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REVISTA DE ESTUDOS ORGANIZACIONAIS E SOCIEDADE

TENSIONS AND DIALECTICS IN THE CAPITALIST EMBEDDEDNESS OF AN INDUSTRY NETWORK: A VISUAL NETWORK ANALYSIS OF COOPERATION IN THE DUTCH PAPER INDUSTRY[1]

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INTRODUCTION

Inter-organizational networks have been essential to the survival of industries throughout capitalism (Ehrich, 2020). The most recent phase of capitalism, post-Fordism, is characterized by labor-market flexibilization, deregulation and neoliberal re-regulation, transnationalization of production and global value chains, the rise of finance-led accumulation patterns, and deindustrialization (Jessop, 1994; Jessop & Sum, 2006; Overbeek, Van Apeldoorn & Nölke, 2007). These transitional factors of a changing mode of regulation in the post-Fordist accumulation regime conditioned the macro-structural context in which inter-organizational networks evolved since the 1980s.

[1] The following article is in parts an adaption and a revised version of Chapter V in my doctoral dissertation "Neither New Nor Heterarchic: Inter-Organizational Networks throughout the History of the Dutch Paper and Board Industry" which can be retrieved online at the Radboud University's Repository: https://repository.ubn.ru.nl/handle/2066/222292.

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Submissão: 29/12/2022. Aprovação: 26/08/2024. Sistema de avaliação: *Double Blind Review*, sob responsabilidade do Núcleo de Estudos Organizacionais e Sociedade da Faculdade de Ciências Econômicas da Universidade Federal de Minas Gerais. Editores especiais: Romulo Carvalho Cristaldo e Elcemir Paço Cunha.

Against this backdrop, we can observe the formation of a new network in the Dutch paper industry around the so-called innovation and knowledge hub, the *Kenniscentrum Papier en Karton* (KCPK). Since its establishment in 1998, the KCPK aims to provide opportunities for sustainable innovation through inter-organizational cooperation in order to keep the industry profitable and, thus, surviving in a climate of intensified competition (KCPK, 2018). To this end, the KCPK created an inter-organizational network including various agents from within and beyond the Dutch paper industry, spanning intra- as well as inter-industry cooperation projects. Succumbed to the rise of the transnational capitalist class fraction, the threats of financialization as well as concomitant deindustrialization, and the repercussions of hyper-competition for manufacturing industries during post-Fordism, trying to build a cooperative network amongst various profit-seeking corporate entities is an arduous task. In this paper, I, thus, analyze the tensions and dialectics the Dutch paper industry network exhibits, emanating from its embeddedness in the post-Fordist accumulation regime.

Through employing visual network analysis and following the tradition of a dialectical view on organizations (Benson, 1977; 1983), the structural underpinnings of the Dutch paper industry network are interpreted considering its embeddedness in capitalist relations of (re-)production. This study finds that the KCPK did manage to successfully stimulate new forms of inter-organizational cooperation and to secure state funding for innovation projects even in post-Fordist times of hyper-competition. Yet, these efforts are succumbed in an economic environment of a shrinking industry amidst aggressive buy-outs by transnational corporations (TNCs). Nonetheless, an analysis of structural power positions, namely bridging centrality, shows that small and medium-sized enterprises (SMEs) and family-owned businesses (FOBs) bridge between densely connected clusters in the network. The numerical and central dominance (in terms of degree centrality) of TNCs is, thus, more nuanced than visible at first sight.

The paper is built as follows: After a thorough contextualization of the establishment and development of the KPCK and its industry network, a quick overview of the data and the method of visual network analysis is given. Subsequently, the industry network is analyzed, substantiating the findings through considering the networks' politico-economic embeddedness. The paper finishes with concluding remarks, emphasizing the tensional facets of inter-organizational cooperation during post-Fordism and the roles occupied by different organizations in the industry network.

THE CAPITALIST EMBEDDEDNESS OF THE DUTCH PAPER INDUSTRY NETWORK

Network research is popular in organizational economics. The vast majority of such network research is anchored in the neoclassical school, analyzing how organizations share resources, such as knowledge or assets through networks (resource dependence theory) (Borgatti & Foster, 2003; Uzzi, 1997), how networks are economically efficient modes of organizing next to markets and hierarchies (transaction costs theory) (Williamson, 1975; Powell, 2003), or how advantageous network positions boost organizational performance (strategic management theory) (Ahuja, 2000; Burt, 1992). While attention has been granted to the embeddedness of economic actions within social relations, id est networks, (Granovetter, 1985), little to none attention has been granted to the embeddedness of networks themselves within the wider politico-economic context (Davies, 2011). Following the work of Benson (1977, 1983) and his dialectical view on organizations, only a view scholars have explored the importance of analyzing the embeddedness of networks within capitalist relations of (re-)production, primarily with a focus on governance and policy networks (Evans, 2001; Marsh & Smith, 2000; Davies, 2011).

Following this work, the Dutch paper industry network needs to be analyzed as embedded in the current accumulation regime of post-Fordism. Amidst the rise of cheaper production capacities in large-scale markets, such as China (Jessop, 1994, p. 258), manufacturing industries rely on product specialization and the flexibilization of commodity production to compete on this increasingly globalized market. Though the state is believed to be retrenching during post-Fordism, deregulation in the public and private sector is accompanied by neoliberal re-regulation, which is geared towards the promotion of the competition regime (Buch-Hansen & Wigger, 2010). Through the deregulation of financial systems and intensified finance-led accumulation (Krippner, 2005), productive capital situated within traditional manufacturing industries becomes dependent upon finance capital and private equity (PE) to sustain its production processes. This shift in global profitability from productive to financial capital and the growing reliance of industrial manufacturing companies on liquid capital is essential for the ongoing process of deindustrialization, which marks so-called 'advanced economies' in post-Fordism.

In post-Fordism, Dutch competition policy is inherently intertwined with industrial policy from the outset. It is in this context that the KCPK emerged to facilitate inter-organizational cooperation within the Dutch paper industry. The prosecution of cartels as well as the intensification of merger legislation posed genuine threats to the industrial activities and economic performance of the Dutch paper industry. Therefore, the replacement of prohibited yet prevalent practices of inter-organizational cooperation, such as cartels, with network project cooperation aimed at promoting knowledge sharing, as well as innovation in products and processes, is distinctive to the post-Fordism era. Concomitantly, the establishment of the KCPK as the industry's hub for inter-organizational cooperation in 1998 and its partial funding by state authorities was more than convenient for the declining industry.

