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Note from the editor

Networks for economic sociology (and not the other way around)

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Content

More than thirty years ago, Granovetter (1985) launched a research program for economic sociology which rested to a large extent on networks as both conceptual and methodological tools. In order to understand concrete economic exchange, he not only argued in favor of a third way between under- and over-socialized views of the economy; he also proposed a path that differed from Williamson's (1985) articulation of market arm's length ties and hierarchical subordination. Network embeddedness was thus the solution for understanding concrete patterns of both market and organizational life.

Early work in economic sociology insisted first on the informational dimension of networks (Granovetter, 1973). Social networks are not only the warm social glue of kinship and friendship ties underlying social cohesion. They also act as information processors, and they enable not only the success of some individuals in specific network positions, but they also improve global welfare beyond them. However, social networks' contribution to the economy is not only positive. They also produce or fuel many inequality-generating mechanisms. Laboratory experiments have thus shown that actors dependent on a limited set of contacts to access key resources tend to accept unfavorable terms of exchange (Cook and Emerson, 1978), thereby contributing to the power of structural holes (Burt, 1992). Opportunity hoarding (Tilly, 1998) is based not only on categorical assignation and identification, but

also owes much to homophilic relations, contributing to discrimination and inner circles phenomena. Mechanisms of asymmetric social comparisons following the pattern of concrete social networks fuel relative frustration (Fligstein et al., 2017) and contribute in return to hierarchization (De Vaan et al., 2018).

Networks therefore appear as a promise for a deep and sound understanding of economic life, ranging from micro-interactions of actors in markets (Baker, 1984) or organizations (Burt, 2004) to solidified chains of suppliers (Gereffi et al., 2005). As such, they became an important branch of economic sociology for the last forty years. However, for a long time, scientific results did not always meet the expectations. Informal networks underlying economic activity leave few traces, and social scientists lacked sufficient data to make breakthrough contributions. Moreover, in areas where social networks were easier to collect, such as US board interlocks, results have long been quite disappointing (Mizruchi, 1996). Economic sociologists might also have been discouraged by the high level of technicality in this subfield, with its large number of metrics (Wasserman and Faust, 1994) – be they measures of centrality or techniques of clustering – or by the inherent complexity of its econometric models (Cranmer and Desmarais, 2011), including QAP regressions, ERGM, TERGM, or SAOM models.

Indeed, the incursion of economic sociology into the study of networks led this branch to integrate the concepts, tools, and methods of network science – an interdisciplinary scientific field at the frontier of mathematics, physics, computer science, and social sciences. While this encounter is very welcome, enabling economic sociology to use more reliable and robust tools and to avoid networks' tricky artifacts, it also comes with some risks. Rather than using the network techniques as a tool for proxying thoughtfully coined economic relations, economic sociology could instead only provide empirical data for testing concepts coming from network science. This last objective is of course perfectly legitimate, but it does more to help network scientists understand networks than it does to help economic sociologists understand economic activities.

Hence, those of us who sometimes venture into network workshops – for instance, the excellent INSNA Sunbelt annual conference – might have been struck by a sense of "déjà-vu" in many presentations. These often include the display of a spaghetti bowl graph; a listing of the most central actors; the delimitation of network clusters thanks to a given block-modeling technique; and the use of an ERGM type of regression for estimating many network effects parameters, including transitivity, k-stars, popularity, assortativity effects, etc. This is fun and fine. But sometimes, comparatively little energy has been devoted to analyzing the underlying social mechanisms that are to be modeled. Some authors tend to apply the standards of the network science field and forget that the meaning of a given measure (centrality, transitivity, etc.) in one social setting might have little to do with its meaning in another social setting. The network is reified, and we tend to forget that the coded network is at best a very crude proxy of the underlying social relations.

Conversely, many inspiring contributions in economic sociology only use rough and simple network measures. However, they innovate in forging relational mechanisms and finding simple network proxies for testing them. Hence, Granovetter's approximation and test of weak ties (1973) was very rudimentary: "Of those finding a job through contacts, 16.7% reported that they saw their contact often at the time, 55.6% said occasionally, and 27.8% rarely (N=54)." Padgett and Ansell (1992) proved that the Oligarch-Medici divide was network-based rather than status-based using four pivot tables and one graph. The more complex block-modeling played little role in the paper. Uzzi (1996) implemented the concept of embeddedness with a simple "first order network coupling" index that captures the concentration of trade among business partners. More recently, Wilmers (2018) gave empirical content to the notion of captive value chains (Gereffi et al., 2005) and showed how they decreased workers' power. To achieve this aim, he looked at how workers' pay in supplier firms declined with the existence of dominant corporate buyers.

This reminder is not a rejection of sophisticated network measures and models. Moreover, simple crude measures are often quite complex to implement, simply because they are not provided in standard network software packages. This editorial tries to remind the reader that concepts of economic activity should determine the choice of the network measure rather than the reverse.

Following this line of thinking, the current issue of *economic sociology_the european electronic newsletter* shows that networks are still a major tool for the understanding of economic activity, provided that they are subordinated to economic sociology's theoretical agenda.

Céline Bessière and Sibylle Gollac open this issue with a very inspiring reminder. Families are a) economic units and b) a complex bundle of differentiated relations. The ethnographic analysis of family exchange networks therefore uncovers a householding phenomenon which goes beyond the taken-for-granted frontier of "households."

Also inspired by the mechanisms of family relations, Lasse Folke Henriksen, Anton Grau Larsen,

Christoph Houman Ellersgaard, and Jacob Lunding propose a very intriguing innovation for the study of corporate networks. They analyze the appointment of executives by chairmen as a form of genealogical succession. This enables them to establish a typology of "patrilineage" structures at the head of Danish firms.

Michel Grossetti presents the notion of "decoupling," when a given network tie between actors acquires an existence beyond the two actors that initiated it, thereby becoming a frame of reference for all actors. A common form of this phenomenon can be found when an initial tie between two individuals turns into an institutionalized relationship between two firms. Decoupling can be viewed as the opposite of embeddedness and can take several forms, including collectivization, formalization, and materialization.

Andrés Chiriboga studies the structure of the exchange between brokers in the Ecuadorian stock exchange and suggests that the geographical split of the country around two centers, Quito and Guayaquil, is a major factor in the clustering of economic transactions and could hamper the development of an integrated modern financial market.

Finally, Emmanuel Lazega's contribution with Julien Brailly, Catherine Comet, Sébastien Delarre, Fabien Eloire, Guillaume Favre, Lise Mounier, Jaime Montes-Lihn, Mohamed Oubenal, Elise Penalva-Icher, Alvaro Pina-Stranger, and Marta Varanda demonstrates the liveliness of network sociology in France. This group of researchers shows how a niche of dense social exchange in a diversity of social settings serves as a way of mitigating market competition and as a base for defining norms.

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Is social network analysis useful for studying the family economy?

Céline Bessière and Sibylle Gollac

Historically, the family was one of the first objects of study for network analysis. In the 1950s, Bott's research on working-class London families showed that the connectedness and density of a husband's and a wife's respective networks of kin, friends, and neighbors are positively correlated with sex role segregation in the marital relationship concerning the performance of domestic tasks, leisure activities, and interests (Bott, 1971 [1957]: 60). Following this pioneering research, studies based on networks revealed that a sense of family belonging may be built outside the nuclear family through visits, communication technologies, emotional and material expressions of care (for example money transfers and presents) (Milardo, 1988; Horst & Miller, 2005; Widmer 2010; Herz, 2015 among many others). More generally, kin relationships are a major part of social capital as they involve connections between individuals who provide material, informational, or emotional support to each other (Furstenberg, 2005; Coleman, 1988).

In this paper, we focus on the *family economy* defined as the production, consumption, and distribution of goods, assets, and services among kin (either inside or outside the household). This concept is not new. Studying the effects of industrialization in Europe, Tilly and Scott describe the transition from a household economy based on production to a family consumer economy based on wage-earning. They demonstrate that the family is still a relevant unit of analysis (Tilly & Scott, 1989 [1978]). In the 1990s, some scholars focused on mutual economic aid in kinship networks, considering them potential compensation for the weakening of the welfare state in Europe (Debordeaux & Strobel, 2002). At the turn of the twenty-first century, in the context of the decline of wage-earning society (Castel, 2003 [1995]) and the implementation of neoliberal policies, family wealth also appears as a major resource with regard to education (Khan, 2011), housing (Bugeja-Bloch, 2013), or being self-employed (Arum & Muller, 2004). Recently, macroeconomic studies have stressed the return of inheritance and gifts from previous generations in capital accumulation (Piketty, 2014).

Can social network analysis help us to understand the family economy in contemporary France? This question has been in the background of our own studies, which address the following issues. How is professional and family care organized for a dependent elderly or sick person (Weber, Gojard &Gramain, 2004)? How do families deal with real estate ownership (Gollac, 2011)? How is a family business handed over to one single heir and how do siblings accept unequal inheritances (Bessière, 2010; Gollac, 2013)? More broadly, how are family assets transferred from one generation to another? How do couples share their wealth when they break up (Collectif Onze, 2013; Bessière 2017)?

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Sibylle Gollac is a research fellow in sociology at the French National Center for Scientific Research, CRESPPA-CSU. She co-authored a book with S. Billaud, A. Oeser and J. Pagis on family memory (*Histoires de familles: Les récits du passé dans la parenté contemporaine,* Paris: Editions de la rue d'Ulm 2015). *sibylle.gollac@ens.fr*

Both of them co-authored a book drawing on a vast research on family courts in France (Collectif Onze, *Au tribunal des couples,* Paris: Odile Jacob, 2013). They currently study the material, economic and legal dimensions of family, in particular through the analysis of inheritance and marital breakdown. Their researches are at the crossroads of several fields: sociology of law and justice, sociology of gender and family, and economic sociology.

First, we show how network analysis inspires national surveys (based on individuals) in a way that allows the statistical study of the family economy beyond the predefined boundaries of households. These surveys are crucial for measuring socio-economic inequalities based on class and gender in France. Second, we discuss network analysis's conception of kin as a web of dyadic relationships. This conceptualization of the family economy emphasizes inter-individual exchanges of assets, goods, and services and tends to ignore groups. Our ethnographic studies show, to

the contrary, that the family economy implies practical kin groups that can be both a resource and a burden for individuals. Third, we stress the feature of kin that is the major obstacle to network analysis: Family is not only a nexus of interpersonal relationships, but is also an institution, defined and framed by law.

Studying the family economy beyond the predefined boundaries of the household

The main contribution of social network analysis to research on the family economy is to broaden the definition of family beyond predefined boundaries. As Widmer puts it, relatives that matter cannot be defined *a priori*, using the household as a natural limit to the family (Widmer, 2010). In France, as of the 1980s, sociologists stressed the importance of the circulation of assets, goods, and services among kin, beyond the boundaries of the household (Pitrou, 1992 [1978]). Network analyses provide an interesting critique of standardized representative national surveys conducted at household level (Widmer, Aeby & Sapin, 2013).

In France, according to the French National Statistical Institute, a household designates all the occupants of the same dwelling (although they do not have to be blood-related). A first way of studying family economy beyond the household unit consists of identifying economic relationships between different households (Déchaux, 1990; Marpsat, 1991). These studies reveal a "hidden economy of kinship" (Dechaux, 1994) composed of emotional support, mutual help (housework, home improvement, childcare, eldercare, administrative assistance), and financial support. According to the French Household Wealth Survey, two-thirds of households receive a financial gift or an inheritance from another household. This applies to 95 percent of households whose reference person (most likely a man) is a self-employed professional and to only 40 percent of households whose reference person is a blue-collar worker. Amounts of gifts and inheritances also vary significantly: self-employed households whose reference person is the son of a self-employed professional receive twelve times more on average than blue-collar worker households whose reference person is the son of a blue-collar worker (Masson, 2006: 90). Informal financial support between households (such as direct loans, providing a guarantee, money transfers) mostly descends from parents to children. This informal financial support is usually followed by formal gifts and inheritance (Masson, 2006: 91). Even though elder care is an increasing concern, entry into adulthood is still the period that concentrates most family transfers (Le Goff, Navaux & Ragot, 2016). Thus, economic transfers between households tend to equalize the standard of living between old givers and young recipients (Déchaux & Herpin, 2004). The same authors show that the "hidden economy of kinship" does not reduce socio-economic inequality between classes. On the contrary, rich households are more likely to help rich households (and poor households more likely to help poor households). Compared with lower class households, upper class households receive financial help more often and in larger amounts.

In the 1990s, statisticians, demographers, and sociologists inspired by social network analysis designed new surveys centered on individuals rather than the household. In 1990, the French survey "Close friends and relatives" (*Proches et Parents*) was the first to focus on personal relationships (Bonvalet & Ortalda 2007). The interviewee (ego) is asked about the role of friends and relatives in relation to his or her academic and professional career, housing and support received in difficult moments. Three types of personal networks are distinguished: The potential family network represented by a family tree, the active network of close friends and relatives, and the support network of mutual help providers. All these lists are made by the interviewee. This new type of survey offers many advantages. First, it describes the circulation of goods and services among kin inside as well as outside households. Second, the interviewee him- or herself defines his or her network of friends and relatives without an *a priori* institutional definition of kinship. Bonvalet and Lelièvre call this the "contact circle" of an individual, which includes relatives and non-relatives and is defined through a combination of kinship ties, shared residence, and key influence during the life course (Bonvalet & Lelièvre 2016).

Another pioneering survey "Three generations" was designed in 1992 by the French Old-Age Insurance Fund (*Caisse nationale d'assurance vieillesse*) (Attias-Donfut, 1995). The survey is centered on a specific sample of baby-boomers (aged between 40 and 53 at the time of the survey) who have children and whose parents are still alive. One representative of each generation is interviewed, which is a big advantage compared with the "Close friends and relatives" survey, in which there is only one respondent. However, the list of significant relatives who potentially help is limited to direct filiation, excluding in-laws and siblings. This is a problem, given that this survey was designed to compare family solidarities with inter-generational transfers organized by the state. Thus, it presumes that all family transfers are direct filiation transfers (Masson, 2009: 21–23).

Many other recent surveys from the French National Statistical Institute collect data on personal networks at an individual level: "Kin and mutual aid networks" in 1997, "Biographies and family circles" in 2000, "Life history" in 2003, "Locations and links" in 2011, and the "Study of family and intergenerational relationships" which is the French component of the international panel "Generations and gender survey," conducted in twenty countries between 2005 and 2011. Using this type of survey one can analyze the asymmetrical position of men and women in mutual aid configurations. Jonas and Le Pape show that women are more likely to help their parents than men, even when they live far away from them. Thus, households favor exchanges with the female partner's relatives rather than the male partner's relatives (Jonas & Le Pape, 2008).

By examining differences between these surveys, one can also discern their shortcomings. First, some of them draw up a restricted list of relatives involved in the family economy, whereas others open up the definition of significant help providers to relatives and non-relatives designated by the interviewee. Second, concerning the types of goods, services, and assets exchanged, all these studies are limitative: They better describe services and informal financial help than actual wealth transfers (inter-vivo gifts, inheritance, liquidation of a property). Third, most of them explore family networks only from a single point of view, that of the respondent, asking him or her many questions about parents, partners, siblings, as well as children and grandchildren.

On this respect, the "Three generations" survey is an exception because it is based on three points of view for each family. Attias-Donfut points out: "The results are disquieting. By confronting the answers of the one who gives and the one who receives, one realizes that some things seem to be given without ever being received, and received without ever being given. This entails that facts and perceptions, perceived and actual exchanges, must be distinguished" (Attias-Donfut, 1995: 70). The meaning and perceived direction of financial transfers, material support, and mutual aid among kin depend on the point of view. This is better shown by ethnography.

From dyadic relationships to practical kin groups

Network analysis considers kin to be a sum of dyadic relationships and tends to ignore groups. However, our research shows that the family economy is not organized like a sum of inter-individual exchanges of assets, goods, and services. We prepared family monographs based on multiple semi-structured long interviews with different relatives, at intervals of several months or years. A given family situation is described from multiple points of view (Weber, Gojard & Gramain, 2003). Our interviewees authorized us to participate to ordinary and exceptional moments of their family life: Drinks and meals with friends, neighbors or relatives, private parties, wedding ceremonies, funerals. They gave us access to some of their private archives (family trees, letters, notary legal acts, inheritance files, divorce files, family pictures).

The Le Vennec are a working-class family in Brittany. In the monograph, we observe a complex circulation of goods and services between family members (Gollac, 2003). Born in 1931, Jeanne Le Vennec is the wife of a manual worker in the construction sector, and the mother of seven children. She provides housing to several of her adult children and their partners. Being a home-based child care provider, she takes care of her grand-children for free, at the same time as other children of the neighborhood. Her husband was treated at home for cancer for several years, before dying. From the beginning of his illness, two of Jeanne's children helped her on a daily basis: Her son Eric with gardening and home improvement and her daughter Dominique with housework and cooking. Other children give a hand from time to time. When her daughter Anne-Marie was treated for cancer, she moved into the family house for a couple of years. Her son Marc, who was diagnosed with schizophrenia, now lives in the family house. In this family, helping each other is not regulated by a logic of personal gift and countergift between individuals. To the contrary, we observe a practical kin group that joins individuals together by pooling resources.

Following Folbre (1986), Douglass (2006), and Weber (2003) we call this "*householding*" to convey the understanding that creating and sustaining a household is an ongoing, dynamic social process. It may involve fictive as well as actual kin, distant as well as under-the-roof members, and hired domestic helpers and nannies who become household members. In most cases, *householding* implies cohabitation or short-distance residence, but the Le Vennec case shows that cohabitation can also be sporadic. Another criterion is the fact that one or several "common causes" rally the members of these practical kin groups. These "common causes" are more or less demanding and more or less circumscribed in time (from a daily routine to an exceptional event). They include: Raising and educating children; maintaining a house on a daily basis; dividing labor and pooling income from livelihood activities; caring for elderly and other non-working household members; caring

for sick or disabled people; and running a family business. The exchange relationship is not established between two individuals, but between an individual and a group. When an individual gives a hand to the group then he or she can expect that the group will take care of him or her in case of need.

Practical kin groups are concerned with economic production and social reproduction. Some groups rally relatives on the issue of wealth transfers from one generation to another, and more broadly the handing over of a social position in a lineage. The following case comes from an ethnographic study of the taking over of family businesses by young wine-growers in the Cognac region (Bessière, 2010: 189 and following). The de Roumarie family belongs to the local gentry. The parents own a large wine-growing farm, several houses that they rent out, and a seventeenth-century castle. They live there with one of their sons, Alain, his wife, and his two children. Alain is the only child who works on the family farm. In 2000, Alain asked his parents to start planning their inheritance through an inter-vivos gift. He wanted the castle to be his in order to do construction work inside. However, the value of the castle was too sizeable to be completely compensated by the other assets. Thus, compared with his siblings, Alain was legally advantaged in the sharing. His siblings found it unfair. Alain defended himself by saying he was the only one who had agreed to live in the castle all year round and take care of the family business. His brother suggested that Alain took over the farm only because of his poor results at school, whereas his other siblings worked hard at university and are now all senior executives or wives of senior executives in the Paris area.

In this case, the parents could have chosen to favor equity and reciprocity between the siblings. They preferred to guarantee the preservation of important assets such as the castle and the wine-growing family business in the lineage. These assets are the embodiment of the social status of the practical kin group. These unequal family wealth arrangements are common in the Cognac area and favor male heirs who take over the family business. The family economy cannot be reduced to inter-individual relationships. To understand the circulation of wealth among kin, one has to study the relationships of individuals to family groups, especially if they share or do not share the logic of reproduction of a social status.

It is worth noticing at this point that being part of these practical kin groups is both a resource and a burden for individuals. In the de Roumarie family, Alain benefits from a job opportunity and a social status he would not have had without the handing over of the family business, but at the same time is morally and materially trapped in the family castle.

Are kin relationships like other relationships? From networks to institutions

The conceptualization of family as a social network presumes strong hypotheses on kin relationships. Network structures are characterized by *nodes* (individuals) and *ties* that connect them. Social network analysis does not presume that these ties are all the same. However, it does suggest that a comparison is possible between them, as shown by the classical opposition between limited strong tie networks and extended weak tie networks (Granovetter, 1973).

On the contrary, the anthropology of kinship differentiates ties and individuals. Kinship diagrams, introduced in the nineteenth century (Morgan, 1871), represent individuals and links between them according to kin relationships. They look like social network diagrams. However, kinship diagrams are based on radically different premises. First, lines connecting individuals are either horizontal (when they represent affine bonds between conjugal partners or sibling bonds) or vertical (connecting parents to children). Thus, kinship diagrams assume that the distinction between the different generations is crucial. Second, affine bonds (between conjugal partners, either married or not) are represented by a double line, thus distinguished from descent bonds and sibling bonds. For Lévi-Strauss, a system of kinship is characterized both by filiation rules that associate individuals to a group, and by alliance rules that organize the exchanges – in particular, of women – between these groups (Lévi-Strauss, 1969 [1949]). Third, kinship diagrams make systematic distinctions between individuals. One distinction is between males represented by triangles and females represented by circles, but other differences are drawn, such as the one between elder and younger siblings.

Compared with social network analysis, kinship diagrams stress the nature of relationships between individuals (alliance, filiation, sibling bonds, direction of the domination) rather than their mere existence or density. Social network analysis presumes that the denser or more extended an individual's network, the more dominant he or she is. However, the size of one's kin network is not always a resource. Studies show that being a single (male) child is an advantage for academic success but also for receiving an inheritance, and especially taking over a family business (Gollac, 2013). Distinguishing between generations and sex is crucial to apprehend the relations of domination among kin.

This comparison sheds light on the other major obstacle faced by network analysis in studying the

family economy, which is that it ignores the fact that family is an *institution* (Bourdieu, 1996 [1993]; Lenoir 2008). In other words, family is not only a nexus of interpersonal relationships, but is also defined by law. Kinship bonds are not always elective ones, some cannot be severed. In Western societies, for instance, marital breakdowns are frequent (and more or less facilitated depending on marital status and the national state of law), but loss of parental authority is extremely rare. Kinship bonds are also associated with rights and obligations.

