compared with those US citizens who sit on other European boards.
13. Neither Canada nor Mexico play a comparable role in cementing the North Atlantic alliance. Despite its membership in the Commonwealth, Canada exchanges only a single director with Britain and only 18 with all of Europe. Mexico exchanges only two directors with Europe. Hence, more than 90 percent of all directors exchanged across the North Atlantic are between the United States and Europe.
14. Carroll (2009) arrives at similar conclusions using a different sampling strategy and a hybrid methodology that samples only those corporate directors who create firm-to-firm interlocks and then explores the number and pattern of director-to-director ties among these persons.

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