In 1998, the industry's lobbying organ *Koninklijke Vereniging van Nederlandse Papier- en Kartonfabrieken* (VNP), the government organization *Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek* (TNO) and the research organization *Wageningen University & Research* (WUR) signed an agreement to finance the operations of the KCPK and its projects to one third (Ehrich, 2020, p. 97). This funding agreement was part of further long-term agreements signed between the VNP and the Ministry for Economic Affairs during the 1990s (Chappin *et al.*, 2008, p. 1467). Through public procurement strategies - similar to the one financing the KCPK - inter-organizational cooperation could continue despite the rising suspicion towards and prosecution of collusive practices (Bouwens & Dankers, 2010, p. 770). Herewith, state authorities followed a reactive, non-transparent form of financially supporting inter-organizational cooperation through the KCPK. Public money was not allocated to industrial projects directly, but based on an all-to-one-third funding agreement with no maximum amount of funding (Ehrich, 2020, p. 98). Thus, the KCPK first generated funding from the companies of the Dutch paper industry, and then requested the TNO and WUR to match this amount. Only then the money was allocated to either one of the two project streams of the KCPK.

Though, organizations like the KCPK were potentially liable to fall in the category of competition distorting (semi-)government organizations, according to EU competition rules (OECD, 1999, p. 22), they were not prosecuted until the early 2000s, when the Netherlands Competition Authority (NMa) finally became an independent governing organ. The fact that the KCPK was established as a knowledge center for R&D projects, but did not and still does not feature its own R&D laboratory, could have potentially made it into a case of "[u]nfair competition from entities related to the government" (OECD, 1999, p. 25). Yet, the NMa was not able to prosecute unfair competition practices, if conflicts of interest arose with its superordinate, the Ministry of Economic Affairs (Konings, van Cayseele, & Warzynski, 2001, p. 3). Due to it not being an independent governing body, the

NMa was not able to provide unobstructed prosecution of collusive practices (Drahos, 2001, p. 381). In fact, it was "most important", as the Director General of the NMa was paraphrased in a 1999 OECD report on the role of competition policy in the Netherlands, "[...] that NMa be, and appear to be, independent in its decision-making. [To avoid] bureaucratic disputes and embarrassments, [...] it will be focusing now on cases it can uphold against a challenge in court" (OECD, 1999, p. 22). Thus, it was a sole matter of time until the NMa was to become independent, possibly investigating the KCPK's industry network as a competition distorting (semi-)government organization (OECD, 1999, p. 25).

The termination of the all-to-one-third funding agreement of the KCPK in 2004 was well timed, since the coming independence of the NMa in 2005 was foreseeable by policymakers and industrial agents alike, as close contact between the Ministry of Economic Affairs and industries' senior management was quite common (Ehrich, 2020, p. 99). Through such close state-industry-relations important legislative changes, like the NMa's independence, were sure to be considered in the substantive restructuring of the KCPK. First, a continuous flow of state funding was secured until the all-to-one-third funding agreement of the KCPK ended in 2004. Second, the VNP's board of directors had sufficient time to restructure the legal status of the KCPK in line with EC-level and national competition rules as well as their interest to keep the industry profitable through fostering inter-organizational cooperation.

In 2004, the board of directors of the VNP, which at that time was comprised of one third of all Dutch paper companies' executive managers, decided to privatize the KCPK via a membership format (Ehrich, 2020, p. 99). Hereby, the KCPK could continue serving the interests of the Dutch paper industry, while at the same time not falling into the category of competition distorting (semi-)government organizations. The privatization of the KCPK implied that thirty percent of all approved project costs were financed through a new state-subsidy system, while

the remaining seventy percent of project costs were paid by the respective organizations participating in the project (Ehrich, 2020, p. 99). This new legal construction of the KCPK aligned with statutes for industrial project subsidies, which had been passed already in 1996 and allowed different ministries, including the Ministry of Economic Affairs, to allocate subsidies to industrial innovation projects that were in line with national guidelines for competitiveness as well as ecological standards (Staatsblad, 1997). Thus, in post-Fordism industrial policy switched from state support in form of co-funding the KCPK itself until 2004 to state support in form of co-funding the KCPK's R&D projects to one third.

The KCPK facilitates innovation projects by distributing different research tasks to the actual R&D centers of the participating paper mills and companies or to external research facilities. Herewith, the KCPK does not compare to research institutes for paper production innovation in other countries such as Germany, France and Norway. These are, in contrast, privatized, corporate entities, which provide contracted services to paying customers. As a result of the KCPK being a *stichting* (foundation), it does not qualify for those national and EU funds, which are exclusively available to for-profit organizations. In line herewith, the KCPK established a 100% subsidiary in 2004, Bumaga BV, which runs under the accounting template of a SME. In 2017, Bumaga and the KCPK listed the same, eight employees on their websites and their offices were registered at the same address (Bumaga, 2017; KCPK, 2017). Even though legally Bumaga is a private company and the KCPK is a foundation, the function and aim of both organizations concerning the Dutch paper industry are very similar, if not identical. In 2017, the webpage of Bumaga stated that the company focusses on product and process innovations through "[...] project management, project support, government support, financial support, market explorations, market introductions and patents and licenses for new technologies" (Bumaga, 2017). Similarly, the KCPK described its aim as generating funding for the purposes of innovation, longevity and capital growth for (companies of) the Dutch paper industry (KCPK, 2017). The different

national and EU-level funding options, which are available to manufacturing industries, require different kinds of applicants. Some are only applicable to cooperative innovation projects between corporate entities and others only to innovation projects that also involve non-corporate entities, such as research institutes or foundations like the KCPK. Consequently, it is beneficial to the aim of the KCPK to apply for funding as either a foundation or a SME. Accordingly, the KCPK is more often involved in process innovation projects and Bumaga more often in product innovation projects.

