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It is possible that there once was a time when scholars used to sit isolated with their cogitations in their attics, emerging now and then to publish their latest erudite offerings which no one had ever thought of before. If such a time did once exist, it certainly does so no longer. Writing a scientific or scholarly book in our era is to a large extent a team effort in which your team members are continually changing and you are unceasingly grateful for the privilege of enjoying and benefiting from the exertions, ideas, comments and support of a large number of very able people. Scientific and scholarly work nowadays is a process impossible without the existence and use of social capital.

This book is no exception to the above stated. There are very many colleagues (some of them referees and thus anonymous) and friends who have made the book possible. The foremost of these is Roger Bolton, with whom I wrote my first paper on social capital. Most of that paper has found its way into various passages of this book, while Chapter 6, Social Capital and Entrepreneurship, comes almost completely from Roger's pen. Thank you, Roger, for letting me use your text!

The empirical studies of the biotech industries of Japan, California and Sweden would have been impossible without a great deal of help. Kiyoshi Kobayashi and Kakuya Matsushima of Kyoto University and Therese Vallerius and Helena Jonson-Franchi of the Swedish Office of Science and Technology in Los Angeles organized the distribution and collection of questionnaires as well as arranging study visits for me in Kansai and California respectively; Lars Norlander attended to the Swedish questionnaire and compiled the data. Miho Ota helped us to interpret the Japanese replies. The empirical study of the biotech industries was prepared by Elin Nilsson, with whom I also coauthored a paper of which some parts are included in this book.

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Parts of this book have been published previously as papers in Small Business Economics (www.springer.com) and Regional Studies (www.tandf.co.uk), with Roger Bolton and Elin Nilsson as coauthors respectively. Also, parts of my chapter in Karlsson C, Andersson ÅE, Cheshire P and Stough RR (Eds) Innovation, Dynamic Regions and Regional Dynamics (forthcoming 2007 by Springer) are included in this book. The publishers’ and editors’ permissions to reuse the texts are highly appreciated.

The English linguistic check was made by Geoffrey French. It is a privilege to collaborate with such a skilled advisor.

Östersund, May 2006

Hans Westlund
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1 Introduction

The Emergence of a Concept

During the 1990s a new concept of capital, social capital, came into general use alongside the established concepts of financial, real, and human capital. Over a decade later, a virtual explosion of social capital research has taken place in a large number of academic disciplines. Unlike its companion concepts, the idea of social capital does not originate from the discipline of economics but has its roots primarily in sociology. It has been said to have originated with the classical sociologists of the nineteenth century (Portes and Landolt 1996). The first explicit use of the term in approximately its present connotation seems to have been in the United States by Hanifan (1916). Jacobs (1961) used the concept in her celebrated book on American cities, and the anthropologist Hannerz (1969) used the term in his book on ghetto cultures. In Europe it was Bourdieu (1980) who made the concept of social capital a familiar one, alongside his better-known concept of cultural capital. Social capital, according to Bourdieu, is “the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (Bourdieu and Wacquant 1992 p. 119). Another scholar who has defined social capital as an individual-related resource is Loury (1977, 1987).

Coleman’s (1988, 1990) definition of the concept places it on a different plane from that of the individual. In Foundations of Social Theory (1990) he uses the figure below to explain the distinction between human capital and social capital. Human capital is the individual-related resource (in the human nodes), while social capital is to be found in the links (relations) between individuals/actors.

Coleman underlines the difference between social capital and private resources further when he argues that most social capital can be viewed from a public-good aspect, i.e., that it forms “an attribute of the social structure in which a person is embedded” and that “social capital is not the private property of any of the persons who benefit from it” (1990 p. 315). Like Bourdieu, he regards social capital as a network attribute. But in Coleman’s eyes it is the links within the group (and between groups) that constitute social capital, whereas Bourdieu takes the view that it is the individual’s/group’s external network that gives access to capital. To put it another way, Bourdieu regards social capital as a resource that is procured via the links to the nodes (individual/group), whereas Coleman’s standpoint is that social capital consists of the links within and between networks/groups.
A

B

C

Fig. 1.1. An example of the relationship between human capital and social capital according to Coleman. “Three-person structure: human capital in nodes and social capital in relations.” (Coleman 1990 p. 305).

In his study of Italy which has attracted much attention, Putnam (1993a) uses the final chapter to explain why differences of civil influence between Italy’s regions result from differences in the amount of social capital. His definition of social capital has much in common with Coleman’s: “‘social capital’ refers to features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit” (Putnam 1993b). Putnam also agrees in characterizing social capital as predominantly in the nature of a public good (1993a).

Objections have been raised against Putnam’s view of social capital. For example, Portes and Landolt (1996) have criticized him for focusing only on the positive effects of social capital without considering the negative ones. They argue that there is also “negative” social capital and give examples of how various kinds of networks have a clearly exclusive function. They also maintain that common norms create conformity, which implies restrictions on both individual freedom and business initiative. One example is from the Andean highlands of Ecuador where many successful businessmen are Protestants. By changing religion they have removed themselves from the obligations for male family heads associated with the Catholic Church. Portes and Landolt (1996) also stress that “there is considerable social capital in ghetto areas … inner-city youth gangs are also social networks ... The same kind of ties that sometimes yield public goods also produce ‘public bads’”. Portes (1998) has summarized four negative consequences of social capital: “exclusion of outsiders, excess claims on group members, restrictions on individual freedoms, and downward leveling norms.” Putnam (2000) has responded to this criticism by recognizing “the dark side of social capital” and that strong social capital may counteract tolerance. Recent works on social capital such

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1 In Putnam (1993b), however, this is simplified to the statement that “social capital is a ‘public good’”.
as Halpern (2005) are also aware of the negative social capital within and between e.g. criminal gangs.

Hardin (1999) has stressed a fundamental distinction between the view of Coleman and the views of political scientists such as Putnam (1993a,b, 1995a,b,c 1996) Brehm and Rahm (1997), and Fukuyama (1995). Whereas the function of social capital according to Coleman (1988) is to “facilitate certain actions of actors,” the political scientists’ prime concern is with how actions of the actors “facilitate the working of institutions, including the whole of government (…) For Coleman, various relationships enable individuals to trust each other; for the others, individual-level trust enables institutions to work well” (Hardin 1999 pp. 171ff).

The brief account above has been based on the discussion within those disciplines in which the concept of social capital has so far been chiefly developed, that is to say sociology and to a certain extent political science and business economics. Reviews of research within these disciplines have been compiled by e.g., Jackman and Miller (1998), Woolcock (1998), Adler and Kwon (2002) and above all Halpern (2005).

Despite the fact that capital is a traditional economic concept, the links established with economic capital theory have been very weak. It was not until the middle 1990s that many economists began to discuss the concept of social capital. Since then the literature has expanded considerably, but there has been a great deal of skepticism among certain prominent representatives of the discipline of economics towards using the concept of capital for social capital. “Tell me again what we are talking about” was the headline of an article by Solow (1997) presenting his view of social capital as an economic concept. Arrow (2000) has urged that the denomination of social capital as a form of capital should be abandoned on the ground that social capital lacks certain fundamental characteristics of capital, especially inasmuch as it is not built up by deliberate sacrifice in the present for benefit in the future. However, other Nobel laureates have been more positively inclined towards the concept. Becker has discussed the concept and connected it to the utility function of the individual: “The utility function at any moment depends not only on the different goods consumed but also on the stock of personal and social capital at that moment” (Becker 1996). Becker’s social capital consists of preferences, created by past experiences, which “directly yield welfare rather than merely casually contribute to the production of other things that yield welfare” (Hardin 1999). This view seems to differ fundamentally from that of Coleman, that social capital is a resource of the actors, which they use to increase their utility. But this does not necessarily have to be the case. Social capital may very well be resources and preferences simultaneously. Social capital may “facilitate certain actions of actors” at the same time as it increases an actor’s individual utility. Still another Nobel laureate, Stiglitz (2000), has stated that “social capital is a very useful concept, but an extremely complex one” (p. 67) and that it functions inter alia as a “complement or substitute for market-based exchange and allocation” (p. 64).

Other leading economists too have accepted and analyzed the social capital concept. In a comprehensive overview of social capital as an economic concept Dasgupta (2000) has stated that there is much to agree with in Solow’s and Ar-
row’s criticism and has suggested the term “informal institutions.” On the other hand he uses the term social capital in his discussion of trust, cooperative ventures, agreements, norms and reputations, networks, sanctions, culture etc and measurement of social capital. Durlauf and Fafchamps (2004) have made an extensive survey of social capital research, mainly in economics. Aoki (2001) uses the concept of social capital when he discusses the tacit knowledge needed by venture capitalists. Empirical studies have been presented by, among others, Knack and Keefer (1997), Knack (1999), Cooke and Wills (1999), Glaeser et al. (2000), Bosma et al. (2004) and Beugelsdijk and van Schaik (2005).

**Does Social Capital Exist Only in the Civil Society?**

One example of the importance attached to the concept of social capital is the OECD report *The Well-being of Nations: The Role of Human and Social Capital*, 2001. The OECD report defines social capital as “networks together with shared norms, values and understandings that facilitate co-operation within or among groups” (OECD 2001 p. 41). This general definition is applicable to all parts of society, i.e. not only the civil society.

However, the enormous influence of Putnam’s books (1993a, 2000) has meant that the concept of social capital has usually come to imply phenomena such as social networks, relations, values, norms etc of the so called civil (or civic) society. The question that arises is how these phenomena outside the civil society should be denominated. Should the term social capital only be applied to the civil society or should it be interpreted literally and include social networks, relations, values, norms etc also within business life and the public sector? Or to ask the question in a very simple way: is social capital something that is created and used only during people’s leisure time?

A fundamental standpoint in this book is that the concept of social capital can and should be interpreted literally. This implies that this book has two basic theses as its starting point:

1. Social capital is a phenomenon that is found in all parts of society, in all types of organizations and thus in the private and public as well as civil sectors of society.
2. Social capital should be analyzed as a concept of economics, i.e. as a form of capital.

The first thesis means that in this book we use a broader definition of social capital than in the majority of social capital studies which restrict the concept to features of the civil society. The second thesis means that as far as possible we analyze social capital as capital objects, as a result of investment, etc. The next two chapters discuss this latter issue more in detail.

It should of course be stressed that although studies of social capital have been focused principally on the civil society, this certainly does not mean that we lack all knowledge of aspects of social capital in business firms and in the public sector, but that studies of networks, norms and values in these types of organizations
have not often been associated with theories of social capital. Important reasons for this could be that research into companies’ and governments’ networks and relationships was already well established before the emergence of the new concept and that the latent demand for a concept to cover these features was not at all as obvious in studies of the business society and the public sector as it was in studies of the civil society. However, there are numerous business studies which have placed themselves in a social capital context. One instance is that of Ronald Burt, who considers social capital to be “a factor as critical as financial and human capital” (Burt 1992a, p. 59). He links the importance of social capital with the fact that competition is never perfect. Thus the social capital of a firm determines the rate of return on its investment in financial and human capital. There are also other examples of studies of social capital in business life (Burt 1992b; Uzzi 1997; Nahapiet and Ghoshal 1998; Leenders and Gabbay 1999; Nooteboom et. al. 2000; Adler and Kwon 2002; Cooke and Clifton 2004, to cite a few).

A fundamental question of course is how the concept of social capital can add to and enrich the existing literature on organizational networks. Is there really a need for a new concept?

In our view, the basic argument for analyzing organizational networks in the context of social capital is that the concept focuses on the economic aspects of networks and entails the application of economic theory to the network concept. A network can be defined “as nothing more (or less) than a system” consisting of “objects and connections” (Casti 1995 p. 5), usually denominated nodes and links. Durable networks can be regarded as a form of infrastructure and can thus be considered to be a relatively static backcloth which supports and constrains a relatively dynamic traffic of system activity” (Johnson 1995 p. 49, italics in the original). Links in economic (production and transaction) networks can be defined as “investment(s) in interaction capability together with a permanent implicit or explicit contract” and thus as “intangible capital structures” (Johansson and Westin, 1994 pp. 244 and 247). The criterion of durability is fundamental to economic links. They “should therefore be analyzed as capital objects, which are basically sunk costs” (Karlsson and Westin 1995 p. 3).

A social network can be defined as “a set of nodes (e.g. persons, organizations) linked by a set of social relationships (e.g. friendship, transfer of funds, overlapping membership) of a specified type” (Laumann et al. 1978 p. 458).