In France, according to the Civil Code "children owe maintenance to their father and mother or other ascendants who are in need" (Art. 205), and "sons- and daughters-in-law owe likewise and under the same circumstances, maintenance to their father- and mother-in-law" (Art. 206), "in proportion to the needs of the one who claims it, and to the wealth of the one who owes it" (Art. 208). How does this legal frame shape practical kin groups of care providers for elderly people? A research team took up the challenge of exploring systematically different points of view in the network of elderly dependent people with memory and behavioral disorders: The main care provider, the other professional and family care providers (practical kin group), as well as all the relatives under the legal obligation of maintenance (legal kin group) (Gramain, Soutrenon, & Weber, 2006).

In matters of wealth, family is framed by matrimonial property regimes and inheritance law, which varies from one country to another (Beckert, 2008 [2004]). Under French law, descendants of the deceased (children, grandchildren, and so on, in order of priority), and the spouse of the deceased when there are no descendants, are entitled to a reserved portion. When there is no will, the Civil Code imposes an order of succession.[1] In practice, fiscal law is also a major constraint: Depending on who is the recipient of the assets, the percentage of estate tax will vary a lot. If – in theory – a single person with no children can bequeath all his or her estate through a will to his or her unmarried partner, in practice the estate will be taxed at a level of 60 percent, whereas this level would be null if they were married. This was one of the issues at stake when France legalized same-sex partners' right to marry in 2013.

Law is a major constraint on the circulation of wealth among kin. This legal frame of the family economy imposes itself at specific moments, limited in time: When one parent moves into a retirement home, when one organizes estate planning, or when a couple splits up. However, during long periods of family life, practical relationships among kin can ignore the legal rules (Weber, 2013). When practical kinship confronts legal kinship, things can become ugly. Drawing on legal files from US courts, Zelizer discusses cases in which, for example, children of a wealthy businessman sue their father's third wife who was the principal beneficiary of his $400 million fortune in 2000 (p.158), or a father refuses to pay for the college education of his son because they lost touch after his divorce (p. 209) (Zelizer, 2005).

Like Zelizer, we study moments in which kin describe the intimate transactions involved in their relationships, and try to have these descriptions endorsed by the law. Thus, we focus on law in action. We study estate planning and marital breakdowns because these are two moments at which wealth is distributed among kin. We call these moments *family wealth arrangements*. We show how notaries and lawyers can play with family and tax law behind closed doors. Wealthy families and their counselors have the power to blur the distinction between what is legal and what is not, in order to undervalue wealth for tax purposes, while protecting assets. Legal professionals are important actors in the family economy. For example, they advantage the wealthier spouse or heirs in the family: Most of the time, men over women (Bessière & Gollac 2017; Bessière 2017).

To conclude, Bott's pioneering book *Family and social networks* showed in 1957 how spouses' personal networks affect marital relationships. Many decades later, social network analysis challenged the way surveys collect statistical data on the family, deconstructing the predefined household boundaries. However, in this paper, we also pointed out the shortcomings of this approach, mainly the difficulty of taking into account institutional dimensions and power in kin relationships, as well as collective logics of practice crucial to the family economy.

Endnote

1 As follows: if the deceased had no spouse and left children, the estate passes to the descendants in equal shares (Art. 734 and 735 of the Civil Code). If the deceased was single and had no children, the estate passes to the parents of the deceased, his brothers and sisters and their descendants (Art. 738).

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Networks of Corporate Ancestry: Dynasties of Patri-Lineages in Chairman–Executive Networks

Lasse Folke Henriksen, Anton Grau Larsen, Christoph Houman Ellersgaard, Jacob Lunding

Introduction

Sociologists and political scientists talk about patrimonialism, patrimonial states, or patrimonial capitalism in relation to a social system that is hierarchically ordered and in which power flows exclusively from a single node, or a few sets of nodes, namely the father(s) (Adams and Charrad 2011; Collins 1998; Piketty 2014; Weber 1978). In these systems, the family as an institution (biological or social) is the key means of securing political and economic stability across generations. For stability, an inheritance of wealth and power is passed on from father to son. Fathers must thus cultivate their offspring, so as to ensure the reproduction and further expansion of the family "estate." Often scholars extend the logic across several generations to talk about grandfather, great-grandfather, or multi-generational lineages (Padgett 2010).

In this paper, we extend patrimonial rule as a metaphor with which to study longitudinal corporate networks, suggesting a focus on parent–children links in executive appointments.[1] How are corporate alleles passed on? We follow Collins' (1998) focus on the tutor–student relationship to trace the inter-generational evolution of intellectual movements, and extend his thinking to an economic sociology context (see also Henriksen, Seabrooke and Young 2017; Godechot and Louvet 2008). By doing so we move beyond a narrow model of power and wealth inheritance via biological family ties to think about lineages of corporate families in terms of how corporate control is passed on inter-generationally. The focus of our corporate-genealogical approach is on a set of exclusive and highly significant ties that are notoriously understudied – the ties that emerge from executive appointments, and the enduring relations, between chairmen and chief executives. Building on 30 years of complete historical data on executive appointments, we trace what we term the patri-lineages of father–son relations over time. We argue that, in contrast to most corporate governance scholarship, which stresses the flow of authority and power from executives to chairmen, in a managerialist system in which ownership is decoupled from corporate governance it makes more sense to reverse the directionality of the chairman–executive networks. Studying these networks – their overall structure, the presence of particular forms of subgrouping, and key actor identification – prompts us to see how "families" (in the broadest sense of the word) emerge and evolve over time to exercise corporate control.

We argue that executive appointments leave significant "network imprints," and tracing these father–son family ties enables scholars of corporate networks to zero in on a novel set of network structures that affect individuals, firms, and corporate elites. We present a new terminology with which to characterize the family structures – or "patri-lineages" – of corporate life. We then present a description of this type of network in a Danish context, drawing on a fine-grained data set on all chairman–executive appointments from 1987 to 2016. We conclude by pointing to future research agendas to further our understanding of how networks of corporate ancestry work and evolve; how elite actors gain prominence in them; and how the networks affect the distribution of power and wealth in contemporary societies.

The chairman–executive tie in a network perspective

The literature on chief executive appointments has focused mainly on the effect of appointments on firms and their market value (Schmid and Dauth 2014; Greve, Biemann and Ruigrok 2015) and on executive pay (Berger, Koetter and Schaeck 2013). Also, the corporate governance research agenda is still spearheaded by research based on the United States, where the roles of chairman and executive are usually entrusted to the same person (Kakabadse, Kakabadse, and Barratt

2006), and as a result considerable attention has been on what is known as "CEO duality" (Allan and Widman 2000; Boyd 1995; Finkelstein and D'aveni 1994; Nahar 2004; Rechner and Dalton 1991). In most continental European countries, however, boards and board chairmen are much more independent from executive officers and play a significant role in appointing and governing the senior managers of a corporation (Mallin 2010). While the relative power of chairmen vis-à-vis executives in the appointment process varies across regions and countries (Aguilera, Goyer and Kabbach-Castro 2013), this should not prevent us from studying those appointments in their contextual settings.

A smaller literature emphasizes the role of social networks in CEO appointments. Focusing on CEO–director ties, Liu (2014) found that CEOs use the social ties they form on a board to assess outside employment options and that executive connectedness increases turnover. Hwang and Kim (2009) showed that executive compensation increases when the social networks of executives and board members overlap (see also Hallock 1997; Nguyen 2012; Kramarz and Thesmar 2013). Most of this literature focuses narrowly on the appointment event or the effect of the executive's network position on performance and/or pay dynamics. Also, the significance of the board chairman–executive tie is often overlooked, even in systems in which chairmen have a strong voice in identifying and appointing a firm's executives. The management and corporate governance literatures have instead focused mainly on the role of the CEO in influencing board-member selection (Shivdasani and Yermack 1999). Instead what we observe, at least in the continental context, are chairmen "heavyweights," highly experienced and well-esteemed corporate elites that are either in the late stage of a managerial career or have already retired from executive positions and have entered the labor market for professionalized directors (Brickley, Linck and Coles 1999). Certainly, an array of actors have a stake in informing executive appointment decisions, but at least in a continental context it is widely recognized that chairmen are absolutely central to the process. Therefore, we propose to take a step back to consider the chairman–executive network, its overall structure, and the importance of subunits in the network.

Patri-lineages and dynasties from chairman–executive networks

In this paper we are investigating a certain type of corporate elite network. We ask how corporate elites reproduce and evolve; who gets to recruit the next generation of elites; and how we can think about these dynamics in network terms? Our starting point is the direct relationship between chairman and executives. Our key claim is that this relationship bears resemblance with kinship relations, and that aggregating these kinship relations produces a network with a highly significant structure that must be studied in and of itself. This perspective on the chairman–executive tie stands in stark contrast with the purely contractual portrait that the management and corporate governance literatures give. For this reason, our focus is on the directed network of chairman–executive ties that emerge from appointments:

$$i_{\text{chairman}} \text{ -> } j_{\text{executive}}$$

While this tie emerges when an executive is appointed, we do not consider the tie to be merely an event. Instead, the tie is state-like, and has a duration that may help us in thinking about the strength of ties: Longer tie duration indicates strong ties of mutual trust and alignment between the chairman and the executive. The ties are therefore socially significant and carry a network imprint, also – we argue – after the formal contractual-governance bond dissolves. In interviews with an exclusive sample from the Danish corporate elite, we note that senior elite individuals narrate how the initial chairman who brought them "on board,"

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into the inner circles of the corporate elite, were instrumental in shaping their careers. They also narrate that these ties are lasting and that they have continuously mattered for their career.

The enduring character of the tie affects the structuring of corporate networks in a given socio-economic context (Larsen and Ellersgaard 2018). Note that in this paper we consider only ties in which an executive was appointed by a chairman. Conversely, we do not consider situations in which a chairman is appointed during an executive's reign; that is, when the chairman was already in place when the executive was appointed. The key idea is that chairmen exercise moral authority over an executive and that this authority imprints the identity of the executive not only during his tenure in a specific firm but throughout his career.

Also, beyond the mere dyadic level of these corporate kinship ties, we can start to consider entire graphs, aggregating these dyads into family trees. Like all family trees, we can identify the roots of ancestors and lineages of parent–children ties that connect generations in what we term "patri-lineages." A patri-lineage is the successive backward-looking path that can be drawn from a node through the tree's branches down to its deepest root. Steps along patri-lineages are walked downstream from son to father to grandfather, and so on. Where patri-lineages denote lines of descent among corporate ancestors, dynasties instead are communities made up of the set of patri-lineages that ascend from a common root, or ancestor. Dynasties are identified upstream by following the flow from a common root through its various branches to its finest, most peripheral buds. These basic definitions allow us to trace these subgroups in larger networks, make inquiries about their structure, and identify elite corporate ancestors and families.

Description of the research project

The corporate networks research team at the Department of Organization, Copenhagen Business School (CBS), investigates, among other things, lineages of corporate ancestry, corporate elite recruitment and reproduction dynamics, the political behavior of corporate elites, and the network origins of organizational inequalities, including pay and reward structures among directors and executives. Using fine-grained data from the Central Business Register in Denmark – coupled with micro-data on individuals and firms – the team applies a range of descriptive and inferential network analytic techniques to understand the historical evolution of board, job mobility, and ownership networks and their impact on socio-political behavior and the distribution of resources, broadly speaking (the research team is funded by the Danish Council for Independent Research, Grant No. 5052-00143B, Grant-holder, Lasse Folke Henriksen).

Corporate ancestry in a Danish context

Data

Our identification of corporate ancestry rests mainly on the Danish Central Business Register (CBR). Established in 1999, the CBR lists all officially registered firms in Denmark. The register, however, also contains data from earlier registers that are verified back in time, and therefore its coverage goes back to 1987. The register contains information on the name and address of the firm, corporate form, and number of employees, as well as the name, address, and title of founders, executive managers, and board directors (including the start and end dates of all positions). The entire register sample contains 156,401 firms, and almost 2,000,000 board positions, of which we identify around 330,000 executive positions and around 140,000 board chairmen positions. Our interest is in corporate elite networks, so to consider exclusively significant nodes and edges, we sample only the 3056 firms with 100 employees or more that were active in the period 1987–2016. In addition, we consider only enduring chairman–executive ties that have lasted four or more years. Four years roughly constitute the average of an elected board term, and we posit that if the dyad endures for a term or more this signifies a positive, strong tie.

Table 1. Initial and select sample overview

	Select sample	Initial sample
Executive positions	9,246	333,200
Chairman positions	5,724	141,349
Firms	3,056	156,401
Executives without chairs (orphans)	3,777	213,832
Number of individuals	6,666	226,114
Number of edges	5,157	119,368

This leaves us with 5724 chairmen positions and 9246 executive positions, distributed among 6666 unique individuals that are connected via 5157 directed edges. A total of 3777 executives in the select sample are what we term "orphans"; that is, they do not operate under a chairman. Given the novelty of the network type investigated here, the remainder of the article identifies basic structural properties of the network using conventional network analytic measures.

Components

The network is fragmented into 1607 components, with a mean size just above four (4.15). Most components are very small; more than 75 percent of them

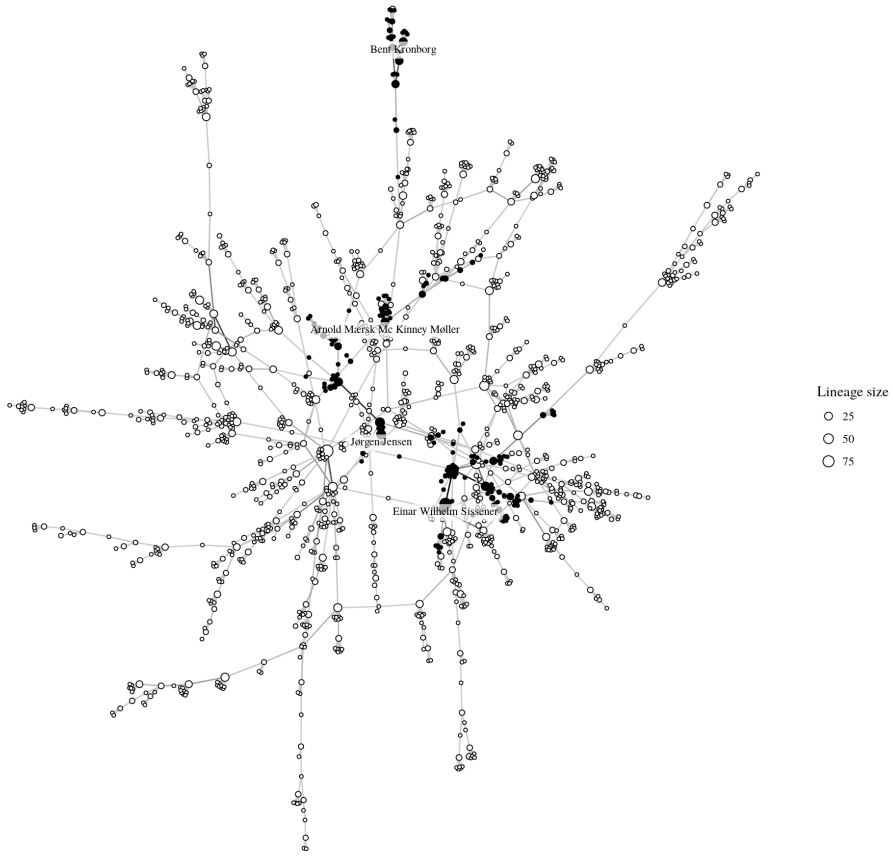

Figure 1. The largest component of the Danish chairman–executive network

contain only three or fewer nodes. Nevertheless a large proportion of the nodes in the network (around one-fifth) are connected via one large component characterized by a dense inner core of "corporate ancestors" – or roots – that branch out into a series of tree-like sub-structures (see Figure 1). This temporal center–periphery structure is common to most genealogical networks (Kornet, Metz and Schellinx 1995). In Figure 1, we depict the large component and emphasize the most prominent dynasties within it (more on dynasties below).

Degree distributions

The in-degree of a node expresses the number of "fathers" an executive has and is thus an indicator of a successful mobility strategy. Executives who have been able to move between firms and sectors in a non-erratic manner, where stable ties have been built with a series of chairmen, are at the high end of the in-degree distribution. Out-degree expresses how prolific a chairman is by counting the number of "children" he has begotten. A high out-degree can signify the "staying power" of a chairman in one or a few corporations that has experienced a number of successive transitions between different executives, or it can express a highly prolific chairman who is highly central in the overall board network and therefore has a high degree of appointment influence. These are the two major strategies for building out-degree centrality.

We plot the distribution of in-degree and out-degree centrality in the patri-lineage network. The in-degree distribution shows that, following our definition of a positive father–son tie (four or more years with the same chairman), a few executives perform several successful transitions. The large proportion of nodes with zero in-degree are simply all those chairmen who either started their careers as executives prior to 1987 or who moved directly to a position as chairman. While the in-degree distribution is rather narrow the range of out-degrees is considerably higher. It is, in other words, much more common to appoint than to be appointed. Moreover, appointing power is distributed in terms of a power law. This means that a few chairmen have a major influence over executive appointments, with a disproportionate say in recruiting newcomers to the corporate elite (Davis, Yoo and Baker 2003) and the control that comes with having many "children," increasing the likelihood of spreading one's own vision and of having strong ties in strategic firms and sectors that may sup-

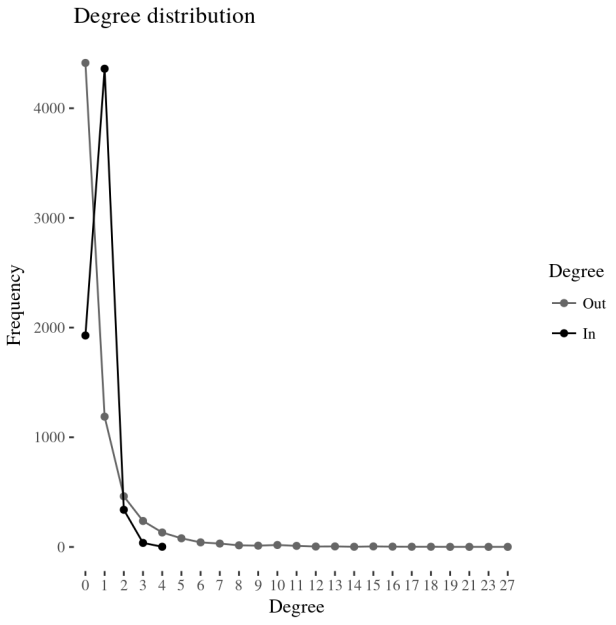

Figure 2. In- and out-degree distribution in the corporate ancestry network

port the governance functions one is exercising, as well as increasing one's elite status in the wider corporate ecology (Westphal and Khanna 2003).

Triad census

Taking a closer look at the prevalence of different triad types can tell us not only about the building blocks of the larger network itself – for example, pointing to dynamics such as clustering – but it can also tell us about local sequences of genealogical reproduction. To what extent does inbreeding occur? Is the family tree of corporate patri-lineages perfectly hierarchical or can siblings become parents to each other? In effect, are patri-lineage networks transitive or intransitive?

Triads are among the basic building blocks of corporate networks, and studying triads can tells us about the processes generating the network we observe. In undirected networks, the exercise is basic – and a simple comparison between open (A is connected to B is connected to C) and closed (A is connected to B is connected to C is connected to A) triads can give us an indication of how clustered a network is as opposed to how many brokerage opportunities a network presents actors with. For directed networks, such as the network of interest in this article, the exercise is slightly more complex given that this involves a census of all 16 possible triad types (for an overview, see Davis and Leinhardt (1972)). In Figure 3 we present the triad census of the corporate ancestry network. The census tells us that mainly four triads are structurally prevalent. First, type four, which is known as the "out star," appears more than 9000 times, and thus represents more than 80 percent of the triad types appearing in the network. This intra-generational motif represents a chairman who has appointed two or more executives. Second, the directed line occurs 1120 times. This motif represents the smallest possible inter-generational lineage, in which a son is appointed by a father who had been appointed by his own father (therefore the son's grandfather). Here, someone who started out as a director, the father, turn into a chairman and hence starts appointing children. The in-star – that is, a node that has been appointed by two different chairmen at different firms – occurs 417 times. Last, the 030T non-cyclical closed triad, occurs 45 times. This awkward triad represents a child with a direct father and a brother that took the role of father subsequently.

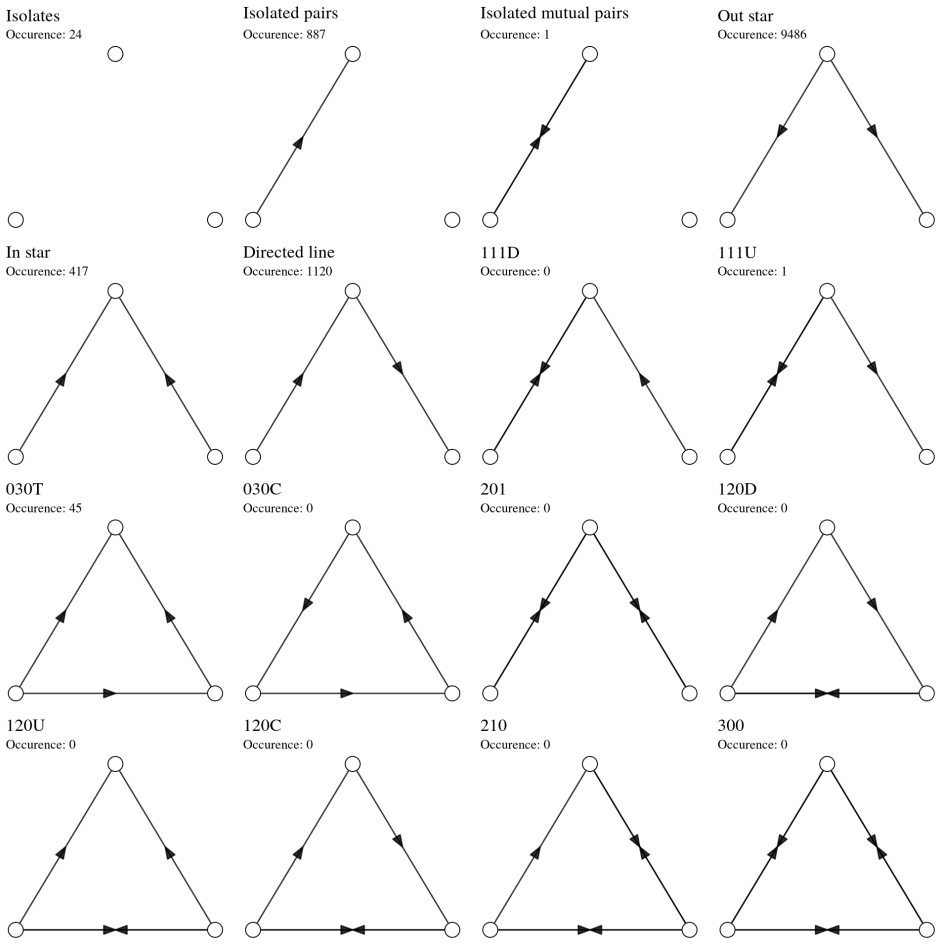

Figure 3. Triad census of the corporate ancestry network

The absence of certain triad formations is equally interesting. Reciprocity in general is rare, and only one triad that involves reciprocal ties occurs in the network. This points to the inter-generational structure of network, with chairmen most often being older and more experienced. In fact, events in which chairmen ("fathers") appoint executives who then, as chairmen, in turn appoint their "father" as an executive are atypical. As in real life, mutual fatherhood is extremely rare in this type of network. Lastly, triadic closure is generally rare, meaning that clustering and community formation are radically hierarchical, center–periphery-like, with triads pointing inwards and outwards with very little cyclicality. The cluster and communities that emerge from the network are therefore instead to be identified from downstream and upstream paths in the network. We point to the structure of two forms of subgroups that we claim are intrinsic to networks of corporate ancestry.

