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**The (Dis-) Embedded Firm.**

*Complex structure and dynamics in inter-firm relations:*

*Adding institutionalization as a Veblenian dimension to the Coase-Williamson approach –*

*An emerging triangular organizational space*

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## **The (Dis-) Embedded Firm.**

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### **Abstract**

The increasing complexity of the environment of firms, of strategic interaction, and emergent informal institutional network cooperation, seems to outreach the traditional Coase-Williamson transaction-cost framework with its market-hierarchy dichotomy. We propose to take the complexity of nowadays' firm ecologies more serious and integrate an institutional dimension to enhance the analysis of real-world organizational forms and the theory of the firm. This institutional dimension is conceptualized as an "OIE" (Veblenian) "institutional dichotomy" that ranges between "instrumental" cooperative networking and "ceremonial encapsulation" (lock-in). Thus, a more comprehensive two-dimensional, particularly triangular, organizational space is drafted, which can better map the numerous and diverse forms of production and innovation systems, including their emergence as spatial clusters and corporate networks. The additional dimension integrates institutionalized network cooperation as "instrumental problem-solving", vs. power and status seeking (by both large hierarchies and fiercely rivalling market participants) as "ceremonial dominance". In addition to ideal market and hierarchy, it provides the ideal solution of institutionalized network cooperation, learned in recurrent social-dilemma problems, as a third vanishing point and corner. The resulting Organizational Triangle is considered a heuristic for inter-firm organizational research. As a check of its usefulness, this device is applied to recent developments in the global corporate economy.

(200 words)

**Keywords:** Theory of the firm; direct interdependence/strategic interaction; institutional emergence/institutionalized cooperation; Coase/Williamson; embeddedness; Veblenian institutional

dichotomy; instrumental/ceremonial institutional aspects; spatial clusters/firm networks; open innovation; organizational triangle. (10 Keywords)

**JEL-Codes:** B52, D02; D23; D85; L14.

## **1 Introduction: “Markets and hierarchies”, vs. increasing complexity and “third” coordination forms**

“Markets and hierarchies”, the long-standing dominating paradigm in industrial and organizational economics, has turned out, in face of *increasingly complex firm ecologies*, of increased *functional and spatial fragmentation* of value-added chains (VAC) and innovation systems (IS), to be merely *one* (dichotomic) dimension, in which firms may realize relative advantage through a corresponding coordination of activities. Social rules and institutions, i.e., interactively *learned, institutionalized (multilateral) cooperative behavior in emergent networks* (“platforms” of carriers of such institutions), have become another critical coordination mechanism. In fact, they had by no means ever vanished in reality with the emergence of market exchanges or hierarchical command. Lasting and relatively stable *cooperative interrelations* have always been developing over time, and will usually lead to relative coordination advantages in modern environments, but not only so in a static costs but more in dynamic advantages (see already Rycroft, Kash 1999; Elsner 2005).

In fact, in *real-world VAC and IS* more or less *intricate incentive structures* reflect manifold *coordination and social-dilemma* problems (e.g., technology choice and standardization problems, both technological and behavioral, or potential free-riding in innovation processes; further, information sharing both inside and among firms etc.), with more than one behavioral

option, and with often resulting complex process among many and heterogeneous agents, in often nonlinear and cumulative interaction. Increasing complexity, in fact, has tended to *increase transaction costs* (TC), and increased demands on interior and exterior organization have resulted (see already North, Wallis 1994). *Solving* complex problems in process, under recurrent decision-making, may lead to some *structural emergence*, ideally to some *institutionalization* and habituation of cooperative behavior (for an overview of the literature on complex systems and the “evolution of cooperation”, e.g. Elsner 2015).

“*Markets*”, as we are used to call some spontaneous decentralized structure and resulting process, then need to be considered *particular network topologies* rather. Under said *intricacy* and complexity, they usually, and particularly if de-regulated, display *adverse* individualistic incentives in ubiquitous social-dilemma/collective-good problems, resulting in *unintended negative consequences*, lock-in, and other *non-solutions*, preventing an appropriate and required level of *collective-action capacity*.

And *hierarchy*, then, is rarely “the” solution as it also has already seen its size and growth limits, itself struggling with internal complexity that has grown with corporate size. And *sourcing-out* and *globalizing* have contributed to *spatial and functional fragmentation* of the VAC and IS, in this way increasing its external complexity and intricacy. Hierarchies have ever more become located in complex network *topologies* (e.g., Bloch, Metcalfe 2013, 85-89; also already Hodgson 1998; Elsner 2005; Dietrich, Krafft 2008). Actually, as one individualistic kind of “solution”, big corporations proactively have *combined networks and hierarchy* through establishing global multi-layered *hub&spoke (H&S) networks*. And their important value-added branches then are usually re-located in spatial *clusters* (see below).

All these challenges of complexity and intricacy, and often insufficient individualistic solutions, do not seem to be properly addressed by an exclusive focus on *TC*. And when addressing observed structures, assuming them as optimal and thus static adaptations, does not seem to be sustainable (see already, e.g., Nooteboom 1992). Different network forms that reflect different institutional structures can likewise not be explained (e.g., Nelson 2002). Appropriate informal institutionalized behaviors and network relations, rather, do play a critical role and will be offered here as a separate third ideal mechanism of coordination.

Oliver *Williamson*, who drafted the *New Institutional Economics* (NIE) paradigm in the context of the “market-hierarchy” dimension, has in fact always considered some complexity (e.g., Williamson 1975, 21ff.). However, taking nowadays’ increasing complex ecologies serious, there appear to be more ways in which firms address the problems they face in modern economies. This has been mirrored in a more significant *plasticity* and *persistent diversity* of forms, both in interior and exterior firm relations (e.g., Pistor 2012; also Aoki 2010). And there exist at least said *three basic coordination mechanisms* for organizational systems. Their complex *combinations* may be one reason that diverse organizational forms do persist in parallel in complex firm topologies and dynamics. They are, as to be expected in complex adaptive systems, *not* mainly to be considered “*optimal*” (*static*) *adaptations* to given conditions.

