

capital and economic infrastructure, emerged as the greatest economic power in the world – the position it retained for quarter of a millennium, to be replaced only by the giant and naturally overabundant economy of the United States of America. In other major players in the economic sphere, France, Germany and Japan (in order of entrance into the race), the reorientation of the economy towards growth – and the ‘take-off’ into sustained growth – followed the development of national consciousness within a generation plus/minus a decade, depending on the historical circumstances, obstructing (as in the case of the Revolution in France) or accelerating the process (as in the case of the forcible opening of Japan to trade, as a result of which Japanese nationalism was from the start defined in economic terms). In the case of the United States, which joined the race for economic dominance at about the same time with Japan, in the last quarter of the nineteenth century, the translation of national consciousness into collective economic competitiveness was slowed, paradoxically, by the acuity of the competition within the nation and by the superabundance of its natural resources, which allowed it to disregard all economic relations with the world except on most favourable terms.

To sum up, nationalism reorients economic activity towards sustained growth, supplying – in its inherent competitiveness – the motivation without which such growth cannot happen. The so-called material or objective conditions within which this motivation arises are at best of secondary importance, for nationalism has the power to activate the previously inert resources in cases where they exist (as in Germany or the United States) and to create resources out of nothing in cases where nature fails to provide them (as in England or Japan). The existence of material conditions in the absence of the motivation is powerless to produce sustained growth, as proved by the

remarkable case of the Dutch Republic. The first world economic hegemon, the dominant economy of the seventeenth century and the only one with a sophisticated developed economic infrastructure, technologically, organizationally and financially superior to any other, the Dutch economy not only stopped growing by the end of its Golden Age, but experienced an absolute decline, completely disappearing from the ranks of major players on the economic arena – and all because the Republic did not develop a national consciousness and, therefore, having all the chances to win, lacked the motivation to compete as a unit, preferring to enjoy its legendary prosperity to investing it in sustained growth.

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NETWORK ANALYSIS

Network analysis is both old and new. On the one hand, network analysis is based on ideas as old as sociology itself; on the other hand, network analysis is as new as the latest mathematical models imported from the cutting-edge in physics. The classic origins of network analysis are most often traced to theorist Georg **Simmel**, who thought carefully about the basic building blocks of social **structure**. In addition to the importance of the relative size of social groups that interact with each other (such as employers and labourers), Simmel considered the position of an individual actor in a group or multiple groups. One of his enduring conceptual contributions on this topic is the development of *tertius gaudens*. *Tertius* is the third who prospers from social exchange. This third individual in a triad may pit the other two against each other to his or her own benefit. Simmel’s theoretical discussions of webs of affiliation are a kind of network analysis, as are contemporary computational investigations of scale-free networks where connectivity follows

power-law distributions (which, rather than peak at average value like a normal distribution, start at maximum value and decrease towards infinity).

Definitions

A network, unlike a group, as Elizabeth Bott (1957: 216–17) points out, ‘is a social configuration in which some, but not all, of the component external units maintain relationships with one another. The external units . . . are not surrounded by a common boundary.’ For example, a job-seeker has a set of social relationships with friends, family and acquaintances that compose his or her network and may help in locating a job. But the set of people with whom the job-seeker maintains relationships may not know each other and do not form a bounded social group. The general applicability of network analysis is such that the units in a network may be measured at any level: individuals, organizations or nations.

Network analysis is the tool of the **embeddedness** perspective, arguably the central thesis of economic sociology. The conception of embeddedness builds on Karl **Polanyi’s** insights that the free-market mentality that emerged in the nineteenth century ignores how economies were traditionally embedded in communal life. Current economic sociology follows Mark Granovetter’s argument about embeddedness, which acknowledges that social actors forming economic relationships cannot untangle them from webs of **social ties**. ‘Network analysis’ has most often meant a collection of quantifying tools to graph social structures in the economy, but also refers to studies of the increasingly interconnected qualities of the economy, i.e. industrial districts and firms that take on a network form of organization.

The network form of organization is a type of governance structure that relies on inter-organizational collaboration. In contrast to markets governed by spot contracts

for one-shot deals, or hierarchies governed by vertical chains of command and multiple divisions, the network form is embedded in durable yet flexible ties with external units. Examples of organizations that employ the network form (sometimes called ‘network organizations’) abound. Older craft-based organizations such as traditional construction firms illustrate aspects of the network form, like requiring workers to use tacit knowledge and make decisions as they build. This task-based work involves a range of skills, and also the ability to cooperate with other highly skilled trades on the building project. Similarly, in the contemporary Hollywood film industry, a movie brings together actors, directors, producers and other independent contractors for a short-term project. Analyses of this labour market show that skilled participants become embedded in networks of long-term working relationships that lead to recurring ties on subsequent film projects. Other project-based organizations that often bring teams together across formal organizational boundaries can be found in advertising, book publishing and, of course, the high-tech industries of information technology and biotechnology.

