

Chains and networks, territories and scales: towards a relational framework for analysing the global economy

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***Abstract** A vast and continually expanding literature on economic globalization continues to generate a miasma of conflicting viewpoints and alternative discourses. This article argues that any understanding of the global economy must be sensitive to four considerations: (a) conceptual categories and labels carry with them the discursive power to shape material processes; (b) multiple scales of analysis must be incorporated in recognition of the contemporary 'relativization of scale'; (c) no single institutional or organizational locus of analysis should be privileged; and (d) extrapolations from specific case studies and instances must be treated with caution, but this should not preclude the option of discussing the global economy, and power relations within it, as a structural whole. This paper advocates a network methodology as a potential framework to incorporate these concerns. Such a methodology requires us to identify actors in networks, their ongoing relations and the structural outcomes of these relations. Networks thus become the foundational unit of analysis for our understanding of the global economy, rather than individuals, firms or nation states. In presenting this argument we critically examine two examples of network methodology that have been used to provide frameworks for analysing the global economy: global commodity chains and actor-network theory. We suggest that while they fall short of fulfilling the promise of a network methodology in some respects, they do provide indications of the utility of such a methodology as a basis for understanding the global economy.*

Despite – or perhaps because of – the immense and fast-growing literature on globalization, we remain a long way from really understanding what is happening in the global economy. As Storper (1997b: 20) rightly points out, 'the theoretical meaning and practical impact of economic globalization remains obscure'. The literature on economic globalization continues to generate a miasma of conflicting viewpoints and alternative discourses (see Hirst and Thompson 1996; Mittelman 1996, 2000; Cox 1997; Doremus et al. 1998; Weiss 1998; Held et al. 1999; Olds et al. 1999). For example, one set of relatively coherent discourses addresses the contested issue of whether a genuinely new, globally-integrated economy now exists, or whether we are simply witnessing a continuation of long-established trends of mere internationalization. On the one hand, ambitious extrapolations are made, often from a

small number of cases, to paint a scenario of unstoppable global forces leading inexorably to a homogenized, borderless world in which local differences are virtually eradicated. On the other hand, there are those who argue that, really, nothing much has changed; that the globalization story *is* little more than hype (albeit politically-charged and powerful hype), and that the world economy remains essentially an international economy (Dicken et al. 1997 summarize this debate, while Yeung 1998a, provides a critique of the idea of a 'borderless world'; see also Cox 1997).

A second set of prominent discourses on economic globalization tends to be bounded by two polar positions with respect to the best way to understand the global economy. On the one hand, there are those that see underlying structures of capitalism (as a mode of production or exchange) shaping experiences that are fundamentally universal (for example, Peet 1991). While such an approach is powerful in its sense of political purpose, it is, in many cases, insensitive to alternative identities, agencies, and scales; to different capitalisms (cf. Berger and Dore 1996; Crouch and Streeck 1997; Hefner 1998; Hollingsworth and Boyer 1997; Whitley 1999). On the other hand, there is the orthodoxy of contemporary macroeconomics that sees economic globalization as the extension and intensification of disembodied markets, in which individuals, firms, states and regions compete for investment flows and export markets (see Ohmae 1990, 1995). Such a reading promotes an atomistic politics of relentless competition.

While not attempting a simplistic reconciliation of the spectrum of complex theoretical positions caricatured above, this article points towards some of the requirements for an analytical understanding of the nature of the global economy that breaks through the impasse that has been generated by the competing discourses noted above. Our approach is informed by the following considerations:

- We must acknowledge that the analytical categories used carry with them discursive power in their own right (Barnes 1996; Gibson-Graham 1996; Kelly 1997, 1999). For example, a particular globalization rhetoric is pervasively deployed by both politicians and business leaders to justify the adoption of specific economic (and social) adaptation strategies. Such discourses naturalize the processes of globalization and construct a view of geographical space that implies the deferral of political options to the global scale. Thus, the (contested) concept of globalization 'itself has become a political force, helping to create the institutional realities it purportedly merely describes' (Piven 1995: 8). There exists, then, a particular constellation of power relations implicit in any understanding of the global economy.
- It follows from the previous point that an understanding of the global economy must incorporate multiple scales of economic (along with political, cultural and social) relations. Too often a particular (for example local) or a bifurcated (for example global-local) geographical scale of analysis is used in ways that, in effect, preclude alternatives and that obscure the subtle variations within, and interconnections between, different scales. Thus, we often end up with an understanding of the global from the local or vice versa, where the automatic privileging of one particular scale over others becomes both a disabling obstacle to understanding and also a discursive justification for particular developmental strategies and political power relations.

- Just as there is a need to incorporate multiple scales in understanding the global economy, so too we must avoid privileging specific organizational loci of analysis. Studies purporting to develop an understanding of the global economy have generally analysed just one, or perhaps two, types of agents, such as firms or industrial sectors. Other agents (such as states, labour organizations, and global regulatory bodies) and non-human intermediaries (for example port facilities, telecommunication infrastructure, policy documents and manuals) have been neglected or even dismissed as irrelevant and anachronistic. In many instances, attempts to understand the changing global economy have also been reduced to particular sectors, and even specific firms, which are then represented as emblematic of the economy as a whole (cf. Baum and Dutton 1996).
- Finally, we must be clear about the level of theoretical abstraction to which we are prepared to go on the basis of available data on processes of change in the global economy. In particular, we must ask ourselves how generalizable are the theories we develop based on particular times and places. In other words we must be aware of the pitfalls (and ethnocentric biases) that are inherent in taking data from specific contexts and trying to theorize about the global economy as a whole. Furthermore, we must be equally cautious about extrapolating the metaphors and motifs of particular theoretical frameworks and inferring a broader epistemology for understanding the global economy. That said, we must be careful not to preclude the option to discuss the global economy, and power relations within it, as a structural whole.