In fact, the *theory of the firm* had already developed in two principal directions, from its *Coasian* origin (Coase 1937). The analysis of factors influencing the size and boundaries of “hierarchies” vis-à-vis “markets”, on the one hand, led *Williamson* towards “*hybrid*” inter-firm organizational forms (e.g., Williamson 1975, 1985, 1991). Between the “market” and the monopolistic hierarchy, *Williamson* eventually came to focus on *small numbers of firm*

*hierarchies in “markets”*, thus *oligopolistic* structure. And, if exchange is *specific* and as *contracting incomplete*, thus implying *uncertainty* and bounded rationality, *informally cooperative* inter-firm exchange that needs to be based on *reputation* and *trust*, became center stage (e.g., Williamson 1975, 26ff., 106ff., 252ff.). But “market exchange”, even among few, remains the *normal* in that perspective (ibid., e.g., 109), and thus all forms may remain in the conceptual framework, and dimension, developed and analyzed somewhere between *ideal market* and *ideal hierarchy*.

This implication was extensively and critically discussed (e.g., Groenewegen 1996; Amin, Hauxner (eds.) 1997), and it was usually referred back to another early post-Coasian perspective, focusing on *complexity* and this *dynamic* organizational factors (e.g., Cyert, March 1992 [1963]; Penrose 1959). In this tradition, Bloch and Metcalfe (2013), among many others (e.g., Navarro-Meneses 2015; Aoki 2010; also Hodgson 1996), have recently related the *embedded firm*, with its manifold external interactions and relations, and dynamic adaption, as well as the persistent diversity of its objectives and forms, to the *complexity* and often unpredictable dynamics and perceived turbulence, of its *environment*. Under these conditions, firms will, among others, strive for some *homeostasis*, i.e., for reduced (perceived) complexity, for simplification and stability, through some *institutionalization of cooperation*, in more or less intricate decision problems, such as social dilemmas (Bloch, Metcalfe 2013, 82f., 86f.; also, e.g., Hodgson 1996, 262f.; Navarro-Meneses 2015, 11f.).

In this second vein, the present paper attempts at *closing the gap* that the *Williamsonian* framework, seems to have left vis-à-vis the firm’s *increasingly complex* dynamic environment. Integrating that *second dimension* of more or less successful problem-solving through institutionalized network cooperation will result in a *two-dimensional organizational space*, with one *additional vanishing point*, ideal institutionalized network cooperation. This

will form an *Organizational Triangle*.

To conceptualize that originary *institutional dimension* we refer back to the *Original/Old Institutional Economics* (OIE) paradigm, and particularly to Veblen's "institutional dichotomy" (e.g., Veblen 1899, 1904). Its vanishing points then reflect, at the one end, a successful learned and habituated, i.e., informally institutionalized, "*instrumental*" *problem-solving*; which, in turn, we interpret as a solution of ubiquitous *repeated social-dilemma* or collective-good problems in an *evolution-of-cooperation* vein (e.g., Axelrod 1984/2006). At the other end, there is a dominant "*ceremonial*" *status- and power-differentials preservation*, notably both in fierce "invidious" rivalry ("market") and in powerful monopoly ("hierarchy") (more below).

This article then proceeds as follows: In Section 2, we will briefly review the *TC approach* and consider its *limits* towards complex external structures and dynamics of firms, and the institutionalization of their outward behavior. *Competence- or resource-based* approaches to the theory of the firm, also briefly discussed in that section, rather, paved the way for the integration of emergent institutionalization of cooperation. We conceptualize the new dimension and the *Triangle* in Section 3 and elaborate on inter-firm relations as *3-tuples* of "markets", "hierarchies", and "networks". In Section 4, we consider some operationalization and apply the new heuristic device to major *recent empirical organizational trends in the global corporate economy*. Section 5 will conclude.

## **2 Theories of the firm: Coase and Williamson, complexity and dynamics, routines, institutions, and relations**

***Transactions: J.R. Commons (1934) and R.H. Coase (1937)***

The recognition of different kinds and magnitudes of costs related to different kinds of transactions had led to a move of the transaction to the center of attention of evolutionary-institutional (OIE) economists already in the 1920s and 1930s. Conceived of as the basic unit of economic analysis, within and among organizations, transactions had helped conceptualizing both the anatomy of exchange and the continuity of an organizational space, covering market-based, hierarchical, and institutionalized-cooperative ways of executing them. Their relevance for understanding economies – in different sets of “rights and duties, no rights, and no duties” (Commons) – had originally been developed by J.R. Commons (Commons 1934, Vol.I, 55ff.), in an understanding of the firm as an institutionalized “going concern”. In this way, the *evolutionary-institutional perspective* on the firm in its ecology has been set for long.

A marginalist understanding of the nature of transactions was then developed by R.H. Coase (1937). He underlined the organization of production in general, later summarized by him saying that “most resources in a modern economic system are employed within firms, with how these resources are used depending on administrative decisions and not directly on the operations of the market” (Coase 1992, 714).

***Williamson: Incomplete contract, bounded rationality, and market-hierarchy “hybrids”***

Core assumptions for the further development of the Coasian approach by Williamson were complexity, uncertainty, bounded rationality, and opportunistic behavior by agents.

Incomplete contracts and exchange specificity, with their implications of uncertainty and opportunism, particularly of moral hazard and potential hold up, motivated a focus on building *informal inter-firm relations*, with *cooperation*, *reputation building*, *trust*, and

*relationship-specific investment*. Combinations of factors such as uncertainty, asset specificity, and the frequency of interactions then served to address such “hybrids” of small numbers of firms interacting in “markets” (e.g., Williamson 1991). That is, *market exchange among hierarchies* (how few, how large, how interdependent ever) remains the *normal* case, and his considerations of complexity, uncertainty, emergent informal cooperation and sanctioning etc., did not make him move beyond the dichotomic market-hierarchy dimension. That the factors shaping TC are numerous and at times hard to capture, was pointed out by Coase himself (e.g., 1992, 718). But this has generally been assumed to be of minor importance for the basic “market-hierarchy” argument (e.g., Williamson 1985, 1991; also, e.g., Podolny, Page 1998, 58).

For an illustration of the Williamsonian dichotomic organizational dimension, see Figure 1. It indicates that Williamson’s critical assumptions and their implications may easily tend towards a *different theoretical foundation on a different organizational dimension* (the dotted arrow) than the one provided by the “market-hierarchy” frame. We have already *idealized* and isolated at the corners the vanishing points “pure” (perfect) “market” and “pure” hierarchy.



internal structures and provisions for the external behavior of firms was central therein. Both Penrose and Cyert/March drew on internal excess resources behind innovation, opportunities for learning, and absorption capacities (also, e.g., Pitelis 2007; Bloch, Metcalfe 2013, 95ff.). The importance of learned *social rules* to maintain *outward operability* and *innovation capacity* and to structure the relations among firms was addressed here (also, e.g., N. Foss 1993; K. Foss 2001). Such dynamic capacities are an example that shows that opportunism alone will fall short to explain organizational structure (also, e.g., Hodgson 2004). Again, the *procedural nature* of operations and the significance of process became center-stage.