Network analysis, then, incorporates studies that treat networks more metaphorically in investigating webs of affiliation in economic life, as well as studies with specific operationalization of network measures. In this broader definition, network analysis is both old and new; and there are both qualitative and quantitative ways of usefully analysing networks in economic sociology.

Developments in network analysis

As early as the 1920s–1930s, network analysis had been performed in firms, notably in the famous Hawthorne studies conducted in Chicago’s Western Electric plant. In the report, sociograms of relationships between workers in the bank wiring room

demonstrated the informal organization by representing individuals as nodes and existing ties as lines. The strength of the visual presentation of networks is that it is a parsimonious way to easily convey a set of relationships between multiple social actors. But consider that a maximally connected set of N actors display $\frac{N(N-1)}{2}$ lines in a sociogram. For five nodes, that would be a manageable ten lines, but for a relatively small group of twenty-five, potentially drawing 300 lines describing relationships becomes more difficult. (Although note that developments in computer animation, including the ability to convey more than two dimensions on screen, have now, in the early 2000s, made dynamic visual representations of large numbers of ties possible, with software programs like Pajek). Meanwhile, the measurement of social networks awaited more practical solutions.

The 1970s brought mathematical and computational developments that laid the groundwork for quantitative network analysis. Harrison White and colleagues worked on the mathematical breakthrough of applying algebraic models to measure individuals' roles in social structure, and through this effort developed block-modelling techniques. Conceptual developments on networks were often intertwined with methodological issues. Structural equivalence, the idea that two social actors are basically interchangeable if they have the same kinds of ties to the same kinds of partners, developed with the formulation of block-modelling methods. Multi-dimensional scaling was another important mathematical development, one which permitted the measurement of distances in social space. As increasingly sophisticated computational resources became accessible, the character of relationships and social structural positions could be represented numerically and compared across larger and larger networks. The development of quantitative measures of connectivity

included a variety of types of centrality, or ways of determining which social actor is the most connected in a network. Some centrality measures look at the direct relationships of the focal actor, such as degree centrality – the count of each actor's total number of ties. Other measures of centrality like closeness are more global measures of connection in the network, and take into consideration how connected the focal actor's partners are. Measures that hone in on the 'groupiness' within a given network include analyses of cliques, clusters and density. A clique, for example, usually indicates a sub-group of actors within which every possible dyad is directly linked, and is not connected to other cliques in the network.

Early findings in the sociological analysis of individuals in networks focused on information flows in markets. Coleman and colleagues argued (in the 1960s, though their claim was later disputed by reanalyses of their data in the 1990s) that a medically innovative product diffused more quickly to physicians who were central in friendship networks with colleagues. Lee studied women in the then illegal market, pre-Roe vs Wade, for a health care provider who could perform abortions. She found that women asked over five network contacts on average before finding an abortionist. Sometimes information would come through the referral of a friend of a friend. But in searching for such sensitive information, the distance between the searcher and the abortionist remained small – usually only two intermediaries at most. Granovetter's well-known 'strength of weak ties' argument was based on a study of male white-collar job-seekers who resided in Newton, MA. Over half of his respondents found jobs not through their strong ties to family and close friends, but rather through weak ties to acquaintances. Weak ties generally provide greater access to new information, unlike strong ties.

The early network analyses of the 1970s were also concerned with the organizational level as well as individual level. Studies of interlocking directorate ties, although measured by the common membership of two individuals on a third board of directors, were used to chart the linkages between US corporations. This early period of development in network analysis was mainly based in the United States.

In the 1980s, economic sociology was reborn and network analysis of organizations and markets grew around the globe. Research on networks in economic life began to expand across social science disciplines and national borders. The rebirth of economic sociology was marked by Granovetter's renowned 1985 essay on embeddedness. His call for structural analysis of the economy in contrast to atomistic neoclassical economic models resonated with many, and brought a coherent theoretical perspective to network analysis.