Patri-lineages and dynasties

In order to start thinking about community structure, we consider the distribution of path lengths in this network. As expected, the distribution of path lengths follows a power law (see Table 2). The longest, and most infrequent, patri-lineage is six steps long. Longer patri-lineages signify stronger the "reproductive" capacity of elite descendants, indicating that corporate governors have been able to reproduce not only horizontally within a generation but also vertically across generations, branching out across firms and sectors. The upper boundary of this distribution is in part driven by the extension of the observation period, and in part by how long the ties endure, on average. Most of the longest paths are located in the largest component.

Table 2. Distribution of path lengths and dynasties

Path length *k*	Frequency in network	Frequency in largest component	Number of dynasties with patri-lineages > *k*
2	1117	801	222
3	310	289	41
4	89	86	15
5	17	17	6
6	2	2	1

As noted above, patri-lineages are lines of descent among corporate ancestors, whereas dynasties make up components of patri-lineages that ascend from a common root, or ancestor. The most reproductive dynasty extends across six generations – and it consists of the two patri-lineages of length six. As shown in Figure 4, Jørgen Jensen is the common ancestor from which this, the deepest dynasty, springs. However, Jørgen Jensen is not a commonly recognized figure in the Danish corporate elite. He only appointed two sons. Instead, his one son Emil Jensen, begat six children. Having been the chairman at Falck – one of the most prominent healthcare service corporations – for an extended period, he appointed Lars Nørby Johansen, the CEO at Falck since the late 1980s. Lars Nørby Johansen has since been a chairman at several prominent Danish corporations, and has many children and grandchildren. Clearly, he is the strongest node in this dynasty and his reproductive activities – being the third generation of the dynasty – makes the shape of the dynasty thick at the middle of the trunk.

By contrast, the second depicted dynasty, Arnold Mærsk McKinney Møller, clearly makes Mærsk the central persona in this dynasty – having begotten many children who were able to reproduce through grandchildren. However, the grandchildren have not branched out as broadly, the result being that the descent of Mærsk is threatened – or simply that the furthering of the family legacy occurs through other, more informal patri-lineage relations. The fourth to sixth dynasties depicted have a more even distribution along the different points of reproduction, suggesting that these dynasties have been effective in sustaining their reproductive capacities.

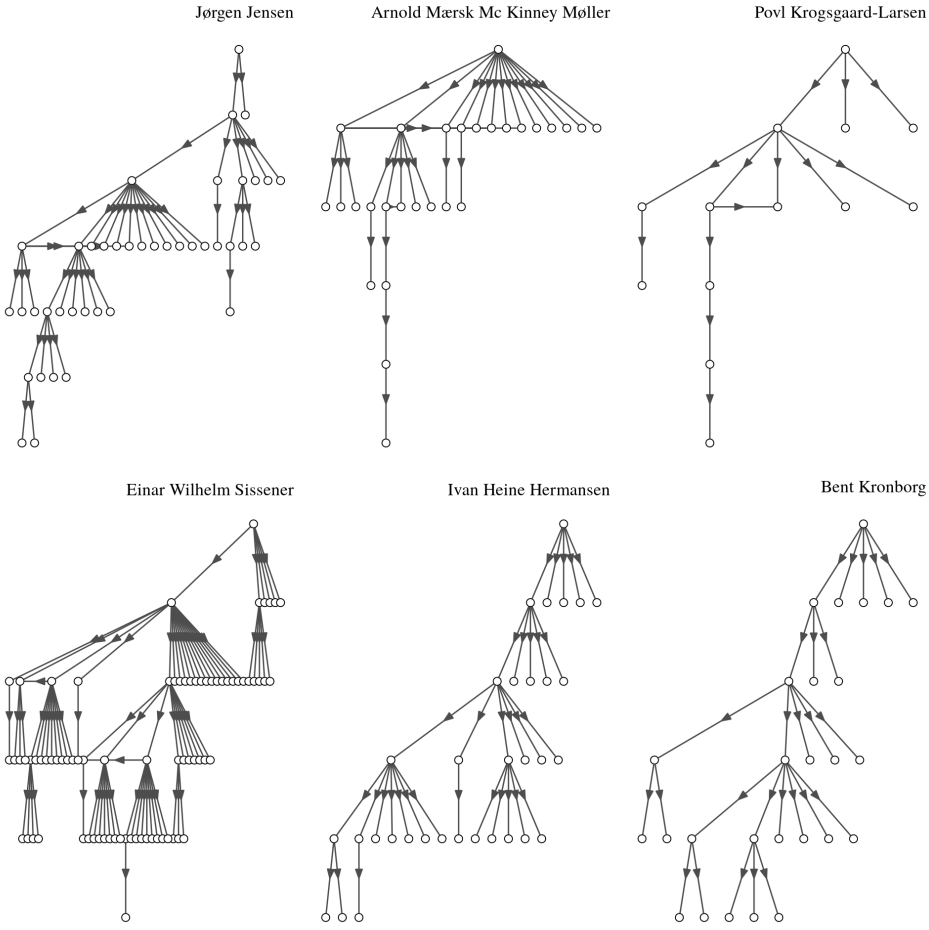

Figure 4. Dynasties of ancestors with patri-lineages of path length *k* >= 5

Concluding remarks

In this paper we have briefly introduced a novel conception of corporate networks, namely those ties emerging from durable chairmen–executive relations in which chairmen have appointed executives. We have presented a general definition of this type of graph and we have walked the reader through a number of conventional network characteristics to explore the genealogical structure of what we have termed networks of corporate ancestry. The short format of this article has only allowed us to present the basic framework for analyzing such networks. In our further research we are investigating more specific outcomes of reproductive power in networks of corporate ancestry, such as wealth and pay; we are identifying generative mechanisms underlying the networks via E xponential Random Graph Models; and we are extending the network by also including reverse ties of executives appointing chairmen.

Endnote

1 We intentionally continue the patriarchal metaphor as the network under investigation almost entirely consists of male corporate governors.

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Embeddedness and decoupling in innovation activities

Michel Grossetti

The notion of embeddedness has been in common usage in economic sociology since the work of Mark Granovetter. Authors in this domain have used this notion to designate the dependence of economic activity on various aspects of social life beyond social networks (politics, institutions, culture, etc.).[1] "Heterodox" economists also use the term, especially to highlight the role of institutions (Hollingsworth and Robert Boyer (eds.) 1997). Management specialists have embarked on network studies to assess the links between firm performance and the characteristics of social networks.[2] Some sociologists are also involved in that area of research (Uzzi 1996).

Among the authors who pointed out the limits of embedding as defined by Granovetter is his own PhD advisor, Harrison White. White's market theory considers them to be partial collective order that emerges from networks and gains autonomy from them (White, 2002). A market emerges from the repetition of exchanges and from the relative stability of the relationships between firms, then decouples and becomes a frame of reference for the companies that are part of it, whose transactions with external firms (suppliers and customers) are partly adjusted by the interface that the market provides. In this sense, firms are thus embedded in the market and relatively decoupled from their upstream and downstream relationships. The same process makes the market an aggregated identity, which establishes relationships with other markets and thus embeds into a network of markets.

For White, Granovetter's conception of embedding does not sufficiently take into account these emergent effects of macro-level social realities: "Granovetter (1985) presents a convincing account of social extension and involvements as a gist of embedding. Yet this is, as it were, a two-dimensional portrayal, one that neglects any emergence of new levels of actors emerging from embedding" (White 2002: 210). White believes that embedding is not just a fact, but also a process, just like its reciprocal, decoupling. Embeddedness is the dependence of an identity[3] vis-à-vis the links that it has with others – in other words the constraint exerted on it by attempts at control on the part of other identities. Conversely, decoupling is the empowerment of identity, and therefore its affirmation as such – but this statement goes hand in hand with the creation of new links and therefore with the establishment of a new embeddedness, located at a different level. These processes of emergence and dissolution take on an ontological character: "Processes of decoupling and embedding supplant birth and death of particular actors as the focus" (White 2002: 215). White thus defines a kind of process ontology and transient states (which are transforming), which replace an ontology of beings (that exist or do not exist, live or die).

My co-author Marie-Pierre Bès and I have proposed to generalize the concepts of embedding and decoupling in order to analyze the processes of emergence or dissolution of social forms. Embedding is defined as a process of increasing the dependence of one level of action compared to another. For example, if a firm becomes more and more dependent on the personal relationships of its members, so much so that the breakup of one of these relationships or the departure of some members could endanger it or at least strongly influence its future, it is embedding into a social network. By extension, one can also use the term embeddedness, as Granovetter does, in a static sense to designate a more or less strong dependency situation. Decoupling is the reciprocal process of empowering one level with respect to another. When an organization puts procedures into place that protect it against the hazards of interpersonal relationships, it becomes decoupled from them. The more an organization dissociates itself from the relationships between its members, or even the individual characteristics of these, the more it becomes a social actor – this actor being itself embedded in a network of organizations or a larger set such as a market. The notions of embedding and decoupling can therefore be used at very different levels of action. They mainly make it possible to account for the changes in these levels of action.

We have also designed a method to account for the dynamics of embedding and decoupling. We first

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did this by studying the relationships between research labs and companies; later I had the opportunity to generalize this method and use the analytical framework in part of a research project on business creation with Jean-François Barthe and Nathalie Chauvac. Later, other authors also took this approach.

In the following sections, I will first present the method of quantified narrations, developed to evaluate embedding effects. Then I will report on the results of the survey on collaborations between laboratories and companies, which shows that if embeddedness is important in the initial contacts and the design of projects, it is then in tension with decoupling processes that tend to partially restore the control of collaborations to formal organizations. Afterward, I will mention a survey of start-ups and the evolution of interpersonal relations in access to resources, which reveals a similar phenomenon of initial embedding followed by partial decoupling. I will conclude with some more general considerations on embedding and decoupling.

1. Quantified narrations: a mixed method for reconstructing relational chains and evaluating embedding effects

At the beginning of the 2000s, Marie-Pierre Bès and I sought to assess the embeddedness of relations between organizations in networks of interpersonal ties in the case of collaborations between public engineering research laboratories and companies (Grossetti and Bès, 2001). We were inspired by the method that Mark Granovetter used in the 1970s to study the labor market (Granovetter 1974). In this study, this author interviewed a set of white collar workers who had changed their cities of residence and employment between two censuses. This aspect is important: the studied population was not selected on the basis of static characteristics (age, sex, occupation, etc.), but on a dynamic criterion (having experienced a change in certain aspects of their careers). In the same way, it was not a question of studying these people by their characteristics or their ordinary activities, but of analyzing processes: in this case, those which resulted in obtaining a new job. Granovetter had reconstructed these processes, distinguishing cases where employment was obtained through "personal contacts" – i.e., chains of interpersonal relationships – from those where the protagonists had instead used advertisements, recruiting agencies, or direct applications. Other researchers have used this type of method. For example, in the 1960s, Nancy Howell Lee (1969) reconstructed relational chains to explain how women could find a doctor to perform an abortion while it was still prohibited. This can be considered to be a social network approach, distinct from classical "personal" or "complete" network studies (Degenne and Forsé 1999) – an approach that focuses on "relational chains."

Relational chains can sometimes be reconstructed from traces – for example, in online communications where we can sometimes know who spoke with whom. But such traces are not often available. One can also attempt to reconstruct relational chains by means of questionnaires, if the type of resource is simple and well defined and if the access processes are already known. In his study, Granovetter had, moreover, combined questionnaires and interviews. A face-to-face questionnaire is used to provide reminders that are necessary in most cases. A self-administered questionnaire makes the detection of relational chains more random, especially when they go beyond a single intermediary. In the case of the labor market, it appears that questionnaires tend to underestimate the mobilization of personal relationships (Chauvac 2011). They are difficult to use when one thinks that it is necessary to reconstruct complex contexts and solicit the memories of respondents through questions that depend on these contexts, or to obtain information about practices that people do not wish to make public. In the two studies for which we developed the quantified narrations method, we found that the questionnaires were inappropriate because of the variation and complexity of the stories and contexts. But we do not exclude the idea that some aspects of this research can be systematized by means of questionnaires.

In the study of collaborations between laboratories and companies, we undertook to reconstruct stories including the genesis of these collaborations – thus, the process of "meeting" between representatives of the organizations – by transposing the method of "relational chains," but we soon realized that we could make some improvements by drawing, on the one hand, on a "life history" approach and on the other, on oral history. Life histories are most often obtained through biographical interviews with people considered to have comparable social positions in at least some of their aspects (Bertaux 1981) or, more rarely, through multiple interviews about the same family history (Bertaux and Delcroix 2000). Oral history usually involves collecting the testimonies of various participants in the same story and developing a synthesis from these accounts (Perks and Thomson, 1998). In the method that we have gradually developed, the unit of analysis is not an individual, a family or an organization, as is often the case in the social sciences, but a

process that can involve various actors, individuals, or collectives. For this reason, some interviews may shed light on several processes in which respondents were involved in one way or another. For example, in the study of collaborations between laboratories and companies, the researchers interviewed reported on an average of four collaborative experiences. Their testimonies therefore relate to several intertwined processes: their own careers, the history of their team (or others they've belonged to before), and their collaborative experiences with industry.

In another study, on start-ups (Grossetti, Barthe, and Chauvac 2011), where we used a similar method, some respondents (for example, managers of business start-up services, "business nurseries," or "incubators") were able to provide information and their points of view on several business creation stories. In addition, we realized that it is desirable to cross several testimonials in order to reconstruct a process.[4] This limits a problem inherent in individual testimonials, which is the centering of the story on one person and her point of view. The information is also cross-checked with written sources (CNRS database concerning collaborations between laboratories and companies, administrative and legal files for start-ups). On the basis of the information and testimonies obtained, we wrote stories which we submitted to our interlocutors to enable them to propose modifications. These stories were then analyzed qualitatively and coded for statistical analysis.

2. The case of relations between laboratories and companies

During the study of collaborations between the laboratories and the companies (130 cases, of which 110 were usable for the study of the geneses of the cooperations), we grouped the contexts of the initial contact between organizations into three types. In the first type, contacts could be considered as resulting from personal relationships. For all the cases gathered in this category, we could reconstruct the relational chain that was actually activated by people in the contacting process and without which the contact would have been very improbable. In the second type, the contacts resulted from the action of a third organization – usually a governmental service, sometimes another company or an interprofessional organization – which voluntarily or involuntarily put representatives of the laboratory and the company in touch with one another. For example, in some of our stories, a ministerial service had appointed a group of researchers from a laboratory and a member of the firm from a small group of experts, who subsequently decided to engage their respective organizations in cooperation. Finally, in the third type of case, at least one of the partners had used available public resources (scientific publications, conferences) to identify a partner and get in touch with him.

The first type (relational chains) was quite frequent (44 percent), so that we could support the idea of a rather strong embeddedness of laboratory-business relationships in personal relationships, at least in terms of the genesis of these relationships. But analysis of the progress of the cooperations showed that this initial situation had little effect on the contents or duration of the relationships between the organizations.[5] It highlighted a series of decoupling processes that allowed organizations to "regain control" after the initial setup.

We categorized these decoupling processes quite easily indeed, because they fit with well-known social logics. We have called the first type "**collectivization,**" referring to all the procedures that lead to the pooling of resources related to collaboration. For example, some organizations rotate their representatives at coordination meetings with the partner organization so as to prevent one person from having a monopoly on all the information. Others organize and systematize the sharing of information on the cooperative project. All these organizational routines have the effect of making collective what could otherwise remain a more personalized relationship between a researcher and an engineer, for example. They help to organize the substitutability of the members involved. The second type of process, which we call "**formalization**," is the drafting and signing of a classic contract, which provides a legal framework for cooperation. The contract is a partially public intermediate object within the organizations concerned and to which each can refer. Here, too, there is an enlargement to the community of agreements, which were limited to a few protagonists in the preliminary phase. The third type of decoupling process is what we have called "**materialization**," using a term previously proposed by Latour and Woolgar to characterize scientific statements taking the form of material elements. When we asked them to describe their work, our interlocutors often mentioned models, sometimes developed in parallel in the laboratory and in the company, or digital models that allowed them to coordinate but also to pass the baton to a new participant. Thanks to these artefacts, the progress of the project was materialized and became partially accessible to a new participant, beyond the only information that the former participants accept to communicate. Relaying is the type of operation that involves a certain degree of substitutability, and thus of decoupling.

In these three processes, organizations partially decouple themselves from the logic of individuals and their relationships in order to impose their identity and integrity. But these decoupling processes are in constant tension with embedding logics: appropriation of information by some members, models that are poorly documented and incomprehensible, etc. In many cases, the decoupling does not resist the departure of a key participant who "takes the relationship with him" to reactivate it in another context.

In the study, the relationships mobilized in the contact between organizations have different origins. Most (about four-fifths) come from teaching activities and industrial activities themselves, but few have been created directly as part of a laboratory-enterprise collaboration. These relationships therefore draw a wider sphere than that which only concerns cooperation, and which in the study includes the different actors who are interested in engineering activities: the laboratories of the "sciences for engineers" department of the CNRS, from which we started; the schools and training courses for engineers in electricity, mechanics, or process engineering; state agencies intervening in these fields; large industrial groups making use of technologies of the same type as those which are developed in laboratories; and small firms that are users of these technologies or are involved in their development. The contours of this set are fuzzy and shifting, and its degree of institutionalization is quite limited, but it frames the flow of exchanges in which are taken cooperation: recruitment of graduates, job changes, student internships, consultancy etc. If we had studied chemistry or laboratories in life sciences, we would obviously have delimited other kinds of spheres. Within the sphere of engineering, relationships are also concentrated in certain finer technological specialties (power electronics, electrical phenomena and components, porous media, etc.).

The same is true for coordination mechanisms: they are both more generic and more specialized than those that would be expected if the sphere of cooperation between laboratories and companies was a relevant level of action. There are few journals or associations dedicated generically to these cooperations. On the other hand, there are devices that are specialized by technological field or that belong to the wider engineering sector. Some of the specialized areas are highly institutionalized, with professional associations, journals, regular symposia, and stable relationships between laboratories and companies. Cooperations between laboratories and companies are therefore not autonomous entities. They are embedded towards the micro level into specialized spheres by technological field, and toward the macro level into all engineering activities and, more generally, technical innovation.

In a study concerning the Poitiers laboratories, Marie Ferru also observed the incorporation of laboratory-company relationships into networks of interpersonal relationships as well as decoupling phenomena (Ferru, 2010).

3. The case of start-ups

In the start-ups survey, we sought to detect embeddedness effects by encoding sequences of access from company founders to external resources. This includes traditional elements such as financing, customers, suppliers or partners, recruitment of employees, acquisition of material resources (premises, instruments), or advice (legal, commercial, or human resources), but also resources such as information or ideas, or work done by external persons for the benefit of the company (for example, a relative who designs a website for free). If for the "classical" resources we have tried to be fairly systematic, for others we have relied on spontaneous mention by the interlocutors and the importance they seemed to give them. It was always possible to change the typology of resources by returning to the stories to include a new category.

The sequences can be of variable duration (a few hours to a few months), but they always appear as bounded in time – at least in the end, by the transfer of a resource to the founders or the new company. For example, if one of the founders finds someone willing to enter the company's capital, we code that the resource is financial in nature. If the shareholder is already known to the founder or presented by an intermediary person, we codify that the access was carried out by a relational chain (of length 1 or 2 in this example), as well as the characteristics (professional relationship, family, friendly, or other) and the context of creation of the first of the relations of the chain – that which starts from the founder. If the shareholder was found in an electronic forum, we code that the access was made on the basis of a coordination resource, and we also code the type of resource. In the current data set, which is the subject of a forthcoming book, we have 97 cases, 230 founders, and 3451 resource access sequences.

In the following table, we have distinguished four major types of resources. Upstream resources include all inputs with the exception of staff recruitment and financing – i.e., advice, premises, equipment, one-off assistance. Financing can take the form of investments giving access to a share of the capital, loans, subsidies, or personal help provided by relatives. Recruitment applies to all persons working in the company for remuneration, regardless of the legal form. Customers are economic actors buying products or

services produced by the company. In this case, we encountered a limit to our method. Indeed, for seven of the 97 companies, the markets are semi-massive markets where customers are numerous and are in contact with the company through resellers or websites. In this case, embedding in the interpersonal relational chains tends to be considerably reduced. Other companies have a limited number of customers, usually large contractors. If we exclude the seven companies with a lot of customers, the embedding rate would go back up to 50 percent.

Table 1. The share of interpersonal relationships in accessing resources of start-up founders

Period Type of resources	Before filing articles of association	First year	Second to fifth years	After the fifth year	Average
Upstream	59.6%	44.8%	50.9%	53.6%	52.6%
Recruitment	90.3%	64.2%	37.5%	39.5%	52.8%
Financing	61.5%	44.0%	31.2%	9.1%	48.7%
Customers	84.2%	30.9%	18.5%	1.4%	13.1%
Together	64.5%	47.0%	35.7%	10.1%	39.3%

Reading: In 13.1% of cases, customers were found by relationship, 30.9% in the first year.