A number of these issues also figured prominently in the explicit *evolutionary approach* offered by *Nelson and Winter* (1982). They focused on changing market structures, driven by differential success in an evolutionary process, which, again, is a result of different internal decision rules, so-called *routines*. Sets of routines, the very structure of firms, will change in path-dependent processes. Routines that are more suitable to a given environment increase the chance of a firm's evolutionary survival. On the other hand, they cannot be constantly assessed and altered and are inevitably to some degree "path-bound" (Veblen). As a result, in changing environments, there is *no reason to expect optimal structures* at any time, and the question of an optimal size for operations becomes moot. This point also Veblen had stressed: Rules are inevitably past-bound and, once established, relatively invariable. Therefore, there is no reason to believe that existing structures are particularly advantageous, let alone an "optimal organizational choice" (also, e.g., Means 1967, xxxv; Berle 1967, xix, xxv; Galbraith 2007).

### ***External dynamics vs. rational choice***

Issues of complex dynamic environments have remained insufficiently addressed as well in the Williamsonian framework. The ability of a large firm to partly shape its environment

means that actual costs and potential costs may diverge. Recognizing the significance of process for developing structures, Pitelis (2012) has stressed that *costs change as organizational structures change* – thus, production costs and organization structures cannot be treated independently or in a unidirectional causation. A new organizational form will change costs of activities over time, in ways that usually are not foreseeable, be they due to learning or to market power leading to an ability to influence prices with further cumulative impacts. The lack of such complex dynamic between the environment and internal developments may impede sufficient understanding of real-world structures.

As such processes may be largely unforeseeable and unintended, they cannot be posited as significant for rational choices. For instance, increasing concentration over time suggests that industrial production structure entails a tendency towards increasing market *power* that is not due to obvious static TC advantages, but rather to numerous factors. Amongst them, a *dynamic TC advantage* derived from increased market power is but one.

Power has indeed been an aspect in Williamson, as, e.g., asset specificity offers opportunities for shifting funds in one's direction. But it remains unclear how, for instance, a monopoly-monopsony market and related negotiations can be properly reflected in a frame of comparative marginal cost and (boundedly) rational choice. It has indeed been argued that using power to influence other agents' opportunities basically remains outside that framework (e.g., Shervani, Frazier, Challagalla 2007).

In one way or the other, repeated interactions and emergent relatively *stable relations* among organizations, with different problem-solving capacities, play a significant role in the complexity approach.

### *NIE and OIE perspectives*

Based on such differing conceptions of what are important factors for individual organizational entities, their behavior and interactions, two principal approaches to the understanding of institutions that contribute to our approach do exist. While NIE, with its specific TC-modeling, at least implicitly assumes that *risk, calculable for optimal* static choices, is adequate, OIE, in contrast, considers fundamental uncertainty significant. The role of (mostly given and formal) institutions in NIE is to expand the space of possible interactions through the reduction of risk, and thus TC, leading to more exchanges becoming worthwhile. Analyses of (formal) institutions, legal (property) rights, and suggestions for their change, in the sense of an “exogenous”, political institutional design, thus centered on attempts to identify the impact of institutions on economic transactions stemming from NIE (e.g., North, Thomas 1973; North 1990).

Recognition of strong or *fundamental uncertainty* in OIE changes the picture. Individual behaviors have the potential to generate new future states that were unknown or *un-knowable* beforehand. Information may simply not exist yet at a certain point in time. Strategically securing against now-unknowable future states likewise becomes an important factor for agents’ decision, in order to reduce their exposure to potentially adverse developments.

*Endogenously changing* systems, based on reactions and counter-reactions to changes in the socio-economic, technological, and institutional environment result, in a continuing, open and open-ended, path-dependent, and idiosyncratic, but also autopoietic (morphogenetic, emergent) process. The perspective is on complex structure and interactions (on networks), complex dynamics, and on *non-optimality*. Information will usually be just local. Modeling will include positive, often non-linear feedback, multi-agent settings, and related computer simulations.

The *firm* then basically is an uncertain, searching, experimenting, and learning, strategically interacting agent, striving to gain control over a complex environment, in order to protect itself against unknown/unknowable future developments (also, e.g., Galbraith 2007).

*Reducing complexity*, stabilizing and adjusting expectations through learning and adopting *emergent institutions of cooperation*, while maintaining the capacity to adapt to new situations, becomes the critical capacity of organizational forms in this perspective.

### **3 Emergent institutions of cooperation and the new organizational dimension**

#### ***A perspective beyond TC-based organizational choice***

In directly-interdependent complex settings, agents cannot know for sure initially, how their interaction partners will act. For instance, in a decentralized (*technological*) *standardization* process, or vis-à-vis a required contribution to a collective good such as a lock-step *innovation*, they are uncertain about their best options, unless they already have gained sufficient *experience* from a *history* of common interaction and have yielded sufficiently stabilized and mutually consistent *expectations*. They may not even be aware of the whole set of behavioral options they have or that are open to their counterparts, let alone of the cumulative effect that may emerge from their interdependent decisions. So they are in a qualitatively different situation with qualitatively different requirements for their *agency capacities* than in the “market-hierarchy” setting. Search, experimentation, and learning of behavior, *striving for complexity reduction*, and, finally, habituating interactively learned long-run collective problem-solving behavior for a potential collective long-run improvement become central for their economic success. Firms then usually are modeled as *players* in inter-organizational *games* (e.g., Aoki 2010), often in different kinds of game structures and/or on different given initial topologies.

***The evolutionary-institutional dimension integrated***

Any real firm interacting in a “market”, i.e., on a network topology with more or less intricate interdependence structures (typically social-dilemma games in our case), simultaneously also exists in a world of complex interdependence structure, process, and emergent *institutionalization*, where social institutions are to be learned and habituated to solve such problems. Such ideal institutionalized multi-agent network cooperation that solves ubiquitous collective-good (i.e., cooperation) problems now becomes *another ideal vanishing point* along that new *institutional dimension*, which we consider to run *diagonal* to the “market-hierarchy” dimension. See Figure 2 for an illustration.