Studies in the 1980s explored what networks look like around the globe, and how they relate to economic development. In the 'Third Italy', small artisanal firms located in regional **industrial districts** exhibited flexible specialization. Through long-estate ties, a community of independent shops, each specializing in one aspect of production, would coordinate the manufacture of a certain kind of good. In Modena, knitwear might be put together cooperatively by a series of firms that each performed one part: the weaving, the dyeing, the cutting, the stitching. The coordination occurs not through an overarching organization, but through the network ties between local producers. Because each firm relies on highly skilled employees and is not subject to a long chain of command, they can adapt production change quickly and flexibly into the process. Thus, flexible specialization within regions means networks of firms stay on the cutting edge of fashion, sharing tricks of the trade among themselves but limiting secrets to the local

community. Other regional economies across Europe were found to have flourishing specialized networks of production as well – e.g. automotive parts in Baden-Württemberg, Germany, silk in Lyon, France, cutlery in Sheffield, England.

Japanese *keiretsu*, or business groups, also became the subject of network analysis in the 1980s. With the visible success of the Japanese economy, particularly in automobile production at the time, American managers were keen to learn about the Japanese model. Japanese firm practices, translated as 'total quality management' and 'just in time' production in English-speaking nations, were linked to the close relationships between employers and employees and between large companies and subcontractors. *Keiretsu* were another example of production networks, but more vertically arranged than the Italian regional networks. In Japanese business groups, one large corporation coordinates production with the input of many satellite subcontracting firms. Unlike subcontracts that go to the lowest bidder, these relationships in a business group are long-term ties characterized by shared information and mutual investment. Other Asian nations, also the subject of network analysis, displayed their own variety of business groups – e.g. *chaebol* in Korea.

Organizations exemplifying collaborative production provided the empirical ground for Walter Powell's influential essays, the first published in 1987, in which he built the theoretical argument for the network form as type of economic organization distinct from both market and hierarchy. In the network form, **trust** is a key concept. Harking back to classic concepts in sociology of ingroup and outgroup membership, trust in networks is often founded on homophily – i.e. birds of a feather flock together. The basis of trust may vary in different kinds of network organizations. *Keiretsu* firms may trust each other because of the common business group identity

(‘we’re part of the Toyota team’), while Italian firms in a regional network trust each other because of long-estate kinship and neighbourhood ties (‘I know your mother’). Nevertheless, trust sustains the durability of the collaboration.

Network analysis was never just about happy outcomes, however. The literature on interlocking directorates in the 1980s continued to investigate cronyism among the power elite, examining links between corporate boards to gauge how the inner circle coordinated the US economy. New York banks often showed up as central links to a variety of industries in this period, and appeared to affect corporate political contribution patterns.

Research on networks flourished during the 1990s. Many scholars contributed theoretical and empirical refinements to the analysis of networks in the economy. Ron Burt championed the concept of structural holes in networks. When two clusters in a network are unconnected, the gap between them is a structural hole. An entrepreneurial network actor who bridges that hole garners more social capital than a member of a cohesive, dense network. Managers whose networks span greater social distances receive faster promotions and higher compensation. Bourdieu’s theory of **social capital** thus made its way into network analysis, defined as the benefits that accrue to network inhabitants through their social ties. Other economic sociologists, like Alejandro Portes, studied the social capital that flows through ties in ethnic enclaves and leads to **entrepreneurship** among new immigrants in both the formal and **informal economy**. Portes also described some of the downsides to networks in ethnic entrepreneurship including status levelling and obligations to make a place for sometimes lazy relatives. A darker side to networks is cast by the homophily principle. If network ties are forged on the basis of similar social backgrounds, then men who have traditionally occupied elite economic

circles will exclude others, i.e. women and minorities. Herminia Ibarra and others who have studied the effects of race and gender on career networks have found that women and minorities often do better to pursue different strategies in building networks, such as finding a strong, well-connected sponsor.

At the inter-organizational level, network analysis charted the effects of networks on firms, industries, and society. Annalee Saxenian investigated how the network form used by computer firms in Silicon Valley allowed the free exchange of ideas and learning across organizational boundaries within the region. Greater innovation and economic development occurred in Silicon Valley than in Boston’s Route 128 high-tech hub, where computer companies worked to buffer their secrets within vertically integrated hierarchies. European, particularly Scandinavian, studies of networks by scholars like Hakan Hakansson also demonstrated the link between networks and innovation in high-tech regional economies in Europe. Brian Uzzi found innovation and learning arising from network ties in the New York garment industry as well. The garment producers who were most successful, however, had a mix of strong, close ties and arm’s-length ties. This mix provided flexibility in pursuing some trusting relationships for investing in innovative techniques and equipment, and some shorter-term contracts with lower bidders.

Banks seemed to play a less central role in interlocking directorates as other forms of financing, including international investment, became more common in the 1990s. A puzzle was that the reconstitution of broken interlock ties occurred less frequently than might be expected for ties supposedly used to coordinate the economy. Although the boards of major corporations in industrialized nations were not densely connected through direct ties, the short network path between most corpora-

tions in a given country showed that the ownership of power remains a small world. Further, interlocking directorate ties were related to the diffusion of firm strategies, such as how corporations pursue or deal with acquisitions.