With these requirements in mind, we propose a relational view of networks as a *methodology* for analysing the global economy (cf. Gulati et al. 2000; Hassard et al. 1999; Latour 1993; Law 1994; Sack 1997; Thrift 1996). In its essence, we see networks as neither purely organizational forms nor structures. Networks are essentially *relational processes*, which, when realized empirically within distinct time- and space-specific contexts, produce observable patterns in the global economy. As such, understanding the global economy requires us to transcend ‘atomistic description’ of activities of individual actors (for example firms) or meta-individual imaginations of ‘deep’ structures. The network methodology advocated in this paper requires us to identify actors in networks, their ongoing relations and the structural outcomes of these relations (see also Emirbayer 1997). Networks thus become the foundational unit of analysis for our understanding of the global economy, not individuals, firms or nation states. This relational methodology, however, does not automatically assume these individuals, firms or nation states as ‘black boxes’. Rather, we argue, to understand networks and their embedded relations requires us to probe into the socio-spatial constitution of these individuals, firms and institutions. Such a relational view of the capitalist global economy clearly stresses interconnectedness, hybridities and possibilities, a form of theory that ‘is best able both to tell stories of how the processes of the world works *and* to situate itself within that set of processes’ (Thrift 1997a: 9).

The article is structured as follows. In the second section, we explore understandings of networks as generic social processes; processes that effectively shape change in the global economy. In that section we critically examine elements of a network methodology. In the third section we move on to reflect briefly on two ways

in which network methodologies have been used in studies of the global economy – global commodity chains (GCCs) and actor-network theory. In the conclusion, we reflect on the validity of using a network methodology to analyse the global economy.

Elements of a network methodology

To some, network analysis is simply a ‘new comfort zone’ (McMichael 1995: 348); to others it represents a microscale retreat from macroscale processes. Certainly the network has become a much-abused concept, ‘more of a “chaotic conception” than a rational abstraction’ (Yeung 1994: 475). Taking stock of the achievements and problems of network analysis during the 1970s, Alba (1982: 68) noted that ‘[f]or network analysis to achieve a secure place in social science, it must demonstrate that it is capable of resolving open substantive problems of major importance. ... Otherwise, it will remain little more than a curiosity, however sophisticated its techniques.’ Nohria (1992: 3) has made a similar observation of the literature: ‘[a]nyone reading through what purports to be network literature will readily perceive the analogy between it and a “terminological jungle in which any newcomer may plant a tree”. This indiscriminate proliferation of the network concept threatens to relegate it to the status of an evocative metaphor, applied so loosely that it ceases to mean anything.’

In the recent revival of interest in networks the term has been used in a variety of ways. Powell and Smith-Doerr (1994), for example, distinguish between the use of the network as an *analytical tool*, which aims to map the topological structures of social relationships, and the network as a *form of governance*. In this second meaning, the network concept has come to be used widely to signify a *new* organizational form. Powell (1990), for example, contests the idea that a network is some hybrid form made up of elements of markets and hierarchies and argues that networks constitute ‘a separate, different mode of exchange, one with its own logic’ (we leave on one side, at this point, the issue that both markets and hierarchies are themselves networks). The business and management literature now bulges with books and articles that eulogize the new network paradigm as the prescription for business success (see Doz and Hamel 1998; Dunning 1997; Nohria and Ghoshal 1997). In the local and regional economic development literature, too, the network has come to be regarded as the key (see, for example, Castells 1996; Cooke and Morgan 1993, 1998; Harrison 1994; cf. Yeung 2000a).

Given the confusion between descriptive and prescriptive views of networks and the fallacious argument that they are, in any real sense, novel there is a clear need to think in more fundamental terms. In this section, we address three intimately connected issues that are central to the use of a network methodology in analysing the global economy: (1) networks as relational processes and structures in which, and through which, power is exercised; (2) the multiplicity of geographical and organizational scales at which networks are manifested and (3) the complex territorial embeddedness of networks.

Networks, relationships and power

A relational view of networks requires us to go beyond just a structural analysis of the global economy. It is insufficient to focus exclusively on organizations and

institutions in order to understand global changes. We also need to examine the *intentionality* and *power relations* among social actors in these organizations and institutions. The recent currency turmoil in East Asia is a pertinent example. It is really a moot point to argue whether the IMF financial packages will work when we know nothing about the intentions and agenda of such key actors as global fund managers, administrators of international organizations and politicians in Indonesia, South Korea, Thailand and the USA (see Olds and Yeung 1999). This does not mean, however, that we have to resort to the notion that idealism, human intentionality and agency rule the world. Indeed, our network methodology argues precisely the opposite. We believe that for human intentionality to take effect it must be mediated through heterogeneous actor-networks that are spatially and temporally constructed. We therefore need to take into account the role of social actors in their actor-networks in our analysis of the global economy.

A central component of any such analysis is the existence of differential power relations within an actor-network. Powerful, or active, actors are those who drive networks and make things happen. Their ability to do so depends on their control of key resources (physical, political, economic, social and technological). In the network literature, most commonly, it is suggested that power in a network is a function of *positionality* within the network (for example centrality) or as being derived from 'the strength of association between actors in the composition of the network' (Bridge 1997: 619). But the structure of a network tells us little about the qualitative nature of the relationships, which is far more important than structure *per se*. Instead, we see power as the *capacity to exercise* that is realized only through the process of exercising. The control of resources does not automatically imply that the actor is powerful until power is exercised – such control is only a necessary, but not sufficient, condition for the ascription of power to any actor. In other words, power should be conceived as a *practice* rather than a *position* within a network (see Pratt 1997). As argued by Allen (1997: 60; original italics),

power is an *inscribed capacity* of either individuals or institutions – inscribed in the sense that power is something that is possessed by virtue of the social relationships which constitute you or an institution. ... To speak of multi-national firms in this context is thus to speak of the powers they possess by virtue of their capitalized multi-country operations and the workforces which comprise them, as well as the web of nation-state and market relationships which envelops them.

Thus, in a global economy that is constituted by networks of flows (Castells 1996; Yeung 1998b), it is important for us to focus on the *exercise* of power by actors in networks, rather than just on the embeddedness of power in these networks. We suggest that the task of a network methodology for understanding the global economy must be to identify the actors in these networks, their power and capacities, and the ways through which they exercise their power through association with networks of relationships (see a case of transnational corporate networks in Pritchard 2000; Yeung 2000b).

