

TECHNOLOGY ADOPTION AND EMBEDDEDNESS

Propositions on a four facet framework

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Abstract

The purpose of this paper is to propose and discuss a framework to study the embeddedness of technology adoption. This paper embraces the view expressed under the notion ‘no business is an island’, here labeled and discussed as the embeddedness argument. The view emphasizes that firms and firm decisions and technology need to be studied with reference to the context, e.g., forces and constraints, which they are embedded in. If the phenomenon is studied in isolation, scholars might be misled. The proposed framework is sorted under the following four facets: relational embeddedness, structural embeddedness, institutional embeddedness and temporal embeddedness. The idea is that, based on prevalent studies, we can structure our conceptualization around four different facets of embeddedness. The framework builds heavily on the Granovetterian delineation of structural and relational embeddedness, and adds to that an institutional dimension and a temporal dimension. These facets differ quite extensively in terms of analytical foci, level of analysis and disciplinary background. Therefore, the paper is concluded with a discussion on applicability and separability of the facets of the framework and if the concept of embeddedness could not easily become empty if applied with to much broadness?

Introduction

The purpose of this paper is to propose and discuss a framework to study the embeddedness of technology adoption. The fundamental framework under which this will be done is the embeddedness argument. An idea that is closely related to the embeddedness argument, and that this paper also embrace, is the view expressed under the notion ‘no business is an island’ (Håkansson & Snehota, 1989) within the IMP-tradition. This view suggests that, in order to understand relationships and conducts in an industrial context, scholars need to acknowledge that (Håkansson & Snehota, 1995:3):

[the explanation to] what is happening in a certain relationship can be searched for, to some extent, in factors ‘external’ to the relationship itself. Each relationship appears then as embedded in or connected to some other relationships, and its development and functions cannot be properly understood if these connections are disregarded.

The concept of embeddedness seems to be a well established concept in many different branches of the social sciences, and not only in business administration. In fact, several different disciplines have addressed embeddedness from different angles and for different purposes. For example, there are several publications in business administration (e.g., Grabher, 1993; Håkansson & Snehota, 1995), in sociology (e.g., Granovetter, 1985), and, in economics (e.g., Richardson, 1972) that address the embeddedness argument. Though the analytical frameworks differ quite substantially, the argument seems to be fundamentally the same for all disciplines. Most of the inspiration of the embeddedness argument, as outlined here, has been found in the stream of research labeled economic sociology (e.g., Granovetter & Swedberg, 2001; Swedberg, 2003). The core reference when the term embeddedness is applied in social science is Granovetter's (1985) work on the embeddedness of economic behavior. According to this seminal article, the problem is atomization and the traditional approach to view economic behavior as atomistic. The atomization can be found in both the conception of rational action and in the assumption of atomized decision making (Swedberg, 2003:36). The problem is that firms and firm decisions (economic action) need to be studied with reference to the context, e.g., forces and constraints, which they are embedded in. If the phenomenon is studied in isolation, scholars might be misled. In this paper, the same argument is used as a framework to study the embeddedness of technology adoption is proposed and discussed.

Defining and delineating technology adoption

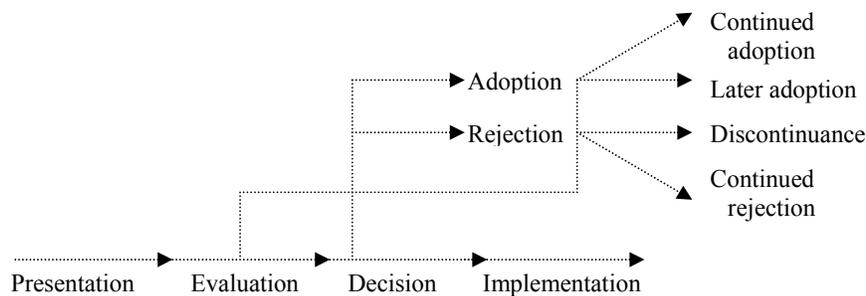
The phenomenon which is assumed to be embedded and for which a framework is outlined in this paper is technology adoption. This paper draws on an established definition when defining and delineating adoption into a workable concept. Even though the specific focus of the paper is to outline a framework of the embeddedness of technology adoption, it first seems necessary to frame technology adoption. In this paper, a specific firm's decision to adopt a technology is referred to (Rogers, 1995:171) according to the definition that adoption is a decision to make full use of an innovation as the best course of action available. However, the phenomenon of technology adoption as a subject of scholarly interest seems to be more relevant if it also included non-adoption. In addition, it is here assumed that studies on adoption need to focus on more than the mere decision to adoption; instead the focus needs to be on the adoption process where the decision is one part. Thus, adoption is here broadly defined as a collective term of the process in which a firm makes a decision to adopt or to not adopt a specific technology. The adoption process has been extensively elaborated on in previous studies. To view adoption as a sequence of events over time also makes sense when the empirical setting is business-to-business. In previous studies, the complex structure of industrial markets has been argued to lengthen the time-span from introduction to diffusion. According to a study of how the diffusion of industrial products differs from retail products. It is argued (Day & Herbig, 1990:265) , for example, that the prolonged time-span is an effect of that:

the decision process almost always involves a multiparty decision-making unit; [and that] adoption decisions typically involve very large commitments of funds relative to the individual consumer or household; [and that] the impacts of acceptance of an innovation usually in the industrial context will be felt throughout the focal organization and by other organizations, whereas consumer

products tend to be limited to the single consumer who buys and uses the product.

These arguments are in line with the arguments of the nature of industrial markets that the IMP-tradition has acknowledged and conceptualized around for quite some time (e.g., Axelsson & Easton, 1992; Håkansson, 1982; Håkansson & Snehota, 1995). In this framework, technology adoption is delineated into four different phases. There are many similar approaches to delineate the adoption process and the figure below shows the steps *presentation* (the subject of diffusion is exposed to the existence of the object of diffusion), *evaluation* (the subject of diffusion evaluates the object of diffusion and forms a basis for a future decision), *decision* (based on the outcome in the evaluation stage, a decision is made to either adopt or to reject), *implementation* (if the subject of diffusion decides to adopt, the object of diffusion is put into use). The decision to adopt or not to adopt a technology is not necessarily definite. Therefore, there is always a possibility for the object of diffusion to change his or her mind. This opens up for a loop back to the evaluation stage in the process.

Figure 1, The adoption process



Even though to depict the process of adoption seems to be vital in order to understand technology adoption, there are still other aspects to its understanding as well. This paper approaches technology adoption with the help of four other entities in addition to process. The first entity is, of course, the technology (characteristics of the object of adoption). The technology could be in the form of a product, a process and idea or a set of ideas or something else. The second entity is the adopting firm (characteristics of the subject of adoption). It should perhaps be noted that the subject of adoption could be something else than a firm, but in this framework we have set the level of analysis to the firm level. Moreover, it could be argued that the outcome of the adoption process, which in many cases is treated binary, has to be included as an entity. Outcome of adoption process is the third additional entity. In addition to process, technology and firm and outcome, and the introductory argument of a need to take the embeddedness argument under consideration, we also need to include other entities that construct a conceptualization of the context in which the subject of diffusion is embedded in. It is this context that this paper concerns. It is this context that technology adoption is assumed to be embedded in. How can we conceptualize around embeddedness and technology and what theoretical fields could be useful to include?

By addressing technology adoption as the phenomenon of interest, we first might need to look at prevalent studies that have approached technology and embeddedness. By addressing

technical embeddedness, the argument in some previous studies of technology have been that one cannot study technology without reference to specific aspects (Ford, et al., 1998). Garud and Jain (1996) have made similar observations on the embedded nature of technological systems. Three of the aspects brought forward by Ford et al., (1998) will briefly be elevated here in order to make some points on the embeddedness of technology. First, knowledge of technology is to a large extent shared across firm boundaries. Second, a single firm has rarely full control of its own technology but control is often distributed and that this has to be taken into consideration. Third, the connection to others through relationships and shared control implies that technological change might produce other changes through connectivity. In addition, within the IMP-tradition, technological development and technology in networks has been addressed in several contributions (e.g., Håkansson, 1987; Laage-Hellman, 1989; Lundgren, 1991). In a recently presented thesis on ICT and resource interaction, Baraldi (2003) outlines a theoretical framework that evaluates ICT tools and their effects on the performance of managerial tasks. This study discloses several embedded aspects of technology. In addition, Håkansson and Waluszewski (2003) recently presented an analysis of technological development in the case of IKEA that also showed the complexity and embedded nature of technology.

A proposition on a framework of embeddedness

The framework presented here has been sorted under the following four facets: relational embeddedness, structural embeddedness, institutional embeddedness and temporal embeddedness. The idea is that, based on prevalent studies, we can structure our conceptualization around four different facets of embeddedness.