This table shows that embeddedness is very high at the beginning of the process but then regresses to stabilize at a variable level depending on the types of resources, but remains relatively high, especially for upstream resources and recruitments.

This regression of relational embeddedness over time can be interpreted as a process of decoupling that gradually and partially substitutes access to resources made by the firm as such (through people acting impersonally) for those made by the founders relying on their personal networks. In the same way, the social relationships mobilized are increasingly professional relationships, related to the activity of the company, and decreasingly family or friendly links.

Jean-Philippe Berrou identified the same type of process in a study of enterprises in the informal sector in Bobo-Dioulasso, Burkina Faso, with a much higher overall embedding rate (more than 80 percent) (Berrou and Gondard-Delcroix 2017).

A dynamic perspective on embeddedness

Social activities are always involved in multiple processes of embedding and decoupling, and their effects maintain or change balances between social forms. Collectives emerge and reinforce themselves or dissolve in networks of interpersonal relationships. Initially established relationships in collectives become decoupled (professional relationships that become friendly, for example); spheres of activity decouple relative to others (a scientific specialty that differs from its mother discipline, for example). Economic activities are like any other, despite the efforts to decouple an economic sphere of social relations through multiple legal and material devices that were perceived by authors such as Karl Polanyi or Edward Thompson. The dependence of these activities on interpersonal relations, which Mark Granovetter has highlighted and theorized, is a dependence on the one hand vis-à-vis the chains of relations that cross the borders of organizations, and on the other hand vis-à-vis the multiplexity of these relationships, which in some cases include relational contents that are not limited to the professional sphere. The analysis presented here shows that these dependencies are not constant and that they are in tension with decoupling processes that tend to give weight to hierarchies, formal organizations, and more generally, to impersonal coordination mechanisms. This tension can lead to varied balances, from the very high embeddedness of informal activities to the very impersonal transactions of large retailers and the intermediate situation of the technical innovation activities, which are the subject of the two surveys that I have presented in this text.

Endnotes

1 For example, Paul DiMaggio and Sharon Zukin, eds. 1990. Introduction to *Structures of Capital. The social organization of economy*. Cambridge University Press, 1–36; Richard W. Scott. 1995. *Institutions and Organizations*. Thousand Oaks, CA: Sage; Ronan Le Velly. 2002. "La notion d'encastrement : une sociologie des échanges marchands." In: *Sociologie du travail*, Vol. 44, No. 1, 37–53; Beckert, Jens. 2002. *Beyond the Market. The Social Foundations of Economic Efficiency*. Princeton University Press; Beckert, Jens. 2010. "How Do Fields Change? The Interrelations of Institutions, Networks, and Cognition in the Dynamics of Markets." In: *Organization Studies*, No. 31, 605–627.

2 Aldrich, H., and C. Zimmer. 1986. "Entrepreneurship through social networks". In: Sexton, D.L., and R.W. Smilor eds. *The Art and Science of Entrepreneurship*, 3–23; for a general perspective, see Ha Hoang and Bostjan Antoncic. 2003. "Network-based research in entrepreneurship. A critical review." In: *Journal of Business Venturing*, 18, 165–187.

3 The notion of identity is complex. To put it in a very simplified way, it is a kind of generalization of the notion of an actor.
4 Most often we have limited ourselves to two interviews. We have done further interviews (five in the most extreme case) to elucidate certain aspects of history. We stopped at two when we had the feeling that the story was stabilized (absence or scarcity of contradictions, sufficient information accuracy).
5 But the initial situation had decisive effects on the choice of the partner and therefore its location, which was central for us in this study.

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A tale of two cities: the regional dimension of the Ecuadorian securities market

Andrés Chiriboga-Tejada

Introduction

This paper is part of a research project on the emergence and particular evolution of a small financial market in South America, the Ecuadorian securities market. This text will explore the regional dimension of trading, relying on networks as a way of representing social systems.[1] The network metaphor is used to study the structure of interdependencies that exist among its members, its influence on them, and the processes that emerge from the way they manage those interdependencies (Lazega 2014). Understood as a social network, the Ecuadorian securities market is approached as a set of trading relationships comprising transactions between actors in the market (Baker, 1984). I study the structure of trading as a way of gathering evidence about the social devices and processes that determine decision-making in the market, whether they are used in order to overcome uncertainty and achieve efficient setups (Beckert, 1996) or to maintain incumbents (Fligstein and Dauter, 2007).

Following economists such as De la Torre and Schmukler (2007) this case could be considered a reflection of the broader underdevelopment of local capital markets in Latin America compared with the larger financial centers in North America, Europe, and the flourishing economies of East Asia. On the other hand, compared with the vertiginous development of financial markets that has happened elsewhere, this exceptional case might not necessarily be a failure, but a structure with a functional role for particular interests and contingent to specific social devices. In this paper I will discuss the fact that the trading structure of the Ecuadorian securities market provides evidence of an important device that influences economic action in this market: The role of the historical – but also political and economic – division between two cities in the country, Guayaquil and Quito.

A tale of two cities

In Ecuador,[2] the Quito–Guayaquil[3] division and by extension the rivalry between the highlands and the coast, is transversal to almost everything: The political system, the economy, the cuisine, and even football, the country's national sport. According to historians such as Juan Maiguashca (1992) the *regional issue* has been present throughout the country's history. Regional disputes started with independence from Spain and the establishment of Ecuador as a sovereign republic in 1830.[4] The *regional issue* goes beyond a spatial and economic division. It includes those elements, but must be understood as a complex politico-historical phenomenon (Maiguascha, 1992: 180).

I will certainly not claim that regional division is the only explanatory variable of economic action in the Ecuadorian securities market. Nor does it explain all the economic and social processes that result from this. For instance, we cannot deny the economic factors that have impacted the general development of capital markets in Latin America. There are also other political and social elements that are relevant to explaining this market. For example, the relations between local politics and large economic groups are certainly reflected in market dynamics. The state also plays a relevant role in the market as a regulator and as an economic actor. These elements interact with the regional dimension and some of them are intertwined in it. In this sense, the regional division should be understood as a dual device: It is one of several elements at play but it is also a complex device in its own right

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that explains the market to a certain extent. Regarding its complexity and invoking Zukin and DiMaggio (1990) we could say that the *regional issue* may capture different types of embeddedness: Cultural, political, and structural. This adds richness to the analysis of a complex fact but, at the same time, poses challenges for rigorous empirical analysis of the explanatory variables for the particular development of this market. The *regional issue* is certainly not enough to fully understand the Ecuadorian securities market and at the same time its explanatory power will have to be critically inspected.

Before we arrive at the point of dissecting the regional dimension of the market it is necessary to establish that there is such a device and that it can help us understand how the market works and in what respects it is functional. It is along these lines that this paper is written. Here, I will provide evidence of and discuss why the regional division, captured by the bipolarity of Guayaquil and Quito, should be a relevant part of the explanatory corpus of this case. I will show mainly how social network analysis has been helpful in arriving at this point. Further disaggregation of this complex issue and more detailed analysis are part of the larger enterprise of this research.

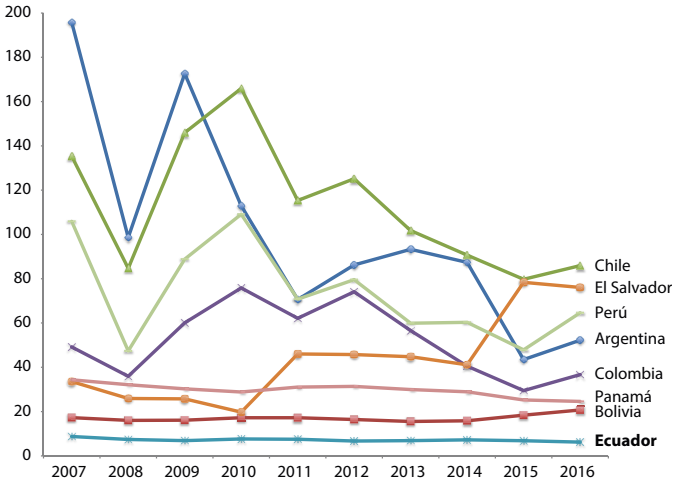

Figure 1. Market capitalization of several Latin American economies as a percentage of GDP (2007–2016)
Note: The sample selected corresponds to space limitations, but mainly to the following criteria: neighboring economies (Colombia and Peru), commodity producer-exporter economies (Bolivia, Argentina, Chile), and dollarized economies (El Salvador, Panamá).
Source: Iberoamerican Federation of Exchanges (FIAB)

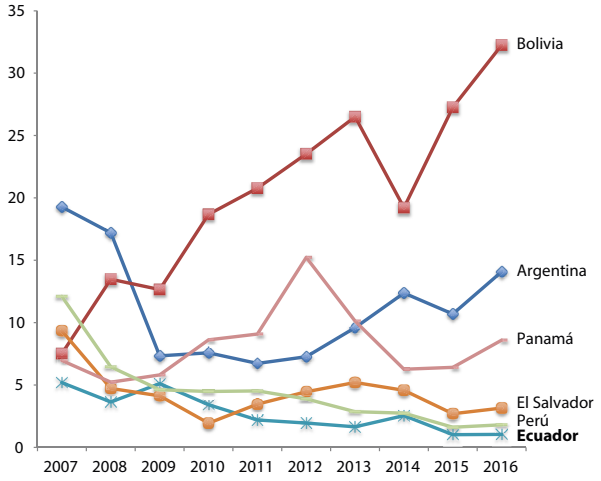

Figure 2. Total value of securities trading of several Latin American Economies as a percentage of GDP (2007–2016)
Note: Chile and Colombia have been excluded from this figure as the volume of trading there is much higher than in the other economies and poses problems for visualization.
Source: FIAB

The case

As mentioned above, the Ecuadorian securities market is a small local securities market, even by Latin American standards. The Ecuadorian securities market is at the bottom level of development compared with those of neighboring and similar economies (Figures 1 and 2). The curious thing about this case is that it has remained like that, despite changes in regulation, external shocks, and public–private efforts to make it flourish. Part of the larger endeavor of my research is to explore why has this happened beyond traditional economic explanations and what particularities can this case contribute to the sociological discussion on markets.

The origins of securities markets in Ecuador can be traced back to the end of the nineteenth century. However, it was in 1935 that a first commercial exchange started working in Guayaquil. In 1969, two securities exchanges – one in Quito and one in Guayaquil – were created by law in order to have a modern and supervised market. In 1993, the first Securities Market Law was passed by the Ecuadorian Congress and has been amended several times. Today it is part of the broader Organic Monetary and Financial Code. Deals are done mainly in the primary market and mostly fixed rent securities are traded. The Superintendence of Companies, Securities and Insurances serves as the regulator of this market in a manner comparable to the Securities and Exchange Commission (SEC) in the United States.

In the period of analysis for this paper, 51 brokerage houses were registered as dealers and nine state institutions traded in the market. There are 516 firms and state entities registered as issuers and their securities were traded in the market.

Data and methods

The data used correspond to a ten-year set of market transactions (2007–2016) recorded by the Guayaquil and Quito Exchanges and reported to the Superintendence of Companies, Securities and Insurances at the request of the author. In that dataset each transaction is recorded and, among other things, it allows us to see the date, type of security, issuer, dealers (buyer and seller), and the amount of the operation, which are relevant to the analysis that will be presented.

As already remarked, the trading relations in the market will be accounted for in terms of the transactions between brokers (Baker, 1984) of a diverse range of securities.[5] Transactions are the relational variable of this design. In network analysis terminology they are the *edges* of the network. *Nodes* are represented by brokerage houses that act as dealers in the Ecuadorian securities market. Public financial institutions such as the Ministry of Finance, the Central Bank, and a handful of public banks can deal directly in the market. For this analysis focused on the regional dimension of the market, state actors will be excluded. Nevertheless, I must insist that the role of the state as an economic actor and as a regulator is very important for fully understanding this market. Other relevant *nodes* in the design are issuing private firms and issuers from the public sector. For the most part, I analyze the dealers (brokerage houses) network and issuing firms will be included only at the end.

Transactions between dealers happen numerous times and especially if an extended time frame is considered for analysis. Most network studies tend to collapse edges into single ones and to delete loops in order to focus on binary relations. In part of my design I have indeed added transactions between two nodes in order to account for the strength of relations. But additionally, I look at them separately as the recurrence of transactions accounts for relevant long-lasting relations. I have also analyzed *loops*, as they show what I have called *egoist trading*. When a dealer "trades with itself" it really means it is doing it on behalf of pairs of its own clients.[6] With these considerations, I should say that this network is studied sometimes as a simple graph with binary weighted edges, but also as a weighted complex graph (Wasserman and Faust, 1994) or a multigraph that includes loops (Shafie, 2015).

A single attribute of nodes will be explored in this article: Domicile. This will allow us to focus the discussion on the regional dimension of trading. To do so, the addresses of traders and issuers were retrieved from the public information of the Superintendence of Companies, Securities and Insurances, the Superintendence of Banks and the Superintendence of Solidary and Popular Economy. The online *Guía de Negocios* of the magazine *Ekos*[7] was also used to crosscheck some firms' addresses.

The findings discussed in this paper are the product of modeling and analyzing 165,052 transactions that correspond to the ten-year data set mentioned above. In terms of amounts, this accounts for nearly 52.4 billion USD in trades. In this paper, analysis and results will be presented generally for the full 2006–2017 network. Some results will be presented on a yearly basis to overcome limitations of the full set[8] or when a longitudinal observation has show interesting evidence.

Findings

Network components

Figure 3 and Figure 4 show network graphs of trading relations corresponding to the years 2007 and 2016, the first and last years of the series analyzed. Transactions have been collapsed into single edges to facilitate observation but loops have been kept. This leaves plots that combine simple and multigraph displays. Edges are weighted and show direction depending on the existence of single or reciprocal trading. Nodes are displayed in colors that refer to the respective domicile of each dealer. Graphs were plotted using the Kamada-Kawai force directed algorithm (Kamada and Kawai, 1989) that makes it possible to obtain a first idea of possible components in the network.

In both graphs displayed here, as well as for all years, plotting shows a persistent two-side division between the Guayaquil (orange) and Quito (yellow) nodes.[9] The extreme with nodes corresponding to Quito dealers is also more intertwined within itself than the one corresponding to Guayaquil. This graphical examination leads us to think that we could be in the presence of a *community formation*. A *community* is defined by Porter *et al.* (2009: 1083) as "a group of nodes that are relatively densely connected to each other but sparsely connected to other dense groups in the network." Closer inspection of the connectedness of the network and its communities, relying on several metrics, will help us to challenge or reinforce these early claims.

At this point it is important to point out again that the Ecuadorian securities market works with a structure of two exchanges, one in Quito and the other in Guayaquil.[10] However, this does not impede any dealer from trading with counterparties of the other domicile. The large majority of brokerage houses operate in both exchanges and some even have offices and personnel in both cities.[11] In fact, although nine out of 29 (31 percent) brokerage houses domiciled in

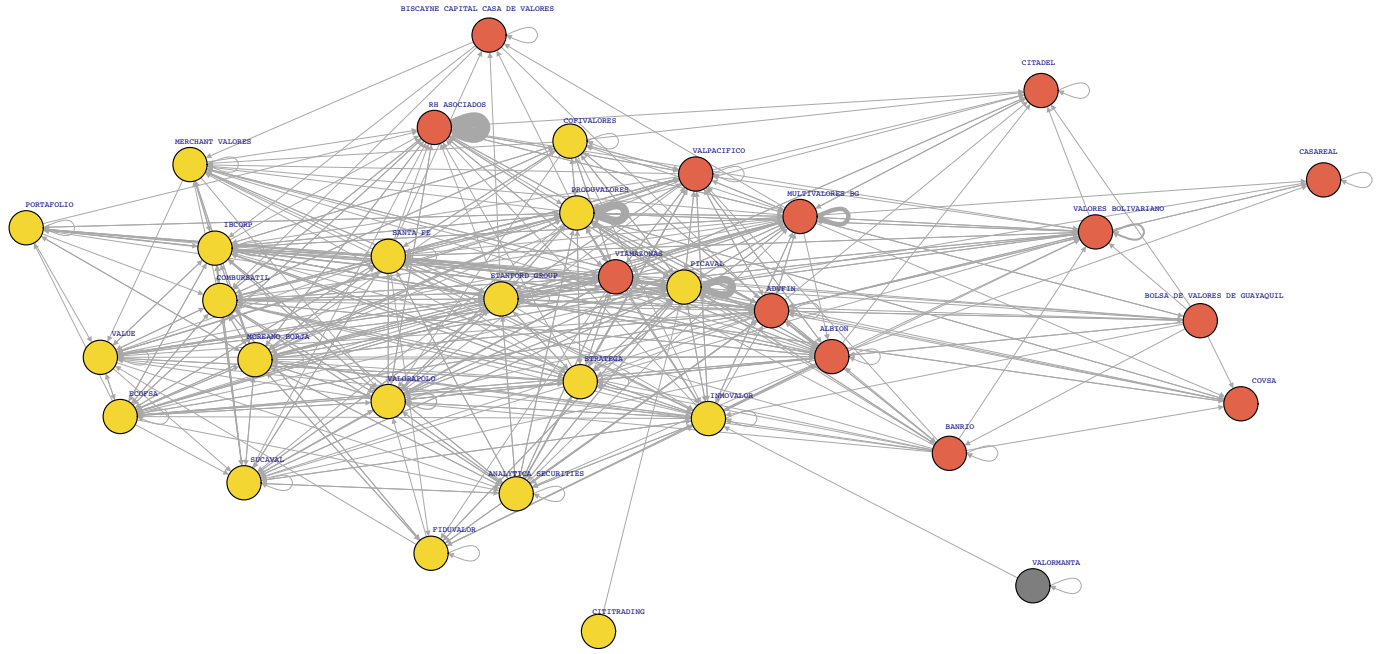

Figure 3. Private dealing in the Ecuadorian securities market (2007)

Quito in the period of analysis were not operational in the Guayaquil Exchange and four out of 21 (19 percent) brokerage houses domiciled in Guayaquil did not deal through the Quito Exchange, all have traded with numerous counterparties from the other domicile on both or a single exchange.

Despite some limitations, density[12] is a good first way to approach the connectedness of a market in which basically everyone can deal with each other. The density of the whole network and subgroups of nodes than can potentially be connected to one another provide a first idea of whether we are in the presence of a

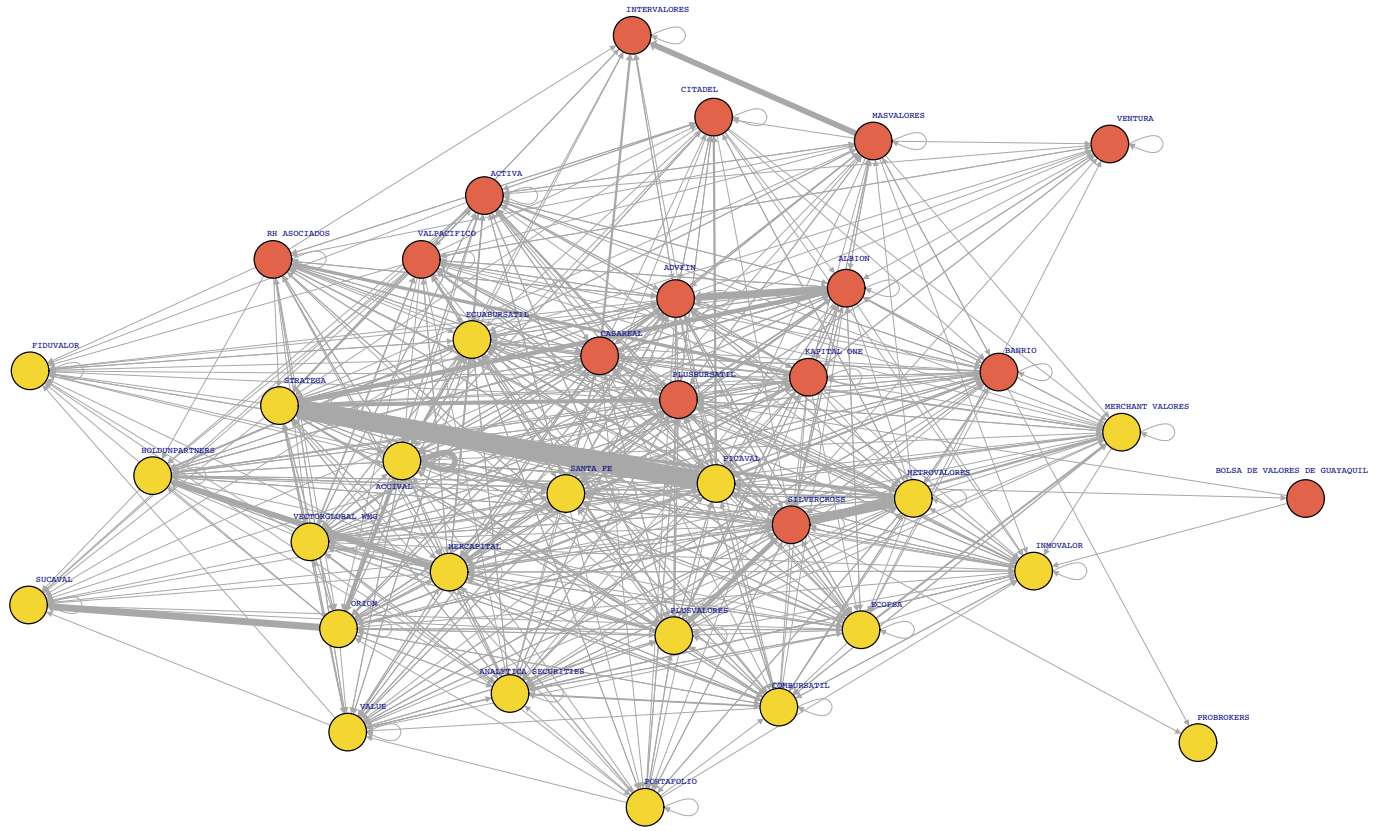

Figure 4. Private dealing in the Ecuadorian securities market (2016)

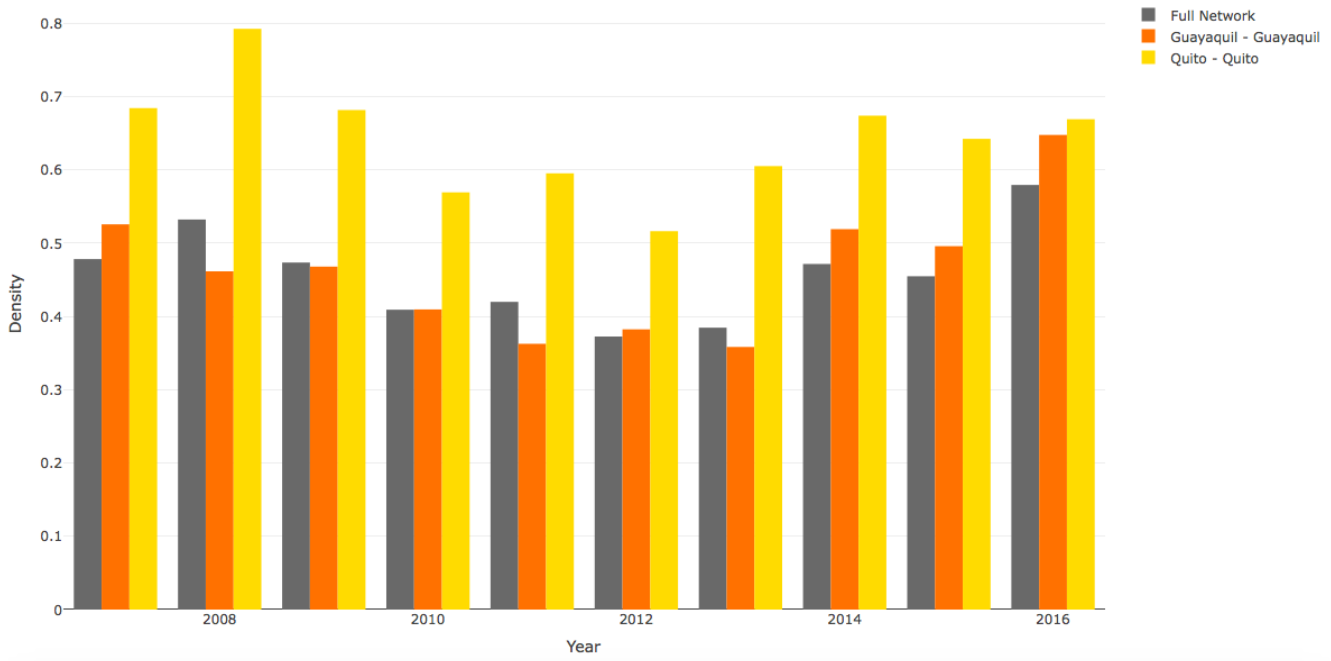

Figure 5. Network density, 2007–2016

network with communities. Throughout the period analyzed, the Network has an average density of 0.46 (sd=0.06; min=0.37; max=0.58). Any claim about whether a density ratio is high or low is always tentative. It always depends on the type of network that is being observed and to the fact that this type of measure is sensitive to the number of nodes considered. However, compared with both the "ideal market" in which everyone can deal with everyone and also the potential connectedness of the empirical Ecuadorian securities market measured by density metrics, firstly, it is possible to say that this network is not highly connected.