It is, however, also possible to ascribe causal power to networks *per se* when network relationships generate an emergent effect so that the sum of these

relationships is much greater than that of individual actors. The configurations of these *emergent network relationships* provide another central dynamic to drive networks. It is in this sense that a network methodology can be seen to make contact with more structural approaches to power in the global economy, moving away from a focus purely on the actions and interests of specific human agents. For many conceptualizations of the global economy, unequal structural power relations provide an explicit starting point of analysis. The radical political economy of dependency theory, world systems approaches, modes of production theory and uneven development, for example, all derive structural understandings of the global economy on the basis of the existence of unequal relationships between core and periphery, labour and capital, and members of particular class formations. We would concur with these approaches that any discussion of a 'global economy' must address power relations, although not necessarily with the economic essentialism that has characterized some Marxian approaches. This would include the power to control resources, the power to influence events, the power to participate in the economy to varying degrees and the power to exclude or marginalize. These dimensions of economic power are fundamental to the operation of the global economy, whether they are explicitly recognized in structural relationships or subsumed within the global market mechanism (wherein power is seen as residing not with agents but with a mechanism that is assumed to operate in the name of efficiency, without prejudice or structural inequity). One way or another, power drives the global economy, be it corporate, political or social power.

A network methodology expands upon a structural understanding by conceiving of power as being diffused in a Foucauldian (capillary-like) sense whereby it is always present in all social interactions (Bridge 1997: 618) and not just in the structures conceived by grand theory. While this is an important point, we must at the same time avoid employing a network methodology that loses a sense of structural power operating beyond the spaces of traceable connections in networks. In other words, in addition to making important points about evolving power relations within networks, we must also acknowledge the power to create, join or escape networks. Otherwise, we risk atomizing the research agenda so that larger power structures cannot be seen, let alone critically engaged. After all to even conceive of a world or global economy is to imply that it is something larger than the sum of its parts.

Our view, then, is that network relationships should be understood as being *both* structural *and* relational. Networks are structural, in that the composition and interrelation of various networks constitute structural power relations, and they are relational because they are constituted by the interactions of variously powerful social actors. These relationships can exist in the forms of rules, conventions, values, regulations and so on (Storper and Salais 1997; Yeung 1998b). To illustrate this point we might consider, for example, networks among stockbrokers and bond traders. Such networks are constituted by more than just the brokers themselves. They also enter into network relationships with each other through established norms, rules and conventions governing practice in that industry (for example see this issue discussed with respect to financial networks in Clark 1997; Thrift 1994; Tickell 1996; Uzzi 1999; offshore financial centres in Hudson 1998, 2000; and the food industry in Hughes 2000; Murdoch et al. 2000). But when such a network and its rules have been constituted, it then collectively forms part of a structural power relationship between

the financial sector and other actors – a recent and obvious example being the governments of Asian countries in financial crisis. Thus while power is exercised within networks, networks themselves constitute structural power relations in which exclusions and inequalities exist. If the global economy is to be understood as a set of interlocking network of economic activity, then we must be prepared to ask who is excluded from such networks, and why.

The multiple analytical scales and loci of networks

A structural/relational view of social actors and their networks in the global economy must always be sensitive to the geographical and organizational scales at which they operate. First, we should accept that any singular geographical scale is an inadequate means for analysing the global economy because what we have in reality is a complex intermingling of *different geographical scales* (global, regional, national and local) in network formation and network processes. Recent work on the production and politics of scale has cogently argued that the process of globalization in economic activity has led to the ‘relativization of scale’ (Jessop 1999; see also Amin 1997, 1998; Brenner 1998, 1999; Kelly 1999; MacLeod 2001; MacLeod and Goodwin 1999; Swyngedouw 1997, 2000). In other words, a distinctive feature of contemporary capitalism is its ability to operate on multiple scales, but none of these scales should, in themselves, be considered a privileged level of analysis. Thus economic activity cannot be viewed as being determined by processes identified at a global scale, any more than relations of production in the workplace dictate the processes of capitalist development. Instead, scales – including the body, neighbourhood, nation-state, region and globe – are mutually constitutive parts of a globalizing economy. One of the particular strengths of the network methodology is that it transcends these various scales and does not fall into the conceptual trap of privileging any one of them. Different scales of economic processes simply become links of various lengths in the network. It becomes meaningless to talk of local versus global processes as in much of the global–local literature; instead, we should think in terms of networks of agents (such as individuals, institutions or objects) acting across various distances and through diverse intermediaries. As Latour (1993: 122, quoted in Thrift 1996: 5) puts it, this ‘offers points of view on networks that are by nature neither local nor global but are more or less long and more or less connected’.

Second, no one set of *institutions* should be automatically privileged above all others. Since all organizations and institutions must be mediated through social actors in networks, there are no *a priori* reasons why certain organizational or institutional forms should be favoured. It is thus equally possible for a firm (for example Microsoft), through its highly entrepreneurial actor (Bill Gates), to make a significant impact on the global economy, as for a nation state (for example the USA) to achieve the same degree of global impact. Hence, a major attraction of a network methodology is its potential to release analysis from attention to *specific* organizational loci. In the past, organizational loci of analysis that are in practice rather blurred, such as the entrepreneur, the firm, the sector, the state and so forth, tended to be used in highly categorical ways. The result has often been conceptual approaches that either focus exclusively on one of these sites, or that engage in dualisms such as private vs. public sector or firm vs. state. The advantage of a network methodology in a generic

sense is that it can incorporate the elements of all these multiple 'categories' that are 'entrained' in a particular set of economic relations, but do not accord them any ultimate causal power, nor treat them as necessarily distinct entities.

Networks and territories

Closely related to the issues of geographical scale and organizational loci is the importance of territoriality in networks. If networks are both social structures and relational processes constituted by intentional actors, and are also causal mechanisms capable of effecting empirical changes, then they must be recognized as having distinctive time-space specificity in their workings such that no regular conjunctions of events and outcomes can be fully predicted by network formation. We can therefore expect networks to create a variety of different spatial configurations in economic life (Yeung 1998b). Some networks are relatively more localized because they are dependent on the traded and untraded interdependencies of geographical agglomeration achieved through territorial embeddedness (see, for example, the literature on spatial agglomeration, of which Storper 1997a, provides a valuable review). Other 'global' networks, however, are controlled 'at a distance' when the key actors are spatially distanced from the sites where empirical events happen (see, for example, the literature on the globalization of finance). In all cases, however, a specific spatial configuration is created and connected to other configurations at smaller and larger geographical scales.