[Figure 2 about here.]

This new additional vanishing point is an *ideal collective instrumental problem-solving* of a repeated social dilemma among firms in dispersed production and innovation systems with (technological and behavioral) *standardization* yielded, and innovation and other collective-good problems solved.

The Veblenian *institutional dichotomy* (for formal detail, e.g., Bush 1987; Elsner 2012), to be stretched into a *dimension* of more or less successful problem-solving, now provides the theoretical foundation for formulating this dimension. At the *ideal instrumental end*, we find social institutions of multilateral (network) cooperation, e.g., a spatial or sectoral culture of *joint problem-solving* in a sectoral or spatial production or innovation system. The perceived complexity, turbulence and surprise that an instable, not yet institutionally-settled, environment generated before, particularly in dis-embedded, de-regulated “markets”, can be

somewhat reduced, *expectations stabilized* and rendered *mutually consistent*, social capital built as stable interrelations among agents (also, e.g., Burt 2000).

*Incapacity* of such institutional emergence, under “*cultural*” conditions of, e.g., institutionalized *myopia* (individualist *short-termism*), relatively high incentives to defect, large, *anonymous* populations, with high turbulence and high disembedding (uprooting) *mobility*, or in face of a loss of such ability (if already emerged earlier), consequently, is captured by an increasing *ceremonial* content of institutions. At the *ideal ceremonial end* of this dimension, thus, there is a *perfectly individualistic culture*, focused, in the Veblenian vein, on *power* and *status differentials*.

This then conceptually connects with the ideal “market-hierarchy” dimension and its two earlier ideal vanishing points. This dimension is *ceremonial* in the sense that it may be either highly *rivalrous*, considered by Veblen (1904) to be “invidious distinction”, “predation”, or “pecuniary emulation”, i.e., the ideal “market”, or *monopolistic* (“predatory”) power maximizing, i.e., the “pure” hierarchy. This end of the new organizational dimension, consequently, merges with the ideal market-hierarchy dimension.

As indicated, also an earlier instrumental institution may *degenerate* into a petrification of behavior, a *ceremonial encapsulation* (Bush 1987) or an *institutional lock-in* (David 1985), when a *ceremonial value warrant comes to dominate*. Superior individualist power and status would then dominate collective “instrumental” problem-solving. The system then would run down the institutional dimension from “instrumental” to “ceremonial”. Reasons for the deterioration of the problem-solving capacity of institutions and their carrier platforms may include

- vested interests profiting relatively more over time from an earlier problem-solving win-win situation, combined with a continued habituation (in fact, petrification) of the same behavior that was problem solving at the outset, thus, increasing *inequity* of payoffs (e.g., Elsner 2012), or
- learning curves with decreasing average decision costs of rule behavior based on the established institution; potentially superior new institutional structures then cannot emerge because the initial cost related to their adoption proves to be too high relative to the established (but petrified) institution (e.g., Heinrich, Schwardt 2013).

“Adverse” structures are well known in institutional theory and complexity economics, and they also apply to the theory of the firm and organization economics (e.g., Hodgson 1993; Dosi, Gianetti, Toninelli 1993; Pitelis 1998).

***The baseline dimension and its ceremonial content and warrant***

At the heart of the ideal, abstract, and thus empirically void “market-hierarchy” dimension, we thus find, in a Veblenian reinterpretation, self-interested a-social agents. Between its two vanishing points, where Williamson has dealt with real-world forms, firms may be connected by contracts, specifying their respective obligations in a VAC or IS. But as said, a core assumption is that whatever is not covered in a contract will be used for advantage at the cost of others. This applies not only to cheating, which is standard to asymmetric information musings, but also to openly taking advantage of others should contingencies arise permitting this. There is thus no room for stable (informal) cooperative relations at that *ideal abstract bottom line*, as all genuinely social aspects of relations are removed from it. There is no room for initiative, search for improvement, voluntary contribution, stable reciprocity etc. (already, e.g., Groenewegen 1996; Nooteboom 1992; Loasby 2001) – a static and (boundedly) rational cost-based choice rather among given organizational forms (competitive or monopolistic) for

individualistic agents. As a result, forms along the bottom line are *empirically void*. The ideal “*market*” can only be expected to be an extreme limit case in the universe of potential real-world combinations of economic coordination forms, as indicated in manifold formal analyses of decentralized systems (e.g., Foley 1998). And the ideal *hierarchy*, if considered without any (informal) institutional coordination, would boil down to a paradox “*pure hierarchy*”, with no single person occupying any of the hierarchical positions as long as to be able to develop routines.

Mutuality has not been learned yet (or has broken down again) at the baseline, and is conceptually not integrated even in the middle, at “small numbers”. The factors changing in their relations during a move along this dimension are the *predatory power* that fewer numbers of agents can exercise over others, and the *fierceness of rival* and *emulative* interaction. Such dominant ceremonial motivations may be expected to result in *mutual blockage* of any collective effort or *innovative behavior* under complex and intricate conditions as indicated.

In reaction to an *increased complexity, volatility* and turbulence, particularly in de-regulated, highly globalized and highly fragmented markets, firms *strive to grow in size and power*, in order to increase the *level of control over the firm’s environment*, or regain a former level. And as larger economic entities can exert influence and control, including path creation in general, the meaning of competition, and competitive pressure and success, has to be reconsidered. Increasing control qualifies what at first is usually thought of as superior competitiveness (i.e., advantage in the cost structure in an environment of price competition and price-based allocation). In complex, evolutionary and cumulative process, however, alleged superior competitiveness and higher efficiency may well turn out to be an effect of superior size and power, and complex constellations may easily entail the survival (the

differential replication) not of the fittest, but of the fattest, the first, or of all (e.g., Nowak 2006).

The firm and its relevant VAC or IS, its relevant firm population, group, sector, industry, cluster or network, would move down the vertical dimension, the more de-regulated, fierce, and turbulent the rivalry among hierarchical competitors would become. On this way, the system may also turn more to the lower right, with increasing concentration, centralization, power, and control. Aspired superior status and power, more control aspired over each one's rivals, *redistribution*, *free riding*, predatory habits and exploitation would have to be expected to come to the fore.