Density on its own tells us that the Ecuadorian securities market is far from being an "ideal market." However, we are interested in testing whether there is a regional division in the market that is accounted for by some type of assemblage(s). As mentioned above, graphical inspection provides evidence that there might be one or two communities in this market that coincide with the historical *regional issue* of the country. In that sense, we can analytically divide the network subsets containing (i) the edges that connect dealers from the same domicile and (ii) those that connect dealers from opposite domiciles. Only the first type can be subject to density analysis as in this type of subset all nodes can be potentially connected and can trade with each other. By doing this, we can check whether each domicile displays community formations that are more densely connected among them and get an idea of whether they are loosely connected to the rest of the network or to other formations.

Throughout the ten years analyzed, we may always identify a denser group among the dealers from Quito. This group always displays a higher density when compared with the whole network and behaves more clearly as a community. It has an average period density of 0.64 (sd=0.08; min=0.52; max=0.79). The Guayaquil group is always less cohesive than the Quito community, with an average density of 0.46 (sd=0.09; min=0.36; max=0.65) that matches the period average of the whole network. With this information in hand, it is not clear that Guayaquil dealers may be organized as another community. Nevertheless, it can certainly be stated that dealers with this domicile appear to participate in the market in a different way. Figure 5 summarizes and shows the annual evolution of density measures for full networks, and the Quito and Guayaquil subsets.

However, our data and type of analysis impose some limitations on the use of density to solely determine the existence of communities in this network. Although the difference is not too large, the number of dealers (nodes) is not exactly the same between domiciles. This difference also varies slightly from year to year. Additionally, when we compare the full network with its subsets we are clearly looking at groups with different numbers of nodes. To overcome problems due to the sensitivity of density metrics to the number of nodes and also to complement the evidence coming from those measurements, clustering coefficients have been calculated for each year in the series.

I have used the average clustering coefficient measure for weighted networks as proposed by Barrat *et al.* (2004), which better fits a multigraph setup. This measure looks at each node in the respective network or selected subset and computes the proportion of its neighbors that are connected to each other in relation

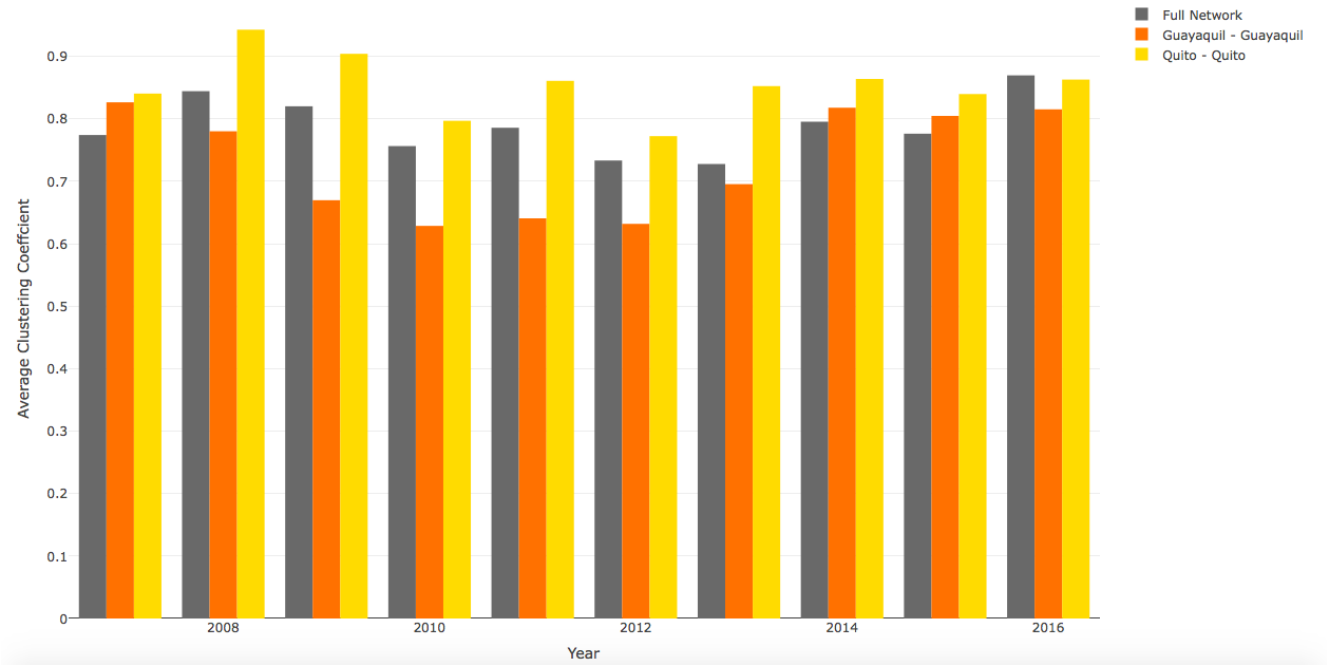

Figure 6. Network average clustering coefficients, 2007–2016

to the number of all potential connections. At the same time, it assigns each edge of the graph a weight proportional to the strength or capacity of connections among nodes (Barrat *et al.*, 2014: 3747). As the measure is provided for each node in the respective network (egocentric analysis), the network average clustering coefficient is the mean of the measures of all its nodes.

The clustering coefficients analysis shows that the Quito group still has the largest density, with an average coefficient of 0.85 (sd=0.05, min=0.77, max=0.94) throughout the period of analysis. The Guayaquil subset shows an average clustering coefficient of 0.73 (sd=0.09, min=0.63, max=0.83), which is below the full network result, with 0.79 (sd=0.05, min=0.73, max=0.87). This adjusted analysis confirms the higher density of the Quito Community. It also provides further evidence that the Guayaquil dealers do not appear to be engaged in the market network in the same way as the Quito group. Figure 6 displays the

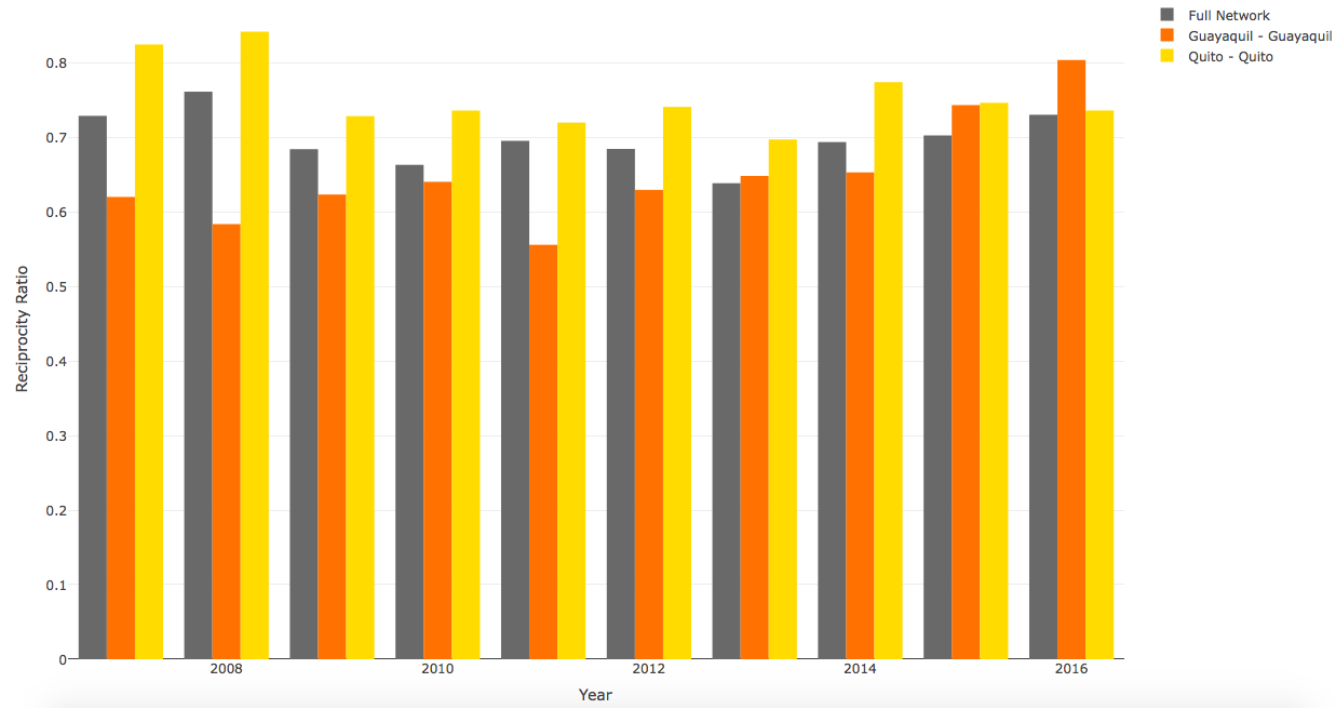

Figure 7. Network reciprocity, 2007–2016

annual evolution of the network average coefficients for full networks, and the Quito and Guayaquil subsets between 2007 and 2016.

When nodes are connected to each other or, in other words, when trading exists between dealers in the Ecuadorian securities market, it largely tends to be reciprocal. The evolution of reciprocity[13] is depicted in Figure 7. If we look at the different subsets, the Quito community is more reciprocal in its trading than the Guayaquil subset. However, the difference diminishes towards the end of the series and reverts in 2016. Reciprocity is an important cohesion measure in directed networks like the one studied here. In this case, it adds some additional evidence, while the density measures presented earlier are more relevant to determine the way the groups of dealers domiciled in Quito and Guayaquil operate in the market.

A closer look at trading and domicile

Graph inspection and networks metrics are a good way to start exploring networks for subgroups. Relying on that, we have drawn evidence to support the proposition that dealers from Quito display a denser subgroup or *community*, while Guayaquil seems to participate in the network differently. In order to further explore the *regional issue* of this market, I opted to take a closer look at the edges that connect nodes in the same domicile and those that connect them to counterparties in the opposite domicile. Looking at *community*-type formations, one simple question worth asking is: Do dealers from one domicile actually trade more with each other compared with how much they trade with others? Will this follow the two-side division between the Quito community and the less dense group of Guayaquil dealers?

Once the state nodes and loops are excluded, we see that 5.37 billion USD[14] in transactions happen between private dealers with domiciles of either Quito or Guayaquil throughout the 10 years of trading. I have inspected these transactions for regional preferences in trading. I have recorded and analyzed what I call "local trades" (transactions that happen between either Guayaquil or Quito dealers) and "outside trades" (a transaction that involves dealers from each different domicile). I have also looked at amounts traded between nodes but also the number of trades, which is relevant to the multigraph design used.

The frequencies of local and outside trades for Quito and Guayaquil were organized as pivot tables. Those were compared with similar tables containing the expected frequencies of trading, without any regional preferences. The analysis was done first on a year-by-year basis to avoid the distortions discussed at the beginning of this section. Afterwards, the results were aggregated (Table 1) to show and enable a discussion of general findings for the whole period.

Approached in terms of amounts traded and number, local transactions from Quito and from Guayaquil altogether are expected (no local preference) to account for the majority of this section of the market: 52 percent for amounts traded and 55 percent for number of trades. On the observed market, this participation goes up four points to 56 percent in amounts traded and even more in terms of number of trades, where we find a difference of 10 points (up to 65 percent). On the other hand, observed outside trading is less that expected, with regard to both numbers of trades and amounts traded. The differences provide evidence that the empirical market seems to favor local trading more and the disparity is more pronounced when intensity of trading (number of ties) is taken into account.

If we look specifically at how each domicile trades (Table 1, row percentages) we see that Quito is expected to sell more within its domicile and less to Guayaquil. By contrast, Guayaquil is expected to sell more outside and less locally. In the empirical market these differences shrink, as dealers from each domicile prefer higher amounts and numbers of local rather than outside trading. Quito dealers show 65 percent

Table 1: Pivot tables of local and outside trading with (observed) and without (expected) regional preference, 2007–2016

Number of transactions

Observed

	GUAYAQUIL	QUITO
GUAYAQUIL	8,388	10,191
QUITO	6,899	22,807

Expected

	GUAYAQUIL	QUITO
GUAYAQUIL	6,072.75	12,506.25
QUITO	9,214.25	20,491.75

Row percentages

	GUAYAQUIL	QUITO	Total
GUAYAQUIL	45%	55%	100%
QUITO	23%	77%	100%
Total	32%	68%	100%

	GUAYAQUIL	QUITO	Total
GUAYAQUIL	33%	67%	100%
QUITO	31%	69%	100%
Total	32%	68%	100%

Amounts traded in USD

Observed

	GUAYAQUIL	QUITO
GUAYAQUIL	1,036,499,684	1,243,904,104
QUITO	1,092,533,536	1,993,718,898

Expected

	GUAYAQUIL	QUITO
GUAYAQUIL	922,054,170	1,358,349,620
QUITO	1,206,979,053	1,879,273,381

Row percentages

	GUAYAQUIL	QUITO	Total
GUAYAQUIL	45%	55%	100%
QUITO	35%	65%	100%
Total	40%	60%	100%

	GUAYAQUIL	QUITO	Total
GUAYAQUIL	40%	60%	100%
QUITO	39%	61%	100%
Total	40%	60%	100%

rather than the expected 61 percent on local sales in terms of amounts and 77 percent rather than 69 percent in terms of number of transactions. Guayaquil dealers sell to Quito counterparties in 55 percent of their trades rather than 60 percent in terms of amounts and 55 percent rather than 67 percent in terms of number of transactions. Quito sells to Guayaquil 35 percent instead of the expected 39 percent in terms of amounts and 23 percent instead of 31 percent in terms of number of transactions. Guayaquil dealers sell 45 percent within their domicile instead of the expected 40 percent in terms of amounts and 45 percent rather than 33 percent if we look at number of transactions. In contrast to what would be expected in a market with no regional preference on trading, the empirical Ecuadorian securities market shows a higher propensity towards local trading in the close-knit and more localised community of dealers from Quito, as well as in the less dense group of dealers from Guayaquil, which is more favorable to outside trading.

Egoist trading

Figures 3 and 4 present several edges displayed in the form of loops. This means that the same brokerage house is the buyer and seller in the transaction. This is possible as private dealers can trade on behalf of several clients. I have called this "egoist trading" and it is possible and important in a complex or multigraph model.

Egoist trading is very significant in the Ecuadorian securities market. At 12.98 billion USD it accounts for 28 percent of the entire private market. Without a multigraph model that includes loops, important information for understanding the Ecuadorian securities market would be missing. In fact, analyzing such edges provides new evidence about the regional dimension of the market.

One way to address loops in a regional analysis like this is to include them as part of a corresponding domicile. After all, a node containing a loop has its domicile in either Quito or Guayaquil and therefore belongs to the groups we have studied as regional subgroups. The consequence of doing this is that differences between local trades and those between domiciles are inflated and one may be too hasty in concluding that there is a clear two-community division in the market. By contrast, I have preferred to inspect the regional dimension of loops.

Egoist transactions in the ten years analyzed account for 52.4 percent with regard to dealers with their domicile in Quito and 47.6 percent as regards those from Guayaquil. There is a slight difference in favor of actors in Quito in the global result, but more interesting is the participation of each domicile when data are examined year by year (Figures 8 and 9).

Generally speaking, dealers from Quito participate more broadly in egoist dealing, which adds to the findings about this close-knit community in the market. Nevertheless, it is interesting to observe the ups and downs in terms of participation (Figure 8) and also in amounts traded (Figure 9) between the years 2008–2009 and 2014–2015. In these years, Ecuador suffered external shocks after the 2008 world financial crisis and in 2014 with the collapse of oil prices and

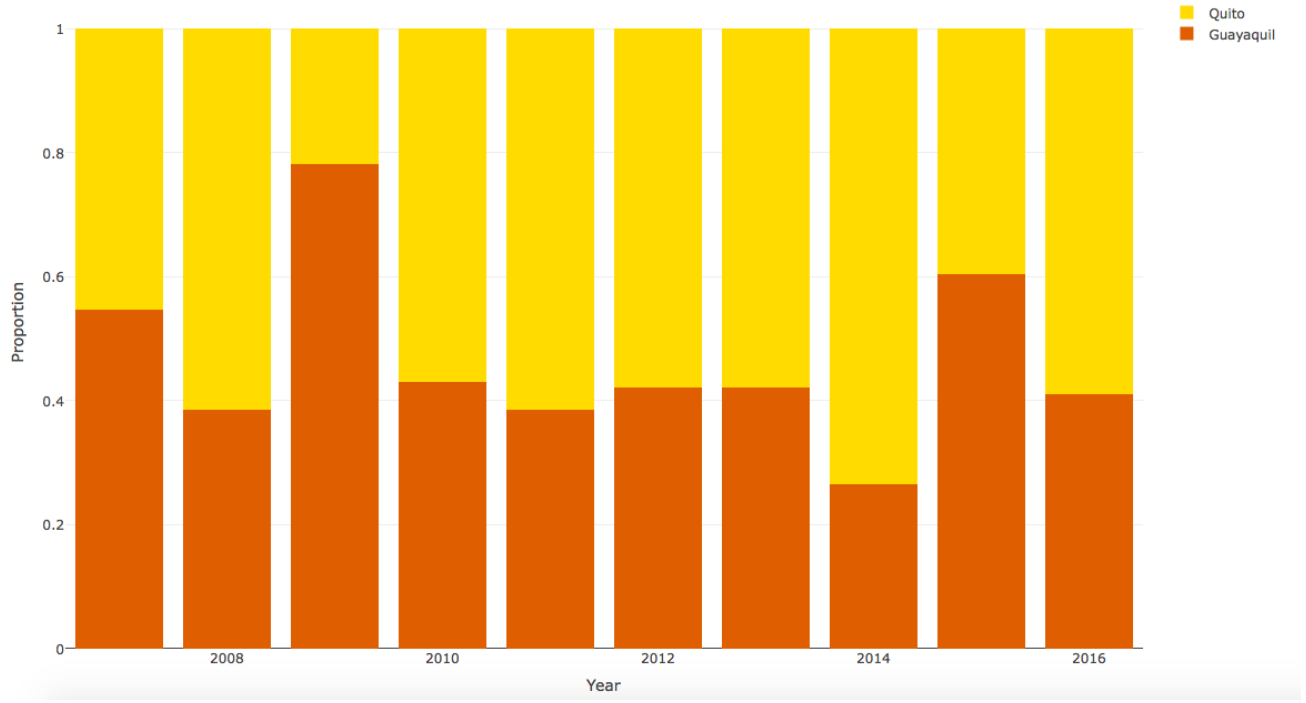

Figure 8. Participation of Guayaquil and Quito in egoist dealing, 2007–2016

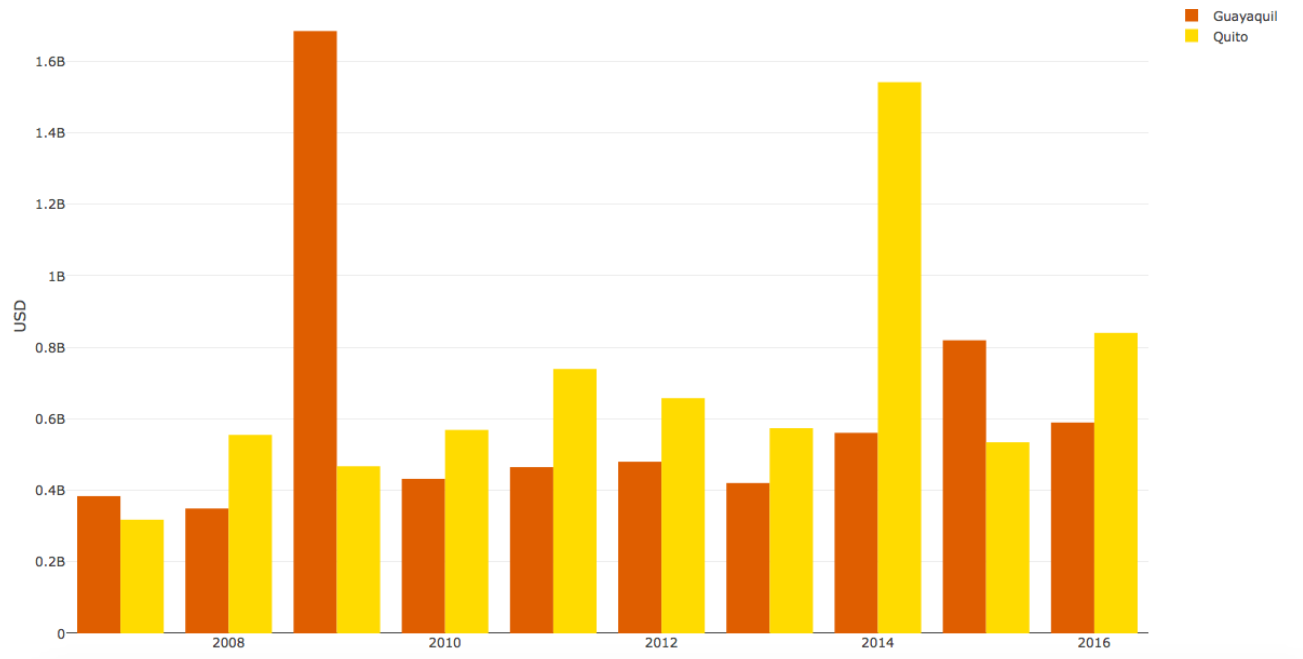

Figure 9. Levels of egoist dealing in Quito and Guayaquil, 2007–2016

the appreciation of the dollar exchange rate. Looking at the way dealers in each domicile coped differently with the external shocks could certainly be a subject for further research.