Emphasizing this general issue of territorial embeddedness in networks is important because it side-steps a potential weakness in emphasizing the networked nature of economic activity. Moving away from the 'topological presupposition' (Thrift and Olds 1996) of the 'bounded region' and towards a network methodology runs the risk of losing sight altogether of profound geographical variations across localities and regions. More significant, however, is the tendency to denigrate the role of the territorial state in global economic processes. While some network approaches successfully incorporate the state as an actor, the state as a *territorial* entity is less well recognized. A network link that crosses international borders is not just another example of 'acting at a distance', it may also represent a *qualitative disjuncture* between different regulatory and socio-cultural environments (see, for example, Dicken 1998; Sassen 2000; Smith et al. 1999; Taylor 1994). National regimes of regulation continue to create a pattern of 'bounded regions', and networks of economic activity are not simply superimposed upon this mosaic, nor is the state just another actor in economic networks.

The regulatory environment created by different states is still, we believe, an immensely formative influence on network development as Whitley (1992, 1996, 1999) argues. This is a point we will note later in our critique of global commodity chains, which, it is claimed, tend to exhibit common institutional characteristics by sector. As Whitley (1996: 422) points out, 'the actors involved in most commodity chains are typically dissimilar because they are the product of different institutional environments and there are few significant international agencies standardizing procedures and ways of organizing economic activities.' In other words, even firms operating in highly internationalized sectors still tend to retain distinct organizational forms and practices that largely reflect the regulatory environment of their home

country (see, for example, Dicken 1998: 193–9; Doremus et al. 1998; Yeung 1998a, 2000c). At the same time, however, the very fact that production networks cross nation–state boundaries means that territories (at all scales) are, in effect, ‘inserted’ into networks whose coordinating and control mechanisms may lie elsewhere. This has implications beyond that of the old debates on the ‘external control’ of economies. A network methodology forces us to address the direct and indirect connectivities between economic activities stretched across geographical space but embedded in particular places. Thus, we have a mutually constitutive process: while networks are embedded within territories, territories are, at the same time, embedded into networks.

To sum up our analytical framework for understanding the global economy, we need to start by identifying both social actors and business networks because we believe that the global economy is constituted by ‘spaces of network relations’. Individuals, households, firms, industries, states, unions or other organizations and institutions can represent social actors in the global economy. We then need to understand the intentions and motives of these social actors and the emergent power in their network relationships. These relationships are embedded in particular spaces. This, of course, does not mean that all social actors in each network must be bound together in exactly the same territory. Rather, we argue that there are ‘spaces’ for social actors to engage in network relationships. These ‘spaces’ can include localized spaces (for example financial districts in global cities) and inter-urban spaces (for example webs of financial institutions and the business media that bind together global cities). The global economy is thus made up of social actors engaged in relational networks within a variety of ‘spaces’. The analytical lens we adopt can thus vary widely. It may be geographical, it may be sectoral, and it may be organizational. It may be some combination of these. The key point is to recognize the fundamental interrelatedness of all of these phenomena, not in some abstract sense but in seriously grounded form. What, then, does this form take? In the following two sections, we present two variants of a network methodology to analyse the global economy.

Global commodity chains: unfinished networks?

Conceptualizing economic activities as being organized functionally into a *chain* of interconnected elements has a lengthy history (Dicken 1994). However, few writers have attempted seriously to explore in detail, either conceptually or empirically, what such chains might look like. One exception, in the business literature, is Porter (1985, 1986) who employed the notion of the *value chain* at the level of the individual firm. But, as a ‘business guru’ intent upon selling his ideas of firm competitiveness to business strategists, Porter’s approach was essentially prescriptive rather than analytical. The most ambitious and consistent attempt to develop the chain concept as an analytical lens through which to understand the global economy has been made by the American sociologist, Gary Gereffi. In a series of papers that have appeared since the early 1990s, Gereffi has gone farthest in claiming that what he terms the *global commodity chain* (GCC) provides the best answer to the question of ‘what is the appropriate organizational field to use in studying economic globalization?’ (Gereffi 1996: 436). In this section, then, we explore Gereffi’s particular conceptualization of the chain. Our argument is that, notwithstanding the very substantial contribution of his

work to our understanding of the structure of the global economy, the global commodity chain concept as developed and empirically substantiated by Gereffi and his colleagues provides only a partial, albeit extremely useful, analytical framework (see also Raikes et al. 2000).

The GCC framework has a specific intellectual lineage: that of world-system theory. Indeed, the most substantial collection of papers on GCCs, edited by Gereffi and Korzeniewicz (1994: 2), arose out of a meeting organized by the Political Economy of the World-System section of the American Sociological Association held in 1992. The aim was to bring 'a new focus to world-system theory'. As such, Hopkins and Wallerstein's (1994: 17) basic definition of a commodity chain provided a starting point: 'a network of labor and production processes whose end result is a finished commodity'. From this starting point, Gereffi et al. (1994: 2) define *global* commodity chains in the following comprehensive way:

A GCC consists of sets of interorganizational networks clustered around one commodity or product, linking households, enterprises, and states to one another within the world-economy. These networks are situationally specific, socially constructed, and locally integrated, underscoring the social embeddedness of economic organization. ... Specific processes or segments within a commodity chain can be represented as boxes or nodes, linked together in networks. Each successive node within a commodity chain involves the acquisition and/or organization of inputs (e.g. raw materials or semifinished products), labor power (and its provisioning), transportation, distribution (via markets or transfers), and consumption. The analysis of a commodity chain shows how production, distribution, and consumption are shaped by the social relations (including organizations) that characterize the sequential stages of input acquisition, manufacturing, distribution, marketing, and consumption.

The GCCs approach promotes a nuanced analysis of world-economic spatial inequalities in terms of differential access to markets and resources. Our GCC framework allows us to pose questions about contemporary development issues that are not easily handled by previous paradigms, and permits us to more adequately forge the macro-micro links between processes that are generally assumed to be discretely contained within global, national, and local units of analysis. The paradigm that GCCs embody is a network-centered and historical approach that probes above and below the level of the nation-state to better analyse structure and change in the world-economy.