At the ceremonial end of the institutional dimension, there will be no approach to properly deal with the complexity of real-world situations. Agents then will not have developed any culture of *recognized interdependence* (e.g., Bush 1999) or *futurity* (Commons 1934; for these critical factors in the evolution-of-cooperation approach, e.g., Axelrod 1984/2006; Elsner, Heinrich 2009), a general striving for short-run extra gains would dominate a culture of long-run institutionalized behavior of cooperation, which would require sacrificing that very short-run maximum.

But again, *real-world coordination forms*, resulting from complex systems and including emergent structure, *qualitatively differ* from both ideal market and ideal hierarchy, and from the ideal hybrids of the baseline dimension (e.g., Powell 1990; Winter 1993; Hodgson 2005; Baudry, Gindis 2005; Dietrich, Krafft 2008).

As this also applies to the third vanishing point and, by analogy to the left and right edges, only the inner space of the Triangle, illustrated by the dotted lines in Figure 2, is empirically relevant and accessible.

### *The inner space of the Triangle*

Thus, when conditions allow for some learning process, a move of the system away from the baseline upwards into the *interior of the Triangle* will reflect *combinations* of some degree of (1) institutionalized cooperation, combined with some degrees of (2) hierarchy and of (3) decentralization and significance of prices, the “market”. This will mark the area of *real-world* organizational forms, as we cannot reasonably assume an institutions-free environment in reality. Exchange and transactions are, in the real-world, inevitably *embedded* in some institutional context. Thus, in our empirically non-empty organizational space, excluding the edges of the triangle, there only exist *3-tuples of hierarchy-network-market*. There is no “market” or “hierarchy” in the real-world that would not receive meaning and sense, and workability, from some institutional base (as a classic of this institutional(ist) perspective: Neale 1994).

Note that *boundaries of the firm* then do play a role in this institutional space as well. Not in a perspective of contracting in markets (outsourcing) or in hierarchies (insourcing) but in the perspective of *exchanging learned and habituated thought, knowledge, and behavior*, together with products and personnel (with their own knowledge and behavior). Here firm boundaries often blur (more below).

As the *instrumental warrant* increases in an inter-organizational culture, and firms increasingly solve intricate collective problems through informal institutions of cooperation, also *general trust* will co-evolve, in a set of overlapping and layered institutionalized

platforms of carriers of institutions, themselves being of appropriate *meso-sizes*, where the *cognitive* conditions for emergent cooperation are sufficiently favorable (e.g., Elsner, Schwardt 2014; Castro et al. 2014; more below).

In the institutionalist tradition, the instrumental content of socio-economic systems has been operationalized through elaborating the so-called *social value principle* (e.g., Tool 1985, 1986). But we will not delve deeper into *operationalization* here (more below).

***Degrees of instrumentality: Network structures and innovation capacity***

In VAC and IS, innovation capacity is of course not necessarily or naturally high, as in production and innovation manifold collective-good problems always linger on. For instance, innovation entails a combination of existing knowledge into something new, and integrating the knowledge of agents signifies an extension of the relevant knowledge base. Structures then have to be established to guarantee the adequate *flow of knowledge* among agents. This will always entail a lasting trade-off between making short-run maximum of one's information and generating the long-run operability of the collective process, including a longer-run individual improvement. If conditions are sufficiently nontransparent, there will be a dominant incentive to avoid one's contribution (in terms of R&D costs, information sharing etc.) and assume a *free-rider* position, when the agent in an IS cannot be excluded from a general information flow. Co-evolving *structural patterns that enable cooperation*, thus, are likely required for individual and collective long-term success (e.g., Nelson, Winter 1982; Beinhocker 2008; Elsner, Heinrich 2010; Matutinovic 2010).

Again, on the one hand, this is a question of platform *size*. On the other hand, it is a question of *network structure*. A centralized network, where all information has to flow through a central node (hub), an *H&S network*, will result in a powerful central player controlling the

ability of others to interact and, thereby, may lead to some limitation of the overall innovation potential. In contrast, informally institutionalized decentralized contacts among the members of a production network may shorten ways and time required, and help its functioning, flexibility, and innovation performance (e.g., Helper, Sako 2010; for an overview, e.g. Beinhocker 2008).

Some network structures display particularly effective properties, and thus received particular interest from both *social network analysis* and network design: The well-known *small-world networks* (e.g., Watts, Strogatz 1998) combine *meso-sized clusters* with their high potentials of *institutional emergence* of cooperation, with a number of long-distance relations among them that ensure that the whole structure has a relatively *short average path-length* between any two agents so that new information may diffuse through the whole system relatively fast. Here, obviously, some agents will have a higher *degree of centrality*, i.e., power and hierarchical position, than others, where network designers would have to be aware of.

In sum, for analyses of complex production and innovation systems, in terms of their problem-solving capacities, the specific structures composed of the particular properties of “markets” (prices), hierarchy (commands), and networks (institutionalized reciprocity) are natural starting points, mirrored by the Triangle. And *social network analysis* will be a natural way to further develop the organizational space conceptualized here.

#### **4 Depicting real-world organizational trends in the wider organizational space**

##### **(1) *Blurring firm boundaries***

As said, VAC/IS do assume a variety of forms and structures, responding to different paths their interaction processes have taken (e.g., Wright, Mukherji 1999). This entails differences in the boundaries of the organizational entities, including hierarchies in “markets”, with arm’s-length relations and prices playing some role, further spatial clusters, and firm networks. However, it has been observed over the last decades that boundaries of firms increasingly blur under forms of informal institutionalized cooperation, particularly in highly innovative and dynamically cooperating spatial production and innovation systems (as a classic, e.g., Saxenian 1994), and that such close reciprocity relations have become increasingly crucial for innovating firms’ “high-road” developments (e.g., Dosi, Salvatore 1992; Amin, Hauzner 1997; Hodgson, Knudsen 2000; Kay 2000). With this, we would conceptualize some movement *upwards* in the Triangle (see Figure 3, Trend 1).

[Figure 3 about here.]