So far, I have reported on the differences in egoist trading in terms only of dealers from different domiciles. But we should not forget that, in the first place, egoist dealing is explained by the fact that a brokerage house can represent multiple clients. Can we extend the regional analysis beyond the brokerage network into the hiring network between clients and dealers? Unfortunately, secrecy regulations obstruct access to a more complete set of information. Nevertheless, the data currently available can be divided into primary and secondary market transactions, which makes it possible to match the issuing firm with the dealer that sells freshly structured securities for the first time. In Ecuador, brokerage houses are in charge of structuring issuances and of dealing those securities in the market for the first time. Because syndicated structuring processes are very rare in the Ecuadorian securities market, the match between the issuing firm (the client) and the dealer is a good proxy for hiring in the primary market.

Running this analysis, I found the following results, with which I will conclude reporting on the findings of this paper. A total of 73 percent of primary market sales deals by Guayaquil brokerage houses are done on behalf of a client domiciled in Guayaquil; that corresponds to 80.4 percent when calculated not in terms of number of transactions, but in terms of amounts sold. For dealers from Quito, 77.9 percent of their primary market selling transactions are done on behalf of clients also with domicile in Quito; that corresponds, in amounts traded, to 79.7 percent of the selling operations of this group of dealers in the primary market. In the secondary market, it would not be surprising if local preference again played a role, but we cannot substantiate this claim from empirical evidence. Nevertheless, it seems that they keep their close and more important clients very local.

Final remarks

Economic sociology has shown how empirical markets are far from being the "ideal markets" that are assumed by neoclassical economic theory. Social devices that play important roles in facilitating efficiency or keeping incumbents are core objects of study of economic sociology (Beckert, 1996; Fligstein and Dauter, 2007). I have devoted this text to exploring whether the *regional issue* (Maiguashca, 1992) – a complex phenomenon that could be summarized as permanent tension between the two most important cities in Ecuador – is indeed a relevant explanatory of a securities market that behaves differently from the general trends of the development of financial markets both in the region and across the world. To do so, I have relied on social network analysis, using a model that combines simple and multigraph networks. By means of graphical analysis and several density metrics and also by taking a close look at local and outside trading I have provided evidence that seems to support the assertion that there is indeed a regional issue that needs to be explored carefully.

The analysis shows that there are preferences for local trading and doing business, despite the expected structure of trading and notwithstanding the fact that the market could certainly be more interconnected. In contrast to what might be expected in a market with no regional preference on trading, the empirical Ecuadorian securities market shows a greater propensity towards local trading in the close-knit community of dealers from Quito, as well as in the less dense group of dealers, more prone to outside trading, from Guayaquil. Egoist trading is an important feature of trading relations and also reflects the regional issue when it is explored in detail.

Turning to possible further developments, the evidence presented in this paper should be subjected to further exploitation and testing. Also, this network should be explored further to check for other formations that could be part of the regional dimension or interact with it, and other variables available in the data can be included to broaden the scope of the research. As I have commented throughout the text, it is important to include the state as an economic actor in the market and also account for its role as a regulator. Finally, it is important to note that other devices that are not easily grasped by the network metaphor might be in play and should be taken into account. This is part of the larger research in which the exploration discussed here is embedded.

Endnotes

1 In sociology, the use of networks as a way of representing social systems can be traced back to the work of Georg Simmel and his claim of the importance of the *triad* as the unit of analysis of sociological phenomena (Degenne and Forsé, 1999; Simmel and Wolff, 1964[1908]; White *et al.* 1976). Several decades later the *New Economic Sociology* reclaimed economic action as an object of study and some of its key exponents did so with the use of networks. It was then that Harrison White and Mark Granovetter, who had already used the network metaphor in empirical explorations of social capital (Lorrain and White, 1971; Granovetter, 1973), brought to light the first works on markets relying on social networks analysis. In 1971, White claimed that "networks will probably become as important to sociology as Euclidian space and its generalizations are to physics" (Lorrain and White, 1971: 77), while Granovetter, in his seminal paper "Economic action and social structure: The problem of embeddedness" (Granovetter, 1985) called for the use of network analysis as the key tool for a sociology of economic action. Following these emblematic claims, a broad and fruitful line of work was triggered and continues to be developed today.

2 Ecuador is an upper middle-income country, which in 2016 had a population of 16.39 million and a GDP of 97.8 billion USD (source: World Bank). Its economy largely relies on the production and export of primary goods. Ecuador has had a dollarized economy since the 1999–2000 economic and financial crisis.

3 Quito is the country's capital, sitting at 2,850 meters above sea level in the Andes mountain range. It is the second largest city. It holds most of the country's bureaucracy and its relevant economic activities are the service sector, commerce, and some industry. Guayaquil is the largest city and the country's main port. Its relevant economic activities are commerce and industry (mostly linked to the agricultural sector).

4 Maiguascha (1992) speaks of a third relevant region-city in the southern highlands, Cuenca, which could be included in this analysis. There are significant issuers in the market that are domiciled in Cuenca and there are records of a failed attempt to create a securities exchange there, to name a few considerations. Nevertheless, the *regional issue* has been to a great extent bipolar and that is how it is generally reflected in the Ecuadorian securities market.

5 In the period of analysis, 25 types of securities were issued and traded in both exchanges of the Ecuadorian securities market, as well as registered in the Public Registry of the Securities Market *(Catastro Público del Mercado de Valores)*, which is administered by the Superintendence of Companies, Securities and Insurances. There are securities, mostly from issuers from the SME and Cooperative Sector, which do not legally require formal registry and are still traded in the national exchanges. Those are available in the data and have been recorded as non-registered. Despite that, the analysis presented in this article makes no distinction between *types of securities* while accounting for transactions (edges), although it is certainly a subject for further exploration. The greater relevance of fixed income over equity trading, as well as the role of securitization processes in the market can be explored using this distinction.

6 Egoist trading exists also among state institutions. In this case, loops are not useful as state institutions always trade with another entity. Nevertheless, from a financial viewpoint, liquidity that moves from one institution to another but never leaves the state is a form of *egoist trading*. Local governments can issue securities but should be considered separately as they are not part of the central administration. It is also important to say that they need to hire a brokerage house to issue and trade on their behalf.

7 Available at: www.ekosnegocios.com/empresas/sectores.aspx

8 A few nodes either appear or disappear from the dataset during the 10-year period. This happens when a brokerage house emerged as a new dealer in the market at some point, closed its operations, merged or sold out and changed its name. To a great extent, the year-by-year analysis helps overcome this problem while also pointing to relevant changes in the period of analysis that could be the subject of further exploration.

9 On 2007 there was a single broker that had no domicile in Guayaquil or Quito, but in the coastal city Manta. It is depicted here but plays an insignificant role in the analysis.

10 Although not a limiting factor in this analysis the existence and stubborn persistence of two exchanges in such a small market is

pertinent evidence of the importance of the regional issue. This can be the subject of further quantitative analysis, as well as a historical explanation of why actors hold on to this scheme.

11 This is constant in the period of analysis even after 2015 when the transactional systems of both exchanges were interconnected by a regulatory instruction.

12 The number of ties in a network as a proportion of all possible connections: n(n – 1)/2

13 The proportion of mutually connected nodes compared with those not connected and those non-reciprocally connected.

14 This is less than 10 percent of the total amount of market transactions for the period analyzed. This shows the relevance of the egoist transactions and of the state as an economic actor. As mentioned before, the state will not be a subject of discussion in this paper but we will come back to egoist trading as it says something about the regional separation in the market.

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Neo-structural economic sociology beyond embeddedness

Relational infrastructures and social processes in markets and market institutions

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"Whoever imagines that masters rarely combine is as ignorant of the world as of the subject. Masters are always and every where in a sort of tacit, but constant and uniform combination."

Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations.

Introduction

In the context of the sophisticated division of labor in contemporary economies, a majority of individuals, organizations, and institutions participating in economic production, exchange, and consumption are thrust into open forms of competition imposed by contemporary capitalisms; in other words, neoliberal public authorities and global companies shaping the contexts and lives of smaller, less powerful actors. To dominate and/or survive, all have strong incentivesto play complex games of cooperation among competitors. Along with capital, labor, and natural resources, cooperation among competitors is seen here as a "fourth factor of production." The research program focusing on this phenomenon combines White's (1981, 2001) perspective on production markets extended to the "Economie des Conventions" (Favereau, 1994, 2002) with a theory of collegiality as collective action among rival peers (Lazega, 2001), thus bringing together structure, culture, and agency (individual and collective) in a new way.[1] In order to accomplish this, we define markets as both bureaucratic and collegial (Lazega and Mounier, 2002), and socio-economic relationships both as channels for heterogeneous resources and as symbolic commitments that have to build their credibility. These commitments are equivalent to a promise, an obligation, or a convention introducing time into the exchange of resources. They rely on social control and conflict resolution to make such commitments credible.

Our work on cooperation among competitors assumes that we live in a stratified and multi-level organizational society (Perrow, 1991). With some exceptions, it looks mainly at intra-class cooperation among competitors. Class differences between small entrepreneurs and high-level executives in these systems matter enormously and are often more conducive to brute force exploitation and violence across levels than to cooperation. The kind of cooperation among competitors on which we work is usually within-class, between actors who tend to share the same position at the meso level of society, for example in the economic market in which they are players or in institutions of joint regulation of markets in which they acquire responsibilities. This, as we shall also see, does not preclude cross-level between-class interactions and activities that can be cooperative – but addressing systematically all the complexities of meso–macro relationships in society remains a future prospect of economic sociology in general, including ours.

This short presentation is a "go to" summary providing interested readers with indications of our development of this neo-structural economic sociology. The notion of a social discipline that is perceived as legitimate by members of a social milieu is an important notion for understanding the contemporary form of cooperation between competitors. This form of cooperation relies on two dimensions of the very general notion of social discipline. A first dimension is located at the individual level and can be observed in the relational and symbolic work previously discussed. Actors are equipped with a social rationality (Lazega, 1992), thanks to which they design common projects and invest in relationships to manage their interde-

pendencies via multiplex social exchange. The second dimension of the notion of social discipline exists at the collective level, although it is also endogenized by individual members. We refer to this second dimension as relational infrastructures.[2] These infrastructures include horizontal and vertical differentiations in the social milieux of interdependent entrepreneurs. Horizontal differentiations correspond to systems of niches and vertical differentiations to heterogeneous forms of status. *Relational infrastructures* are crucial for the deployment and steering of key *social processes* usually associated with collective action among interdependent peers. We focus on such processes because they can help actors in managing the dilemmas of their collective actions: collective learning and socialization, bounded solidarity and exclusions, social control and conflict resolution, regulation and institutionalization. Our methodological contribution offers models of such processes using socio-economic network analyses mixed with other methods.

Observatoire des Réseaux Intra- et Inter-Organisationnels (ORIO Network) is a research group that was created in 2003 with help from the Institut Universitaire de France *(http://www.iufrance.fr)* to develop neo-structural approaches in sociology and to research contemporary societies as organizational and market societies. Information about its membres and activities is available here: *http://blogs.sciences-po.fr/recherche-network-organization-institution-dynamics-multilevel*
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An entrepreneur's social niche can be defined as the subgroup of other entrepreneurs with whom he or she has particularly dense, multi-functional, and durable relationships linked, directly or indirectly, with his or her production activities. It then constitutes a pool of privileged partners in the exchange of these resources, at the inter-organizational level. A niche makes sense only in a system of niches identifying a division of work based on the concept of structural equivalence (White *et al.* 1976) and social homophily. It can be detected in a social milieu by its strong relational cohesion and by the presence of some form of generalized exchange measured as relational cycles of direct and indirect reciprocity. The precise contours of a social niche as an empirical entity capable of organized collective agency are sometimes difficult to grasp, for its members as well as for the observer.

In addition to niche-seeking, the quest for status – that is, the "importance" of the individual in the collective – creates another relational infrastructure on which collective action among rival peers relies. The multiple exogenous dimensions of social status classically defined by Max Weber can be measured as concentrations of different kinds of resources (economic, political, and social). With more endogenous measures such as those offered by network analysis (essentially measures of centrality and prominence), additional and heterogeneous dimensions of status are brought into the picture. Exogenous and endogenous status competition gives access to a mandate to represent the collective, to gain authority, to control resources, and to the capacity of defining terms of social exchanges. This approach to status both relies on and reaches beyond Podolny's (2011) definition of status as indicative of quality and as criterion for the selection of exchange partners in situations of market uncertainty.

Also beyond Granovetter's (1985) embeddedness studies and critique of theories for which economic transactions are under-socialized or over-socialized, our neo-structural economic sociology focuses on modeling this social discipline, relational infrastructures, and social processes in collective action among entrepreneurs. From this perspective, cooperation among competitors – for example, in partnerships or joint ventures between companies and their subcontractors, in joint R&D programs, in industrial districts, and so on – is an oligopolistic game. Oligopolies emerge notably to protect entrepreneurs from merciless monopolistic competition, helping them impose jointly dictated or "suggested" prices and rules. Entrepreneurs may overtly or secretly look for opportunities to eliminate competitors. But as Adam Smith's words above indicate, in waiting for such opportunities, an intermediary objective is to collectively reproduce the market by maintaining common relational infrastructures and agreements for coordination and collective action. Markets with oligopolistic structures are therefore the rule more than the exception. Our methodological choice has been, over the years, to study "collegial oligarchies" or "collegial pockets" in market areas, thus examining articulations between strategies of elites and strategies of small and medium-size actors often struggling for survival.

Finally, managing cut-throat competition with durable cooperation based on relational infrastructures and social processes among competitors does not depend exclusively on shared varieties of such social disciplines. It also depends on the knowledge and recognition of that discipline by public authorities involved in social control and regulation of markets. New questions arise from shifting boundaries between private and public spheres in society. The growing privatization of public services, for example, increases the influence of business and cooperation among competitors on public policies (often open penetration – through governance – of the State apparatus by business), both economic and social policies. Under

such conditions, one of the main tasks of neo-structural economic sociology is also to focus on (ethnographically observable) specialized social settings in which interdependent entrepreneurs carry out political work promoting their regulatory interests and specific designs for the organization of markets. By shedding light on their social discipline, this work offers new insights into public/private institutions and ecologies of institutions regulating markets –institutions often characterized by discretion and opaqueness. Such insights can also contribute to strengthening public interest in new and polynormative forms of "joint regulation" of markets (that is, by business itself and public authorities) that characterize Western forms of capitalism.

Multiplex social exchanges: The entrepreneur's relational and symbolic work

Organizations in general, be they public administrations or private enterprises, individual or multinational, do not conduct their business in isolation. They are necessarily resource-dependent (Aldrich and Pfeffer 1976), which forces them to establish links of cooperation with other organizations. These relationships are expressed within a more or less defined legal and social framework. Levine and White (1961) already laid down the foundation for an analysis of inter-organizational relationships in terms of exchanges and resource-dependencies (Aldrich and Marsden 1988). These inter-organizational resources, exchanged through multiplex links, consist of information, goods, and services that are not necessarily of a purely monetary or functional nature. Therefore, cooperation among competitors requires symbolic work and social exchanges establishing personalized relationships with competing peers, using both threats (for example, of open economic war and cut-throat practices) and promises (for example, of shared benefits).

Cooperation between competitors thus presupposes important relational and symbolic activities within social exchanges. Numerous studies of the complex, sometimes paradoxical relationship between the entrepreneur's relational capital and the various forms of economic performance (survival, profits, growth, and so on) (Burt 1992 2005; Ingram and Roberts 2000; Uzzi 1999) illustrate the importance of social exchange. For Burt (2005), a successful entrepreneur has a network that is dense within and sparse beyond the group or organization in which he belongs. Working beyond Burt's approach, Comet [2007] shows that craftspeople in the French construction industry need to juggle with several business models in order to survive: as subcontractors for large bureaucratic building companies; as individual craftspeople for personal clients; as contractors/subcontractors with their fellow craftspeople when their building sites are too large for a small individual business. Given the diversity of business models, the situation requires multiplex relationships and cooperation skills with fellow craftspeople. Comet's research shows the various ways in which multiplexity becomes a source of economic performance depending on each entrepreneur's variability of tasks and specific technical constraints in construction sites.

At the level of giant financial or industrial holdings as well, cooperation among competitors by building, maintaining, and dissolving relational infrastructures is part of complex adaptation to markets. Delarre (2005) has shown that, in France, holdings of French enterprises (1991–1999) tend to fit that model, too. These groups form new social entities characterized by dense and multiple exchanges between the enterprises that they cluster. The empirical phenomenon of strategic alliances offers the possibility of observing social niches founded on multiple exchanges between partners. Delarre describes different types of resources circulating within such business groups: capital, personnel, expertise, control, and so on. In spite of the crystallization of such a social entity, holding groups of enterprises remain flexible enough to last longer than might be expected. They notably do so by structuring group-level labor markets. By rapidly laying off and reshuffling members in the companies that they administer (15 percent turnover per year), these groups maintain a constant watch over the evolution of markets. They are thus capable of managing the fundamental problem of the "paradox of embeddedness": being neither too "embedded" (that is, immobilized in a collective, cohesive, and stable configuration), nor too "disembedded." They can find a balance and durability that explains their domination over the contemporary French economy. This does not stop them from encouraging their personnel to buy shares in group enterprises that are scheduled to be liquidated very quickly.

Relational infrastructures in social processes

Analytically speaking, relational and symbolic work creates relational infrastructures, and the latter trigger or facilitate, in turn, social processes in what Berkowitz (1988) calls "market areas." Reconstituting relational infrastructures – in particularistic forms of

solidarity (and the discriminations and exclusions that come attached), in collective learning and socializations, in social control and conflict resolution, and in regulation and institutionalization of new norms – provides evidence of the existence, at the collective level, of the social discipline among competing entrepreneurs in which we are interested. The articulation between relational infrastructures and social processes in social discipline can be illustrated with examples of empirical research on these four generic processes. These processes are not mechanical in the sense that they would exist independently of individuals' intentional efforts. But they are social mechanisms on which individual actors are nevertheless embarked. They are triggered by relational work and eventually escape individuals' control in a Mertonian sense.

Collective learning

The first social process facilitating collective action between competitors is collective learning. In highly technological societies and economies, which value research and innovation exploiting this technology, collective learning in the exchange of tacit knowledge and sharing experience (Polanyi 1967) represents a crucial process. It has long been studied in management (Cohen and Levinthal 1990; Nonaka and Takeuchi, 1995) and a rich literature reports research on the process of learning in strategic alliances. Organizations seeking quantitative and qualitative competitive advantages mutually monitor one another (White, 1981). Enterprises establish alliances because they hope to benefit, among other purposes, from the learning resources to which such links give access. Companies are particularly attracted by new know-how, techniques, and competencies from alliances with other companies (Kogut and Zander 1996; Powell *et al.* 1996). But at the level of sophistication reached by contemporary technology, these enterprises seek to learn from each other while at the same time trying to compete on strategic aspects, such as market distribution. In this complex learning process, social interactions and informal relationships that are more or less collusive are decisive for social exchange of tacit knowledge. In particular, where entrepreneurs depend upon one another for unbillable exchanges of opinion and advice, the collective nature of production and certification of quality often corresponds to hidden costs carried by the milieu ("the profession"), its institutions, and its most important actors (colleagues with "reputation").

Examples of modeling collective learning among competing entrepreneurs based on information sharing and advice relationships are provided in research by Pina-Stranger (2008), Oubenal (2015), and Montes-Lihn (2017).