This is an impressive and ambitious agenda. Were it to be implemented fully it would, indeed, vastly increase our understanding of the dynamics of the global economy and satisfy many of the considerations outlined earlier in this article. However, so far at least, this agenda has been only very partially addressed. The individual chapters in Gereffi and Korzeniewicz (1994), together with Gereffi's subsequent work (see, for example, Gereffi 1995, 1996, 1999) deal, in analytical terms, with only a *part* of the 'mechanism' of the global commodity chain and, in empirical terms, with a very narrow range of 'commodities'. Gereffi (1994: 96–7) identifies four main dimensions of global commodity chains: (1) an *input–output structure*: 'a value-added chain of products, services, and resources linked together across a range of relevant

industries'; (2) a *territoriality*: that is, a pattern of geographical distribution that may be spatially dispersed or spatially concentrated; (3) a *governance structure*: the 'authority and power relationships between firms that determine how financial, material, and human resources are allocated and flow within a chain' and (4) an *institutional framework*: 'that identifies how local, national, and international conditions and policies shape the globalization process at each stage in the chain'.

In fact, despite identifying these four basic dimensions, Gereffi has concentrated overwhelmingly on just *one* of these four: the *governance structure* of GCCs. He argues that two dominant types of governance structure have evolved to coordinate transnational production systems: what he terms *producer-driven commodity chains* (PDCCs) on the one hand and *buyer-driven commodity chains* (BDCCs) on the other. PDCCs are those in which large transnational corporations control a tightly integrated production system, notably in capital- and technology-intensive industries such as automobiles, computers, aircraft, and electrical machinery (for example see Gourevitch et al. 2000). BDCCs, in contrast, are those in which the power to organize the chain lies essentially with large retailers, brand-name merchandizers, and trading companies (for example see Dicken and Hassler 2000; Hartwick 1998; Hsing 1999; Hughes 1999). The diagnostic feature of BDCCs is that the controlling firms do not, themselves, own production facilities; rather they coordinate dispersed networks of independent and quasi-independent manufacturers. Such kinds of governance structure are most evident, it is claimed, in labour-intensive, consumer goods industries such as garments, footwear, consumer electronics, toys, and in handcrafted products such as furniture. The rationale for the distinction between producer-driven and buyer-driven commodity chains lies in differential barriers to entry.

Thus, Gereffi not only focuses almost exclusively on just one of his four dimensions of GCCs – governance – but he also conceptualizes such governance in terms of just two ideal types. Although he sees PDCCs and BDCCs as 'contrasting (but not mutually exclusive) poles in a spectrum of industrial organization possibilities' (1994: 99) and argues that they should not be seen as static and fixed entities (Gereffi personal communication), the fact remains that the way commodity chain governance is represented is very simplistic. Further, in most of his writings – and especially in his empirical analyses – Gereffi focuses overwhelmingly on buyer-driven chains on the grounds that these are becoming increasingly pervasive. Unfortunately, the range of empirical cases examined in the global commodity chains literature remains extremely limited. The other three dimensions of GCCs identified by Gereffi are given little or no detailed consideration. For example, the complex, multifaceted nature of *input–output relationships* remains largely unexplored, both conceptually and empirically (other than in a few cases such as apparel). Although presumably not intended, the impression given is one of an essentially linear process rather than one in which the flows of materials, semi-finished products, design, production, financial and marketing services, finished products are organized vertically, horizontally and diagonally in complex and dynamic configurations.

One undoubted strength of the GCC approach is that it explicitly focuses on 'cross-national forms of economic organization' (Gereffi 1996: 428). Hence the 'chain' concept usefully highlights the multiple scales of the global economy in the sense outlined earlier. However, the *geography* of GCCs (what Gereffi calls their 'territoriality') is dealt with at a very high level of spatial aggregation, a clear

reflection of the world-system ancestry of the GCC concept (see also Leslie and Reimer 1999). The scale is that of the 'core' and 'periphery' of the world-system and of the ways in which individual countries are inserted into this international division of labour. However, it is the way the *institutional framework* of GCCs is conceptualized that has provoked most criticism, particularly the role of the national state. Although Gereffi asserts that 'state policy plays a major role in GCCs' (1994: 100) there is no doubt that he sees the real driving forces for change in the global economy as being located within GCCs themselves. The different institutional configurations characteristic of different nation-states (what Whitley (1992) calls their 'business systems') are recognized as having an influence on the way GCCs may be organized but, in Gereffi's view, such influences are being eroded by globalization processes. In that sense, Gereffi (1996: 433) appears to subscribe to the 'convergence' school of analysis:

globalization ... tends to diminish the influence of national origins on business systems, and to highlight the role of design, production, and marketing core competencies and strategic capabilities within and between economic sectors. The way firms do business in the global economy thus is determined to an increasing extent by their position in GCCs, not their national origins.

Whitley (1996, 1998, 1999) contests this viewpoint, arguing that national institutional differences continue to exert a significant influence on the international structure of economic activities. He makes two especially relevant points in this regard. First, he argues, 'characterising an entire sector in terms of a single type of firm is fraught with difficulties, even if it is possible to agree that there is a single dominant logic underlying the general coordination system ... these differences will be exacerbated by the cross national nature of GCCs, so that firm types within the same sector, and fulfilling similar roles in it, may well vary dramatically across societies' (Whitley 1996: 419). Second, 'the sorts of firms that dominate GCCs often follow different strategies and develop different roles within them because of their idiosyncratic histories and institutional contexts' (Whitley, 1996: 419). Thus, to return again to the considerations outlined at the start of this article, the GCCs' approach helpfully decentres the nation-state as a locus of economic analysis, but in its place privileges the role of the industrial sector and marginalizes the continued importance of state regulation.

This recent exchange of views between Gereffi and Whitley over the extent to which the GCC and business system approaches may be reconcilable raises interesting issues. In particular, it focuses attention on the differentially embedded nature of economic activities. In their initial formulation of GCCs, Gereffi et al. (1994: 2) emphasized that 'these networks are situationally specific, socially constructed, and locally integrated, underscoring the social embeddedness of economic organization' (see also Dacin et al. 1999). As noted earlier, a recognition of territoriality in such a way is important, but something of this perspective seems to have been lost in the subsequent development of the GCCs concept, with its preoccupation with one dimension, that of governance – and of a rather stylized conceptualization of governance mechanisms.