Table 1., The proposed four facets of embeddedness

Embeddedness facet	Analytical focus	Core references	Unit of analysis	Disciplinary background
<i>Relational embeddedness</i>	Connectedness	Granovetter (1985) Cook & Emerson (1978)	Network of individuals	Sociology
<i>Structural embeddedness</i>	Network position and power structures	Granovetter (1985) Pfeffer & Salancik (1978)	Network of individuals and firms	Sociology Economics
<i>Temporal embeddedness</i>	Time and timing as impediments or facilitators	Rosenberg (1982) Utterback (1994)	Industry	Economics
<i>Institutional embeddedness</i>	Normative pressures	Powell & DiMaggio (1991)	Organizational field	Sociology Economics

These facets differ quite extensively in terms of analytical foci, level of analysis and disciplinary background. This framework is an extension of the Granovetterian separation between structural embeddedness and relational embeddedness (1992:34-37). To the two facets of embeddedness brought forward by Granovetter, two additional ones are added; institutional embeddedness and temporal embeddedness. In this section, a proposed framework for the embeddedness of technology adoption will be outlined in detail. The two first facets might be easy to trace in the IMP tradition, the two latter are less explored. Each of proposed the facets will be extensively elaborated on and distinguished.

Relational embeddedness

The first facet in this framework is the notion that technology adoption is influenced by *relational embeddedness*. Here, to study the relational embeddedness of technology adoption means to put emphasis on how adoption and adoption processes are embedded in and influenced by direct and indirect relationships. A core reference regarding relational embeddedness the distinction that Granovetter (1992:34) makes when separating relational embeddedness from structural embeddedness. It could be argued that the distinction made by Granovetter could mean that relational embeddedness meant direct links and that structural embeddedness meant indirect links. Here, however, it is argued that the distinction is a bit more complicated and that, in fact, indirect relational links are included in the relational embeddedness. One of those who explicitly have employed the concept of relational embeddedness is Uzzi (e.g., 1997) while studying the paradox of positive and negative effects of embeddedness. In this particular study it is concluded that firms that relies on exclusively embedded ties would might have problems picking up new information in the same way that Granovetter claimed in his work on strong and weak ties (Granovetter, 1973). Uzzi found that a mixture of market ties and embedded ties are needed, something he labeled the paradox of embeddedness.

When employing the definition outlined by Granovetter (1992), that relational embeddedness refers to cohesive links, the step into the theorizing on *connectedness* is not far. Connectedness has been argued to be one of the most central characteristics of industrial networks as it is employed within the IMP tradition (e.g., Halinen & Törnroos, 1998; Håkansson & Snehota, 1995). In addition, another core reference in work on connectedness is the article on power in networks (Cook & Emerson, 1978). To argue that two or more relationships are connected, or, to refer to more contemporary works within industrial marketing, to define a network as a set of connected relationships (Håkansson & Johansson, 1992), is to say that exchange in one relationship affects, positively or negatively, another relationship. Anderson et al., (1994), in their study on dyadic business relationships within a business network context, outline a comprehensive conceptualization on connectedness. Among other findings, they assert that connectedness could take the facets of constructive or deleterious effects on business relationships.

Structural embeddedness

The second facet in this framework is the notion that technology adoption is influenced by structural embeddedness. Here, to study the structural embeddedness of technology adoption means to put emphasis on how adoption and adoption processes are embedded in and influenced by a positional and structural setting. In this framework, structural embeddedness refers to that beyond the direct relational as for example the structural positions that firms occupy (Granovetter, 1992:35). Those who explicitly have employed the concept of structural embeddedness have, for example, done it by referring to spatial aspects or positional aspects or network density aspects. In addition, much of the work by Pfeffer and Salancik (1978) can be applied here. Even though perhaps not explicit, Pfeffer and Salancik elaborate on how firms are embedded in a structural environment and that this leads constraints and dependencies necessary to include in analysis of firm actions. In addition, much of the work on path dependence (e.g., Rosenberg, 1982; 1994) and dominant design (e.g., Utterback,

1994) could be seen as structures that are built up around technologies or innovations and that eventually influences of adoption and adoption processes.