A VISUAL ANALYSIS OF THE DUTCH PAPER INDUSTRY NETWORK

Visual network analysis (VNA) is a branch of network research, which foregrounds the visual and descriptive inspection of network structures. Instead of testing the effects of a network structure upon individual or organizational level outcomes or testing the relationship between non-network variables and their effect on network structure as commonly done in social network analysis (Borgatti & Halgin, 2011), VNA considers both the analysis of social structure as commonly pursued in quantitatively oriented network research as well as the strategies of qualitatively oriented network research by employing relatively open, flexible and descriptive methodologies for network analyses (Decuypere 2020). Through this combination, the role particular organizations play within the wider industry network can be understood within the politico-economic context this network is embedded in.

To carry out a visual analysis of the Dutch paper industry network, this paper draws on data of 48 inter-organizational projects initiated by the KCPK or Bumaga between 2000 and 2016 through accessing their digital archive[3]. These projects involve a total of 310 organizations, of which 40 belong to the Dutch paper

[3] The data was collected in the context of my doctoral dissertation ""Citation removed for peer review"

industry, 206 belong to other industries, 53 are public research organizations, and 12 are state organizations. On average, each project includes 9 participating organizations with a range of 36. The projects are formalized, contracted cooperative ventures aimed at process or product innovation and commonly last a few months up to a few years. For instance, these projects include a pilot study for testing refining technologies, which enable high-quality solutions for the use of hemi-cellulose in the production process of paper.

The network data is limited due to two aspects. Since the data refers to two different types of nodes, projects and organizations, we speak of a two-mode network. In two-mode network data nodes of one type can only be connected to nodes of another type (project - organization) and not to each other (project - project or organization - organization). Yet, the majority of network analysis tools and centrality measures are developed for one-mode networks. Thus, two-mode networks either need to be projected into one-mode networks or each mode within the two-mode network needs to be analyzed separately. In this paper, the first route is chosen.

In addition, the data is limited to the fact that the information collected only includes projects the KCPK or Bumaga have been involved in. Thus, each project has a direct tie to either the KCPK or Bumaga in the two-mode network. To control for the overrepresentation of both organizations, the following analysis includes an analysis of (1) the original two-mode network including all organizations and (2) the projected one-mode network only including the paper industry organizations and excluding the KCPK as well as Bumaga. This one-mode projection of the original two-mode network data onto the organizations means that now organizations are connected to organizations, if they participated in one or more projects together. To zoom in on the paper industry more particularly, the one-mode network projection was reduced to only include organizations from the

paper industry, while also excluding the KCPK and Bumaga due to their overly central positions in the network.

I have showed elsewhere (Ehrich, 2020) that the KCPK took up the role of 'a third who controls' within the network. This strategy is called *tertius gaudens* and is based on the idea that the flow of information and other resources are controlled by a broker, serving foremost their own advantage at the cost of all other agents. Based on Burt's Structural Holes (SH) theory (2005), this strategy describes the strategic advantage of gatekeeping and information control. The fact, that both the KCPK and Bumaga cooperate in projects with unconnected others time and time again, maintains their structural power position and ultimately defeats their goal of strengthening the Dutch paper industry through stimulating knowledge sharing, increasing profitable innovation, and encouraging inter-organizational project cooperation. Additionally, my research showed the increasing power positions of very few TNCs in the network over time.

In this paper, I instead shift the focus to a measure, which assesses the role organizations play within the network to connect densely connected clusters in the industry. Clusters are subgraphs within the overall network, in which the nodes are densely connected with one another, but the clusters themselves are sparsely connected to one another. "The bridging centrality of a node is the product of [its] betweenness centrality and [its] bridging coefficient" (Hwang *et al.*, 2006), meaning that such nodes connect densely connected clusters – that is, communities of the network that are disconnected from each other. These nodes are, thus, well-positioned between network clusters and any resources, such as information, need to first pass through the node with high bridging centrality in order to flow from one cluster to the other. While this measure has not been frequently applied to data from social contexts thus far, for the network at hand bridging centrality helps locate those organizations of the Dutch paper industry, which play crucial roles in connecting otherwise disconnected clusters of

organizations within the industry through their participation in projects. These organizations cannot only be defined as brokers, namely organizations carrying much structural power in fostering and hindering the flow of resources between network clusters, but as crucial for spreading resources or reaching organizations within disconnected communities of the network, thus strengthening the entire Dutch paper industry. The bridging centrality of the Dutch paper industry organizations was calculated in the one-mode network projection, not including the KCPK and Bumaga.

TENSIONS AND DIALECTICS IN THE DOMINANCE OF TRANSNATIONAL CORPORATIONS

In the following paragraphs, a visual analysis of the industry network, which the KCPK and Bumaga established between 2000 until 2016, is conducted. While previous work of mine shows that the industry network grew more and more unequal in terms of structural power distribution over time (Ehrich, 2020), the upcoming analyses focuses on the importance of particular industry players to connect and, thus, possibly strengthen the industry as a whole through their project cooperation. To do so, the bridging centrality of all paper industry organizations was calculated.

Figure 1 is meant to give a better orientation of the underlying, complex, two-mode network data as well as its descriptive and relational features. Thus, before diving deeper into the one-mode network of Dutch paper industry organizations and their role for the industry, a brief overview of the original data is provided. Figure 1 depicts the two-mode network, in which a tie symbolizes the participation of an organization (grey nodes) in a project (blue nodes). Those nodes, which belong to the paper industry, are labeled and colored according to the highest 10th (red), 25th (orange), or 100th (yellow) percentile of bridging centrality. Furthermore, the size of those nodes indicates their bridging centrality and the shape of those nodes

indicates their type of organization as lobby organization (circle), SME or family-owned business (triangle), TNC (square), and private equity owned companies (pentagon). The KCPK and Bumaga are colored in black. The normalized density of the two-mode network is 0,116.

At first glance, one can see that the projects initiated by the KCPK and Bumaga entail a large number of organizations, which do not belong to the Dutch paper industry (grey nodes) and only participate in a single project over the span of 16 years. These single-project-members are located towards the periphery of the network in large grey clusters. Only a small subset of organizations not belonging to the Dutch PBI is located more towards the core of the network among the KCPK, Bumaga and the Dutch paper industry organizations. To gain a better understanding of the relations amongst organizations of the Dutch paper industry currently nested within this wider inter-organizational cooperation network, zooming in on their particular project cooperation is necessary, thus, cutting out the "noise" of all other organizations scattered throughout the periphery of the network. This also enables an analysis of the importance of particular paper industry organizations to connect the actual industry as a whole.