Actor-network theory: a broader analytical framework

While an extensive literature presents the global commodity chain as the most fruitful approach to the study of economic globalization, and GCCs are explicitly defined as ‘interorganizational *networks* clustered around one commodity or product’ (Gereffi et al. 1994: 2, emphasis added), the nature and properties of networks *per se* are weakly examined in the GCC approach. A more developed consideration of networks is provided by actor-network approaches, which, while not attempting to grapple with the global economy *in toto*, do provide some important insights to assist in understanding the global economy.

Actor-network theory (ANT) is an approach originally developed within sociological studies of science by Michel Callon, Bruno Latour and John Law and others in Paris in the 1980s (see expositions on ANT in Hassard et al. 1999; Latour 1997; Murdoch 1997a, 1999; Thrift 1996, 1999). ANT’s impact is increasingly apparent in a number of other fields in the social sciences, including organization theory, social psychology and human geography. While ANT is not a coherent and unilinear approach to network analysis, it is safe to state that ANT is a broadly ‘materialist semiotic’ approach; a non-textual ‘relational materialism’ that focuses on the building of orders, paths of development and meanings in the pursuit of agendas (Bingham 1996: 643). More specifically:

The provenance of actor-network theory lies in poststructuralism: the vision is of many semiotic systems, many orderings, jostling together to create the social. On the other hand, actor-network theory is more concerned with changing recursive processes than is usual in writing influenced by structuralism. It tends to tell stories, stories that have to do with the processes of ordering that generate effects such as technologies, stories about how actor-networks elaborate themselves, and stories which erode the distinction between the macro- and micro-social.

(Law 1994: 18, cited in Thrift 1996: 23–4)

Unlike the structuralist-influenced GCC approach, therefore, ANT is a *non-representational* theory. Actions or practices, rather than structures, form the focus of analysis. As such, it has four main tenets, as delineated by Thrift (1997b: 126–31): (1) it is about the ‘practices’ that ‘shape the conduct of human beings towards others and themselves in particular sites’, especially everyday practices; (2) it is concerned with the ‘practices of subjectification’ where the subject is decentred (an assemblage of influences, agendas and practices), embodied (it has the capacity to develop and exercise skills – to do), affective (through desire subjects become subjects), and dialogical (subjects always engage in action with others, never as isolated beings); (3) it is spatial and temporal in that the world is ‘always in process’, being encountered and encountering and (4) it is concerned with ‘technologies of being’ (namely the technologies that humans use to engage in action, and the technologies).

One of the most debated characteristics of ANT is that it encourages the conceptualization of networks as *hybrid collectifs* of humans and non-humans. Agency and social relations should never be conceptualized in a manner that excludes (or cordons off) the non-human, or in a manner that is technologically determinist (cf. Castells

1989, 1996). Practitioners of all forms of ANT assume that it is the *non-human artefacts* (for example computers, container port cranes, trains), tools (for example reports, maps) and rules (for example laws, policies) that *enable* social beings to develop and maintain modern social relations; relations that span out across space at *all* scales via networks (Busch and Juska 1997; Holloway 2000; Kortelainen 1999; Law 1994; Murdoch et al. 2000; Whatmore and Thorne 1997). In other words, human societies are made up of diverse heterogeneous materials: 'it is utterly impossible to understand what holds society [or the global economy] together without reinjecting in its fabric the facts manufactured by natural and social sciences and the artefacts designed by engineers' (Latour 1997: 3). We are all, to use Haraway's (1991) terminology, *cyborgs*; the global economy is driven by cyborgs. Moreover, non-humans are not simply resources and constraints – they 'intervene actively to push action in unexpected directions' (Callon and Law 1997: 178). For example, technical objects such as production machinery, or computer hardware might be constructed with specific intentions in mind in one locale, but may then be interpreted and used in entirely different ways in another context, generating unintended impacts. The implication for understanding the development of the global economy is that analysts need to recognize 'agency' as an 'effect generated by a network of heterogeneous, interacting materials' in which the non-human plays a critical role in embodying and shaping (often in unexpected ways) action (Law 1994: 383). Theoretical and methodological approaches that privilege the status of human beings, firms or nation-states need to speak of non-humans in the *same* analytical terms (Law 1986: 257–8), and be 'capable of making sense of the way in which these pieces [the social, the technological, the natural and the political] fit together' (Law 1986: 235).

Given ANT's ontology and methodological framework, actor-networks are essentially defined as 'the chains which give rise to natural and social realities, realities which can only be understood as stabilized sets of relations which allow the construction of centres and peripheries, insides and outsides, humans and nonhumans, nature and society, and so on' (Murdoch 1997b: 743). In short, an 'actor-network is simultaneously an actor whose activity is networking heterogeneous elements' of humans and non-humans 'and a network that is able to redefine and transform what it is made of' (Callon 1987: 93, cited in Bingham 1996: 647).

ANT has recently been applied to the issue of globalization (for example Leyshon and Thrift 1997; Olds and Yeung 1999; Thrift 1996; Whatmore and Thorne 1997; Yeung 2000c). As a non-representational theory, ANT effectively encourages us to focus on the *ordering* of the global economy through multiple (and not necessarily related) examinations of the *performances* that underlie processes of economic change and development. Actor-network theory is thus focused upon the ability of actors to 'act at a distance' by entraining both other actors and the necessary material objects, codes and procedural frameworks to effect the activation of power.

Actor-networks can take many forms, subject to the conceptual powers and judgement of the analyst. Thrift (1996: Chapter 6) for example, delineates four 'overlapping but relatively stable types of actor-networks' that play a key role in shaping the current international financial system: the nation state, the media, money capitalists, and machine 'intelligence'. The nation state, for example, generates regulations to attract foreign direct investment, develops and attempts to implement monetary policy, and forms inter-state alliances via entities such as the G7. The media shape the

international financial system via the transmission of information at a global scale, and through the shaping of this information convey meaning and significance. Money capitalists, operating in and through the skein of global financial centres, seek to understand, represent, and exert control and profit from the machinations of the international financial system. And machine 'intelligence' acts as both resource and shaper of the international financial system (for example artificial intelligence systems that play a role in shaping fluctuating stock markets). The strategic sites of concentration and calculation for all four actor-networks are global cities; cities where money capital is constituted, represented and manipulated.