Applying an economic approach to social networks would mean that social relationships are built by (intended or unintended) investment (of time or other resources), which results in links that can be regarded as capital objects. When these investments are made in social networks, it is logical to say that they amass a form of “social capital.” Thus, considering social networks as a form of social capital brings investment into the center of analysis.

A company’s motives for investing in economic links are governed by the basic mission of any economic enterprise, which is to earn money and operate at a

\[2\] The term investment is here used in a broader sense than its formal definition in economics: “…a purchase of newly produced capital goods or a new addition to inventory” (Dolan 1983 p. 117).
profit. A link is established and maintained if it is considered to bring net revenues to the company. The social networks of a firm have a more complex background. The creation and maintenance of social links in which the firm makes deliberate investments – e.g. investment in corporate culture, personal customer relations and so on – are governed by the same net revenue principle as economic links. But – as Putnam (1993a) pointed out with regard to the social networks of the civil community – many social networks are unintended byproducts of other interactions. For a company this means that many social links are byproducts of its economic networks. To the extent to which people are involved, social links/relations arise spontaneously as a consequence of the economic links. Thus, a firm makes certain deliberate investments in social networks, but many of the internal and external social networks of a firm are byproducts of investment in economic networks.

This means that the social networks of a firm have two sources: deliberate, formal investment decisions by management at different levels, in accordance with the firm’s basic mission, and spontaneous, informal investment decisions by individuals originally connected via the economic links, based on volition to interact. The volition to interact is dependent on the “affinity” – here defined as attraction, liking or feeling of kinship – between the actors (cf. Johansson and Westin 1994). In principle, for a social link to be established, the nodes/actors must have something in common (e.g. some norms, values or preferences, or some minimum degree of mutual trust). Moreover, economic interaction can to some extent be governed by the ease of formation of social capital between companies. Rauch (1996, 1999, 2001) has underlined the role of social capital and networks in international trade and drawn attention to the high importance of e.g. common language/colonial ties.

Public government differs from private firms in many aspects. Government is run by political objectives, but a fundamental need for public government is to legitimate itself. For this reason it builds social links to the citizens and organizations of society alongside the essential economic and technical networks it needs to fulfill its regular tasks. As in the case of the firm, public government’s activities also create and maintain many social networks as byproducts. However, as the basic mission of public government is to redistribute the resources of society, the deliberately created social networks of government, and the norms and values distributed in them, fulfill other objectives than the social networks of the firm. The unintended, spontaneously created social networks of government may still perform tasks similar to those of their private counterparts.

From an economic perspective, the use and maintenance of social links and networks are governed by the same constraints as other activities. If we assume decreasing marginal utility of a link or network, it is used up to the level where the benefits equal the costs of using and maintaining it and the opportunity costs of any other profit-producing activity. However, up to the level where benefits equal

3 However, if we accept the modern managerial theory of the firm, managers may have personal goals which include elements other than profits: for example, social capital can make life more enjoyable for managers quite independently of their firms’ profits.
costs, the actors of the network experience increased utility by using the network and continue to invest in it. What is it that causes this increased utility to be experienced?

One way to answer this question is to link up with Giddens’ structuration theory. According to Giddens (1979, 1984) there is a dual relationship between the agents (actors) of society and the structures in which they participate. Actors create structures, which impose restrictions (“rules of the game”) on the actors. Giddens’ structures consist both of what we denominate as social networks and of the norms, values and preferences which the networks and their links are created to uphold. The social integration processes that take place in social networks come about through repeated interactions which reproduce the norms, values and preferences. These repeated integration processes strengthen the initial trust which made the creation of the network possible. In our interpretation, it is by building and maintaining (i.e. investing in) social networks that actors form their preferred routines and sense of safety that constitute their experienced utility.

However, structures are not eternal. Over time, the repeated interactions that maintain them are not wholly identical interactions; the actors in a structure are replaced as time passes; a structure cannot be completely isolated from influences emanating from the rest of the world; new actors may break with existing structures and form new ones. Conflicts emerge between what Giddens calls structural principles, changing the shape of the social networks as well as the norms, values and preferences they sustain and reproduce.

How does Giddens’ structuration theory relate to the social capital concept? If we use the term social capital as a basis for an economic approach to social networks, then as happened above it becomes natural to consider networks, and the norms etc. which they uphold, as a form of “structure.” The link-creating activities and repeated interactions which form and reproduce the networks can be considered as investment (in the wide sense of the term). The repeated interactions are essentially a process of accumulating norms, values and preferences which results in strengthened networks featuring enhanced trust between the actors of the network as a byproduct. Thus, if we consider social networks as a form of Giddens’ structures, the conclusion is that they can be regarded as a kind of social capital. This conclusion is in line with Burt’s (1992a p. 60f) pronouncements that “… networks are themselves a form of social capital” and that “Social capital is at once the structure of contacts in a network and resources they each hold.”

The Definition Used in this Book

In the discipline of economics, the concept of social capital is only one decade old, but the phenomena which are referred to today as social capital have been commented on by, among others, Marshall and Schumpeter, albeit in the form of other terminology. Moreover, Bruni and Sugden (2000) have shown that the eighteenth-century philosopher-economists Hume, Smith and Genovesi had a clear view of
the importance of trust and other elements of society’s economic life, which today are summarized under the concept of social capital.

There is no recognized, established definition of social capital in the discipline of economics and still less is there a common definition extending across disciplinary boundaries.

In this book, social capital is defined as social, non-formalized networks that are created, maintained and used by the networks’ nodes/actors in order to distribute norms, values, preferences and other social attributes and characteristics, but which also emerge as a result of actors sharing some of these attributes. An important feature of this definition is that it distinguishes between the networks and the norms etc they are distributing and/or being based on. Social capital is considered as a type of infrastructure with nodes and links. The nodes consist of actors, i.e. individuals and organizations, which establish links between each other. The construction of links is governed by the actors’ norms, preferences and attitudes, which can thus prevent the emergence of links between individuals or organizations as well. In the links, different types of information are distributed between the nodes. From an infrastructure perspective, this distribution of information is comparable to traffic in the transport infrastructure. Social capital’s impact on society depends on both its quality and its quantity. The norms, preferences and attitudes of the nodes, and thereby the kind of information being distributed in the links, is at least as important as is the number of links. A “strong” social capital can thus have preservative as well as progressive effects, depending on its qualitative characteristics.

As discussed in Chapter 7, it is necessary to distinguish between a general, societal social capital and social capitals specific to the needs of organizations (groups, firms, public sector bodies). In the latter case, social capital has characteristics of sunk costs inasmuch as it often cannot be used for other purposes than those for which it was formed and may become useless or even detrimental when the organization changes its activities. Analogously with this, we can make a distinction between public social networks, to which in principle everyone with certain skills has access, and private networks formally or informally controlled by certain groups.

Two concepts that are related to social capital are culture and institutions. However, culture should be regarded as a considerably broader concept than social capital. A common definition is that culture consists of “shared values and beliefs” (Casson and Godley 2000 p. 2). "Institution" is normally a very broad term too. North’s (1990) view is that institutions may be formal (as with rules) or informal (as with norms of behavior). In North’s opinion, institutions are the rules of the game and organizations (government, enterprises and other organizations) are the

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4 This definition is a further development of Westlund and Bolton (2003) who “define spacebound social capital as spatially-defined norms, values, knowledge, preferences, and other social attributes or qualities that are reflected in human relations. In network terms this may be expressed as meaning qualities, capacity, objectives, and quantity of the nodes (actors) and qualities, capacity, objectives and quantity of the links in primarily informal, spatially-demarcated social networks.”
players. Thus, both “culture” and “institutions” include values and norms, but not networks, which North probably would say belong to the organizations.

In contrast to North’s division into institutions and organizations, most scholars who have made use of the concept of social capital have employed it in a way that includes both certain parts of what North calls institutions and certain parts of what he terms as organizations. Social capital is normally considered as non-formalized norms and values but also as the bearers of these values, i.e. the actors and the relations, links, networks they form. Also when it comes to the “organizational” part of social capital, the focus lies on the informal relations, links and networks that are being built by the actors. As a consequence, a formal organization is not considered to be social capital; but social capital – in terms of informal norms, non-formalized relations and networks – is an inseparable component of every organization. Accordingly, instead of differentiating between institutions and organizations, the social capital perspective differentiates between what on the one hand is formalized in organizational rules, charters and laws, and on the other hand the informal norms, relations and networks that coexist with the formal rule-book and official policies but are not directly governed by formal decisions. Thus, more substantial, formal institutions and organizations, which Hardin (1999) and Krishna (2000) denominate institutional capital, are not included in our definition. This view of social capital, as being the informal counterpart to formal institutions and organizations, makes social capital much harder to measure than the formalized parts of institutions and institutions. How this has been and can be tackled is discussed in the next chapter.

A Different Economy Needs a Different Social Capital

For more than twenty years, the transition from an industrial society to a knowledge economy and knowledge society has been debated and studied while increasingly becoming the subject of policies from local to global level. However, it is possible to find the embryonic current points of view in the history of the scientific discourse. As early as the 18th century, Adam Smith referred to “human capital” (Blaug 1997). Another of the most celebrated economists, Alfred Marshall, pointed out that “knowledge is our most powerful engine of production” (Marshall 1890, quoted in Becker 1993).

The current focus on the knowledge economy and knowledge society is based on a large number of contributions from different disciplines, not least economics. Peters (2001) mentions e.g. economics of information (e.g. Marschak 1974), economics of knowledge production and distribution (Machlup 1962), human capital theory (Schultz 1961, Becker 1964), public choice theory (Buchanan and Tollison 1972, Tullock 1966) and the new growth theory (Romer 1986, 1990). Important input has also come from the disciplines of sociology, management theory, futur-

5 See Stehr (1994) for a presentation. Stehr traces the concept back e.g. to works by Drucker (1969) and Bell (1973).
ology, and communications and IT (Peters 2001). Also the books of Gibbons et al. (1994) and Nowotny et al. (2001) have been very influential for both research and policy development. An early Swedish contribution bearing on any discussion of the knowledge society was Andersson and Strömquist’s (1988) book on the K-society.

**Table 1.1.** Key attributes of the knowledge and industrial societies and of the mercantilist era of the pre-industrial society.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Knowledge society</th>
<th>Industrial society</th>
<th>Mercantilist era</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key assets / production factors</strong></td>
<td>Labor with knowledge and information, intellectual property</td>
<td>Physical capital, transportation</td>
<td>Land and trading assets</td>
</tr>
<tr>
<td><strong>Extent of market</strong></td>
<td>Global “Supra-state” organizations increase in importance</td>
<td>Mainly national Nation-state democracy</td>
<td>Mainly local Autocracy /oligarchy</td>
</tr>
<tr>
<td><strong>Polity</strong></td>
<td>Application of knowledge</td>
<td>Use of non-muscle power, division of labor</td>
<td>Increase muscle power through population growth, organize trade</td>
</tr>
<tr>
<td><strong>Central principle(s)</strong></td>
<td>The individuals</td>
<td>Capitalists</td>
<td>Landowners</td>
</tr>
<tr>
<td><strong>Owners of decisive production factor</strong></td>
<td>Access / rights to knowledge, information and benefits</td>
<td>Justice: Division of social accumulation between labor and capital</td>
<td>Liberty: business autonomy, the individual’s freedom from feudal restraints</td>
</tr>
<tr>
<td><strong>Central conflict</strong></td>
<td>Horizontal, cooperative</td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td><strong>Management principles</strong></td>
<td>Organization/collective needs the individual who possesses knowledge</td>
<td>The individual needs the organization / collective (enterprise, trade union, etc)</td>
<td>Mutual collective dependencies between crown, nobility, church, burghers and peasants</td>
</tr>
<tr>
<td><strong>Dependency relations</strong></td>
<td>Creativity</td>
<td>Adaptability</td>
<td>Fidelity</td>
</tr>
<tr>
<td><strong>Central individual qualification</strong></td>
<td>Growing equality</td>
<td>Emerging emancipation</td>
<td>Patriarchal</td>
</tr>
<tr>
<td><strong>Gender relations</strong></td>
<td>Digital nets, social infrastructure, airports, roads, rail</td>
<td>Land transportation systems</td>
<td>Waterways and ports</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Metropolitan region</td>
<td>Industrial town</td>
<td>Agricultural region, market town</td>
</tr>
<tr>
<td><strong>Central spatial units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment: The table is partly based on Lakshmanan (1994) who, however, does not deal with the knowledge society. Some aspects are also picked up from Karlsson, Johansson and Stough (2001).