## (2) *Spatial clustering*

For further conceptual qualification of the organizational space, other reference points may be located at the edges for a better orientation in the space. Another ideal organizational form that integrates spontaneous decentralized exchange with (still) some role for prices (i.e., “markets”), but transactions taking already place in some increasingly stable relations, is *spatial clusters*. It is, thus, ideally located “halfway” between ideal market and ideal institutionalized network on the left edge. We consider such local/regional clusters informal coordination forms, ideally emerging from “markets” under (perceived) complexity conditions, as *spatial organizational forms* of firms in a *Marshallian* sense of industrial agglomerations, in order to deal with and reduce complexity and to stabilize expectations and behavior, reflected by repeated, relatively stable, lasting and *increasingly price-resistant* exchange relations that is becoming institutionalized to some degree (often with agents not

being even aware of that) (e.g., Elsner 2005, 2010). According to Alfred Marshall (1890), cluster display and practice some *informal labor and supplier “pooling”*, while shared “*information is in the air*”. In fact, nowadays high-tech firms are caring for their high value-added and highly innovative branches and plants to be located in (or relocated into) effectively interacting specialized clusters. The empirical literature on this is nearly infinite, and we cannot delve deeper into this here. Just note that with this trend firms are moving with their high value-added plants towards the “halfway” left hand of the Triangle. (Figure 3, Trend 2).

### **(3) *Open-source networking***

*Strategic firm networks* then are more *deliberately agreed* forms of multilateral, often project-based and fix-termed institutionalized cooperation, often emerging from the above cluster interactions among a subset of cluster firms. Institutionalized cooperation behavior appears to be even stronger and often more formal in a strategic network than in a cluster. But also, such networks often do not have the spatial limitations that clusters have (although they also need to care for face-to-face meetings to remain productive) (again, e.g., Elsner 2005, 2010).

Against this characterization, and as generally argued throughout this paper, network forms generally are to be located in the upper part of the Triangle.

A development that comes close to the ideal networking with fully shared-information flows and collective-good contributions has been the “open-source” movement in software development. This has also been extensively analyzed (e.g., Raymond 1999; Lerner, Tirole 2002), and we will not delve deeper into it here. Open source and *open innovation* have indeed developed from the limited early “hacker” and programmers scene far into the “normal” *commercial firms* world.

Under original open source, individual reciprocal contributions to the collective good would become the predominant institutionalized behavior, and information and expectations become fully common (for an empirical case study of the *Linux* networks on the background of the Triangle, see Elsner, Hocker, Schwardt 2010). Note that such ideal movements would be conceptualized to approach the upper angle of the Triangle (Figure 3, Trend 3).

**(4) *Flatter hierarchies and increasing control through H&S networks***

A trend that has also been long-established and well-analyzed is that *large hierarchy*, still a prime tool for increasing control over a firm's environment and to compensate for increasing complexity and turbulence under de-regulated globalization, has tended to be reduced and made flatter over the past decades to *reduce internal complexity*. This was due to increasing difficulties in managing larger hierarchical systems of many interrelated units. But this obviously did not out-compete larger entities by smaller ones, smallness over bigness, flexibility over power, etc. Rather, control has increasingly been exerted through more *network-based* forms, in face of ever more complex VAC/IS, towards *new combinations of interior hierarchies and exterior networks* (e.g., Armstrong 2001; Perraton, 2001; Choi, Hong 2002; Elsner 2005; Vitali et al. 2011). Resulting global H&S networks may be multi-staged, with distributions of firms' sizes and firms' centralities, and even sets of distributed hubs. In this way, the central hub and assembler firm (the final brand firm) may command hundreds of firms and many hundred thousand laborers worldwide. Contracting out will also shift risks of volatility to smaller, formally autonomous units. Also, it helps improving financial indicators in a more short-run stockholder-financialization regime (e.g., Lazonick 2010; Milberg, Winkler 2013).

As a combination of hierarchy and network, the ideal H&D network would have to be conceptually located half-way on the right-hand edge of the space, and with the above trend, we would register a move towards it in the Triangle (Figure 3, Trend 4).

**(5) *An emergent narrow network of dominating financialized entities***

As a final example, a most critical and dominating development in the today's financialized global corporate economy is its centralization into *around forty leading financial-industrial mega-powers*. According to the so far largest recent *corporate network analysis*, this forms a relatively closed network of mutual ownership and personal interlocks, each commanding several multi-layered H&S networks with hundreds of firms each, in total representing the largest parts of the world economy. This analysis covers the 40,000 largest firms and is based on the largest corporate data set ever (an ETH Zurich study: Vitali et al. 2011; for institutional(ist) classics on a corporate power-based "planning" networks with capital and personal interlocks, e.g., Berle, Means 1967; Galbraith [1967] 2007; Munkirs 1985; Hayden, Bolduc 2000).

In the Triangle, this development would mean a *move to the lower right* (see Figure 3, Trend 5). The strong ceremonial content, in a Veblenian vein, would stem from the fact that they have the full set of instruments available to network at the expense of third parties and the general public (transfer pricing and tax evasion, price coordination, mergers and acquisitions, collusion, entry deterrence, lobbying and rent seeking etc.).

In order to *operationalize* such trends in the Triangle, we might refer again to the Veblenian theory of institutional change and some "*index of ceremonial dominance*" developed therein from network analyses (e.g., Bush 1987; Hayden, Bolduc 2000). But again, we will not delve deeper into operationalization and measurement issues here.

## 5 Conclusion

As Coase stated, “the relationship which governs the mix of market and hierarchy ... [is] extremely complex, and in our present state of ignorance it will not be easy to discover what [the] factors are” (Coase 1992, 718). This paper has argued that the most critical of those factors can be captured only through a systemic and complexity approach, integrating a *complexity-governing (institutionalized problem-solving) dimension* with the “market-hierarchy” dimension into an extended organizational space.

Thus, we have proposed a *two-dimensional* organizational space conceptualizing real-world direct interdependence, complexity, and dynamic process, to get beyond the ideal “market-hierarchy” frame based on marginal calculus. We strive to extend the analytical scope to address the larger and persistent variety of real-world organizational forms. Ubiquitous interdependence, and coordination and cooperation problems render stand-alone firms and arm’s-length market interactions of relatively limited utility for the analysis of organizational forms.

We have “idealized” the Coase-Williamson dimension to an empirically void limit and referred to the OIE (Veblenian) institutional dichotomy to capture emergent institutionalized organizational network forms on a new, second dimension, the end-points of which again are ideal and empirically void extremes. While the “ceremonial” end of this dimension connects with the idealized Coase-Williamson “baseline”, the other “instrumental” end constitutes a third ideal angle of the now unfolding Organizational Triangle, ideal institutionalized

cooperative networks. Ideal spatial clusters and ideal H&S networks further characterize the (empirically void) edges of the Triangle.