Following the reasoning above, structural embeddedness explicitly has to do with positional aspects and that structural embeddedness refer to that beyond the direct relational as for example the structural positions that firms occupy. Again, we can turn to industrial marketing to find additional conceptualization on structural embeddedness and position. Network position provides a perspective on a single business relation to other businesses in a network context (Axelsson & Easton, 1992). Here, network position is categorized into function, identity and relative importance if the business in its network. Power and relative position are two interrelated concepts. In addition, Johansson and Mattson (1992) stress that since network positions can be identified for all actors in a network, the concept can be used to describe network structure and network distance between actors. Turnbull et al. give an alternative perspective on network positions, as they categorize the concept of network position into access, reputation and expectations (Turnbull, et al., 1996). In a longitudinal study on network position, Henders (1992) gave empirical support of the view that positional structures, in fact, are not static but dynamic and changing over time.

Temporal embeddedness

The third facet in this framework is the notion that technology adoption is influenced by temporal embeddedness. Here, to study the temporal embeddedness of technology adoption means to put emphasis on how adoption and adoption processes are embedded in and influenced by previous and current experiences, developments and decisions made. Those who have explicitly have applied temporal embeddedness in prevalent studies, have done so, for example, by defining it as ‘a shared/common history’ – a product of repeated exchange and the experiences thereof (e.g., Berger, et al., 1995; Rooks, et al., 2000). Rooks et al., discuss two important aspects of shared inter-organizational past. First, there are the knowledge, experience and information about a specific counterpart that firms gain. Second, there are the mutual investments and adaptations that a common past often implies. Here, exemplary works on inter-firm adaptations have been made by Swedish scholars on inter-firm adaptations (Hallén, et al., 1991), providing empirical accounts and a structural model of how interacts and adapts depending on either trust or dependence.

Perhaps the most famous concepts that are related to temporal embeddedness as discussed here, albeit not explicit, are the studies on the two concepts are path dependence and dominant design. These two concepts have already been mentioned as parts of the structural embeddedness facet. Using path dependence to explain technological diffusion and adoption is to study how historically early random events can lead a random walk process to lock in a specific standard. The dominant design perspective, brought forward by Utterback and others (Suarez & Utterback, 1995; Utterback, 1994), emphasizes both the voluntaristic and deterministic sides of diffusion and non-diffusion as they suggest the term dominant design to describe the phenomenon which has it that there is a standard that firms within a given industry follow. Both concepts put part of its focus on time. Temporal embeddedness can be expressed in terms of two or more firms shared past or in terms of a single technology’s history and embedded nature in terms of path dependence. In addition, temporal embeddedness of adoption can be expressed in terms of timing. In this case, instead of

looking backwards, a specific point in time is addressed as the importance of timing in presenting (launching or introducing) a technological application.

Institutional embeddedness

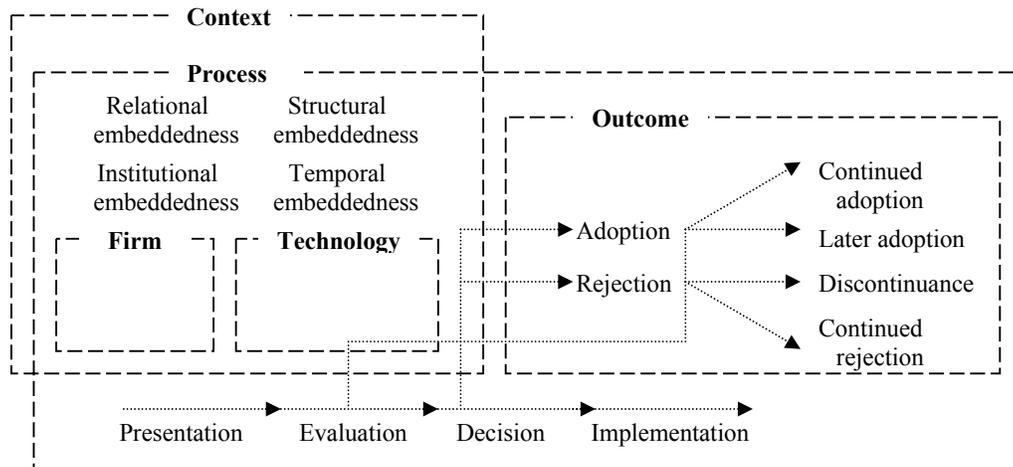
The fourth and final facet in the framework that is outlined in this paper, is the notion that technology adoption is influenced by *institutional embeddedness*. Here, to study the temporal embeddedness of technology adoption means to put emphasis on how adoption and adoption processes are embedded in and influenced by socially constructed norm systems. With the latest year's boom of internet technologies and applications in retrospect, these socially constructed norm systems seems to have the potential of functioning as quite powerful analytical tools. The notion of institutional embeddedness has spurred out of what could be labeled the field of institutional theory, or institutionalism, which represents quite a broad range of studies with disparate meanings and within disparate scholarly disciplines (e.g., Powell & DiMaggio, 1991). To paraphrase Granovetter from the former section, this stream of research looks at distinctively more "subtle and less direct" influences on actions than those that until now have been presented as the first two facets of the embeddedness framework. Those who explicitly have employed the concept of institutional embeddedness have done it by referring to institutional forces and putting focus on, for example, structural mechanisms and cultural influences (Strang & Soule, 1998) or taken for granted structures, norms and procedures (Jepperson, 1991). When the term institutional embeddedness is applied, it refers to, for example, the nesting of firm and market behavior in a social and normative context (Oliver, 1996). In accordance to this, in the framework proposed here, a specific focus will be put on the normative aspects of institutionalism (Scott, 2001). Within institutional theory, adoption is not a new subject. However, the focus has been on the broader diffusion of organizational forms and practices rather than on technological applications (e.g., Strang & Meyer J, 1993:487). In addition, the focus has, to a large extent, been on macro-aspects (diffusion in e.g., organizational fields) rather than micro-aspects (individual firm adoption).