The fact that knowledge economy and knowledge society are not only multidisciplinary academic concepts but also policy concepts is probably an important rea-
son for the absence of common definitions of the concepts. One of the most cited definitions is in fact a policy one, launched in a white paper of the UK’s Department of Trade and Industry: “A knowledge-driven economy is one in which the generation and the exploitation of knowledge has come to play the predominant part in the creation of wealth. It is not simply about pushing back the frontiers of knowledge; it is also about the more effective use and exploitation of all types of knowledge in all manner of economic activity” (DTI 1998).

The knowledge society is often regarded as something that replaces the industrial society in the same way as the latter replaced the last phase of the pre-industrial society, the mercantilist era. This approach is illustrated in Table 1.1 which compares a number of key attributes of the three societal forms.

Table 1.1 shows that the differences between the knowledge and industrial societies are at least as comprehensive as between the industrial society and the pre-industrial mercantilist era. Knowledge, the individual bearers of it and their social infrastructures, are some of the key elements of the knowledge society. This makes new demands on the individual’s qualifications and affects relations between the individual and the organizations as well as gender relations.

The shift from an economy based on raw materials to a knowledge-based economy has been manifested among other things in the emergence and growth of a number of new industries. Perhaps the most extremely knowledge-intensive of these new industries is the biotech industry, which in several respects differs fundamentally from traditional manufacturing industries. While the main value of a manufacturing firm resides in its physical capital, the value of a biotechnology firm is in its intellectual property. Whereas a manufacturing firm sells tangible products for consumption or refinement, a biotech firm’s products consist of R&D products, including patents, with a potential for being commercialized and profitable. Instead of final products, the biotechnology business focuses on a number of intermediate outcomes, such as knowledge production for increasing the knowledge base, company creation as a proof of commercial potential in research, and business development in the form of expanding R&D and/or bringing selected projects closer to commercialization (Nilsson 2001). In these respects, the biotech industry represents an extreme case of tendencies found in several sectors of the knowledge economy. With a continued expansion of the role of knowledge for the economy, it may plausibly be argued that certain tendencies in the biotech industry of today will become general tendencies in the knowledge economy of the future.

One of the differences between the knowledge society and previous societies, stressed in Table 1.1, is that it is individuals who are the “owners” of the decisive production factor. Knowledge is an individual asset which is non-productive unless possessed and used by its individual bearers. This characteristic is reflected in the vast human capital literature. On the other hand, knowledge also has some of the attributes of public goods. It is only imperfectly excludable and therefore subject to spillovers (Romer 1990; Fisher and Varga 2003). These characteristics are fundamental to the endogenous growth theory and in particular to the knowledge spillover literature.
Although the two approaches focus on different aspects of knowledge, they have in common the recognition that knowledge is produced, exchanged and used in social systems which may differ in their ability to produce, exchange and use knowledge. In the institutional theory’s perspective, it is the societies’ institutions and organizations (see e.g. North 1990) that are more or less adapted to production, exchange and use of knowledge.

Institutions and organizations can be divided into formalized and non-formalized. For instance we can distinguish between formal rules, charters and laws, and informal rules, norms and attitudes. It is also possible to distinguish between formalized organizations and informal networks and groups. In this perspective, the growing literature on social capital deals to a large extent with the informal parts of institutions and organizations, i.e. the norms and values of organizations, groups or spatially demarcated areas and their internal and external networks.

While certain components of social capital can be seen as an inferior substitute for market and formal institutions in developing countries (see e.g. Omori 2001) it has also been argued that social capital plays an increasingly important role in the knowledge-based society as it facilitates and speeds up economic actors’ acquisition of information and knowledge (Maskell 2000). It can of course also be argued that social capital promotes production and the exchange of knowledge in research, education and commercial R&D processes.

A basic hypothesis can be expressed in the following way: During stable growth phases the economy benefits from strong, stable societal networks that are closely adapted to the needs of the economy. Actors (nodes) form links to distribute and reproduce desirable norms, values and behavior which are in conformity with the economy’s demand. When economic-structural changes happen, the economy needs new industries with new actors to obviate stagnation. However, the existing networks are adapted to the earlier economic structure and do not necessarily support the restructuring of the economy and the emergence of new actors. The new actors need to build new, competing networks that distribute and reproduce norms, values and behavior in conformity with the new economic actors’ demand. If the networks of the old economic structure are too strong, they may retard or prevent the emergence of new actors, new networks and economic restructuring. Using Schumpeter’s term, one might argue that there is a need for a “creative destruction” of obsolete social capital in order to facilitate the creation of new social capital. The transformation from industrial society to knowledge society is a huge-scale example of this economic restructuring and the need for new economic and social networks to emerge.
2 Social Capital as an Economic Concept

The Capital Concept’s Development

Today, the established division of the means of production into land, labor and capital as declared in textbooks seems, superficially, to be completely undisputed. However, even though the traditional division into factors of production was cited as early as Adam Smith, it is possible to find, both in Smith and several other classical and neo-classical economists, a view of capital that is considerably broader than that provided by the textbooks of today. Smith himself distinguished between circulating and fixed capital and defined the latter as “produced means of production,” including implements and buildings but also the “human capital” of “the acquired and useful habits of all the members of society” (Smith 1776, quoted in Blaug 1997, p. 52).

Several other leading economists of the 1800s and 1900s have also expressed the idea that the concept of capital should be interpreted much more widely than is normally done today. Wicksell writes, for example, that:

"It is possible, even if it is less common (...) with Walras and Pareto to regard also human beings themselves, human skills and human wealth, as capital; the last mentioned concept then becomes synonymous, on the whole, with the productive forces, or (...) with the concept of source of income, regardless of what type it is, as the opposite of income itself. Nothing stands in the way of talking about ‘capital in the broad sense of the term’ beside ‘capital in the limited sense of the term’, as long as no misunderstanding is caused by this.” (Wicksell 1901/1966 p. 218f)

Even though Wicksell was thus not opposed, in principle, to a wide definition of the concept of capital, he supported the traditional classification of the factors of production. However, he conceded that the demarcation of capital was problematical: “One difficult question is where the borderline between capital and non-capital, between indirect and direct productive forces should be rightly drawn.” (Wicksell 1901/1966 p. 219). As Blaug (1997 p. 92f) points out, the refinements of the capital theory introduced by Böhm-Bawerk and Wicksell were limited to working capital. It is highly probable that their view of the concept of capital was influenced by this.

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1 Blaug (1997 p. 52) comments: “This follows quite rightly from the fact that fixed capital stands for the ‘produced means of production’: the acquired skills of workers are certainly ‘produced’ by the using up of material resources.”
Wicksell developed his opinion stating that “… in the economic sense, all long-term capital investments, all so-called fixed or standing capital, houses and buildings, permanent machinery and so on are on the borderline between capital in the real meaning of the term and land (…) If the period of review is not excessively long, it is strictly speaking only the short-term capital objects, the working capital in other words, that have the character of capital in the real sense of the term.” (Wicksell 1901/1966 p. 220).

This approach is reflected in one of Wicksell’s examples which is of relevance today for the view of human capital and social capital:

”... a manufacturer who imports skilled workers from abroad to open up an industry that has never been run before in the country, thus makes a capital investment that, where he is concerned, is perhaps repaid in full after a few years; but the skilled workers in this sector who then, by tradition, reproduce themselves in the country, are for all time to come a plus on the labour account and not on the capital account.” (Wicksell 1901/1966 p. 220).

Several American economists contended that the concept of capital should be interpreted in what Wicksell called the broad sense of the term. Fisher’s definition is based on the distinction between the source of income and the income itself:

”... capital is wealth, and income is the service of wealth. (…) A stock of wealth existing at an instant of time is called capital. A flow of services through a period of time is called income.” (Fisher 1906/1965 p. 52).

According to Fisher, “wealth” is real estate, commodities and human beings (Fisher 1906/1965 p. 5). Fisher lists a number of both older and contemporary economists with a similar view of the concept of capital, including Turgot, Say, Cannan, Clark, Pareto and Giffen. He also points out that:

”Originally the term ’capital’ was not a noun, but an adjective. ‘Capitalis pars debiti’ indicated the principal part of a debt, i.e. the ‘principal’ as distinguished from the interest. This virtually represented the distinction between a fund and a flow. The term soon became applied to a merchant’s stock in contradiction to the flow of profits springing from it, and hence to any fund or stock whatever.” (Fisher 1906/1965 pp. 61f).

”Knight and some of his predecessors and followers,” according to Ahmad (1991 pp. 441 and 449), also adopted a similar point of view. Ahmad’s explanation is that they have taken as their starting point one of the two basic characteristics of capital, namely that capital constitutes the discounted value of anticipated future revenue. The other basic characteristic of capital can be described as the quantitatively measurable volume of accumulated investments in capital goods. These two separate characteristics of the concept of capital have been described by different writers in somewhat different terms, depending on the aspects that have been discussed. However, the basic difference between discounted value and physical means of production can be considered to be common to these descriptions of the dichotomy of the capital concept.

The character of capital was also the subject of an in-depth discussion during the “second capital controversy.” The core of the controversy was whether physical capital was homogeneous enough to be susceptible to aggregated measurement. One outcome of the discussion was the development of the so-called “pro-
ductivity theory” (Weston 1951). This theory is not based on capital as a means of production in itself, but on the use of capital. According to the theory, capital is used and consumed in the production process in the same way as labor. The value of capital cannot therefore be measured directly, but instead must be derived from the value of its discounted future use. (As Ahmad (1991) points out, this is thus not an appropriate indicator of capital when characterized as a means of production). According to Ahmad (1991), Knight et al maintained that this method of defining and measuring capital was not merely applicable to capital goods; it was also applicable to land and labor. Their conclusion was, therefore, that all factors of production are “capital.”

However, one of the most significant regenerations of the capital theory took place “beside” the theory. In his presidential address at the 1960 annual meeting of the American Economic Association, Schultz (1961) sharply criticized the classical view of labor as something homogeneous and simple to replace, requiring little knowledge or skill. His conclusion was that human resources were a form of capital, a produced means of production and a product of investment. In the foreword to his pioneering work Human Capital, Becker (1964/1993 pp. 11f) pointed out that “the growth of physical capital (…) explains a relatively small part of the growth of income in most countries. The search for better explanations has led to improved measures of physical capital and to an interest in less tangible entities, such as technological change and human capital.” Since then the human capital theory has been further developed and has formed the basis of extremely extensive empirical research.

Nevertheless, the main lines of the capital theory have retained and refined the more circumscribed view of the capital concept, i.e. that it comprises real capital and not labor and its characteristics or other “external” factors. This view of capital, however, appears to be increasingly in conflict, both “internally” and “externally,” with other views. Externally, there is a clear conflict between the abstract value that an enterprise has according to economic capital theory and the value the enterprise has on the capital market where, increasingly, the value is not determined by the enterprise’s possession of real capital. One example of this is the market’s valuation of that part of an enterprise’s social capital represented by its trademark. Internally, the emergence of the human capital theory can be seen as a necessary response to this new reality, which is usually described in terms of transition from an industrial society to a knowledge-based society.

What, then, does this development of the concept of capital mean for the view of “social capital” as a concept in the “capital family”? It is naturally obvious that what we define as social capital lies far outside the demarcation of capital that merely includes real capital, whether it is limited to working capital or also includes fixed capital. On the other hand, the older, broader concept of capital, under which land and labor are also capital, seems easier to link to “social capital.” With this broader approach, human capital seems to constitute an obvious, undis-

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2 It is significant that one of the foremost modern works on the development of capital theory, Syed Ahmad’s (1991) Capital in Economic Theory, does not mention the concept of human capital at all.
part of the capital concept, since human capital is an attribute of labor. However, where the concept of social capital is concerned this is not so obvious. As social capital consists of networks that the individual may or may not have access to, it cannot be considered as an attribute of labor, and so differs from human capital in this respect. As we have seen, the broader capital concept is also usually limited to comprising material, physical objects (including human beings), and not the immaterial phenomena we classify as social capital.

The position of the concept of social capital in the “capital family” has thus only weak, indirect support in a historical doctrine perspective. This is entirely understandable. The central factors of production in the agrarian and industrial societies were labor, land and capital. The economists naturally concentrated on these factors. Even if social capital, by definition, ought to have existed as long as human beings themselves, the hypothesis that its importance to the national economy is greater today is not unreasonable. The immense impact of the concept during the last decade of the 1900s can hardly be explained in any other way than that it seems to meet the need for explanations of the phenomena that have arisen in the knowledge-based economy. Possibly the most fundamentally important of these phenomena is the decline in the importance of physical capital for economic growth.