Any real-world and empirically accessible organizational form, then, appears as a 3-tuple of (1) spontaneous decentralized mechanisms, where prices play some role (“markets”), (2) ideal structures of superior-inferior command relations (“hierarchies”), and (3) interactively learned informal institutionalized cooperation forms dealing with complex environments and intricate decision structures, emerging as multilateral networks solving, better or worse, the complexity challenge. We have defined the inner space of the Triangle as the empirically relevant space and have, for illustration purposes, allocated some *well-known real-world trends of organizational development* in the Triangle (blurring firm boundaries; spatial clustering; open source/open innovation; global H&S networking of large corporations; and emergence of a global level of few interlocked and networking financial-industrial mega-entities), to illustrate its empirical accessibility.

Our exercise seems to provide an opportunity to advance the analytical capacity in the field. It opens the space for integrating the real-world variety of forms into an organizational space. Systems of production, of information, and of innovation, and intricate technological standardization and open innovation problems center on the increasingly significant real-world forms of clusters and networks. This also marks the inevitable institutional embeddedness of both market and hierarchical transactions.

So while the additional dimension provides meaning for an increasing *embeddedness* of firms in general, its ceremonial direction also demonstrates possible *dis-embedding* options.

The TC dimension does not remain untouched by the new conceptualization: Instrumental institutionalized network relations will improve the ability to lower TC. That such relations, however, also may deteriorate over time, towards an institutionalization of status- and power-based “ceremonial” values, implies regular evaluations of structures and their *problem-solving potentials*.

Proper *institutional design* of organizational triples in support of improved problem-solving action capacities may then become mandatory for an (enlightened) *public-policy agent*. The Triangle appears to be able so far to support our understanding of processes by tracing changes as movements through its empirically accessible interior space.

As explained, *social network analysis* and related *index measures*, together with further operationalization of the “instrumental value principle”, are considered natural directions to further elaborate this so far only conceptual approach. Issues of *operationalization* and empirical measurement must be left to future research.

(6,820 words)