Two examples illustrate the use of ANT in analysing the global economy. Whatmore and Thorne (1997; see also Hughes 2000) focus on the global 'fair trade' actor-network; a network shaped by a variety of actors. Mainly driven by ethical institutions from the North that consciously pursue a normative economic agenda, the global fair trade actor-network seeks to use a variety of network strengthening techniques and practices to develop more equitable and 'just' coffee production chains (chains linking buyers in the North with producers in the South). Whatmore and Thorne use ANT to guide their research at a variety of levels as they critically examine the complex range of problems that are associated with building qualitatively superior (from the perspective of coffee growers and pickers in the South) and durable networks across space. A second example is provided by Olds and Yeung (1999) and Yeung (2000c) who explore the relationships between globalizing tendencies and the changing form of 'Chinese' business networks. They discuss how Chinese business networks, traditionally conceptualized as closed and internally shaped due to a variety of historically and geographically specific factors, are being (re)shaped by an array of actor-networks with an *international business* dimension. Groups of actor-networks associated with international finance, the international business media, and multi-lateral institutions are engaging with Chinese business networks. Through their capacity to enrol relevant Chinese firms into their actor-networks, the international business community is forging changes in some Chinese business practices, while also reinforcing other business practices.

The adoption of an ANT perspective on the 'global' implies a rejection of a global-local dualism, with one scale (the global) dominating the other (the local). As Latour (1997: 5) notes in some detail:

The notion of network allows us to dissolve the micro-macro distinction that has plagued social theory from inception. The whole metaphor of scales going from the individual, to the nation, through family, extended kin, groups, institutions etc. is replaced by a metaphor of connections. A network is never any bigger than another one, it [is] simply longer or more intensely connected. ... A network notion implies a deeply different social theory: it has no *a priori* order relation; it is not tied to the axiological myth of a top and of a bottom of a society; it makes absolutely no assumption whether a specific locus is macro- or micro- and does not modify the tools to study element 'a' or the element 'b'. ... *Instead of having to choose between the local and the global view, the notion of network allows us to think of a global entity – a highly connected one – which remains nevertheless continuously local.* ... Instead of opposing the individual level to the mass, or the agency to the structure, we simply follow

how a given element becomes strategic through the number of connections it commands and how does it lose its importance when losing its connections.
(Emphasis added)

In this way research is directed to the ‘associations’, processes and performances that give rise to so-called ‘purified outcomes’ (for example nature, society, human, modernity, firm). As noted above, research guided by ANT therefore tends to focus on ‘how associations and networks are built and maintained’ across space (Murdoch 1997a: 334–5). Such a perspective on the constant creation and management of networks recognizes that business activity (and especially international business) is a *performative* act, an issue rarely examined in the more static GCC approach. As Whatmore and Thorne (1997: 290, 302) put it, ‘global reach’ is a ‘laboured, uncertain, and above all, contested process of “acting at a distance”’. The ability of actors to reach across space and act at a distance ultimately depends upon entraining other actors *and* the necessary material objects, codes, procedural frameworks and so on that are required to effect the activation of power. A fundamental part of extended network construction is the ability to create and manage the knowledge, vocabulary, procedures, rules, and technologies through which economic activity is conducted. An example is the globalization of accountancy standards that allows financial management from a distance (Sassen 1999), or the development and implementation of standards shaping the behaviour of subcontractors. The creation, legitimization and adoption of such knowledge and rules generate power for the network enroler because they are effectively able to reshape the strategy and activities of the network enrollee. Thus, as Bridge (1997: 619–20) points out, ‘power in actor-network theory is the ability to bind other actors and intermediaries into knowledge-producing networks.’

Given ANT’s ontological claims, it is important to note that the approach ‘opens up space-time to the coexistence of multiple cross-cutting networks of varied length and durability’ (Whatmore and Thorne 1997: 302). In contrast to a conceptualization of globalization (and the global economy) as a homogenous and steamroller-like entity, the new topology is one of *nodes* that ‘have as many dimensions as they have connections’ (Latour 1997: 2). More precisely, ‘ANT claims that modern societies cannot be described without recognising them as having a fibrous, thread-like, wiry, stringy, ropy, capillary character that is never captured by the notions of levels, layers, territories, spheres, categories, structure, systems’ (Latour 1997: 3). As in the GCC approach, national boundaries are insignificant; but unlike the GCC approach, the fibrous links shaping production systems have no linear, bounded and fixed character whatsoever: they continually shudder, shatter, mutate and evolve into new constellations of connections – a ‘syrrhese’ (Serres and Latour 1995). The implicit need to deconstruct corporate or institutional actors in ANT leads us to resist ascribing causal power to the notion of unified firms, industries, nation states or other institutions. Rather, ANT leads the researcher to be interested in the constitution and reshaping of economic organizations via tracing their engagement with an array of actor-networks. This stance reflects a socio-technical constructionist approach to analysis, and the ‘reconstruction of power without refiguring it as an inhuman force leading to foregone conclusions’ (Thrift et al. 1995: 1).

While writers in the commodity chain literature lay claim to higher theoretical ground by claiming to identify fundamental structures in global capitalism, actor-

network theory is explicit in its rejection of metatheoretical ambitions. According to Murdoch (1997a: 332), actor-network theory ‘renders problematic many of the traditional forms of “macro” theorising that (particularly Marxist) geographers have adopted to interpret the relations between place-specific outcomes and generalizable structural process’. Certainly the emphasis on relational practices highlighted by ANT is welcome, but there is a danger that concentrating attention on actors in networks will descend into a mechanistic framework that atomizes agents and focuses solely on the links between them, without a sense of the social processes that constitute these relationships. This danger is perhaps evident in Murdoch’s (1997a: 332) statement that:

Network analysis is quite simple: it means following networks all the way along their length; there is no need to step outside the networks for all the qualities of spatial construction and configuration of interest will be found therein. ... Actor-network theorists thus reject the view that social life is arranged into levels or tiers some of which determine what goes on in others; everything is kept at ‘ground level’.