Can “Saved” Social Capital Provide a Yield?

In the introduction to this paper, reference was made to several leading economists who were critical of the use of the concept of “capital” in respect of social capital. In addition to the problem of measuring social capital, which is discussed in section 4, the most important objection can be summarized as follows: Capital is the result of a situation in which resources are not consumed but saved. If we disregard the type of saving that can be described as “postponed consumption,” saving is an investment that is made to acquire a greater stock of welfare than that which was invested. In such a case what is it that is saved and invested to make the stock of social capital increase? If social capital is a by-product of other activities (Coleman 1990, Putnam 1993a), is it really possible to speak about investments in the sense that one intentionally refrains from consumption at the present time in order to be rewarded with a higher yield in the future? And is it not primarily non-economic” values” that the so-called social capital yields?

To start with the last question, as long as we keep to what we call social capital in civil society it is naturally mainly correct that “… much of the reward for social interactions is intrinsic – that is, the interaction is the reward – or at least that the motives for interaction are not economic. (…) The essence of social networks is

However, there are examples of writers who have defined capital so widely that even our modern definition of social capital can be included: ”… MacLeod extends it (the definition of capital, my comment) to all immaterial goods which produce profit, including workmen’s labor, credit, and what he styles ‘incorporeal estates,’ such as the Law, the Church, Literature, Art, Education, an author’s Mind.” (Fisher 1906/1965 p. 55).
that they are built up for reasons other than their economic value to their participants.” (Arrow 2000 p. 3f). A great part of the returns on social capital are useful in non-economic respects, for example "euphoria and significance, cultural diversity, social solidarity and integration, training in democracy, defense of rights, mobilization of marginal groups, inculcation of discipline (…) public health, job opportunities, fresh ideas and innovation, and other particular qualities” (Blennberger, Jess and Olsson 1999, quoted in Westlund 2003).

As Arrow (2000) points out, there is naturally no reason to deny that social networks are also created for economic reasons. This type of deliberate investments in “club affiliation” can be compared in many respects with investments in human capital. They normally yield economic and social returns for the individual in the form of jobs, salaries and status. The reason why social capital has become such a popular concept, however, is the hypothesis, mainly advanced by Putnam (1993a,b), that those parts of social capital that are created for non-economic reasons also have economic effects, i.e. they are (positive or negative) externalities. Few, if any, would maintain that this was completely wrong. There appear to be empirical relationships, for example, between involvement in voluntary organizations, neighborhood watch etc, and factors such as the ability to cooperate and trust (Putnam 1993a, 2000). It would seem to be highly logical that this has certain effects on economic variables such as transaction costs, costs of surveillance and of the administration of justice, knowledge diffusion, avoidance of prisoners’ dilemma-situations, etc. The controversial issue is rather how important these effects really are, both in relation to the non-economic benefits that social capital in civil society yields and in relation to the traditional factors of production. The critics (Solow 2000, Dasgupta 2000) have referred to certain studies at macro level (Kim and Lau 1994, Collins and Bosworth 1996, Lau 1996) which do not provide any support for the notion that growth in East Asia is a result of anything other than the accumulation of physical capital and human capital. However, they do point out that interpretations of the findings of these studies are not undisputed. One objection could be that, the higher the level of aggregation, the less differentiated social capital in civil society is, and this type of social capital can be assumed to have strongest effects at local and regional level (see Chapter 6).

On the other hand, if the discussion focuses on enterprise-based social capital, there should hardly be any doubt at all that social capital contributes to providing economic returns. In general an enterprise has no reason to allocate resources to something that does not provide returns. Investments in good internal relations, relations with suppliers, development partners and political decisionmakers, as well as in the enterprise’s trademark, are made because they are expected to lower costs and/or increase revenues.4

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4 However, not all components of an enterprise’s social capital are a result of deliberate investments by the management. All employees are actors who, intentionally or unintentionally, contribute to the forming of an enterprise’s social capital. Another aspect is that deliberate investments may have unintended by-effects. If these effects are external to the enterprise, they can be considered as a form of (non-tradeable) externalities. These parts of an enterprise’s social capital resemble the social capital in civil society and should be measured by similar methods.
The other two questions in the introduction to this section are, in principle, of a theoretical nature. What is it that is saved/invested, and is it relevant to speak of investments if social capital is a byproduct, an unintentional result of consumption? As in the case of the previous question, enterprise-based social capital would not appear to present a problem. An enterprise uses saved or borrowed financial resources for investment in the expansion, maintenance and renewal of its internal and external social capital. This component part of the enterprise-based social capital is therefore not an unintentional by-product, but a result of deliberate investment.\(^5\) However, from a strict capital theory perspective, this is not a correct statement. If real capital alone is regarded as capital, the enterprise’s internal and external networks are not capital. The conclusion is the same even if we were to accept the enterprise’s human capital as capital. The concept of social capital is accordingly not compatible, even from the enterprise perspective, with the traditional demarcations of the capital theory. Another reflection of this is that the enterprise’s investments in social capital are not, by definition, investments in the strict economic theory sense, i.e. a purchase of newly produced capital goods, etc. or a new addition to inventory.\(^6\) There are two possible conclusions as a consequence of this. Either the concept of capital should not be used in respect of the phenomena we call enterprise-based social capital, or the capital theory must be modified and adapted to changes in production patterns and industry.

Social capital in civil society is, for understandable reasons, even less compatible with traditional capital theory. It is not possible to assert that people are saving something when they contribute to the creation and maintenance of social capital through their activities. If the creation of social capital in civil society is principally an unintentional byproduct of other activities, it naturally cannot be claimed that this is a result of a deliberate sacrifice for returns that will be received at some time in the future.\(^7\) We therefore arrive at the same conclusions as in the matter of those component parts of the enterprise-based social capital which emerge as a byproduct of other activities.

Regardless of whether the concept of social capital is included in the “capital family” or not, there is reason, however, to attempt an interpretation in economic theory terms of the phenomena covered by the concept. In doing so we choose to continue to use the expression social capital – since this is an established concept today, whether we like it or not – but the reader who dislikes it can opt for the social network concept instead. We also use the concept of investment in a broader sense than the strictly theoretical.

An economic interpretation of what we refer to here as social capital in civil society can have as its point of departure the use made by people of their time for

\(^5\) Here the unintentional components of social capital discussed in the foregoing note are disregarded.

\(^6\) Nor can investments in human capital be classified as investments on the basis of this standard definition (see below).

\(^7\) On the other hand the deliberate building up of social capital that people spend time on, with the specific intention that it shall provide a return in the future, has considerable similarities with enterprise-based social capital. This is therefore not discussed further here.
different activities. A basic division is into production and consumption respectively. One common assumption is that production takes place during working hours and consumption during leisure time. However, human capital theory has drawn attention to problems with this simple categorization. According to traditional theory, people who devote part of their leisure time to study are engaged in consumption. Nevertheless, the result is an increase in the stock of human capital and this “consumption” is thus an investment (see e.g. Schultz 1961 p. 1).

A corresponding line of argument is also valid for social capital. The activities people spend their time on can contribute a great deal or a little – or nothing at all – to the building and maintenance of social capital. This social capital, in turn, can have either strong or weak effects on the economy – or no economic effects at all. On the other hand, the fact that a large part of social capital is a by-product of other activities (consumption of time) is of no importance in this perspective. It is not the purpose of an investment that determines its importance, but the actual effects of the investment.

If this line of argument is correct, it means that the division into consumption and saving/investments made by the established theory is only applicable to certain component parts of the concept of social capital (and, as discussed above, this holds for the concept of human capital as well). A certain consumption of time actually leads to an unintentional investment in social networks of a certain duration, whose effects are not merely to produce a benefit that is consumed immediately. The networks that are of a longer duration than the direct consumption period are thus also used for other purposes than those they were originally created for. The result of these investments is a social capital of links between individuals and groups, and the use of these links in disseminating attitudes, values etc.

The resource that is invested in social capital in civil society consists primarily of people’s time. Whereas the supply of real capital is determined by saving, the supply of social capital is determined differently, viz by how people use their time. Time is something that cannot be saved in the “quantitative” sense. However, the fact that people intentionally invest their time in the creation of human capital and social capital can be interpreted to mean that they are investing their time in the present with the aim of improving the quality of their lives in the future.

The use of time that focuses primarily on the consumption of immediate benefits, but which also has effects in the form of networks that have a certain duration, additionally produces, through the establishment and maintenance of these networks, yet further effects in that it influences the future of the individual concerned or that of other people. Becker maintains that “Social capital incorporates the influence of past actions by peers and others in an individual’s social network and control system” and that “an individual’s stock of social capital depends not primarily on his own choices, but on the choices of peers in the relevant network of interactions. A simple formulation has next period’s social capital of person $i$ equal to the consumption of social goods by all persons in $i$’s network plus the undepreciated portion of his current social capital.” (Becker 1996 pp. 4 and 12). Becker does not discuss explicitly the essential problem that consumption results
in an investment, but it is difficult to interpret him in any other way than that his opinion in these cases is that consumption does also constitute an investment.

Problems of Measurement and Aggregation

Measurement of social capital has proved to be difficult (see e.g. OECD 2001). This is one of the points where the concept of social capital has met the strongest objections from economists. These objections must be interpreted as an implicit demand that it must be possible to analyze and measure social capital in the same way as real capital. However, the fact that concepts are difficult to measure empirically is no argument that they are incapable of being used. Difficulties in measuring traditional capital have not constituted an obstacle to the development of the traditional capital theory or of economic theories in many other areas; therefore they should not reasonably be an obstacle in the case of social capital.

On the other hand there is no doubt that unclear definitions exacerbate the measurement problem. Dasgupta (2000 p. 327) has maintained that, among other things, Putnam’s (1993a) definition of social capital⁸ “encourages us to amalgamate incommensurable objects, namely (…) beliefs, behavior rules and such forms of capital assets as interpersonal networks – without offering a hint as to how they are to be amalgamated.” He adds that “they cannot be amalgamated.”

Fukuyama (1997) has suggested that a society’s social capital can be calculated as a weighted sum of the size of the social networks. The weighting is done on the basis of the different qualities of the networks, for example internal cohesion and attitudes to outsiders. A network can therefore also be weighted negatively, as for instance in the case of a gang of criminals. Dasgupta’s objection to this is that aggregations of normal capital use prices as a weighting instrument, whereas this is not possible in the case of social capital, since social capital is not the subject of market transactions. In this section an examination is made of the possibilities available for measuring social capital in the light of the problems emphasized by Dasgupta. Here the distinction between enterprise-related and society-related social capital is of central importance.

Measurement of Enterprise-Related Social Capital

Dasgupta’s criticism applies primarily to what is referred to here as social capital in civil society. Where enterprise-related social capital is concerned, it constitutes a part of the enterprise’s assets, on which the enterprise’s market value is based. The investments in the various components of the social capital should, in principle, be measurable in the form of the enterprise’s expenses for these activities.⁹ On

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⁸ See Chapter 1.
⁹ Westlund and Nilsson (2005) have presented a pilot study in which measurement of firms’ investment in social capital was done by questionnaires.
the other hand, the accounts used by enterprises today are not specially adapted to allow direct specifications to be made of these investments. Therefore, measuring the investments made by enterprises in social capital is problematic in the short run and would need a change in bookkeeping methods.\(^{10}\)

Measuring the *stock* of an enterprise’s social capital is a still more difficult task, since it requires that the rate of depreciation of the investments can be determined. It is probable that the rate of depreciation varies between different types of investment, but it should be possible, in practice, to estimate an average period of depreciation. However, the problem is more a question of methodology than of principle. It requires the development of new bookkeeping methods and methods of closing the books. In the case of the trademark, its value is assessed as capital stock in another way, through an estimate of the price it would command if sold on the market.

One problem is naturally whether investments in social capital really achieve their intended effects. However, investments in social capital do not differ from investments in real capital or human capital in this respect. Wrong investments are possible regardless of the form of capital concerned, and so is the reverse contingency, viz that an investment may give a higher return than expected.