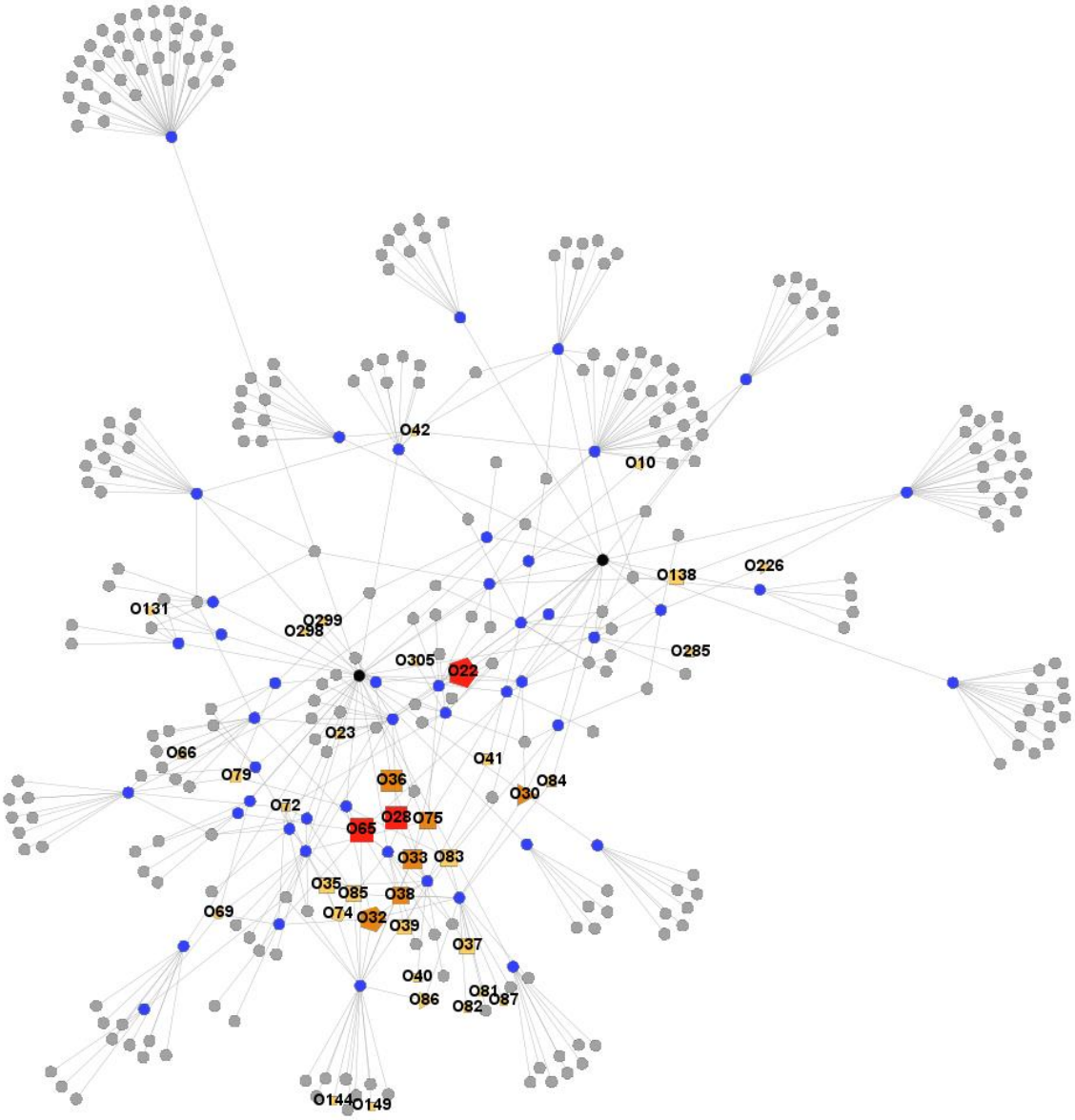

Figure 1 – Original two-mode paper industry network

Note: Network of organizations (n=310) and projects (n=48). Nodes are connected, when an organization participated in a project (n=451). Projects are colored in blue, nodes are colored in grey, except those, which belong to the paper industry (labeled) and to the highest 10th (red), 25th (orange), 100th (yellow) percentile of bridging centrality calculated in the one-mode projection only including organizations from the paper industry (and also excluding the KCPK and Bumaga). Size of those

nodes indicates their bridging centrality and shape of those nodes indicates the type of organization as lobby organization (circle), SME or FOB (triangle), TNC (square), and PE (pentagon). The KCPK and Bumaga are colored in black. Layout in Gephi: Yifan Hu, Noverlap.

Figure 2 displays the one-mode projection of the original two-mode network data onto the organizations, meaning that now organizations are connected to organizations, if they participated in one or more projects together. To zoom in on the paper industry more particularly, the one-mode network projection was reduced to only include organizations from the paper industry, while also excluding the KCPK and Bumaga due to their overly central positions in the network. Similar to the previous graph, the shape of the nodes indicates their type of organization. Circles are lobby organizations of the paper industry, triangles are either SMEs or FOBs, squares are TNCs, and pentagons are PEs. Additionally, the colors of the nodes indicate, which percentile of bridging centrality they belong to: the highest 10^{th} percentile is marked as red and the highest 25^{th} percentile is marked as dark orange. All other nodes are light orange. In contrast to the previous network, the size of the nodes in the one-mode network indicates the degree centrality of nodes. Degree centrality determines those nodes with the most ties to other nodes, which in this case refers to those organizations with the most project partners throughout the observed time period. Three isolates, that is three organizations, which only cooperated in projects together with the KCPK and/or Bumaga, were removed from the graph.

The density of the one-mode network is 0,303 with an average weighted degree of 11,6. The average clustering coefficient is relatively high at 0,755 and the average path length is quite low at 1,889. Though, the network exhibits two definitional characteristics of a small world network, namely a high clustering and a low average path length meaning that it is effective at connecting communities within a short path length, it is not particularly sparse with a density of 0,303. The graph modularity is 0,241 with a total of 4 communities. “The small-world structure

is characterized by dense clusters, or hubs, randomly connected to other clusters by weak ties in a sparse structure" (Giustiniano & D'Alise, 2005, p. 51). For analyzing such structures, not only intra-cluster aspects are of importance, but also inter-cluster dynamics: Through whom are the clusters in the Dutch paper industry network connected?