Pina-Stranger's (2008) studies collective learning between entrepreneurs in the French biotech industry. Entrepreneurs from this milieu face very high levels of risk: a product development timeframe is rarely shorter than ten years; capitalistic needs can be satisfied only by a small number of financial actors, notably venture capital; there are increasingly demanding regulatory constraints on product registration; and there are also difficulties related to the innovative and complex nature of activities linked to therapeutic prescriptions in life sciences. These entrepreneurs evolve in an environment in which competition is permanent: they fight to obtain grants and subsidies from the State, to be granted use of an incubator or to be admitted into a "pole of competitiveness" ("*compétitivité*") to reach private investors or win a contract with a pharmaceutical company. In this context, Pina-Stranger examines advice, friendship, and business networks among the 140 biotech entrepreneurs specializing in human health in France. Analyses show that in the absence of any contractual relationship, scientific entrepreneurs in these diverse and small companies are involved in multiple, reciprocal relationships, building forms of bounded solidarity in specific social niches. In very open business models, based on the maintenance of a multiplicity of contracts with various partners (direct investors, investment banks, suppliers, notation agencies, public institutions, subcontractors, and so on), they often count on locally direct competitors to validate their choices, thus informally integrating the latter's judgments in their decisions. One of the outcomes of this research is to show that inter-organizational collective learning is different from the same process at the intra-organizational level (Pina-Stranger and Lazega, 2010). At the intra-organizational level, epistemic disagreements are solved by centralization and alignment on high-status opinion leaders. In this context, members tend not to seek advice from others "below" them in the organizational status hierarchy. At the inter-organizational level, absence of a formal hierarchy encourages entrepreneurs to invest heavily in relational activity. This behavior allows them to keep their status in a context in which epistemic conflicts become entrenched, following a polarization process, in different epistemic communities. This difference has implications for the way in which a collective solves the problems related to the creation of a hierarchy between different bodies of appropriate knowledge.

Montes-Lihn (2017) shows how wine producers manage the transition to organic and biodynamic farming by relying on networks of informal advice

among competing peers. Farming based on ecological alternatives prohibits synthetic chemicals. This restriction represents a technical challenge and leads to the introduction of a new set of agronomic practices. The adoption of organic practices is seen by wine producers as a risky decision with strong economic and symbolic (prestige-related) consequences in case of failure. In that sense, information that they may share to make appropriate technical decisions through advice networks is key. Montes-Lihn shows that advice sharing and discussion among over 60 wine-producers in the Burgundy Region in France are part of a larger socialization process that requires a strong relational and ideological investment, signaling a commitment to shared ecological values. Adoption of green practices is far more than a mere technical issue. This study identifies two simultaneous learning processes. The first is based on homophily among wine producers within the boundaries of social niches. The social boundaries defining the profile of the participants in this specific learning process are determined by common values. In the second learning process, knowledge is shared beyond the boundaries of social niches. It maintains a ratchet effect in ecological transition. This learning process is coupled with a socialization mechanism because experienced wine producers tend to initiate novices into the implicit social norms on which the professional milieu is founded. Ethnographic work shows that this socialization mechanism (learning and reminders of social norms that come attached) present in the second process is led by the experienced wine producers. Socialization aims to preserve the collective, sometimes exclusive ways in which knowledge is shared and the values that have guided experienced producers' own ecological transition.

Oubenal (2015) looks at how information about new financial products is managed by market players promoting these products based on the idea that they are risk-free. This orchestration of the circulation of information about the products is examined in the network of social relationships between the players in this market. Promoters with specific forms of epistemic status in this community (in particular, university professors in key business schools) facilitate the diffusion of a positive and reassuring discourse in academia and the press, even if their financial products are complex and represent much riskier investments than acknowledged. Specialized journalists do not have access to actors who could provide them with relevant information about the riskiness of the products unless their articles contribute positively to the overall project. They are subjected to a form of social control that strengthens the social construction of ignorance of risks in this financial market.

Particularistic solidarities and discriminations

Echoing previous work in the literature, such as that of Ingram and Roberts (2000), a second social process facilitating collective action by interdependent but competing entrepreneurs is a form of particularistic, bounded solidarity. It is represented by the creation, often in social niches within the collective, of informal systems of multiplex generalized exchange, as already identified. Such a system helps members exchange several types of heterogeneous production-related resources, directly or indirectly, allowing for lasting circulation, while also partially suspending behavior perceived as opportunistic. As already discussed, the analysis of "complete" networks allows the observation, in and between organizations, of the presence of cyclical relational substructures characterizing indirect and deferred reciprocity, with their potential implications for direct or indirect forms of social exclusion and discrimination. The analytical connection between the notion of social niche and that of particularistic solidarity, measured by the existence of indirect reciprocity, requires that the latter be based notably on the identities, boundaries and norms defined by the former.

Here the articulation between the search for social niches and status competition at the inter-organizational level deserves special attention. A striking example is provided by Eloire (2007) in his study of restaurant owners in the city of Lille. His analyses of social networks among more than 300 restaurateurs identify the coexistence of several Whitian markets varying along a culturally coded quality schedule. He detects a specific form of homophily in this network: restaurant owners seem to have a stronger propensity for exchanging with colleagues whose restaurants belong to the same type of sub-market. For example, owners in White's "paradoxical" sub-market (that of high-end restaurants of gastronomy chefs) are more central and strongly homophilous and exclusive. A central social niche that structures this milieu and in which high-end restaurant owners, far more relationally active than others, share interesting business information pertaining to subjects as varied as staff, suppliers, food, or overhead expenses. This central niche maintains social distances, in the friendship network, with a second social niche bringing together younger, yet to be consecrated chefs. Unlike general discussion networks, networks focused on transfer or exchange of interesting business tips are much more confidential and selective. Indegree centralities in the latter network show that strategic information is very unequally distributed between the members of this occupation. Cooperation in this milieu is indeed driven by both status competition (for stars in famous guides)

and niche homophily. Within social niches, Eloire clearly finds special forms of particularistic solidarity between these restaurateurs. The fact that these niches do not seem to bridge different kinds of sub-markets tends to reveal social class logics in this form of bounded solidarity: sub-markets in this milieu are stratified socially, economically, and culturally.

Bounded solidarity based on variable combinations of social niches and status competition have also been identified among corporate elites in France (Comet & Finez, 2010; Finez & Comet, 2011) and in Morocco (Oubenal 2016; Oubenal & Zeroual, 2017).

Social control and conflict resolution

This example stresses that the existence of social niches and the recognition and acquisition of various forms of status also facilitate a third process, that of social control in the business world (but also sometimes the deactivation of such relation-based controls). It must nonetheless be noted that few neo-structural studies examine the importance of niches and of status competition for control and rule enforcement. At the inter-organizational level, social niches are far more often identified as sources of deviance or corruption, or considered infractions of antitrust laws. However, much more than at the intra-organizational level, organizations' selective relational "investments" in each other raise the problem of sunk costs (when partners behave in an opportunistic way). Relational processes prove necessary for treating questions of first- and second-order free-riding problems. This is not new because previous sociological approaches to social control in the business world insist on use by actors of ex ante methods based on reputation, considered by institutional economists to be a powerful governance mechanism (Macaulay 1963; Raub and Weesie 1993). Entrepreneurs who wish to maintain long-term economic relationships with partners worry about their reputations. But this reputation does not belong to them; it is the product of evaluations and critiques from their partners and the milieu of other entrepreneurs concerning their behavior, their reliability, their creditworthiness, and so on (Burt 2005).

One approach consists precisely in observing legal institutions used by entrepreneurs to solve their conflicts. A study of social control of business by lay "consular" commercial courts in France shows how competition for social status (among other mechanisms) has allowed such an institution to last for nearly five centuries. A longitudinal network study of 238 judges at the Commercial Court of Paris, an institution founded in the sixteenth century, exposes precisely that kind of process. Lay judges coopted into this court act as individual voluntary judges, as well as representatives (in theory without specific mandates) of the local business community. Observation of this organization shows that half of these judges have a legal background. Twenty-nine percent (between 2000 and 2005) among them come from the banking and finance sector, an obvious overrepresentation which, in most European and Anglo-Saxon countries, would raise questions about impartiality and conflicts of interest (or at least the appearance of conflicts) – especially in a jurisdiction handling bankruptcies, as well as ordinary contract-related commercial litigation. Analysis of the dynamics of advice networks between these magistrates shows that the bankers with law degree have a very high "epistemic" social status in the court; over time they tend to become increasingly influential among their colleagues, for example in issues related to contract breach, assessment of damages, unfair competition, conflicts between boards and minority shareholders. Thus, their specific form of social status is used at the inter-organizational level, via this institution, to remote-control local business communities in a framework of joint regulation of their markets. Social niches also emerge within this institution, as in the conflict between, for example, a cluster of bankers with a law degree and another cluster of judges coming from the building industry: the two are strongly opposed on matters of punitivity and interventionism in markets and in boards. This articulation between niches and statuses seems to facilitate the social control of markets, but at the price of domination of the court by the banking industry and its brand of pragmatism and criteria of commercial justice (Lazega and Mounier 2008). The question arises whether such mechanisms of social control of business and contractual activity actually increase unequal conflict resolution between small and large businesses, or between producers and consumers.

In the same spirit, Comet (2011) shows how a Ponzi scheme can be based on manipulation of lateral social control by con crews abusing solidary and trusting relationships, using their victim's social network to escape social controls usually at work around financial operations, allowing the deviant system to feed upon itself. In an extraordinarily rich and ongoing project on social control in the management of common pool resource institutions (CPRIs), Brailly and Faye (forthcoming) measure longitudinal social networks between households in seven villages in a region of Senegal where management of scarce water resources is both formally institutionalized and informally carried out by villagers themselves using these personal ties. Beyond Ostrom (1990), they use a sociological neo-structural approach to show that sanctions for members pumping more water than allowed can be less impersonal than expected by CPRI theory, more

personalized and based on relational infrastructures found in the community. Social control in the commons is thus shown to be based on a combination of two mechanisms. The first mechanism allows the members of a community to lower the costs of exercising control by using their personal ties and low punitivity for that purpose, especially for targets of social control that are personally close to them. The second mechanism consists of using an executive committee ("the board") – that is, a more formal process – for more impersonal and more punitive sanctioning, for targets either very close to or socially distant from the respondent. Combining both mechanisms is meant to avoid oppositional solidarity between respondent, sanctioners, and targets.

To our knowledge, research only scratches the surface of all the ways in which relational infrastructures help interdependent entrepreneurs monitor and sanction each other before resorting to legal proceedings. Social studies of finance also show that financial actors exchange information and engage in collective actions among competitors (Abolafia 2001; Baker and Faulkner, 1993; Mackenzie and Millo, 2003). While financial markets are considered to be spaces of fierce competition, recent investigations related to the Libor and Euribor scandals have shown that they actually involve systematic collusion and conflicts of interest.

Regulation and institutionalization

The neo-structural approach has been particularly used to explore and model the fourth, most political process of regulation and institutionalization of new norms, namely the redefinition of the rules of the game between interdependent but competing entrepreneurs. Formation of norms and definition of standards stabilizing commitments and social exchanges in situations of uncertainty has long been an issue in institutional economics (for example, Commons 1924). This regulatory process is in fact one of institutional adaptation, as well as institutional change and redesign. Here again, competitors cooperate in order to establish a common language of reference and common norms. In this area, beyond neo-institutional culturalist and cognitivist approaches, neo-structural sociology often relies on conventionalist and regulationist economists, for whom the role of rules and institutions, whether formal or informal, is crucial in explaining entrepreneurs' cooperation and the performance of markets in general (Boyer, 2015; Favereau 1989, 2002; North 1991).

Public regulation of the economy using incentives is a traditional domain of political and institutional economics. Neo-structural sociology, in a Selznickian (1949) vein, has contributed insights into the efficiency of such incentives (Varanda, 2005). For example, in the case of the city-center commerce of a medium-size city in Portugal a network study using blockmodelling shows the existence of social niches and different forms of status among shopkeepers, creating particularistic forms of solidarity that encourage or undermine participation in a policy program, namely attempts to modernize tourism as an industry. One block, composed of the board of the trade association ("formal" leaders of city-center commerce) and those close to them, promotes participation and acceptance of an incentive program offered by the city, which does not disrupt the status quo. Another social niche is composed of the group of young shopkeepers who do not accept these incentives and build their social status by breaking with the status quo – for instance, by systematically opening their shops on weekends. No group wants to let go of their position. Status competition, age, and cultural homophily impede a broader solidarity and lead to the failure of modernization.

Business has always tried to participate in the regulation of its markets and create self-contained, autonomous, often public–private normative orders smoothing market operations. Status competition is an essential element of this regulatory process, whether leading to real changes or to resistance to change. Special dynamics characterize regulation: that of oligarchic negotiation of precarious values (Lazega 2001). The regulatory process for markets looks at how entrepreneurs become institutional entrepreneurs active in the regulation of their markets. Even in an egalitarian system, it can be observed that not everyone defends their regulatory interests with the same efficiency. It is not simply that the strongest impose their rules: rather, network analyses show that actors with multiple, heterogeneous, high and inconsistent (in the sense of socially uncorrelated) forms of status (Lazega 2001, 2016; Lazega and Mounier, 2002; Lazega *et al.*, 2016) are the most influential in this selection of priority norms. They punch above their weight in the regulatory process because they combine a form of legitimacy (an ability to speak on behalf of the collective in a credible manner, especially using the rhetoric of sacrifice of status) with power (the control of resources others need). This approach establishes a link between norms and values, on one side, and interests, power, and structure, on the other. High status inconsistency combined with the right kind of rhetoric, in particular, is important: able to lose status on one dimension because they keep their status along other dimensions, institutional entrepreneurs succeed in buying enough legitimacy to sell stagnation or change to their entire system of actors. In this as well, a form of endogeneization of the structure helps catalyze a very com-

plex process. In the business world, regulation of business is today openly characterized by a great polynormativity (Lazega and Mounier, 2009). The relative weight of the law versus other types of norms depends on the strength that the state and public institutions summon to influence this joint regulation in concrete situations of economic conflict. To contribute to a theory of institutionalization, it is useful to observe that the primacy of law with respect to other norms is not necessarily based on the primacy of the State. It be based on businesses' ability to participate in the definition and enforcement of the law via processes of lobbying and joint regulation (as, for example, in Edelman *et al.*'s [2011] "endogeneization" of law).

As the above example of the Commercial Court of Paris shows, business intervention in the regulatory process has always existed. But it is becoming increasingly more systematic today, as the so-called "regulatory" State tends to establish – in all the domains of public policy – general and vague legal frameworks, leaving the task of defining the substance of the rules to stakeholders contributing to governance, in our case, market operators. Penalva-Icher (2007) offers an excellent example of this type of regulatory process by examining the social construction, in France, of a financial market, the so-called "socially responsible" market promoting "ethical" funds. Actors involved in building this market – mainly trying to lure pension funds and savings institutions – are very heterogeneous. Nuns rub shoulders (and elbows) with bankers, asset managers, extra-financial analysts, union activists, university professors, regulators, and so on. Penalva-Icher examines an intermediate step in the construction of this market, the cooperation between institutional entrepreneurs seeking to impose their concept of "social responsibility" on everyone else. Effectively, in this market, investment vehicles such as shares are selected based not only on the financial performance of companies, but also on social, environmental, and ethical considerations. Analyses of the relational infrastructures of the milieu promoting this market reveal the social discipline that is mobilized to preselect operators allowed to participate in the regulatory process. On the market of socially responsible investments (SRI), ethnographic observation identifies two kinds of important relationships: collaboration and friendship. The analysis of networks of collaboration and friendship between the principal institutional entrepreneurs in this market in 2005 shows that, at its construction stage observed by Penalva-Icher, the market relies on a balance between heavy economic cooperation and heavy social competition. Even if there are no entry barriers in this market, social and informal barriers do exist to becoming a central actor, a true institutional entrepreneur (Penalva-Icher 2008). These social barriers also separate actors with different notions of "social responsibility," thus linking structure and the idea actors hold of their product's quality. If access to the market is free, regulatory activity is "costly" in the sense that, in order to become an important actor in the process, it is necessary to develop personal relational work. At this stage friendship is used by actors as a utilitarian tie excluding many players from the regulatory process, thus allowing for a form of balance between collaboration for the collective construction of the market itself and social competition preserving self-interests. Because of the specific kind of relational infrastructures characterizing this milieu, certain actors have the means to become successful entrepreneurs in the social construction of their market in more than one way: they have different economic, relational, and symbolic resources at their disposal, allowing them to influence regulation. Thus, after having emerged from action carried out by agencies of extra-financial rating pushing for technical norms, the market and its rules are redefined by financiers who impose their own view of SRI and take control of the market through complex strategies of cooptation.

Social networks are also central in peers' use of their status to promote and institutionalize new norms at the transnational level. Their collective work is often collegial by construction (members of a parliament, for example, are all formally equal). For example, we find the same reliance on status inconsistency and rhetoric of sacrifice in transnational settings. A study of combined relational and cultural approaches to transnational institution-building –that of the European *Unified Patent Court* (Lazega, Quintane and Casenaz, 2016) – focused on a network analysis of a small collegial oligarchy with this high status inconsistency and this rhetoric of sacrifice for the collective good. The study of a field-configuring event – called a "conclave" by some of its members – namely the so-called Venice Forum that was central in creating and mobilizing a network of European patent judges for the construction of this new kind of European institution, tracked normative alignments in this collegial hierarchy of judges and their management of divergent interpretations of the contemporary European patent. Using personalized social networks among its members, this collegial oligarchy works on harmonizing European approaches to intellectual property by selecting its institutional leaders based on cultural and strategic calculations of the costs of alignments on these leaders' normative choices and judicial interpretations. Highlighting this underexamined articulation of relational structures and cultural framing in transnational institutionalization shows, for example, how Northern European forms of capitalism tend to domi-

nate in this institutionalization process at the expense of other forms. It also helps us to reflect on the usefulness of analyses of small networks of powerful players in organizational societies, in which power and influence are highly concentrated, as already shown by Laumann and Knoke (1987).

Co-evolutions of social processes

Relational infrastructures and horizontal and vertical differentiations that constitute social niches and forms of social status facilitate cooperation between competitors. It is important for economic sociologists to be able to identify them because these forms are the means by which entrepreneurs seek to structure the contexts of their interactions and social and economic exchanges when they are thrust into open competition. The list of social processes facilitating this collective action between competitors – which can be modeled by network analysis – is indefinite (that is, there is no finite list of these processes) because there are no social processes without a relational dimension. With help from creative statisticians, the neo-structural approach is not limited to these four generic processes or mechanisms. Other relational and informal processes that characterize collective action between interdependent entrepreneurs have been the object of neo-structural formalizations: integration; assimilation; cooptation; balance of powers; evaluation of production quality; extraction of surprising economic performances and exploitation; discrimination; and desolidarization.

These processes remain separate only analytically. Together they contribute to make durable cooperation between competitors possible. They are linked in a dynamic way, for example by retroaction effects. The redefinition of rules can engender new solidarities. Normative beliefs produced by the regulatory process influence, for example, choices of advisors and therefore learning. Controversies in part energize the evolution of structures that facilitate collective learning. They contribute to the endogenous formation of the constraints that actors can then consider legitimate or not, and to which they submit more or less "voluntarily." Research on the articulation between these processes is only beginning. Knowledge of the social discipline that they constitute together and that organizes the business world is necessary to reflect on issues of social control of business and markets.

The articulation of interdependent processes also has an effect on the structural forms reconstituted by the observer and endogenized by the actors. These effects are at the origin of the dynamics of relational structures: new rules can reconfigure a system of niches; exercise of social control can encourage the emergence of new forms of social status and modify principles of status consistency. In turn, the new processes that result from these changes make possible new modes of coordination between interdependent competitors. In order to better understand what it means to be in business in this interpersonal, inter-organizational, and dynamic context, neo-structural economic sociology must develop methods combining the systematic study of longitudinal and multi -level data on identities, trajectories (in the long term), exchange networks, and representations (or controversies).

Developing this approach to cooperation between competitors leads to a re-evaluation of the role and organization of the State in its relationship to markets and the business world. This neo-structural theory offers an approach to this kind of cooperation that is useful for the protection of public interests through social control of business because it is adapted to the latter's complexity. Drawing from Weberian theories concerning the "organizations of regulation of the economy" (*wirtschaftsregulierende Verbände*), economic sociology has, since its beginnings, been concerned with the creation, functioning, and evolution of institutions controlling market operations (Swedberg 1998; Steiner 1999). The state and public authorities have traditionally provided such institutions, notably allowing the business world to manage the risks and problems that competition and contractual activity raise. But business has also participated, from the beginning, in building these institutions, as well as in the legal infrastructure of its markets (Berman 1983; Swedberg 2003). Through their efforts for cooperation between competitors, as previously outlined, entrepreneurs have always sought to define the context of their exchanges, their opportunity structure.

Today, these forms of cooperation between competitors confront public authorities with new problems of social control over markets and business. When individual and corporate actors are thrust into increasingly more open competition, cooperation also becomes, paradoxically, the "fourth factor" of production. The examination of social discipline and cooperation between competitors in the organizational and market society offers new insights into contemporary forms of protection of the general interest. What exemptions should be granted by competition policies when competition is also a matter of delivering quality in public services? In case of financial crisis, which bank should be saved from bankruptcy with taxpayers' money? How should incentives for R&D be designed in a given market area? Old questions can be reassessed using insights from neo-structural sociology on systems of interdependencies, relational work

and social mechanisms facilitating cooperation among competitors.

Using network analyses in this way to model social mechanisms is a useful for understanding cooperation between interdependent competitors. There is a chance that this approach to coordination between interdependent and competing entrepreneurs develops because it seems to be in the best interest of both business and public authorities: the former within the framework of strategy, but also in its efforts to "capture" regulatory institutions or participate in the definition of social and economic policies; the latter in order to carry out its role as a "regulator" in more sophisticated ways and in increasingly complex contexts. However, in this domain, as in many others, expertise is still rarely on the side of public authorities and the general interest.

Towards dynamic multi-level network approaches to markets and market institutions

Social processes are highly dependent on the temporality of collective actions. For example, Montes-Lihn (2017) observes that the temporality of individual decisions is a key variable in understanding how relational infrastructures are endogenized by individuals in specific situations. He shows that, in order to make informed decisions, his wine producers rely, alternatively, and depending on the temporality of the technical decisions that they need to make, either on members of their social niche or on actors with much higher status. When they face an urgent, short-term decision, they tend to rely on individuals with high status (experienced pioneers, identified with centrality in multiplex networks). However, when they need to validate a non-urgent or ordinary decision they turn to peers of their social niche.