However, an assessment of an enterprise’s social capital stock cannot merely be based on investments and the rate at which they are written off. Measures taken inside and outside the enterprise, for other purposes, can have unintended effects on social capital. Changes in the enterprise’s organization or in that of a partner in a cooperative organization can produce unintended effects of this type. The composition of an enterprise’s labor force or human capital naturally has an influence on its social capital. Staff turnover is not only a measure of the turnover of human capital. Personnel leaving an enterprise are also a form of depletion of its social capital. A rational action in a strictly economic respect may be judged as unethical by the market and thereby damage the enterprise’s social capital. Measures taken by competing enterprises can affect, in principle, all the component parts of an enterprise’s external social capital. The actions of individual employees also create links that have a positive or negative effect. How these unintended effects on social capital should be measured is often a much more difficult problem than measuring direct investments and their rate of depreciation. However, it is always possible for the enterprise to counteract undesirable effects that its measures cause by making “counter investments.” These counter-investments are measurable in the same way as the enterprise’s other investments in social capital.

**Measurement of Social Capital in Civil Society**

If, then, enterprise-based social capital can in principle be measured in the form of prices/costs, the measurement problem would appear to be greater compared with what is the case with social capital in a civil society. How is it possible to measure

\(^{10}\) However, as discussed in Chapters 5 and 14, the value of a firm’s trademark and goodwill are capitalized expressions of its market-related social capital.
the stock of social capital linked to a certain individual? How is it possible to measure the social capital of a region?

Many scholars, e.g. Putnam (1993a, 2000), have used the number of members and other formal aspects of civic organizations as an approximate measure of social capital. One way of attacking the problem is to separate measurements of the links of the social networks from the qualities that the participants in the networks fill the links with. The response to Dasgupta’s criticism of Putnam (see above) is accordingly that the links should be measured separately and their qualities separately, which is reminiscent of Fukuyama’s suggestion. One possible method of measuring an individual’s investments in social capital is to measure his use of his leisure time, broken down into a number of categories. Information about time spent on club activities, social engagements, meeting friends etc. can then be aggregated for communities, regions or particular groups, thus providing an aggregated picture of this aggregate’s investments in social capital. With the aid of data on the income of individuals it is possible to calculate an opportunity cost, and hence a value, for this use of time. Estimates of the depreciation rates of these investments must probably be based on empirical studies.\footnote{Putnam (1993b p. 38) argues that what is referred to here as social capital in the civil society is “a resource whose supply increases rather than decreases through use and which (unlike physical capital) becomes depleted if not used.” If we accept this view, “use” may be seen as a new- or re-investment (maintenance) of social capital and depreciation is caused by lack of investment or maintenance.}

An important question is the extent to which all investments in social links are productive or whether all investments are always equally “productive.” Concerning the first problem, it is quite possible that there is a negative correlation between the time spent on social networks and the time spent on productive work. Thus, investments in social capital may have a negative influence on labor supply and consequently on production. In this respect there is no difference between social capital and other factors of production. There is no reason to expect a linear relationship between social capital and production. In a given production function, there is a certain amount of social capital that generates maximum yield.

The second problem concerns whether investments in certain social networks have greater effects on the economy, for example, than investments in other networks. If the latter is true, we should differentiate between a general social capital of civil society and specific social capital for different parts of society. For example, the calculation of the specific economic social capital in civil society is based on weighting the use of time on the basis of an assessment of the importance of the activities in question for economic growth. In this context, activities in organizations with a social focus should be given a higher weighting than, for example, a game of cards with neighbors. On the other hand, in the context of local community relations, a game of cards with neighbors may be more important than voluntary activities outside the local community.

The calculation of time and costs of investments in social capital in civil society, together with weightings based on the importance of different activities to different areas of society, would be sufficient if norms, values etc were similar in all
groups and regions of a society. However, the impact on economic development of e.g. involvement in the same type of voluntary organization does probably vary between regions, depending on differences in attitudes to entrepreneurship, risk-taking, etc. Even if the civil networks are quantified and weighted, the information about their effects is limited unless it is supplemented with qualitative information on the attitudes, norms, values etc. that these networks distribute. If the economic effects of social capital in civil society are placed at the center of the analysis, attitudes and values in respect of entrepreneurship, trust, tolerance, transformation and so on should constitute important qualities in the links of the social networks. The effects of social capital in other than economic respects should require, completely or partly, other attitude variables.

On this basis of this approach, a measure of the economic effects of social capital in civil society should thus consist of two variables:

- A quantitative variable that measures the stock of capital in the form of annual investment costs, based on the time spent on these investments. In assessments of capital specific to different areas of society, the use of time is weighted on the basis of an assessment of the importance of the activity to this area of society.
- A constructed, weighted, positive/negative qualitative variable of economically relevant attitude variables. In combination with the first variable this raises or lowers the value of the effects of the investments made, when data are aggregated in spatial or social units.

One obvious criticism of the method of measuring social capital in civil society as outlined here is that it is partly based on subjective assessments of the importance of variables. However, there is at least one possible solution to meet the objection made by Dasgupta (2000) that a network cannot be priced, namely to use the incomes of individuals as a point of departure and calculate a shadow price for their leisure time. The method outlined here thus provides a possibility of aggregating “total” social capital in civil society. The analytical value of a variable of this type can be questioned, however. A weighting or selection of different types of networks on the basis of their importance from the economic perspective would probably be necessary. Both economic theory and empirical tests of the theory should be able to provide important data for this weighting. The same should apply to other areas of society than the economy.

The Aggregation Problem

In the methods of measuring social capital discussed above, the aggregation of variables and their values does not appear to be a problem. If social capital merely consisted of local social networks in enterprises and the rest of society, the aggregation of these networks would not, in principle, constitute a problem. However, social capital consists of both horizontal networks that extend over communities and regions at the same level, networks at other levels than the local level, and vertical networks between different levels in enterprises and society. Both time in-
vested and the characteristics of attitudes in these networks are measured by the method described above. The problem is whether these different types of non-local networks have effects other than local ones and should therefore not be lumped together with them.

One solution here could be to make use additionally of a breakdown into internal and external social capital for social capital in civil society. The internal social capital would then consist of the networks that are established and maintained within the organizationally or spatially defined unit. The unit’s hierarchical level would be determined by the aggregation made, i.e. it would not be limited to local level. External social capital from this unit’s perspective consists in turn of two separate types of networks:

- Horizontal networks between units and corresponding units at the same organizational or spatial hierarchical level.
- Vertical networks between the unit and higher and lower levels in the community or organization hierarchy.

For each type of network it is necessary, as before, for them to be supplemented with variables in order to measure the characteristics with which the actors/nodes fill the links.

**Concluding Remarks**

The review has shown that to apply the label “capital” to the concept of social capital is not compatible with traditional, established capital theory. The phenomena that are included in the concept of social capital do not belong to those normally regarded as production factors and thus cannot, even in a broad sense of the term, be included in the traditional concept of capital as was done by many of the earlier economists. Investments in social capital do not fulfill the established definitions of investments.

Two alternative conclusions can be drawn from this:

- Social capital should be designated as something other than “capital”.
- Established capital theory is based on the production system of the agrarian and industrial societies. It needs to be supplemented with a theory that explains the phenomena that have emerged in the knowledge society. The theory of human capital has proved to be a theory of this type. The social networks designated today as social capital could probably lend themselves to this type of theorizing.

The two conclusions do not need to be completely incompatible. Even those who consider that the term “capital” should only be used in its traditional sense may be of the opinion that new theories are required for the production systems of the knowledge society. It was established a hundred years ago that what should be regarded as capital is primarily an issue of demarcation. Since social capital is an established concept today, even within large areas of the subject-matter of economic science, this paper supports the second conclusion.
Both economists and representatives of other disciplines have hitherto employed the concept of social capital mainly as a designation of civil phenomena, outside the territory of both the public and the private sector. This chapter has emphasized the existence not only of social capital in civil society but also of enterprise-related social capital. Without doubt, research into social capital will be enhanced if it is supplemented with an enterprise and organization perspective. Similarly, research into the social networks of enterprises and organizations will be enhanced by linkages to theories about social capital. This division also makes it possible to formulate hypotheses about the influence of the different types of social capital on economic growth.

This chapter has also outlined how it is possible to measure enterprise-related social capital and social capital in civil society respectively. There is no reason to deny that there are problems with the methods presented, but there are also problems with methods of measuring and collecting data on all social phenomena. The ideal measure of a theoretical variable seldom or never exists. It has often taken decades to convert new concepts in economic theory into empirically measurable variables.

In other words, it is a matter of taste whether the social networks and attitudes which are referred to here and elsewhere as social capital shall be designated as “capital.” Regardless of one’s opinion in this matter, the development of economic theory and empirical methods is necessary for the growing field of research these networks constitute in the knowledge economy.
3 Social Capital as Capital in the Economic Sense

To what extent can social capital be compared with other forms of capital and thus analyzed in the same way as they? In this chapter we compare social capital with other capital forms in certain respects crucial to entrepreneurship: productivity, vintage aspects, accumulation, rights of possession, and complexity and levels of aggregation.

Productivity

Both Coleman and Putnam regard group-related social capital as productive. If social capital is viewed as a positive externality, then from the economic standpoint there is no reason to call this into question.\(^1\) Then how is the “negative” social capital which Portes and Landolt (1996) and others discuss to be characterized from the productivity standpoint?

One basic answer is that since neither other capital nor other factors of production always produce something “good,” the same applies to social capital (Collier 1998; Ostrom 2000). In purely economic terms unbalanced investment and over-investment of both real capital and social capital may result in falling yield (Gabbay and Leenders 1999). Excessively strong links can be very costly to maintain (Hansen 1998).

A more detailed answer to the question can be derived from modern economic network theory. Economic networks can be regarded as capital in which investments have been made. One purpose of investment may be to obtain or guarantee a certain market share. By creating relationships with customers in diverse ways (advertising, personal contact, servicing contracts, etc.) a firm attempts to shut out competitors from a network it has established. It can build similar networks with suppliers. An established firm with strong customer and supplier networks can use these to shut out new and more productive capital from the market. This new and more productive capital has to find new, unestablished market segments or else break down parts of the old capital’s customer and supplier networks in order to force its own way into the market.

The relation between positive and “negative” social capital can be viewed in a similar light. Capital (excepting financial capital) is timebound. The social capital

\(^1\) Collier (1998) has a detailed discussion of *externalities* as effects of social interaction.
Social Capital as Capital in the Economic Sense

of groups and regions that is considered negative from society’s standpoint came into being once upon a time as a rational solution intended to safeguard and strengthen the group’s interests. Social capital, like real and human capital, is a “sunk cost.” If it is not changed pari passu with other changes in society it becomes obsolete and non-productive and so withers away (Sandefur and Laumann, 1998). If obsolete social capital is retained and kept in repair then in the worst case it will become counterproductive. This can be compared with other obsolete capital forms which tie up resources for which there might be some more productive alternative use.

In such a situation, by creating strong networks, actors/groups have shut others out from the resources and markets to which they have access. Putnam’s argument that lack of (positive) social capital implies a “never cooperate” strategy (Putnam 1993a p. 177) must therefore be called in question. Cooperation outside a group’s own network is limited precisely because cooperation inside its own network corresponds best with its aim in the given circumstances. Just as new and old economic networks compete on the product markets, positive and negative social networks compete on their “markets.” As long as the old – and from society’s standpoint less positive – networks retain the power to offer the group higher and/or more reliable satisfaction of needs than the new, flimsily established and more positive networks – and as long as the old networks retain the power to punish those who break away from them – the old social capital will maintain its grip, despite the fact that it is less productive from society’s standpoint. A customer of many years’ standing, with rebate and bonus benefits, has “invested” in a trademark and will be reluctant to abandon it for an uncertain new brand – especially if his investment will become valueless and he will be punished by withdrawal of his perquisites. In similar fashion the old social networks in which the participants have invested in various ways retain their hold over their individuals and groups.

The argument above is not valid merely within a region or country. Even entire countries or groups of countries can be regarded, from a Western country’s perspective, as being dominated by a body of social capital that inhibits innovations and improvement of productivity. However, this social capital produces a satisfaction of needs at a certain level in combination with preservation of traditional cultural norms, which does not make a transition to more Western-style norms a self-evident prospect in the short term.

The conclusion is that although, from an overall social perspective, “negative” social capital is less productive than “positive” – and perhaps even counterproductive – at the micro level it produces a satisfaction of need which the weaker (in this group or region) “positive” capital cannot offer. A group’s internal social capital can be used both positively and negatively from the larger society’s standpoint. What determines whether social capital is used positively or negatively is whether the group’s goals are in harmony with society’s interests. A group that has been the bearer of socially-positive capital for a period can come into conflict with society as time goes on if the latter changes and the group does not change its internal social capital. Accordingly it becomes necessary to distinguish between
internal and external social capital. What decides whether internal social capital is used positively or negatively is whether the group’s external social capital, i.e., the links to society at large, are positive or negative.