To explore this further, let's look at how the Dutch paper industry network as rooted in project cooperation depicts a well-known dimension of post-Fordism: the dominance and centrality of transnational corporations (TNCs) in manufacturing industries. Overall, the vast majority of organizations within the industry network are TNCs (squares). The transnationalization of finance and productive capital during post-Fordism coincides with the loosening of barriers for capital movement and the spatial decentralization of production ownership (Bonanno *et al*., 1994; Bratsis, 2014; Van Apeldoorn & Horn, 2007; Wigger, 2015; Wigger & Buch-Hansen, 2013). TNCs thrive under the minimization of tax liabilities and the removal of trade and investment barriers, as the resultant transnationalization of production processes allows for the maximization of their global profits (Overbeek, 1993, p. 259; Wigger, 2015, p. 122). The dynamic interplay between large European and US-American TNCs on the global (financial) market excels competitive forces and, in return, yields the continuation of deregulation of cross-border transactions in the interest of capital agents (Buch-Hansen & Wigger, 2010, p. 33). As a result of these processes, the concept of TNCs has outdated the formerly employed concept of multinational corporations (MNCs), as the majority of large-scale corporations since the 1990s operate *across* national regimes, while at the same time being embedded in the societal, political and economic frameworks of the countries they operate in (Bélanger & Edwards, 2006, p. 29). TNCs, thus, exhibit resources in comparison to other agents, such as state and labor, which allow them to "mobilize around political projects", while at the same time being "subject to different governmental policies" (Bélanger & Edwards, 2006, p. 29).

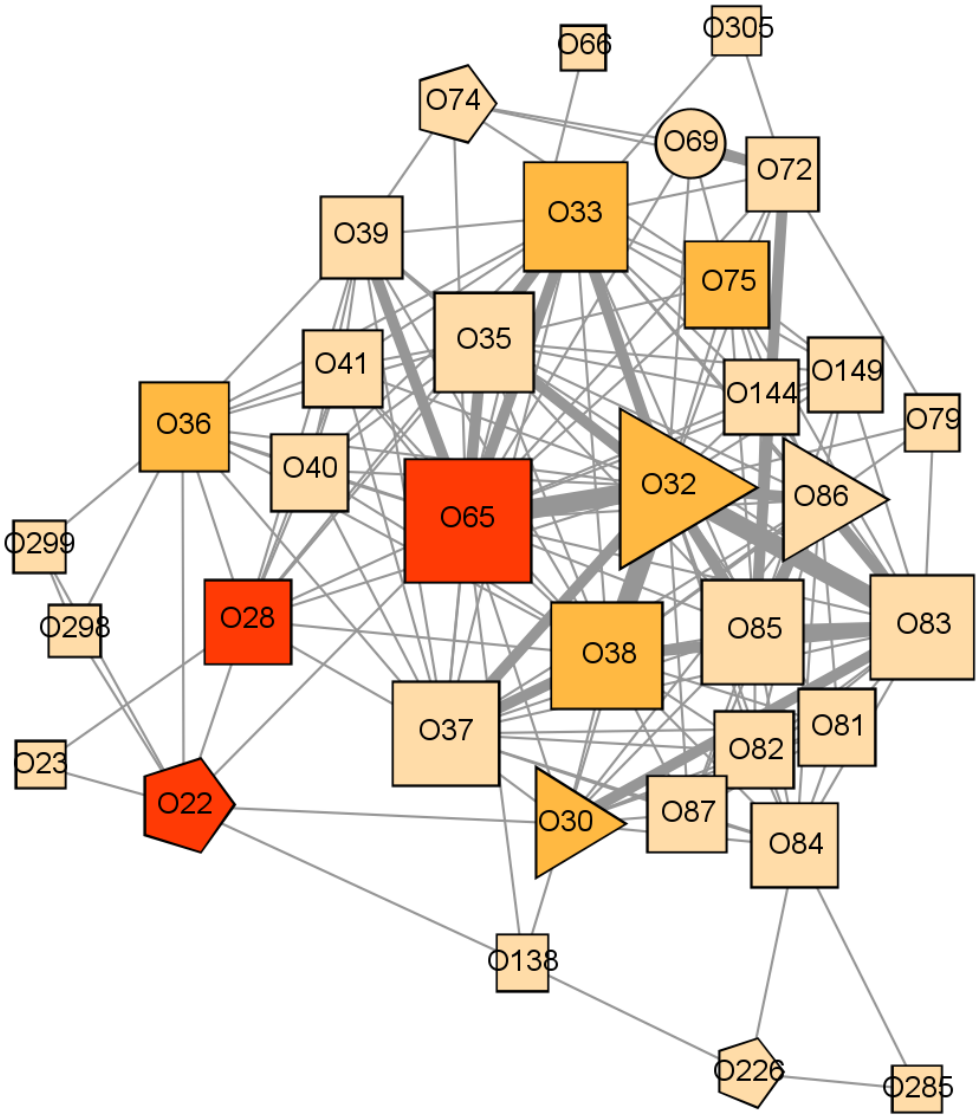

Figure 2 – One-mode network of Dutch paper industry organizations, excluding the KCPK and Bumaga

Note: Network of organizations (n=35), which are connected through a tie (n=180), when they participated in one or more projects together. Ties are weighted and adjusted for better visibility on a scale from 3 to 9. Nodes are colored according to belonging to the highest 10th (red), 25th (orange), or 100th (light orange) percentile of bridging centrality. Size of nodes indicates their degree centrality

and shape of nodes indicates the type of organization, namely lobby organization (circle), SME or FOB (triangle), TNC (square), and PE (pentagon). Layout in Gephi: Yifan Hu, Noverlap.