The idea of including institutional embeddedness into the framework outlined here is that there are other goals than financial fitness and profit that firms pursue (Granovetter, 1992:25). As it seems, organizational analysis needs to take into consideration that firms seems to seek some form of social fitness (e.g., Oliver, 1996; Powell, 1996). In order to pursue this thought, there is a need for additional concepts to understand economic action. Institutional embeddedness can be expressed in terms of how a firm's decision-making process can be influenced by social uncertainty. For these reasons, to deal with institutional embeddedness, it can be asserted that several prevalent studies have, implicit or explicit, put focus on normative structures and legitimacy. In addition, an explicit focus on a societal homogenization mechanism, not necessarily conscious (Powell & DiMaggio, 1991:8), that firms strive to resemble each other, suits this approach. This refers to the mechanism of homogenization that, according to advocates of institutionalism, functions as forces that pushes firms into mimetic behavior (Powell & DiMaggio, 1983). In this case, firms would adopt new technology on the basis that other firms in their environment have done so. This could, for example, be an expression of the fact that a market failure without trying the adoption option would be more difficult to explain than failure with doing as every other firm.

Embeddedness and technology adoption: a discussion

If one would like to be critical towards a framework like the one proposed in this paper, one could raise the question if the concept of embeddedness could not easily become completely empty, a tautology if you wish, when addressed as broadly as it is in this proposition. This question has also been raised by Granovetter (1995). Are not all events embedded in some sense? Is it not evident that neither technology adoption nor other firm activities are isolated events? I would like to emphasize that the embeddedness facets is merely a starting point and that it is what we fill the facets with, what concepts we link to the embeddedness facets, that matters. It seems reasonable to continue the work that is started with this paper by selecting a number of key concepts from each facet that needs to be added and applied in analysis. By doing this, one could probably also shorten the conceptual distance between the embeddedness facets and technology adoption. Tentatively, by using the discussion of technology adoption that was outlined in the beginning of the paper, the facets could be framed in the following way:

Figure 2, Framing technology adoption



The purpose of this paper was to propose and discuss a framework to study the embeddedness of technology adoption. In conclusion then, there are, however, some aspects and questions of the applicability that can be discussed further. The intention is to devote the remaining part of this chapter to these questions. As it seems, there are several challenges in applying the proposed framework. These challenges are also related to the ability to separate the four different facets. Three such challenges can be identified as:

- many of the embeddedness influences could be present at the same time in the adoption process
- the different embeddedness influences could be inter-connected and interrelated and thus difficult to separate
- different embeddedness influences could be affect more or less or not affect the adoption process at different stages in the adoption process

Is then the broadness and potential inseparability of the framework a problem? Or, is it possible to identify, separate and select the plethora of concepts that can be identified in each

facet of the framework? The answer is probably: it is not possible. As each empirical case is different, its framework of analysis needs to be different as well. Partly, at least, the problem could be solved by addressing key concepts instead of broad facets. Nevertheless, the framework presented here could provide an umbrella under which further research on technology adoption embeddedness. As I conclude, one could counter argue the low necessity of at least the separation and, perhaps, accept the fact that these factors function in cooperation. Is it, at all, possible to describe all properties of a given organization, or, should we, in stead, focus on our ability to grasp the most significant? If this is the case, the identification might be more relevant than the separation.