The above discussion of social capital’s contribution to productivity has centered on Coleman’s view of social capital as a resource. In Becker’s perspective, it is past experiences that form the social capital which influences a person’s preferences. As far as the household’s utility is concerned, Becker (1996) expresses the relationship in the following general terms: “… the past, present and future are still linked through the capital stocks that determine the productivity of commodity production. Present accumulation of personal and social capital changes household productivity in the future.” Then can the preferences of the individuals be graded according to their degree of productivity? The answer is that the actions resulting from individual preferences differ where productivity is concerned. Individuals use (consume) their time more or less productively. Certain forms of consumption, e.g., smoking, may raise productivity in the short term but will definitely decreases it over the long term.

Thus, in terms of productivity social capital differs from other forms of capital. Whereas other forms of capital are neutral with regard to society’s interests, a certain proportion of social capital consists of nodes/actors with preferences and links, which determine whether this particular item of social capital is positive or negative for society. The same type of links between society’s actors determines whether other capital forms are used positively or negatively from society’s point of view.

The Vintage Aspect

The fact that real capital consists of different vintages that become less productive with age is an important feature of the modern theory of capital. Human capital has similar properties. Social capital too is timebound and ought to be regarded as historical investments, but it differs from real capital and human capital in that, as with wine, older vintages are not necessarily less valuable than new. Not all old social capital is necessarily “negative” and not all new “positive.” In this respect it has more of a vintage aspect in its original meaning than the other two forms of capital.

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2 Adler and Kwon (2002) base a comprehensive review of the literature and an attempt at a conceptual framework on precisely the distinction between internal attributes and external resources of social capital.

3 How “society’s interests” are to be defined is often considered a political-moral issue. There are fundamental human value-judgments as to what is right and wrong, and also that the interests of society at large can be defined as the social, economic, and cultural goals around which a high degree of unity prevails. However, from the pure economic perspective, the Scitovsky criterion (Kaldor-Hicks efficiency) can be regarded as an expression of “society’s interests.”
It can be compared to a vintage port wine more than to a personal computer. Port wine is a blend of different vintages to produce the best taste. Social capital is a blend of norms, values, traditions, knowledge and preferences of an extremely wide range of vintages in which the older ones function as a stabilizing factor and the newer ones as factors for change. Certain elements among the older vintages undoubtedly have negative effects, but social capital, unlike port wine, does not permit of these elements being omitted by a wine-blender.

Social capital must be renewed in order to preserve its productive function in the long term, i.e., it has to be topped up by new vintages while simultaneously preserving “the best” of the old. Without this renewal, it becomes increasingly out of step with economic developments and assumes an increasingly negative character.

Accumulation and Maintenance

The various forms of capital are built up, generally speaking, by means of combinations of equity capital, other forms of capital, and labor. Financial, physical, and human capitals need contributions both of each other and of social capital in order to come into being and accumulate. The situation with human capital is often the same in practice. Theoretically speaking, it can accumulate without the direct intervention of financial or physical capital – but not without social capital. Many forms of social capital are even less dependent on financial and physical capital than human capital is. But certain types of real capital facilitate the creation of social capital (e.g., public meeting places), while maintenance of pre-existing real capital (e.g., preservation of historic monuments) also helps. Human capital in many different forms also assists in generating social capital. What is invested in social capital most of all, however, is human time.

Coleman (1988) also claims that social capital differs from other forms of capital in a more crucial way, viz that social capital is primarily a byproduct. Whereas other forms of capital are built up deliberately as ends in themselves, he sees social capital as an unintentional consequence of social interaction with other, frequently profit-oriented, purposes. As noted above, Putnam voices the idea that social capital, unlike physical capital, increases when it is “used” and diminishes when it is “not used.” The consequence of what people are doing when, in Putnam’s words, they “use” social capital (i.e., consume it in the economic sense), is that an unintentional investment takes place! On this view, the fact that consumption normally results in an investment makes social capital a very special item compared with physical capital. In this respect, Putnam’s and Becker’s views are in fact very close to each other, as the social capital of Becker is also a product of past consumption. But this peculiarity also explains why most economists are skeptical of using the term “capital” when discussing social interactions. Arrow (2000) claims that the term “capital” implies among other things a deliberate sacrifice in the present for future benefits.
However, that criticism might be directed towards the concept of human capital as well. Many people who study, i.e., invest in human capital, enjoy what they are doing and do not consider it a sacrifice. Human capital in the form of knowledge and competence is also amassed through work without any deliberate sacrifices. Thus, if human (and social) capital is considered as “capital,” Arrow’s criteria cannot be used. A solution could perhaps be to interpret “sacrifice” as “restrain from production.” From a strict production perspective leisure/consumption is a necessary sacrifice for maintaining and improving man’s production capacity. Physical capital does not need leisure, only maintenance/reinvestment.

Whether any human or social capital is accumulated during a person’s non-productive time, or these forms of capital are merely maintained or even depreciate, is determined by the kind of consumption on which he expends his time. Certain uses of leisure – e.g., certain social activities – definitely increase the social capital of an individual, a group, or a community. Individuals and organizations which decide to devote their time and resources to different activities might thus be considered as investors in something that will render returns in the short or long term. The involvement of an individual in a non-profitmaking association thus entails not only consumption of time but also an investment in a social network – an investment that yields non-material returns in the form of status, contacts, etc. Coleman’s point that individuals’ and organizations’ decisions to invest in social activities also bring unintentional consequences on higher levels should be noted here. What are intentional individual investments thereby also contribute to unintentional effects in a group, a place, or a region.

However, it can also be the case that actors use/consume their social capital without maintaining or reinvesting in it. Anyone who makes use of his social networks disproportionately more than he puts into them is in this situation. The probable consequence is that the person’s/group’s external links will deteriorate. Utilization without maintenance/investment therefore wears out social capital just as it does physical capital. This can be expressed in network terms by saying that a node that does not act reciprocally in a reciprocal network tends to lose its links. Becker’s individual social capital has similar characteristics. A too limited social capital means weakly diversified preferences that the individual may simply become fed up with. Without new experiences, i.e., accumulation of new social capital, the individual’s utility diminishes. Non-profit organizations furnish another example showing that social capital can wear out when it is used. Organizations depend for their survival on a certain amount of new recruitment as members drop away. If this new recruitment does not happen despite the members’ using their social capital, the capital wears out and the activity fades away.

Social capital also differs from physical capital in another important aspect, by being much harder to construct through external interventions. A national or local government can grant funds to different types of infrastructure, but “to make an infrastructure operate efficiently requires knowledge of local practices that may differ radically from place to place. Organizational structures that facilitate the operation of physical capital in one setting may be counterproductive in another. Local knowledge is essential to building effective social capital” (Ostrom 2000). The
social capital of a group, place, etc., is not only constructed by its formal government, but also by many individuals in these more or less restricted networks. There is no visible decisionmaker able to form the social capital in the same way as it makes decisions about traditional capital.

Rights of Possession Versus Public Goods

Bourdieu’s individual-related social capital can be put in the same category as human capital in many ways. It is a resource which an individual or group possesses and may be regarded as productive in the sense that it helps to increase the individual’s/group’s well-being. Like human capital it cannot be disposed of entirely. It does differ from human capital in a crucial way, however, inasmuch as it is inherited chiefly by the social environment, whereas human capital is influenced by the supply of education. In this respect, Becker’s social capital has similar characteristics to Bourdieu’s.

On the other hand the Coleman perspective is that social capital is a public good for a group or for the whole of society. The economic effects of social interaction cannot be “internalized,” i.e. ring-fenced by a firm or organization. The effects are therefore externalities (Collier 1998). Whereas the other three forms of capital make possible an individual right of possession, this is not the case with social capital. Then what determines whether a given item of social capital is a good for a group or for the society at large?

Putnam’s reply would probably be that it depends on how “civic” the society is. The greater the civicness, the more public the society and the less the propensity (and opportunity) to monopolize goods within the group. Another way to say this might be that it is the part of social capital that is formed of horizontal links between groups at the same level and vertical links between those at different levels that determines how general the general good is (Flora 1998). The establishment, extent and exploitation of these links is determined by the nodes, of course, i.e., by the intensity of the will to cooperate exhibited by the groups and levels. The connection is clear, however: the more cooperation there is between groups and between different levels of society, the more widely the general goods are disseminated. Burt (1992b) is referring to this view when he asserts the importance of “structural holes,” i.e. of links to groups that would not otherwise be coupled to the network. Granovetter (1973, 1982) has stressed that even weak external links to subgroups with strong internal links signify a good deal in terms of the cohesion of society.

If it is a certain type of social capital that decides the diffusion of public goods in a society, it is not far-fetched to aver that it is primarily this type of social capital that Putnam has in mind when he focuses on positive effects. The fact that the establishment of these important links is decided by the nodes also helps to explain the existence and retention of social capital that is negative and counterproductive from society’s standpoint. If for diverse reasons groups do not wish to es-
pouse a society’s norms, they minimize the positive links to it but preserve and even strengthen the negative ones.

Just as we did above, we can here compare in network terms the internalizing efforts of an out-group such as a semi-criminal youth gang to those of a firm. A firm has certain business secrets which it endeavors to monopolize so that they do not become public; its success depends on this information not becoming public goods. Strong internal links are created in order to preserve it, while external links in this area are punished – even though, from society’s standpoint, they might lead to generally positive developments such as diffusion of technology, increased competition, and lower prices. The youth gang bases its existence on being a group whose attitudes and actions diverge from those of society. The forging of over-positive links with the rest of society conflicts with the idea of outsiderhood and would dissolve the social capital that unites the gang as a gang. Negative links to society, on the other hand, help to preserve and strengthen the internal social capital. In both cases, however, it remains true that the network cannot be totally screened off and the social capital totally internalized. This means that at least part of the capital becomes an externality in the form of public good or “bad.”

Thus, even though an individual right of possession of social capital is impossible according to the Colemanesque approach we are using here, it is evident that the degree of “publicness” varies widely between different types of social capital, whether “good” or “bad.” How “public” any particular social capital is will be determined, as in our earlier discussion of productivity, by that part of the social capital which forms external links between different groups and levels of society. A large quantity and proportion of positive links will make the social capital general and homogeneous. A larger proportion of negative links gives rise to heterogeneous social capital, fragmented into groups and “public” only within each group.

In other words there seems to be a strong coupling between social capital’s character of public good and its productivity. In both cases it is the links between groups and levels of society that are crucial to how strong an influence the most productive social capital has at any given time.

**Complexity and Level of Aggregation**

The various forms of capital differ in their complexity. Financial capital is the most homogeneous and in principle differs only in being expressed in different currencies. Physical capital occurs in the form of land, tools, plant, machinery, etc. Differences between the types of physical capital are many and wide but there are also strong common denominators. Human capital displays very great complexity in that it cannot be considered entirely alike in any two individuals. In social interactions, every individual participates as actor in an endless variety of relations and networks, and there are probably no two individuals with exactly similar preferences. Therefore, social capital must be regarded as the most diversified of capital forms.
This raises great problems if we want to be able to operationalize and analyze social capital empirically. Solow (2000 p. 7) asks, e.g., “Just what is social capital a stock of? (…) What are those past investments in social capital? How could an accountant measure them and cumulate them in principle?”

Rose (1998) considers that three different approaches can be distinguished for interpreting the complexity of social capital, and this fact affects the possibilities for operationalizing it. One approach is Coleman’s (1990 p. 302) view that social capital is an endogenous phenomenon in social relations that varies from one situation to another. Rose argues that this view means that since both networks and individuals shift from one situation to another, social capital cannot be aggregated to form a single entity. A second view is Inglehart’s (1997 p. 188), to the effect that networks are a consequence of people’s having trust in each other and so cooperating with each other. Social capital can be described as a generalized consequence of this trust and cooperation. It is not the networks that vary from one situation to another but the adherence of individuals to the networks; certain individuals have more trust and cooperate more than others. Thus the source of social capital is an individual resource that is reflected in attitudes and is therefore capable of being measured. The third view is Fukuyama’s (1995 pp. 26ff), to the effect that that a society’s culture is the source of trust and cooperation. Different societies have different social capital because they have different cultures. Individual access to social capital does not vary within cultures but between them.

To this we must add Becker’s view that social capital is an individual asset that might produce different benefits for different people even from the same set of goods and services (Hardin 1999).