Furthermore, recent research has shown that TNCs' operations and structures changed under rising globalization in post-Fordism as previously still centralized functions are now internationally dispersed, such as R&D and design (Lundan & Mirza, 2010, p. 31). The rising dominance of specialization, continuous innovation, economies of scope and rapid responsiveness to consumer markets accelerates the dominance of TNCs even further and yields deindustrialization (Jessop, 1994, 2002; Wigger, 2015). Deindustrialization becomes apparent through the "significant decline in the share of manufacturing in GDP" as well as a "fall in the share of manufacturing in employment" in first-wave industrialized countries (Tregenna, 2011, p. 5). Deindustrialization intensifies under as well as unleashed a "decrease in union membership, diminished working class political influence[,] the creation of a new, more precarious work force[, and] the erosion of labor market security" (Varga, 2013, p. 443). Therefore, deindustrialization goes hand in hand with national industrial policies of labor market flexibilization, which undermine labor's possibility to organize strongly against (transnational) capital in post-Fordism.

It is especially these trends and the dominance of TNCs that manifest in the Dutch paper industry network. For example, belonging to the highest 10th percentile of bridging centrality as well as having a high degree centrality, O65 is a TNC playing a central role in the network. O65 cooperated in six projects with a total of 23 organizations throughout 2000-2016, of which four organizations were recurrent project partners (see Appendix 1). The most central and numerically dominating organizations in the industry network are TNCs. A closer look at the industry's recent history, including M&As, bankruptcies and moving production sites abroad, contextualizes this dominance. The Dutch paper industry is characterized by a balancing act of concentration through high market shares, the legally enforced

independence of production sites as split-offs, and the corporate strategy of buying competitors to shut them down respectively. Only a small number of SMEs and FOBs in the industry have not been bought yet by either PEs, such as H2 Equity partners or CVC, or TNCs, such as Norske Skog, Sappi, Mayr-Melnhof, Jefferson Smurfit and Kappa Holding, or even shut down in the process of fusions and M&As.

A good example of such activities are the organizations affected by the M&A of Jefferson Smurfit (JSG) and Kappa Holding (Kappa) in 2005. These are Smurfit Kappa Packaging BV (including Smurfit Kappa Roermond BV), Kappa Packaging, Smurfit Kappa Solidboard BV, Smurfit Solidpack, and Solidpack BV. When JSG acquired Kappa in 2005, JSG was jointly owned by its own management and by Madison Dearborn Partners (MDP), which is "a private equity fund based in the USA, [investing] in management buyout and other private equity transactions across a broad spectrum of industries" (Commission of the European Communities, 2005, p. 2). Even though the M&A was publicized as an exciting endeavor to "combine[.] two highly complementary businesses", the reality was that JSG, under the lead of MDP, bought its rival (Pulp and Paper Online, 2005). Therefore, the merger was subject to EU competition approval and consultation, resulting in (1) the new group Smurfit Kappa Solidboard, (2) the disposition of the mills in Sappemeer and Hoogezand, which continued as ESKA Graphic Board until sold to Aurelius AG in 2015, now continuing under the name Solidus Solutions, and (3) the disposition of Smurfit Solidpack (Commission of the European Communities, 2005). Smurfit Solidpack was sold to three external investors, including Dirk Schut, CEO and shareholder of Solidpack since 2005, who has held various management positions in the Dutch paper industry for decades (Consultancy.nl, 2017). Dirk Schut used to work for Meerssen & Palm, Schut Papier and De Naeyer Papier, and was a board member of the VNP (Consultancy.nl, 2017). In 2017, Solidpack was sold to VPK Packaging Group and Dirk Schut became partner of Fortaleza Capital, a consultancy for M&As, which, interestingly, was involved in the 2005 disposition of Smurfit Solidpack (Consultancy.nl, 2017). Smurfit Kappa Solidboard was owned

by Madison Dearborn Partners and CVC Capital Partners and Cinven (all three are private equity firms) before selling four of their five Dutch mills to Aurelius AG in 2015 (Orbis, 2017). Solidpack is currently still owned by VPK Packaging group, which in turn is owned by the global investor group Auriga Finance SA, owning no fewer than eighty companies throughout different industries worldwide (Orbis, 2017).

The increasing industry buy-outs of TNCs and PEs amplify the already contradictory dynamics of cooperation in a context of hyper-competition and prosecution of collusive practices in manufacturing industries. PEs often follow short-term profit strategies, which essentially collide with longer-term commitments, such as inter-organizational project cooperation. Similarly, companies owned by TNCs are often bound in their ability to engage in inter-organizational innovation projects due to the strict patent and confidentiality regulations of their mother company. Nonetheless, researchers have uncovered similar trends as found in the analysis at hand, namely of partially publically funded networks benefitting a few, powerful, transnational corporations. Faria (2004), for example, found Brazilian automotive networks to be "political economies led by TNCs and other members of the transnational capitalist class, comprised of chief corporate executives and members of the local elite" (p. 206). In a similar fashion, Gerybadze and Reger (1999) found that transnational corporations execute their R&D cooperation in multiple learning and innovation networks, yet "with one dominant center of coordination" (p. 251). The fact that anti-collusion laws and cartel prosecution have hitherto not dealt with network-based cooperation might have created a unique condition for TNCs to exert control over the utilization of national and supra-national funding.

Erro! Fonte de referência não encontrada. helps interpreting the Dutch paper industry network further, as it lists those nodes and their characteristics in the highest 10th and 25th percentile of bridging centrality. It becomes clear that TNCs

make up the majority of organizations bridging between less connected components of the Dutch paper industry network, namely 66%. Furthermore, most of the organizations with the highest bridging centrality have existed for the majority of the survey period, with the oldest being the family-owned business O30 and the youngest being the TNC O36. These years of existence solely refer to the existence of the particular paper mill under the in the analyzed projects listed company names.

Table 1 – List of organizations in highest 10th and 25th percentile of bridging centrality

Node	Bridging Centrality	Percentile	Type	Years of existence
O65	1509	10th	TNC	since 2005
O22	1417	10th	PE	1993-2016
O28	1374	10th	TNC	2005-2015
O36	1242	25th	TNC	since 2006
O32	1075	25th	SME	1983-2014
O33	1043	25th	TNC	since 1999
O30	882	25th	FOB	since 1924
O38	831	25th	TNC	1956-2015
O75	821	25th	TNC	until 2005

Source: Research data.