Thus dynamic dimension is made even more complex by the multi-level dimensions of collective action. Study of the regulatory process, in particular, has shown that competition between public authorities and private business to regulate markets and build market institutions intrinsically has multi-level and dynamic dimensions. Relational infrastructures are complex and also intrinsically multi-level. Institutional entrepreneurs with high status inconsistency, for example, can try to endogenize the structure by working simultaneously at several levels to seek to modify a normative order, and hence a given opportunity structure, to their advantage. A clear difference must be made, for example, between networks of individual entrepreneurs and inter-organizational networks of businesses, although both levels must also be linked in systematic ways by observation of cross-level interactions.

This insight about the multi-level dimension of markets and market institutions has been generalized. Economic sociology has established the interdependencies between economic and social structures using the notion of embeddedness of the former in the latter. However, research usually studies inter-organizational commercial networks and inter-individual informal networks separately. From a neo-structural perspective, economic activities and markets are influenced by both levels (Brailly, 2016). A deal between two companies, which is an inter-organizational tie, depends on inter-individual relationships, and vice versa. Economic relationships such as deals between two organizations and informal relationships between their members are interdependent. To explore this dual dimension, a multi-level social networks framework has been developed by Lazega *et al.* (2008). This approach is based on the study of multi-level networks observing two superposed and partially nested, interdependent levels of agency, an inter-organizational system of action, and an inter-individual one. Supposing that these levels are nested does not imply that they evolve symmetrically and in sync. The coevolution of two levels is complex, dynamic, and can be partly disconnected if not asynchronous, raising the issue of the costs of synchronization (Lazega, 2015). Different levels may not evolve and change simultaneously. The structural organization of each level and attributes or context explaining tie formation at each level can be different. Brailly *et al.* (2016) have argued that this is why a multi-level approach is an interesting point of departure for reframing the issue of embeddedness. The challenge is to understand how social systems at both levels co-evolve and how actors at both levels coordinate to generate the socio-economic structure of the market. What specific multi-level social processes construct and explain the structure of an economic milieu? As shown by recent work, this multi-level approach is crucial for understanding globalized markets that require long-distance partnerships between companies, "global pipelines" as Bathelt and Schuldt (2008) and Bathelt and Glückler (2010) call them.

Building on this framework Brailly *et al.* (2016) and Favre *et al.* (2016) have studied network formation at each level of specific markets; that is, trade fairs for television programs in Eastern Europe and in Africa. They show that inter-individual and inter-organizational networks are partly interdependent but also that different processes emerge at each level.

In the European trade fair sellers and buyers of TV programs (distributors and TV channels) meet

once a year to discuss contracts, make deals, keep informed about new films, series and game shows, and observe market evolution. Brailly *et al.* (2016) study the informal exchange of information between trade-fair attendees and formal deal ties between their companies by examining network formation at each level. They find that these networks are heavily interdependent but that each level has its own specific processes. They emphasize that the contexts of tie formation between two organizations and two individuals are different in terms of temporality. In the case of the market for TV programs, ethnography suggests that tacit knowledge and private information are crucial for individuals to identify commercial opportunities. The best way is to attend many events during a short time period ("next time this year"). But in parallel, their organizations have to be reliable in participating over a long time period in successive events at the same place ("same time next year"). If deals are initiated by specific employees in an inter-organizational context, different temporalities overlap and interact in the system: inter-individual relationships change faster and inter-organizational relations change more slowly. Organizational relationships have a different time frame than interpersonal links. Some organizations develop specific mechanisms to cope with this a-synchrony. This underlines that the efficiency of the meta-unity individual/organization is a complex articulation between these two sets of actors, forever on the razor's edge. While each level has its own specific processes they are partly nested: levels of agency emerge in different contexts and in different temporalities. Multi-level temporalities should thus be considered in terms of understanding the complexity of economic performance in such multi-level settings: in spite of different temporalities, actors at each level manage these different temporalities and both levels co-evolve nevertheless.

Favre *et al.* (2016) study the process of integration of the African continent into the globalized TV program distribution markets by also focusing on trade fairs as multi-level settings. These settings bring together African TV channel directors and international TV program distributors from all parts of the world in the same place. During the post-colonial period, African TV channels used to acquire programs for free, but entering the global market led to new forms of acquisition of TV programs. Integrating the global market requires a learning process, away from former market practices, to adapt to this new context and define new ways of transferring copyrights in this region. In fact, only the African actors have to adapt to and learn the rules (formal and informal) of the international TV program distribution market (Favre and Brailly 2015a). This means, for example, joining social niches of international sellers that are based, for example, on linguistic homophily (francophone, Latin American, anglophone). Multi-level network analyses of the African trade fairs reveal a market segmented into groups with divergent interests and "visions" of how this market should be regulated. In particular, they show that only two groups are able to influence the evolution of this market by controlling the trade fairs' conferences. Favre *et al.* (2015) also give evidence of this adaptation as a synchronization process. Studying informal discussion networks among individual sellers and buyers and business ties between their companies, they show that while "long-terms" relationships are highly influenced by inter-organizational structure, the ties created during the events are not. This difference shows that during this kind of event individuals can break free from the influence of inter-organizational structure to create ties across borders, and show that the synchronization of levels could sometimes belong to the organization. However, only individuals well integrated in the market could do so. Understanding performance in a global market requires dual positioning of individuals and organizations and understanding of how actors build their relational infrastructures to control processes such as learning and regulation. This explains, in part, the spread and homogenization of audiovisual culture at the global level.

Conclusion

Thus, the emergence of cooperation in competitive economic environments depends on interdependent entrepreneurs' capacity to build this social discipline and to (self-)impose it collectively. This requires relational infrastructures and the deployment of social processes that these relational infrastructures facilitate. We have illustrated these articulations with several examples. Identifying such social niches and forms of status in various markets is an important step in neo-structural analyses of the economy. Both kinds of differentiations, horizontal and vertical, are modeled using social network analyses combined with information about actors' attributes and their organized collective action (division of work and authority/power rapports). Searching for a social niche corresponds to searching for multifunctional contexts in which these entrepreneurs can have access to resources at lower cost and protect their social relationships; status competition allows, for example, for concentrating these resources in order to achieve a dominant position in the definition of the terms of exchanges, in particular social exchanges.

This approach to cooperation between competitors can be termed "neo-structural" because it com-

bines culture, structure, and agency, originally extending White's approach to markets to include, and bring to light, the social discipline (between interdependent entrepreneurs) and public–private economic order that is created by reliance on relational infrastructures and social processes. In particular, this social discipline, which succeeds in making competitors (through price and/or quality) cooperate, can be measured and modeled thanks to the analysis of social and economic, intra- and inter-organizational, networks, combined with data on culture and agency. It shows that innovations, in terms of production markets or market institutions, always emerge in multi-level settings: every innovation is both "networked" and controversial at all levels, separately and jointly.

This "go to" presentation provides a few leads and short illustrations for further exploration of the work and potential of neo-structural economic sociology. For the past twenty years, this approach has been using the sociology and ethnography of work and organizations, combined with network analyses, to develop a perspective on production markets and their joint regulation (by public authorities and private business). As shown by all these illustrations, there is a strong link between the ways in which cooperation among competitors works as a "fourth factor" of production and the creation/reproduction of social inequalities in contemporary capitalist societies. Neo-structural economic sociology increases sociological knowledge of how markets can be used as Selznickian organizational "tools with a life of their own" to increase inequalities. Whether in the restaurant industry, where multiplex relational life can be another source of inequality between restaurant owners locked in or out of market segments; or in trade fairs, for example, where relational infrastructures are used disproportionately by sales representatives of the largest companies; evidence abounds that mechanisms of cooperation among competitors are often too costly for many actors in the market, above all for individuals working in/as smaller organizations at the lowest levels of social stratification. In addition to these attribute-based inequalities, the capacity to act at several levels simultaneously is another discriminant factor of inequality that helps to reinforce the power of the stronger companies by helping their employees to obtain contextualized, private and strategic client-related resources and to hoard opportunities (Tilly, 1998) while desolidarizing smaller players and breaking down their capacity to cooperate.

In a context in which people are not equal in their capacity to defend their regulatory interests, the more private actors can promote private cooperation among competitors to shape public institutions (Lazega 2001, 2016; Lazega and Mounier, 2002; Lazega *et al.*, 2016), the more neo-structural work adds value by collecting live data on structure (including network patterns), culture and agency independently, based on own academic surveys and fieldwork; in other words, not just relying on secondary datasets derived from sources that are conveniently – and often misleadingly – made available one or two clicks away. Designing one's own surveys, collecting live academic datasets and carefully mixing methods will always permit a better understanding of actors, actions (including their meanings), infrastructures, and generic social processes, including combinations of State dirigism and/or laissez-faire in economic policies. This is especially the case when Big Tech private hegemons increasingly do the same with unprecedented levels of intrusiveness in monitoring both the private and public dimensions of these social realities. This is where neo-structural sociology more generally will always be pivotal in public research on the economy and on politics. This is how public social sciences can be critically relevant in the current era of momentous transitions.

Endnotes

1 This perspective was first introduced at the 1996 Summer School organized around the economic sociology of Harrison White, who was invited by LASMAS-CNRS to spend a sabbatical year in Paris. A collective book (Favereau and Lazega, 2002) brings together the contributions and debates that took place around this neo-structural approach to the economy.

2 We consider Simmel's "social forms" as both sources and expressions of these relational infrastructures.

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This being a short "go to" paper, we refer almost exclusively to a sample of work carried out from the neo-structural perspective. We also do not have room to include our methodological contributions. To contextualize it in dialogue with economic sociology, please look into the publications themselves. For a more complete list, see http://elazega.fr/?m=201709.

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Book reviews

Diane-Laure Arjaliès, Philip Grant, Iain Hardie, Donald MacKenzie, Ekaterina Svetlova · 2017

Chains of Finance – How Investment Management is Shaped

Oxford: Oxford University Press

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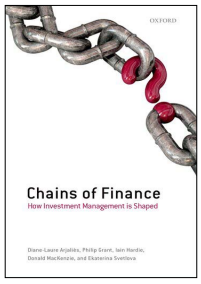

For some time, the activities of fund managers, buy- and sell-side analysts, risk managers, brokers, traders, and other financial market players were scarcely researched in the social sciences. This has changed significantly – at the latest since the collapse of Lehman Brothers Bank a decade ago and the associated crisis phenomena that still affect us to this day. In the meantime, the so-called „Social Studies of Finance" has become firmly established as an area of research. New publications regularly appear that contribute to the deciphering of activities in this highly specific cultural sphere. The 193-page book *Chains of Finance* by a group of five authors is one of the latest outcomes of this type of research.

The book presents the findings of a project funded by the Seventh Framework Programme of the European Union on valuation practice in financial markets, and a project by one of the authors (Ekaterina Svetlova), funded by the German Research Foundation, which dealt with the analysis of economic calculations. In the projects, a comprehensive database was created. According to the information provided in the book, a total of 424 interviews were conducted with fund managers, analysts, traders, brokers, and employees of stock exchanges and over-the-counter trading venues, as well as other experts who were able to provide information on the investment chains of investment management. The interviews were conducted in the United Kingdom, France, Germany, Switzerland, and the United States. In addition to the interviews, material from two longer phases of participatory observation (two and a half years, three months) and expertise from previous work experience in investment management (two people with five and six years of professional experience, respectively) were included in the analyses. This impressive degree of field experience informs the discussions, which clearly demonstrate an in-depth understanding of the respective research subjects.

The central thesis of the book is that investments today are influenced by a large number of financial intermediaries, who can be understood as links in an investment chain. The individual intermediaries are related to each other in each case and thus mutually determine what opportunities and limitations arise in the process of investing. After an introductory chapter, the linkages of the intermediaries are analyzed in the chapters that follow. First, the internal investment chain within an investment management company is discussed (Chapter 2), and then the relationships between fund managers and investors (Chapter 3) and also those between quantitative asset management and other intermediaries (Chapter 4). Chapter 5 deals with over-the-counter trading venues (so-called "dark pools") and attributes the significant increase in trading on "second-generation" platforms to changes in relations in the investment chain. Chapter 6 focuses on the irritations that can arise between the "responsible investment" and "fixed income management" departments of an investment management company as a result of considerable differences between their investment strategies. Chapter 7 gives a concrete example of how an attempt by a group of responsible investors from the trade union milieu to sanction a company failed because of the "logic" of the intermediary investment chain.

The linkages in the investment chain differ from chapter to chapter. In this respect, the cover design – showing a metal chain with a red question mark as a link – is an effective visualization of the book's findings. Sometimes the intermediaries of the chain seem to complement each other, sometimes they appear to be in conflict; sometimes epistemically closed cultures seem to influence each other, sometimes there are indications of established translation paths or even attempts at joint interaction (especially in the case study in Chapter 7). The interaction of the various intermediaries in the investment chain is therefore portrayed as very complex. Accordingly, the authors distance

themselves from the principal–agent theory (above all in Chapter 3), which describes proxy relationships between clients and investment management in a more schematic and less nuanced way. In the summarizing final part (Chapter 8), the difference from a network perspective is also addressed; the position taken is that it does not necessarily constitute a rival point of view. Investment chains in investment management are rather interpreted as part of an overarching financial market network. This tentative demarcation from network-analytical approaches is surprising. In fact, the findings and the distinctive methodological approach basically lead to the claim that, with regard to further theoretical development, the investment chain perspective could be much more than an indication of the relevance of the area between the dyadic relationship (for example, the principal–agent relationship) and an overarching network perspective.

The chain character of investment management is criticized in the final chapter of the book. On the basis of the chapters' individual findings, problems of the division of the investment process are identified, such as the short-term nature of investment horizons, the limitation of opportunities for socially responsible investment, and the far-reaching decoupling of investment activity from the investment preferences of investors. Possible solutions are also discussed, such as shortening the investment chain, regulations, or greater recourse to passive investment strategies.

Overall, the book is to be highly recommended. It provides interesting insights into the limitations and interfaces of investment management. The focus on the investment chain links the individual chapters, which highlight the details of the respective linkages. The chapters, however, can also be read independently of each other. For instance, the fourth chapter is recommended as an alternative jumping-off point for readers who do not read books cover to cover. Here, the relationship between "quantitative investment management" and "fundamental portfolio management," which fluctuates between friendship and hostility, is persuasively elucidated. The fifth chapter is the most innovative: From a social-science perspective, never has so much light been thrown on the "dark pools" of over-the-counter trading. The only major criticism of the book might pertain to its modest size. Given the book's considerable empirical footing, it would certainly have been possible to provide more detailed reports. This would in particular have provided readers with greater transparency as to the evaluation steps that were taken, as well as more insight into the data. The sheer amount of material available offers reason to hope, however, that other publications will follow that expound more fully on the research projects' findings.

Klaus Kraemer and Florian Brugger (eds) 2017

Schlüsselwerke der Wirtschaftssoziologie

Wiesbaden: Springer VS

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In the past forty years or so, economic sociology has flourished as a field of study in its own right. Stimulated by the birth of "the new economic sociology" in the United States in the 1980s, the rise of the "economy of conventions" approach in France, and various returns to classical German economic sociological approaches (Marx, Weber, Sombart, Simmel), economic sociology has matured into a vibrant, internationally established sub-discipline with its own sections, study programmes, journals, and newsletters (see also the Economic Sociology European Electronic Newsletter founded in 1999). "Parsons' Pact" (as coined by Beunza & Stark, 2004, but see also McFall and Ossandón, 2014) – the division of labour between economists and sociologists whereby "sociologists were to study institutions, social integration, and values, in plural—but not markets—while economists were to focus on economic growth and competitive market arrangements coordinated by prices, information, and value, in singular—but not religion, crime, or families" (McFall & Ossandón, 2014, p. 510) has long been overcome, or at least so it seems.

The German-language volume *Schlüsselwerke der Wirtschaftssoziologie* (Key works of economic sociology) edited by Klaus Kraemer and Florian Brugger reflects the field's institutional maturity. It is a comprehensive handbook of economic sociology that introduces readers to both foundations and more recent currents in the field. The book is divided into two main parts. The first part covers classical works, many of which inspired more recent strands of economic sociological thinking. Here, we find essays on selected key works by Marx, Durkheim, Veblen, Simmel, Sombart, Weber, Mauss, Schumpeter, Polanyi, Merton, Hirschman, DiMaggio and Powell, Luhmann, Coleman, and Hall and Soskice. The second part is devoted to "newer works" in the field, from the 1970s onwards. Here, among other things, readers are introduced to strands within the North-American based "new economic sociology," as represented, for example, by works on social embeddedness and networks (for example, Granovetter, Burt, Uzzi, Podolny); studies on morals and markets, the making of markets, and the institutional make-up of markets (White, Garcia-Parpet, Zelizer, Abolafia, Dobbin, Fligstein); an essay on Gambetta's study of the Sicilian mafia; Ingham's work on the nature of money; Trumbull's study of consumer capitalism; Fourcade's and Lebaron's analyses of the rising influence of economics and economists; as well as discussions of more recent works in the sociology of finance, including studies of financial markets and financial market capitalism (Knorr Cetina and Brügger, Windolf), the performativity of finance (MacKenzie and Millo), the framing of finance (Preda), processes of financialization (Froud, Johal, Leaver and Williams), and the political origins of the rise of finance (Krippner).

The handbook also contains essays on the French regulation school (Boyer and Saillard), Bourdieu's study of the social structure of the economy, Boltanski and Chiapello's "New Spirit of Capitalism," and overviews of key works from the "economy of conventions" research programme (Storper and Salais, Boltanski and Thévenot, Orléans, Eymard-Duvernay). The volume also covers more recent studies of valuation (Aspers, Stark, Karpik). Finally, it engages with a number of seminal German works, including Streeck's *Buying Time*, Deutschmann's analysis of "capitalist dynamics," Ganßmann's work on "money and labour," Dörre's book on land grabbing, *Landnahme*, Neckel's study of cultures of success (*Erfolgskultur*), or Beckert's essay on the role and relevance of uncertainty (*Ungewissheit*) for the development of a genuinely sociological perspective on economic life.

The different works are introduced by means of short essays, authored by scholars in or adjacent to the field. Each essay provides a brief overview of the core ideas, theoretical context, and core contributions of the key work in question. Of course, such overviews cannot replace reading the originals. And, to be clear, that is also not the stated aim of the book. Rather, the essays should be seen as useful orientation devices that help navigate a field that has grown enormously in the past forty years.

It would be beyond the scope and aim of this review to introduce any of the chapters in more detail. As one can see from the lists presented above, the handbook covers a vast number of different studies and approaches. As the editors highlight in their introduction, economic sociology has come to comprise a wide range of theoretical approaches, research paradigms, methods, and empirical foci. It is this plurality that makes economic sociology such a vibrant area of study. The handbook reflects this diversity. And in doing so, it also cuts across geographical divides, bringing together North American, British, French, and German works, which is a particularly welcome feature of the book that sets it apart from its more narrowly focused North American counterparts.

Notwithstanding such multiplicity, the editors Kraemer and Brugger are also clear what keeps their volume – and the field of economic sociology more generally – together: Namely, a shared interest in exploring what contribution different sociological concepts and theories can make to understanding economic life (economic action, structures, and processes). What are the social and cultural conditions and consequences of markets? How are enterprises and markets shaped by social relations, conflict, and status hierarchies? How should we conceptualise, problematize, and study relations between economy and society? These are some of the key questions the book sets out to explore.

Overall, the book is a very welcome European addition to current North American handbooks on economic sociology. The book is not only useful in taking stock of a vastly expanding field, it also helps to stimulate and formulate new avenues for research. In their introduction, Kraemer and Brugger sketch out some of these. Criticising economic sociology's preoccupation with the study of markets, they underscore for instance the importance of devoting renewed attention to the role and constitution of households in the economy (as both consumers and participants in processes of production). Kraemer and Brugger further suggest that economic sociology should engage more with the classical foundations of the field (for example Weber's, Sim-

mel's, and Durkheim's works) and revisit the relevance of economic sociology for social and societal theory-building and our understanding of broader processes of societal differentiation. The editors further emphasise economic sociology's relevance for the study of social inequality (revisiting Weber's classical work on social stratification and unequally distributed opportunities and Simmel's conceptualisation of property as critical in the production of class positions). How is economic success dependent on, or influenced by, social inequality? How, and to what extent, is social inequality economically produced? This volume makes a useful start in bringing together a range of different contributions that can help address such questions.

The book covers a vast number of different studies and, understandably, the editors had to be selective. Nevertheless, I would want to highlight two themes that deserved a bit more attention. One concerns the role and relevance of failure, as both a category and an empirical phenomenon (see here e.g. Halliday & Carruthers, 2009). Economic sociologists, with a few notable exceptions (Halliday & Carruthers, 1996, 2009; Hirschman, 1970), have paid remarkably little attention to the phenomenon of failure (notions and workings of market failure, market exit, bankruptcy regimes), and this applies also to the volume reviewed here. Given the centrality of failure in the governing of economic life, particularly markets, this is surprising and more work ought to be undertaken in the future by economic sociologists to understand, as Kurunmäki and Miller have put it, the moment of economic failure, the moments that precede it, and the calculative infrastructure and related processes through which both failing and failure are made operable and with what consequences (Kurunmäki & Miller, 2013; but see also Miller & Power, 1995).

The second topical area concerns the sociological study of economic calculation. Also here the book is remarkably silent. Weber and Sombart put accounting (in particular, capital accounting, "*die Kapitalrechnung*") at the heart of their studies of capitalism. But over time, economic sociology seems to have forgotten accounting and its roles and relevance for the governing of economic life (also this handbook does not contain any contributions devoted to the examination of accounting). Rather, sociologically oriented studies of economic calculation emerged outside of economic sociology, within Departments of Accounting, particularly in the United Kingdom (Hopwood & Miller, 1994). Moving forward, I would welcome more engagement on the part of economic sociology with social studies of accounting, and vice versa. Such engagement cannot only offer valuable insights into the workings of accountability and performance regimes, for example within economic organisations. It can also contribute to enhancing understanding of the intricate relationship and interplays between economy and society. For calculative techniques, including accounting, are in many ways driving institutional and societal change. Hence, it is important to follow the contingent ways in which certain calculative tools become "world models" (Meyer, Boli, Thomas, & Ramirez, 1997) of rational economic decision-making and control. Or, put differently, it is important to appreciate how accounting concepts and techniques are mobilised in specific societies, within certain discursive frameworks, and with unique consequences, so as to trace the institutional and discursive configurations within which new economic regimes become possible and old ones are redefined (see also Mennicken, Miller, & Samiolo, 2008, in an earlier issue of this newsletter).

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