The differences between the four approaches are largely a matter of level and aggregation. Becker’s individual social capital is individual and thus impossible to aggregate, but the outcome of the use of this social capital should be possible to categorize. Coleman’s micro approach emphasizes the differences between networks and between individuals but should of course make it possible to categorize them. Inglehart’s individual approach keeps the networks constant and enables individuals’ trust to be measured. It is a condition, however, that these individual values can be aggregated to become a value of the social capital at the macro level. Another prerequisite is that the culture is common and that networks are there if individuals want to connect with them. On the other hand Fukuyama’s aggregated cultural approach holds the individuals constant while keeping the networks distinct. The variations between the social capitals of individuals become marginal compared with the variations between cultures, and the focus of study is on comparing cultures.

A somewhat different way of tackling the problem of complexity is to distinguish between internal and external social capital, as was done in the previous sections. The next step is to establish that there are different levels of aggregation and that homogeneity of social capital stands in converse ratio to the level of aggregation. The approach is described from a spatial perspective in Figure 3.1, which also contains examples of commonly used terms for social capital on different levels as an illustration of the heterogeneity of the concept.
At the lowest level is the individual actor. By definition, each individual is a homogeneous unit (even though a psychologist perhaps would question such a statement) with his or her own preferences, attitudes, behavior, etc. But the individuals constitute only one of the two components, the nodes of the networks we denominate social capital. The other component, the links, are principally of two different kinds: a) horizontal links between the individual and other individuals in
the network/group, and b) vertical links between the individual and the network/group as a decisionmaker of higher order (i.e., the relations between individuals are not the outcome of the single individual, but of all the individuals in a network/group. This is a crucial principal problem in measuring social capital and particularly in aggregating it to higher levels.)

The next lowest level is the local group of individuals, whose internal social capital has high homogeneity. These local groups are coupled to horizontal external links and collectively form a deposit of local, placebound social capital with a lower degree of homogeneity than that of each group. In contrast to a group, a place cannot be considered to be a decisionmaker, but still the social networks of a place form opportunities and restrictions affecting the decisionmaking of individual and groups. The local groups and places also have vertical links to actors at regional level. Social capital at regional level is less homogeneous than at local level, and so on, and the social capitals on these levels constitute opportunities and restrictions affecting decisionmakers as well.

The fact that decisionmakers, like individuals and groups, are nodes but not links is a principal general problem in measuring social capital. In practice, most empirical methods of measuring different aspects of social capital must accept this shortcoming and build on data on the nodes, which means that the links are measured indirectly by the nodes’ access to, preferences concerning, use of, attitudes to, etc, different links.

The differences in homogeneity between social capitals on different levels constitute the fundamental problem in aggregating social capital. Knowledge about links on one level does not necessarily reveal anything about links on a higher level. Information about links between two levels may not be valid at all for links between other levels. Glaeser, Laibson and Sacerdote (2000) recognize this when they point out that “the complexity of aggregation means that the determinants of social capital at the individual level may not always determine social capital at the society-level” (p. 5; cf. also Dasgupta 2000).

Woolcock (1998) uses the terms “bonding” and “bridging” links for what we call internal and external links, respectively. However, he does not discuss the circumstance that bridging/external links between units (e.g. groups) on one level (place) simultaneously constitute bonding/internal links for that level in relation to a higher level (region). The fact that from another perspective bridging/external links simultaneously constitute bonding/internal links is another illustration of the problems entailed in aggregating social capital of different layers.

Thus, the crucial factor from the homogeneity point of view is the external links between actors on and between the respective levels. In those instances where local actors have weak or negative links between them, for example between different firms or residential districts, the local social capital will be less strong and homogeneous. In cases where weak/negative links only cover marginal

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4 Cf. Flora (1998): “Networks are most effective for the community as a whole when they are diverse, inclusive, flexible, horizontal (linking those of similar status), and vertical (linking those of different status, particularly local organizations or individuals with external organizations and institutions that have resources not available within the community).”
groups, however, the effect on local social capital is also marginal. Similar reasoning applies to the links between different levels. For example, Rose (1998) describes post-communist Russia’s problems in this respect as over-strong networks within small groups (family, neighbors, etc.) that function as compensation for the absence of positive links between these small fragmented networks and society at large.

While the absence of (positive) links or presence of negative links between actors and levels constitutes one extreme problem, the other extreme consists of over-strong links that resist necessary change. History shows many examples of countries and regions that have not managed to adapt themselves to changing norms and values when economic conditions changed.

Thus, over-weak links create a heterogeneity that risks ending up as disintegration, while over-strong links create a homogeneity that generates inflexibility and resistance to change (Grabher 1993; Grabher and Stark 1997). Theoretically speaking there is probably an optimal balance between homogeneous and heterogeneous social capital at and between each level (Westlund 1999). Woolcock (1998) has discussed this central question in terms of “embeddedness” and “autonomy” respectively (Granovetter 1985), where embeddedness (in our terms) refers to the links that help to make the group/society homogeneous while autonomy refers to links that preserve the group’s/society’s heterogeneity and diversification.

The conclusion from Figure 3.1 is that social capital and its effects, for example in the form of entrepreneurship, ought to be studied in various ways at different levels. It is the type of links and their levels that determine how social capital is to be studied. However, attempts to aggregate links specific to different levels into a “general” level run up against great problems of principle. The common denominator of social capital must be sought at each level individually.

Social Capital as Capital – Summary

The discussion in this section concerning similarities and dissimilarities between social capital and the other capital forms is summarized in Table 3.1.
Table 3.1. A summary of similarities and dissimilarities between social capital and the other capital forms, involving references to productivity, vintages, accumulation, possession and complexity.

<table>
<thead>
<tr>
<th>Similarity</th>
<th>Dissimilarity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productivity</strong></td>
<td></td>
</tr>
<tr>
<td>Social capital are sunk costs that might become obsolete.</td>
<td></td>
</tr>
<tr>
<td>Social capital can be put to good or bad uses (from society’s perspective).</td>
<td>Social capital expresses interests of actors, good or bad from society’s perspective. It is not neutral with regard to society’s interests.</td>
</tr>
<tr>
<td><strong>Vintages</strong></td>
<td></td>
</tr>
<tr>
<td>Social capital consist of vintages.</td>
<td>The vintages of social capital are more comparable to a port wine than to other capital forms. The composition of vintages is decisive. There is no simple correlation between age and decreasing productivity.</td>
</tr>
<tr>
<td><strong>Accumulation and maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>Social capital wears out if it is not maintained.</td>
<td>Social capital is a product of both intentional investments and an unintended by-product of other activities.</td>
</tr>
<tr>
<td>Social capital is a result of past activities.</td>
<td>Accumulation of social capital does not necessarily entail deliberate sacrifices for future benefits.</td>
</tr>
<tr>
<td><strong>Rights of possession vs. public goods</strong></td>
<td></td>
</tr>
<tr>
<td>Access to social capital is never completely public. Access requires connection to a network and/or certain skills.</td>
<td>Social capital is social, i.e. it cannot be individually possessed.</td>
</tr>
<tr>
<td><strong>Complexity and levels of aggregation</strong></td>
<td></td>
</tr>
<tr>
<td>Diversified social capital means less vulnerability to economic structural changes.</td>
<td>Social capital is the most diversified, least homogeneous form of capital.</td>
</tr>
<tr>
<td></td>
<td>Aggregating social capital belonging to different levels entails great methodological difficulties.</td>
</tr>
</tbody>
</table>
4 Social Capital as a Spatial Externality

Introduction

Many industries, in particular knowledge-intensive industries in their early stages of development, seem to be concentrated in certain locations, often termed clusters. What are the driving forces of such a development and what is the role of social capital in these spatially concentrated growth processes of the knowledge economy? What is the role of social capital in the theories that aim to explain phenomena such as industrial districts, clusters, innovation systems and triple helix cooperation? This chapter discusses these and other questions relating to social capital and space.

Throughout history, space and social capital have influenced each other in both cumulative and counteractive ways. *Physical* space, expressed in distance, has in general contributed to the forming of divergent social capitals within groups separated in space. The social capital of groups has been a prerequisite for group cohesion, which in its turn has reduced interaction between groups already separated by space. On the other hand, when a group or organization has been spread out in space, its social capital has helped to diminish the role of space in shaping and re-shaping social capital. Thus, we can distinguish between social capital as a proximity-strengthening, internalizing factor and social capital as a network-building, externalizing factor, over-bridging space.

*Social* space, expressed in ethnicity, religion, class, etc, is in many cases an original result of physical space. The forming of ethnic groups has in particular been a process in which distance has played a crucial role. However, class division is much more of a purely social process in which, if physical distance between classes occurs, it has been the result and not the cause. In the case of social space, social capital has been a fundamental prerequisite behind the cohesion of social groups and their delimitation from each other – but establishment of “critical links” between groups has also contributed to mutual understanding and conflict reduction. Thus, in the case of social space, we can distinguish between social capital as an “intra-action”-promoting, i.e. internalizing factor and social capital as an interaction-promoting, externalizing factor.

This dual role of social capital – under certain circumstances promoting spatial and group internal cohesion, under other circumstances contributing to link-building that promotes spatial interaction across physical and social borders – makes social capital much more complicated than the trust-building, transaction-cost-reducing factor often assumed in the modern literature. In the spatial perspective, certain component parts of social capital have an internalizing effect and are
governed by the actors in that locality/region, while other component parts give access to externalities which the local/regional actors cannot govern. A similar conclusion can be drawn from the firm’s perspective. The internal social capital of a firm is formed by its management and employees and for its survival there are strong incentives to internalize firm-specific knowledge – but by its location decisions and other investment the firm also builds links and relations to gain access to externalities such as knowledge and information.

From the perspective of the spatial concentration of firms and their connections to each other and other actors, the character and composition of firms’ internal social capital are the first important factor. The basic activities of the firm, its type of production and products, its possession of (partial or temporary) product monopolies, its need for the input of knowledge and information, its position in formal ownership, supplier-customer networks or other dependencies, etc. – all these characteristics contribute to the firm’s internalization and externalization of different actions. A firm with a great need to keep its tacit knowledge internalized – and with the resources to generate new knowledge internally – has low incentives to interact with other firms outside regular market transactions. A firm tied up in formal networks might not even be permitted to engage in certain interaction external to the network. On the other hand, a group of independent firms whose activities complement each other has very strong incentives to share knowledge and cooperate in R&D. Thus, a firm’s activities, its ownership and other dependencies govern its opportunity to gain from, and its need to use, the externalities of an agglomeration – and accordingly also govern its location decisions. The firm forms its social capital in accordance with these needs and the social capital becomes a factor supporting and reinforcing the firm’s positions on the internalization-externalization scale. In this way, the firm’s internal social capital is a reflected image of its external social capitals.

On the level of spatial agglomerations the decisive social capitals are 1) the internal social capital of the agglomeration, i.e. firms’ and other actors’ proximity-related social capital, and 2) the social networks between the agglomeration’s actors and the rest of the world. By definition, the internal social capital of agglomerations must be stronger than the external – otherwise the agglomeration would be dissolved, or preserved by other forces than the social.

**Producer Surplus and Place Surplus**

Different types of capital have very different types of effect. Homogeneous financial capital has an output which is also homogeneous, viz. more financial capital, which can be consumed or invested. The output of physical capital consists of products which are either consumed or else invested as new physical capital. Human capital reproduces itself in similar fashion to the two capital types aforementioned, but the output of human capital extends much further than that. Neither financial, physical nor social capital can come into being and be accumulated
without human capital. Therefore human capital contributes actively to investment in other forms of capital as it does to production for consumption.

What, then, is the output that social capital produces? From the Becker point of view, the effects of social capital “are more or less entirely within the actor” (Hardin 1999). But the welfare of actors of course also has external effects. Based on the Colemanesque perspective, Collier (1998) identifies three effects of social capital, all constituting externalities: Social capital consists of knowledge that is disseminated and exchanged in the social networks, thereby raising the level of human capital; it increases mutual trust between actors, thereby helping to reduce transaction costs; it increases capacity for common action. In social capital, norms and rules are created for the behavior of actors, reducing tendencies towards free-riding and the accompanying costs of formal systems of control and sanctions. An obvious addendum to these three points of course is that, as noted above, social capital also reproduces itself by virtue of the fact that its consumption normally constitutes an investment as well.