Yet, when taking into account the total number of types of organizations throughout the industry, it becomes apparent that PEs are most strongly represented in the highest 10th percentile of bridging centrality (with 25% of all PEs in the industry), whereas only 7% of all TNCs are in the highest 10th percentile (see

Table ***2***). Curiously, both FOBs and SMEs are well-represented in the highest 25th of bridging centrality (with 50% of all SMEs and FOBs in the industry), followed by PEs (25%) and TNCs (14%). Thus, while the industry network was shown to become more unequal over time with a few TNCs gaining more and more power

(Ehrich, 2020), the network nonetheless exhibits SMEs and FOBs occupying structural power positions, too. In terms of bridging between densely connected clusters of the network, SMEs and FOBs are comparably well represented in the industry network, holding strong positions not only for fostering and hindering the flow of resources between network components, but for spreading resources or reaching organizations within disconnected portions of the network. They thus hold key positions that could help strengthen and connect the entire Dutch paper industry as envisaged by the KCPK, possibly also resulting from decade-long personal relationships between managers in the industry. The numerical dominance of TNCs is, thus, nuanced in the industry network during post-Fordism as it does not lead to structural power positions in terms of bridging between densely connected clusters of the industry network.

Table 2 – List of representation of type of organizations in highest 10th and 25th percentile of bridging centrality in percent

Percentile	Type of organization	Representation (in percent)
10th	PE	25
	TNC	7
	SME	0
	FOB	0
	Lobby organization	0
25th	SME	50
	FOB	50
	PE	25
	TNC	14
	Lobby organization	0

Source: Research data.

CONCLUSION

The analysis of the Dutch paper industry network during post-Fordism illustrates how cooperation changed under the post-Fordist competition regime in the case

of the Dutch paper industry. The rising suspicion and actual prosecution of collusive practices through the NMa placed pressures on manufacturing industries, especially on already struggling ones, like the Dutch paper industry. In light of the changing relations of production, the competition regime, rising transnationalization of ownership and the continuing deindustrialization in post-Fordism, new forms of inter-organizational cooperation as well as industrial policies, which allowed the state to allocate public money to industrial projects, were founded. In essence, newly established network organizations, like the KCPK and Bumaga, are a response to meeting the challenges manufacturing industries face in post-Fordism.

Though, the KCPK managed to stimulate new forms of inter-organizational cooperation and to secure state funding for innovation projects even in post-Fordist times of hyper-competition, the established industry network is dominated by TNCs. Nonetheless, an analysis of structural power positions other than degree and betweenness centrality, namely bridging centrality, showed that the network does enable SMEs and FOBs to bridge between densely connected clusters of the network. The numerical and central dominance (in terms of degree centrality) of TNCs is, thus, more nuanced than visible at first sight.

Overall, the above-explicated findings regarding the inter-organizational network of the Dutch paper industry are in line with the identification of a transnational capitalist class fraction dominating the post-Fordist accumulation regime. The allocation of public money to private industrial projects, which are dominated by TNCs – as in the Dutch paper industry network – is an often-critiqued facet of the European Commission Investment Plan for Europe (EC IPE). As the in 2015 established European Fund for Strategic Investment (EFSI) only deems projects 'investable', which promise a high return on investment rates, the EC IPE is, in fact, a strategy of socializing risk and playing into the hands of the already powerful – the transnational capitalist class fraction (Medarov & Tsoneva, 2015, p. 9, p. 14).

Thus, the Dutch paper industry network is an organizational model pierced by capitalist principles of profit and growth. Its essential goal is to revive a dying industry, which is almost entirely financialized through TNC and PE buy-outs. The KCPK's efforts to fortify inter-organizational cooperation for sustainable innovation in alignment with national and supra-national regulations for paper production may yield short-term innovation successes for production processes or product specialization and, thus, relieve the industry of competitive pressures at times, but are sincerely threatened by the rising dominance of the transnational capitalist class fraction during post-Fordism. These tensions will have to be resolved in the future, if the Dutch paper industry is to survive.

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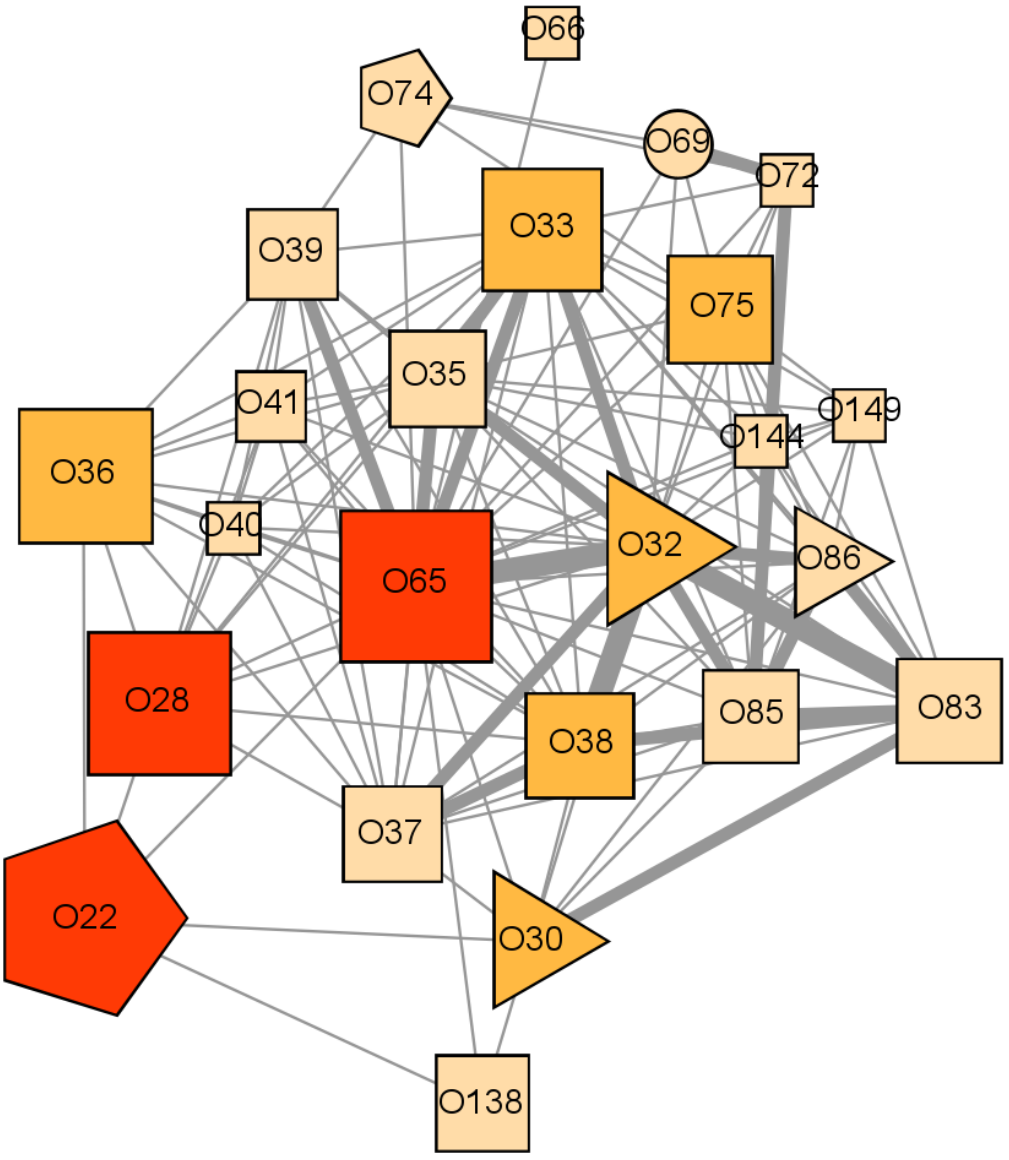
APPENDIX