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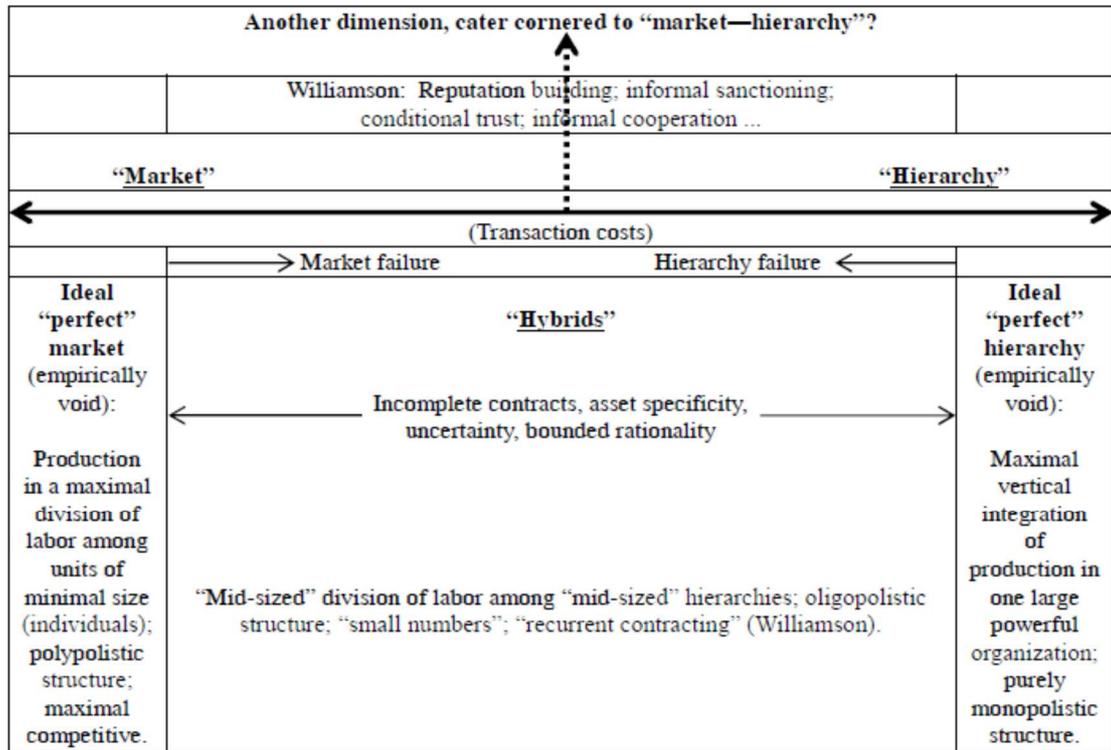
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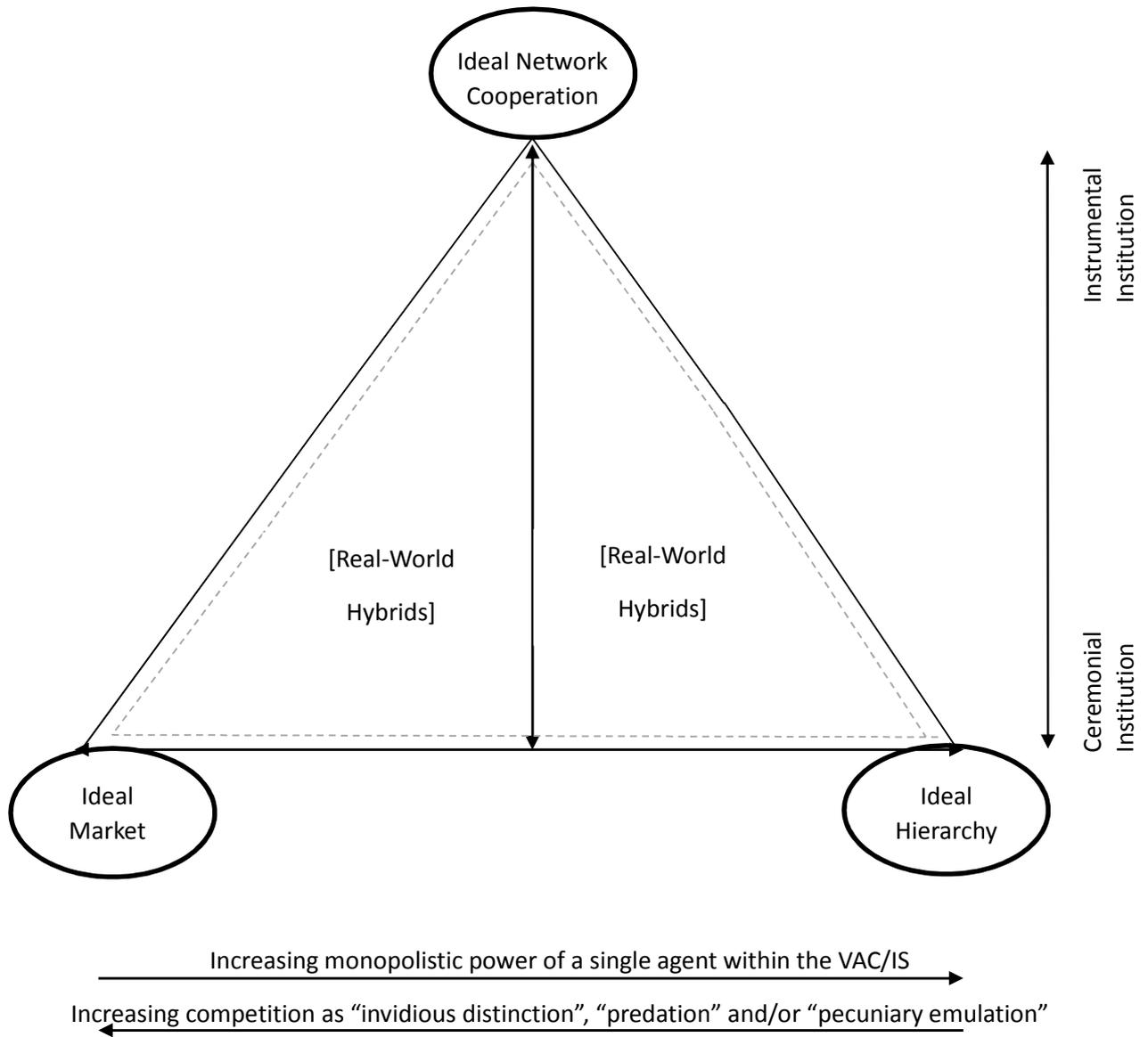
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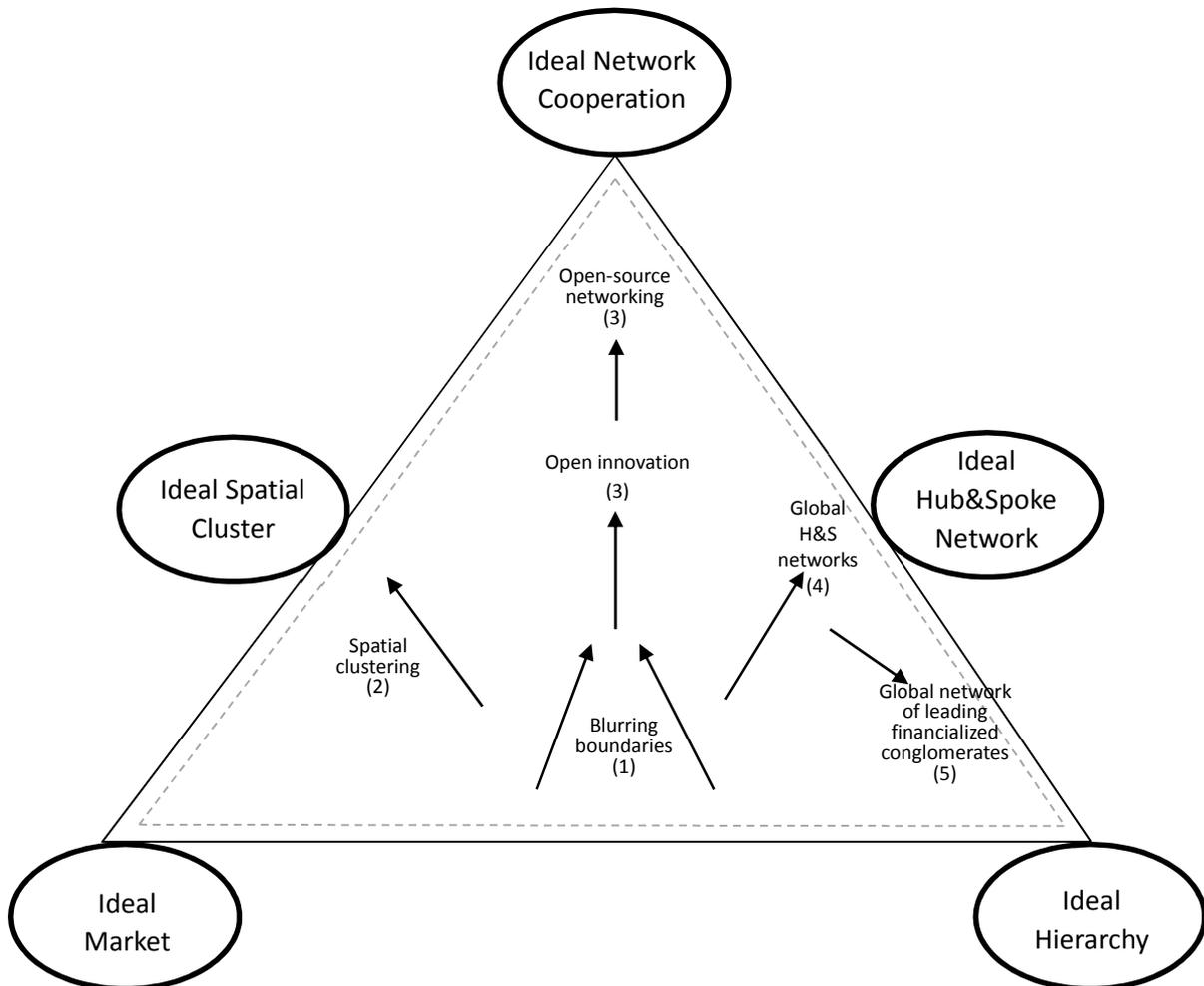
Figure 1: The Williamsonian market—hierarchy organizational dimension – Illustration.



*Figure 2: An “Organizational Triangle” with ideal benchmark organizational forms – Illustration.*



**Figure 3:** *The current main move in the real-world global corporate economy: Towards a narrow power-based oligopolistic network of multi-layered H&S networks (after Vitali et al. 2011) – An illustration in the Organizational Triangle.*



(9,025 words, incl. abstract)