Keeping things at ‘ground level’, however, makes it difficult to keep structural power relations within the global economy in the same frame. It may be true that ‘capitalism’ is too abstract a category to be very useful in understanding spatial specificity in the global economy or the finer empirical contexts of economic life (necessarily incorporating the non-economic). However, we should surely not discard this level of abstraction *entirely*. Useful work has been conducted, for example, under the rubric of regulation theory that seeks to specify the particularities of capitalism over time and space. To constrain our analyses of the global economy to the ‘ground level’ and to approach the power relations therein as simply traceable through tangible linkages would be a mistake. A fundamental requirement of a framework for understanding the global economy should, therefore, be to acknowledge the points made by network theorists concerning the need to avoid using ‘a separate vocabulary for the large’ (Callon et al. 1996, cited by Murdoch 1997a: 335), and yet at the same time retain understandings at higher levels of abstraction. In other words, just as we need to incorporate multiple scales and loci of analysis so, too, we should remain sensitive to the insights provided at multiple levels of abstraction.

Conclusion

In this article we have tried to outline some of the arguments for adopting a network methodology to building an analytical framework for the global economy. Our position is that networks are both *social structures* and *ongoing processes*, which are constituted, transformed and reproduced through asymmetrical and evolving power relations by intentional social actors and their intermediaries. This relational view of networks emphasizes the role of human agency and the ongoing formation of networks that produce empirical outcomes.

Three final points can be made in this discussion of the value of a network methodology to understanding the global economy. The first relates to the discursive power of the language we use – the conceptual metaphors that we circulate in order to understand the global economy. Representations of the ‘global economy’ (itself a

representation, of course) translate into actions on the basis of such an understanding. The strength of the network methodology is that it serves to identify and embody the agents of the global economy in a way that undermines the image of the faceless juggernaut of globalization under the control of the transnational corporation. Instead of conceiving of the global economy as a disembodied and disembedded set of supra-human forces, the network understanding of how commodities and services are produced, distributed and consumed highlights the *grounded* mechanisms through which a web of international economic relationships is actually created and reproduced. In this way, points of resistance and opposition can be identified in order to rework aspects of the global economy towards an agenda based on social justice. In other words, a network methodology provides discursive spaces for challenging certain relationships within the global economy, while stopping short of advocating a radical revision of capitalism as a mode of social organization. Gibson-Graham (1996) makes a similar point in her discussion about 'querying globalization', as do Whatmore and Thorne (1997) in their account of fair trade networks in coffee production.

A second progressive dimension opened up by actor-network theory is the space provided for *ethical* analyses of the global economy (Bingham 1996: 645; Hughes 2000; Whatmore 1997; Whatmore and Thorne 1997). By fusing the human and non-human (including animals, plants, soil, air, water etc.) agents that become entrained in networks, actor-network theory allows ethical analysis in two senses. On the one hand, by collapsing the society–nature dualism, the ethical rights or responsibilities of all network participants can be considered within an analysis of the global economy, including, for example, the environmental impacts of economic relations (see Whatmore 1997). On the other hand, a network methodology expands the horizons on which our actions can be seen to be influential and within which we might be held to some ethical responsibility. Thus, thinking in terms of a global actor-network for coffee or gold production or tourism services allows direct connections to be made between geographically distant consumers and producers, and the intermediaries in between (Clancy 1998; Hartwick 1998; Whatmore and Thorne 1997). In this way, the 'claims of distant strangers' (Corbridge 1993) can become a part of economic and political analysis, rather than limiting such analysis to discrete political entities, notably the nation-state.

The third point takes us back to the issue of the relationship between a network methodology and other analytical bases for understanding the global economy, such as the 'logics of capitalism'. Several writers have certainly sought to establish some general theoretical claims for a network methodology. Notably, Gereffi (1996) seems to suggest that GCCs (which represent a particular type of network structure) represent a fundamental analytical unit for the global economy and argues for an institutional and organizational approach to the global economy that explicitly theorizes at the same level as, for example, Wallerstein's world-system framework. In other words, the GCC approach seems to aspire to the same level of abstraction as the 'logics' of capitalist world development but at the same time withdraws from any such structural analysis. Whitley (1996) implicitly draws attention to this leap of abstraction when he suggests that GCCs are just one organizational form among many in contemporary capitalism. Actor-network theory, meanwhile, eschews the language of structural analysis and attempts to understand social relations through the actions of both human and non-human agents and their enrolment in networks.

Both GCCs and ANT, then, go some way towards fulfilling the promise of a network methodology for understanding the global economy. We have argued, however, that both fall short in some important respects. Like the conceptual framework for GCCs, but unlike its operationalization in subsequent research efforts, we suggest that a network methodology should consider governance structures, institutional frameworks and territorial embeddedness. Like ANT, we have suggested that the relational nature of networks and the centrality of intentional human agency must be at the centre of analysis. We would, however, argue for an approach that provides more room for structural understandings of power relations in the global economy.

The structural/relational view that we have advocated requires us to identify actors in networks, their ongoing relations and the structural outcomes of these relations. Certainly, this network methodology neither provides a rigid analytical framework nor attempts to lay out an explicit prospectus for future research. What we have tried to do, however, is to show how understanding the structures and relationships in the global economy in terms of network formations provides an important point from which empirical work can take off. It raises our sensitivity to the multiple scales at which economic life is constituted; it highlights the need to incorporate multiple analytical loci when trying to understand global economic relationships; it attempts to undermine the sense of powerlessness that the concept of a disembodied global economy frequently inspires; and, it attempts to draw together structural understandings of power relations with relational approaches to human agency. In this way, it is hoped, it provides the basis for a more nuanced analysis of the complexity of the contemporary global economy.

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Acknowledgements

A preliminary version of this paper was presented at the Boston meeting of the Association of American Geographers in 1998. We wish to thank participants for their helpful comments. In particular, we thank Bob Jessop not only for providing characteristically penetrating comments but also for suggesting a wonderful title: 'Networkers of the world unite: you have nothing to lose but your commodity chains'. Despite its obvious attractions we did not feel able to use it here.

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