Appendix 1



Ego-network of most central node O65

Note: Ego-network of O65 (n=24), which are connected through a tie (n=129), when they participated in one or more projects together. Ties are weighted and adjusted for better visibility on a scale from 3 to 9. Nodes are colored according to belonging to the highest 10th (red), 25th (orange), or 100th (yellow) percentile of bridging centrality. Size of nodes indicates their degree centrality and shape of nodes indicates the type of organization, namely lobby organization (circle), SME or family-owned business (triangle), TNC (square), and private equity (pentagon). Layout in Gephi: Yifan Hu, Noverlap.

TENSÕES E DIALÉTICA NA IMERSÃO CAPITALISTA DE UMA REDE INDUSTRIAL: UMA ANÁLISE DE REDE VISUAL DA COOPERAÇÃO NO SETOR DE PAPEL HOLANDÊS

Resumo

Embora seja bastante comum aplicar a análise de rede para estudar a cooperação e/ou a concorrência em estudos de economia organizacional, a fim de delinear estratégias para uma rede eficaz em termos de inovação, desempenho ou outros aspectos, este artigo tem como objetivo, em vez disso, apontar as tensões e a dialética subjacentes à inserção capitalista das redes industriais. A análise visual da rede do setor de papel holandês ilustra como a cooperação mudou em face das crescentes suspeitas e da acusação real de práticas de conluio. Enquanto, por um lado, os esforços para fortalecer a cooperação interorganizacional para aliviar as pressões competitivas são, às vezes, ameaçados pelo crescente domínio das empresas transnacionais na rede, o estudo também mostra como as empresas de pequeno e médio porte ocupam posições de ponte estruturalmente vantajosas entre os conglomerados densamente conectados da rede.

Palavras-chave

Cooperação em rede. Centralidade de ponte. Corporações transnacionais. Análise visual de rede.

TENSIONES Y DIALÉCTICA EN EL ARRAIGO CAPITALISTA DE UNA RED INDUSTRIAL: UN ANÁLISIS VISUAL EN RED DE LA COOPERACIÓN EN LA INDUSTRIA PAPELERA HOLANDESA

Resúmen

Aunque es bastante habitual aplicar el análisis de redes para estudiar la cooperación y/o la competencia en los estudios de economía organizativa con el fin de esbozar estrategias para la creación de redes eficaces en términos de innovación, rendimiento u otros aspectos, este artículo pretende, en cambio, señalar las tensiones y dialécticas subyacentes en la incrustación capitalista de las redes industriales. El análisis visual de la red de la industria papelera neerlandesa ilustra cómo cambió la cooperación ante las crecientes sospechas y la persecución real de las prácticas colusorias. Mientras que, por un lado, los esfuerzos por fortalecer la cooperación interorganizacional para aliviar las presiones competitivas a veces se ven amenazados por el creciente dominio de las empresas transnacionales en la red, el estudio también muestra cómo las pequeñas y medianas empresas ocupan posiciones estructurales ventajosas de puente entre los conglomerados densamente conectados de la red.

Palavras clave

Cooperación em red. Centralidad de puente. Empresas transnacionales. Análisis visual de red.

TENSIONS AND DIALECTICS IN THE CAPITALIST EMBEDDEDNESS OF AN INDUSTRY NETWORK: A VISUAL NETWORK ANALYSIS OF COOPERATION IN THE DUTCH PAPER INDUSTRY

Abstract

While it is a common practice in organizational economics to utilize network analysis for the exploration of cooperation and competition, especially in the context of formulating strategies related to innovation and performance, this paper takes a different approach by emphasizing the underlying tensions and dialectics within the capitalist embeddedness of these industry networks. Using the Dutch paper industry network as a key illustration of inter-organizational cooperation during the post-Fordism era, the visual network analysis demonstrates how cooperation changed under rising suspicion and actual prosecution of collusive practices. On one hand, the efforts to fortify inter-organizational cooperation to relieve the industry of competitive pressures at times is threatened by the rising dominance of transnational corporations in the network. On the other hand, the study reveals that small and medium-sized enterprises, as well as family-owned businesses, occupy strategically advantageous structural positions by acting as bridges between densely connected clusters within the network.

Keywords

Network cooperation. Bridging centrality. Transnational corporations. Visual network analysis.

CONTRIBUIÇÃO

Martha Emilie Ehrich
A autora declara ser a única responsável por todas as fases envolvendo a elaboração desta contribuição.

CONFLITOS DE INTERESSE

A autora declara não haver conflitos de interesse.

PROCEDIMENTOS ÉTICOS

A autora declara que foram observados os princípios e preceitos éticos que norteiam a pesquisa com seres humanos no estudo que serviu de base para esta contribuição.

AGRADECIMENTOS

-

COMO CITAR

Ehrich, Martha E. (2024). Tensions and dialectics in the capitalist embeddedness of an industry network: A visual network analysis of cooperation in the Dutch paper industry. *Farol – Revista de Estudos Organizacionais e Sociedade*, *11*(31), 728-762.