Continuing the question on applicability, the quite noticeable fact that different aspects of embeddedness are enthused by different theoretical antecedents could imply further problems. As outlined in the former section, the different embeddedness facets have different disciplinary backgrounds and, in most cases, different units of analysis. Temporal embeddedness seems to have its roots in economics and the unit of analysis seems to be industry. Institutional embeddedness has obvious antecedents in institutional theory, which, in its turn, has its roots in sociology and economics. A unit of analysis that seems to be common is the organizational field and thus, as mentioned before, the focus has, to a large extent, been on macro-aspects (diffusion in e.g., organizational fields) rather than micro-aspects (individual firm adoption). Relational and structural embeddedness has their roots in sociology, but traces can also be found in business administration with its contemporary focus on relationships and perhaps also in economics if one looks at structural influences as in path dependence studies. Depending on what disciplinary background one looks at embeddedness from here, one will find units of analysis varying from the individual to firms in networks.

References

- Anderson, J., Håkansson, H. & Johansson, J., (1994), Dyadic business relationships within a business network context, *Journal of Marketing*, Vol. 58. (October), pp. 1-15.
- Axelsson, B. & Easton, G., (1992), (Ed.), *Industrial networks: A new view of reality*, Routledge, London
- Baraldi, E., (2003), *When information technology faces resource interaction: Using IT Tools to handle products at IKEA and Edsbyn*, Doctoral Thesis, Uppsala University, Department of Business Studies, Uppsala
- Berger, H., Noorderhaven, N. G. & Nooteboom, B. (1995), *Determinants of supplier dependence: an empirical study*, in Sjöstrand, S.-E., Pitelis, C. & Groenewegen, J. (Eds.), *On economic institutions: theory and applications*, Edward Elgar, Aldershot.
- Cook, K. S. & Emerson, R. M., (1978), Power, equity and commitment in exchange networks, *American Sociological Review*, Vol. 43. (5), pp. 721-739.
- Day, R. L. & Herbig, P. A., (1990), How the diffusion of industrial innovations is different from new retail products, *Industrial Marketing Management*, Vol. 19. (3), pp. 261-266.

- Ford, D., Gadde, L.-E., Håkansson, H., Lundgren, A., Snehota, I., Turnbull, P. & Wilson, D., (1998), *Managing business relationships*, John Wiley & Sons, Chichester
- Garud, R. & Jain, S., (1996), The embeddedness of technological systems, *Advances in Strategic Management*, Vol. 13. pp. 389-408.
- Grabher, G., (1993), (Ed.), *The embedded firm: on the socioeconomics of industrial networks*, Routledge, London
- Granovetter, M., (1973), The strengths of weak ties, *American Journal of Sociology*, Vol. 78. (6), pp. 1360-1381.
- Granovetter, M., (1985), Economic action and social structure: The problem of embeddedness, *American Journal of Sociology*, Vol. 91. (3), pp. 481-510.
- Granovetter, M. (1992), *Problems of explanation in economic sociology*, in Nohria, N. & Eccles, R. G. (Eds.), *Networks and organizations*, Harvard Business School Press, Boston.
- Granovetter, M. (1995), *La notion d'embeddedness*, in Jacob, A. & Vérin, H. (Eds.), *L'inscription sociale du marché*, L'Harmattan, Paris.
- Granovetter, M. & Swedberg, R., (2001), (Ed.), *The sociology of economic life*, 2nd Ed., Westview Press, Boulder
- Halinen, A. & Törnroos, J.-Å. (1998), The role of embeddedness in the evolution of business networks, *Scandinavian Journal of Management*, Vol. 14. (3), pp. 187-205.
- Hallén, L., Johansson, J. & Seyed-Mohamed, N., (1991), Interfirm adaptations in business relationships, *Journal of Marketing*, Vol. 55. (April), pp. 29-37.
- Henders, B., (1992), *Positions in industrial networks: Marketing newsprint in the UK*, Doctoral Thesis, Uppsala University, Department of Business Studies, Uppsala
- Håkansson, H., (1982), (Ed.), *International marketing and purchasing of industrial goods*, John Wiley & Sons, Chichester
- Håkansson, H., (1987), *Corporate technological behavior*, Routledge, London
- Håkansson, H. & Johansson, J. (1992), *A model of industrial networks*, in Axelsson, B. & Easton, G. (Eds.), *Industrial networks: A new view of reality*, Routledge, London.
- Håkansson, H. & Snehota, I., (1989), No business is an island: The network concept of business strategy, *Scandinavian Journal of Management*, Vol. 5. (3), pp. 187-200.
- Håkansson, H. & Snehota, I., (1995), (Ed.), *Developing relationships in business networks*, Routledge, London