The visibility of network analysis in popular culture grew during the 1990s with the *Six Degrees of Separation* play, movie and online game. In economic life, the connection between flatter, more lateral forms of network organization and successful technological innovation not only became popularized, but also may have accounted for some of the hype that peaked with the dotcom craze of 1999–2000. Meanwhile, in academic circles, network analysis played a central role in the institutionalization of economic sociology.

The early 2000s are still an exciting time in network analysis with innovation in methods and software, and with new substantive frontiers being brought together with the core focus on structural analysis in economic life. Duncan Watts and other sociologists affiliated with the Santa Fe Institute have worked to develop mathematical measures of connectivity, importing some ideas from the physical sciences and combining them with sociological insights. Growth in sophisticated software and computing capacity has greatly aided this effort. As a result, network analysis has developed the means to better understand the dynamic nature of ties over time, such as the decreasing returns to connectivity. Substantively, economic sociologists have begun to work on integrating network analysis of economic structures with other connections that are vital but have been largely missing in the literature – such as looking more closely at the family, consumerism and technology. The connection between network analysis and technology, for example, has benefited from the infusion of ideas from science and technology studies (STS). STS scholars Karin Knorr Cetina and Urs Bruegger argue that inter-

national banking is a new organizational form that takes connectivity beyond the network form with information technology. ‘Platform’ organizations, as they call them, provide more transparency between economic partners, as all parties have pertinent information available onscreen. International investment banks and high-energy physics collaborations provide examples where knowledge has no geographic location, but rather ‘exteriority’.

Research in the 2000s also moved further toward predicting when ties and the network form of organization help or hinder outcomes of profit, innovation and equality. Mizuchi and Stearns, for example, discovered how strong ties proved detrimental to bank officers trying to make deals with corporate customers. Reliance on their strong ties to other bankers precluded more extensive search behaviour, resulting in a greater sense of security but poorer financial outcomes.

Debates and questions

A strong criticism levelled against network analysis in the late 1990s was that this stream of economic sociology assumes a politically conservative tone. This criticism that network analysis is an implicitly neo-liberalist, pro-capitalist ideology may gain strength from the fact that many of the analysts of social networks in the economy are employed in business schools, programmes out of which scholarship correspondingly has a pro-business slant. If, however, neo-liberal organizations like the IMF set out to ‘destroy collective structures’ (Bourdieu 1998) in order to support a pure market logic, then the study of collaborative, interconnected network forms of organization in the economy would fail to support the neo-liberal camp. On the other hand, the point that network analysis needs to spend less time ‘studying up’ to the elite and highly educated members of society and their successful firms is well

taken. Further analysis of poverty, downward mobility and failed organizations through the study of networks at various levels is needed in economic sociology.

While the broad applicability of network analysis to both old and new questions in economic life is surely a draw, a caution for network analysis is to avoid the pitfalls of popularity. Some sociologists have contended that 'social capital' has become so overused as to almost lose meaning as a concept. Does 'network' similarly run the risk of becoming the metaphor that ate New York, so to speak, and thereby losing potency as the key tool of economic sociology?

See also: corporate governance; inter-firm relations; interlocking directorates.

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NICHES

Developed within a scholarly tradition that lies at the intersection of human ecology (Hawley 1950) and classic structural macrosociology (Blau 1977), the niche concept features prominently in contemporary organizational sociology. The concept originated in bioecology with the work of Elton (1927) and later Hutchinson (1957) and was used to describe the environmental space (confined by parameters on multiple dimensions) in which a population of species can sustain itself. In the early 1980s, three theories of organizations adapted the concept to organizational sociology and spurred a research tradition that has greatly illuminated our understanding of the relationship between organizations and their environments. Freeman and Hannan (1983) relied on the niche concept to define organizational populations – a set of collective social actors that rely on similar resources and share the same organizational form. Broadly, the central predictions of the theory relate the adaptability and viability of a population to the distribution of resources within its *fundamental niche*. A fundamental niche is a multidimensional constrained resource space including all relevant social, economic and political dimensions in which organizations of a certain form can maintain non-negative growth in the absence of competitors (i.e. other populations with similar or overlapping resource requirements). By contrast, the term '*realized niche*' is used to describe the subset of the fundamental niche in which an organizational population operates in the presence of competitors. The distinction between a fundamental and a realized niche is important as it highlights the utility of the two concepts – the former is appropriate for analysing the population–environment relation as well as intra-population dynamics of institutionalization and competition, while the latter brings attention to the