- Håkansson, H. & Waluszewski, A., (2003), *Managing technological development: IKEA, the environment and technology*, Routledge, London
- Jepperson, R. L. (1991), *Institutions, institutional effects and institutionalism*, in Powell, W. W. & DiMaggio, P. J. (Eds.), *The new institutionalism in organizational analysis*, University of Chicago Press, Chicago.
- Johansson, J. & Mattsson, L.-G. (1992), *Network positions and strategic action - an analytical framework*, in Axelsson, B. & Easton, G. (Eds.), *Industrial networks: A new view of reality*, Routledge, London.
- Laage-Hellman, J., (1989), *Technological development in industrial networks*, Doctoral Thesis, Uppsala University, Department of Business Studies, Uppsala
- Lundgren, A., (1991), *Technological innovation and industrial evolution : the emergence of industrial networks*, Doctoral Thesis, Stockholm School of Economics, EFI, Stockholm
- Oliver, C., (1996), The institutional embeddedness of economic activity, *Advances in Strategic Management*, Vol. 13. pp. 163-186.
- Pfeffer, J. & Salancik, G. R., (1978), *The external control of organizations: A resource dependence perspective*, Harper & Row, New York
- Powell, W. W., (1996), ON the nature of institutional embeddedness, *Advances in Strategic Management*, Vol. 13. pp. 293-300.
- Powell, W. W. & DiMaggio, P. J., (1983), The iron-cage revisited: Institutional isomorphism and collective rationality in organizational fields, *American Sociological Review*, Vol. 48. (April), pp. 147-160.
- Powell, W. W. & DiMaggio, P. J. (1991), *Introduction*, in Powell, W. W. & DiMaggio, P. J. (Eds.), *The new institutionalism in organizational analysis*, The University of Chicago Press, Chicago.
- Richardson, G. B., (1972), The organisation of industry, *The Economic Journal*, Vol. 82. (327), pp. 883-896.
- Rogers, E. M., (1995), *Diffusion of innovations*, 4th Ed., Free Press, New York
- Rooks, G., Raub, W., Selten, R. & Tazelaar, F., (2000), How inter-firm co-operation depends on social embeddedness: A vignette study, *Acta Sociologica*, Vol. 43. (2), pp. 123-137.
- Rosenberg, N., (1982), *Inside the black box: Technology and economics*, Cambridge University Press, Cambridge
- Rosenberg, N., (1994), *Exploring the black box: Technology, economics and history*, Cambridge University Press, Cambridge

- Scott, W. R., (2001), *Institutions and organizations*, 2nd Ed., Sage, Thousand Oaks
- Strang, D. & Meyer J, W., (1993), Institutional conditions for diffusion, *Theory and society*, Vol. 22. (4), pp. 487-511.
- Strang, D. & Soule, S. A., (1998), Diffusion in Organizations and Social Movements: From Hybrid Corn to Poison Pills, *Annual Review of Sociology*, Vol. 24. pp. 265-290.
- Suarez, F. F. & Utterback, J. M., (1995), Dominant designs and the survival of firms, *Strategic Management Journal*, Vol. 16. (6), pp. 415-430.
- Swedberg, R., (2003), *Principles of economic sociology*, Princeton University Press, Princeton
- Turnbull, P., Ford, D. & Cunningham, M., (1996), Interaction, relationships and networks in business markets: An evolving perspective, *Journal of Business and Industrial Marketing*, Vol. 11. (3-4), pp. 44-62.
- Utterback, J. M., (1994), *Mastering the dynamics of innovation: How companies can seize opportunities in the face of technological change*, Harvard Business School Press, Boston
- Uzzi, B., (1997), Social structure and competition in interfirm networks. The Paradox of Embeddedness., *Administrative Science Quarterly*, Vol. 42. (1), pp. 35-67.