Two basic concepts in microeconomic theory are consumer surplus and producer surplus. Bolton (2002) has suggested that in a spatially limited perspective the two surpluses help to form a place surplus. In the paper cited, he concentrates on the relation between consumer surplus and place surplus. Here we highlight the other side, viz. the composition of producer surplus, the emphasis being on the role of social capital in creating producer surplus. We concentrate on that part of social capital that consists of links between actors and levels of society, since these may be regarded as the most important factors for a spatially limited social capital that contributes to place surplus.

Figure 4.1 provides an outline description of producer surplus as a function of the four types of capital. However, we confine ourselves here to discussing the influence of social capital. The figure shows that social capital influences producer surplus in two ways. The first is via its effect on supply costs and revenues (supply costs are defined here as the sum of transaction, transport, production, and development costs (Johansson and Westin 1994)). The second is via its effect on human capital.

Social capital has direct effects on transaction costs. It affects information and its dissemination, and thus also information and search costs, and affects trust between actors and thus contract costs. It also affects the propensity to free-ride and thus the costs of control and sanctions. Thus, supply costs are influenced by social capital through the degree of trust and the climate of cooperation prevailing both in individual workplaces and between firms and actors in a region.

Social capital also influences producer surplus through its effect on human capital. Social capital can itself be described as a kind of knowledge, which is diffused and exchanged, thereby raising the level of human capital (Collier 1998). These changes in human capital can affect, in principle, all the components of supply costs and revenues. Human capital in turn also has effects on real capital and financial capital, but we do not discuss these in detail.
Externalities

The kinds of phenomena that the economic literature calls *externalities* are the fundamental reason for a firm’s choice of location and other investment in social capital. The concept of externalities dates back to Marshall (1920 [1890]) and since then has been considered one of the most elusive and difficult to formalize in the economic literature (Scitovsky 1954). Sraffa (1926) considered externalities as the only source of increasing returns under perfect competition and claimed that although externalities are external to the firm they are internal to the industry (cf. the spatial perspective above).

Based on Scitovsky’s (1954) classification of externalities as either pecuniary or technological, Johansson (2004) has made a fundamental distinction between firms’ *intra-market* and *extra-market* externalities. Intra-market externalities are mediated through the formation of prices, while extra-market externalities comprise links, agreements, networks and other club-like arrangements, but also information and knowledge spillovers, denominated communication externalities by Fujita and Thisse (2002). It should be noted that the establishment of links, networks, etc are deliberate actions of a firm with the aim of internalizing transactions within the network that otherwise would have been market transactions, while the spillover externalities may be a result both of deliberate aims and of unintended by-products. Johansson (2004) also makes a distinction between *proximity* externalities, within an urban region or district, and *link* externalities, being more or less distance-independent. Links can be established both within and between regions; in the latter case they are substitutes for proximity.

A number of concepts have been formulated to describe and analyze the proximity- or link-based interaction between individual firms and other actors producing externalities. *Industrial districts* – the term already coined by Marshall – are normally defined as spatial agglomerations of SMEs in one or a few complementary industries (Paniccia 2002). In particular, the term has been used for agglom-
eralizations of SMEs in Italy. *Cluster*, a concept with a number of slightly different interpretations, has received an enormous amount of attention in both research and policy circles through Michael Porter’s book *The Competitive Advantage of Nations* (1990). Clusters are often defined as spatially delimited industrial systems regardless of the size of the enterprises (Paniccia 2002), but it should be noted that Porter (1990) has also considered clusters as being functional industrial systems without a proximity dimension (Malmberg 2002). Another ambiguity is that much of the cluster literature, based on Porter (1990), treats clusters as purely a spatial concentration of related firms (see e.g. Enright 1998), while Porter later (1998, 2000) explicitly includes public institutions, such as government educational institutions and support services, in the definition of clusters. The vast popularity of the concept, not least in industrial policies, has resulted in “cluster” having become a possible denomination of almost any agglomeration of economic activity.

Even though clusters are thus sometimes regarded as consisting of firms as well as public institutions, both the cluster and the industrial district approach have their main focus on inter-firm relations. As Johansson (2004) points out, these external relations of a firm can be of an intra- or extra-market character.\(^1\) The latter can be divided into two forms: 1) organized transaction-link externalities (with club characteristics) where knowledge exchange may be a deliberate aim of the relation, and 2) spillover externalities. These inter-firm spillovers can be horizontal, between similar firms imitating each other or in other ways taking advantage of the spillover externalities in “the air.”\(^2\) But spillovers between firms in an industrial district or cluster can also be vertical, between an input-buying firm and its suppliers or between an input-selling firm and its customer firms. In both directions, the knowledge spillovers are by-products of the market interaction.

While the terms industrial districts and clusters have been used mainly for local and regional relations between firms, the concept of *innovation systems* was originally formulated for systems at a national level and denoted not only inter-firm relations but also links between firms and government, firms and research institutions or between all three of them. It was used for the first time by Freeman (1987) in his analysis of the economic development of Japan after World War II, where government, especially the Ministry of Industry and Trade (MITI), played a crucial role. Leading scholars of this tradition (Lundwall 1992; Nelson 1993) have regarded the nation as the evident level of analysis since “… the policies and programs of national government, the laws of a nation, and the existence of a common language and shared culture define an inside and outside that can broadly affect how technical advance proceeds” (Nelson 1993 p. 16).

In the last decade the concept of *regional* innovation systems (RIS) has yielded a rapidly increasing literature (see e.g. Cooke 1992, 2001 and 2003; De la Mothe and Paquet 1998; Asheim and Gertler 2004; Doloreux and Parto 2004, etc). The

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\(^1\) In a conceptual paper, Paelinck (2004), in line with rigorous mathematical definitions, proposes a similar distinction between a market approach, which includes “vertical”, “sectoral” and “industrial” clusters, and “externality clusters” consisting of “knowledge” and “technology” clusters and “new industrial spaces.”

\(^2\) Johansson (2004) refers to these horizontal spillover externalities as “Porter externalities.”
Social Capital as a Spatial Externality

Regional approach to innovation systems according to Doloreux and Parto (2004) is a normative and descriptive approach based on two main bodies. The first is the national innovation systems approach, based on evolutionary, non-equilibrium theories, in which innovation is a result of processes both internal and external to the firm. These processes are not only technical and economic but also social. Learning, through interaction, is a key concept in the innovation processes. The second body of literature is that of regional milieu, embeddedness and the role of proximity.

According to its analysts the concept of regional innovation systems has increasingly become an all-embracing term for firms’ interaction with each other and other actors at regional level. In a typology of regional innovation systems Cooke (2003) interprets RIS as a more general one than clusters and industrial districts, which he regards as variants of regional innovation systems. The Italian industrial districts are considered as a “grassroots” type of RIS but also as “classic clusters.” Cooke also distinguishes between a German-Austrian type of “integrated” RIS and a French and East European “dirigiste” RIS type.

A fourth concept, strongly linked to the above-mentioned, is that of triple helix, which “… is a spiral model of innovation that captures multiple reciprocal relationships at different points in the process of knowledge capitalization… … The triple helix denotes the university-industry-government relationship as one of relatively equal, yet interdependent, institutional spheres which overlap and take the role of the other.” (Etzcowitz 2002 p. 2). It is no coincidence that university is the actor named first. According to Etzcowitz, an important difference between the innovation system and triple helix approaches is that the former has its focus on the firm and views innovation as occurring primarily within the firm. In contrast, the view of the triple helix approach is that “Innovation is increasingly likely to come from outside of the individual firm or even from another institutional sphere such as the university…” (Etzcowitz 2002 p. 1). Triple helix processes are possible at regional and national as well as multi-national level.

**Formalized and Non-formalized Interactions**

The four approaches very briefly summed up above have one thing clearly in common: the focus on interaction where firms are involved. Apart from that, the approaches show differences not only between each other but also between different interpretations of the same approach, when such factors may be involved as spatial level, which actors are included, their size and sectoral scope. The industrial district approach is the most limited as it only comprises interaction at local level between SMEs in one or a few closely related industries. The different interpretations of clusters – from pure industrial districts with only firms involved, to non-spatial, sectoral systems of innovation with several types of actors – is an illustration of the concept’s popularity, but also of its weakness as an analytical tool (cf. Marcusen 1999). Similar criticism has been raised against the regional innovation systems concept (Doloreux and Parto 2004), which, as shown, has also been
considered to be a still broader concept than the cluster. Finally, the triple helix approach is a more restricted normative approach which not only states that three types of actors *should* interact but also that their activities partly *overlap*. Moreover, triple helix’ prime focus is not on the firm’s knowledge input and innovation process but on the interaction as such and how it transforms the actors.

Although not always explicitly expressed, the four approaches also have something else in common, namely their acknowledgment of externalities in the form of *transfer of (tacit) knowledge or knowledge spillovers*, *emergence of new knowledge* and *collective learning* as a primary outcome of the interaction. It is in these knowledge-creating and transfer processes that social capital constitutes a ubiquitous but multifaceted factor.

Following Johansson (2004) we can assume that knowledge transfers and collective learning take place through two types of processes:

1. Deliberate, formalized transaction-links, agreements, networks and other club-like arrangements between firms and firms and other actors, and
2. Unintended knowledge spillovers between firms or between firms and other actors, caused by non-formalized interactions. These kinds of interactions consist of: a) vertical technical/economic interactions between firms and their suppliers and/or customers, b) spin-offs of new firms from existing ones and turnover and exchange on the labor market, c) horizontal interaction in the form of informal exchange of information and knowledge in the (local/regional) civil society, between individuals connected to firms or other actors.

In the first case, that of formalized transaction-links and networks, the formalization is in itself a confirmation of the firm’s willingness to invest in a link with a longer duration than a pure market transaction. In contrast to the “conventional wisdom” on (spatial) clusters, the reasons for the emergence of these fixed links/networks are not the firm’s wish to enjoy informal knowledge and information spillovers and other outcomes of flexible inter-actor interactions – but to *internalize* knowledge within the fixed network, often a corporate grouping. McCann and Arita claim that the cluster type of Silicon Valley is more of an exception which should not be generalized, and that the internalizing “industrial complex” type of cluster is “… typical of many firms and sectors, and in particular, of the semiconductor industry” (McCann and Arita 2004 p. 247). In this case, knowledge spillovers within the delimited industrial complex are internalities for the industrial complex yet still extra-market externalities for the individual firms; externalities that are both formalized and institutionalized.

It can be assumed that the motives for a link-investment are completely based on economic considerations, but the outcome of this “long-term” investment is dependent among other things on the social relations between the actors who establish, use and maintain the link. With negative attitudes to the link among these actors, incentives to use the link would be lower, and the link would yield lower returns than in the case of neutral or positive attitudes. Thus, it is in the interest of all the actors who invest in the link or network to establish a positive social capital among its users.

However, it is important to note that this “officially sanctioned” support of positive social capital is restricted to the official activities of the fixed
link/network and does not include other activities of the firm. Links and networks or values and attitudes created and promoted for particular purposes might result in unintended spillovers of information and knowledge. For the network as a whole, as well as for firms below average productivity, knowledge spillovers are likely to be positive since they tend to spread best-practice, intensify competition and raise average productivity. For firms above average productivity, unintended outflows of knowledge may be negative in the short run if they result in the firm’s losing some of its monopoly assets bound up in tacit knowledge. However, in the long run these firms might gain as well since the increased competition gives them stronger incentives to keep up their pace of innovation. Firms with best-practice solutions cannot be unaware of these possible (short-term) disadvantages of forming links/networks with worse performing actors. The reason that links/networks are still formed and maintained must be that the best performing firms consider the positive effects of the links to be higher than the negative.

In the second case, the non-formalized interactions consisted of three types, each of them being able to result in unintended knowledge spillovers. The first type, vertical, technical/economic interactions between firms and their suppliers and/or customers, is a similar process to that of intended links having unintended effects discussed above, although there is no formalized link but market transactions. The purpose of these transactions is to buy input or sell output, but spillovers of knowledge and information may occur as a by-product between the actors involved. These spillovers do not necessarily have to happen through social interaction – it may be sufficient with purely technical/economic information, i.e. the information and knowledge “built-in” in a product, a complicated order or specialized demand. But knowledge spillovers without social interaction between human beings have their limitations. They are one-way, one-occasion spillovers, entirely dependent on the internal absorption and learning capacity of the firm, without any informal external dialogue or support. As the relations between suppliers and customers as a rule are non-competitive in both directions, there are normally no reasons for the firms involved to regard informal links and positive attitudes to limited informal knowledge exchange as a threat. The conclusion is that social capital facilitates this non-competitive informal knowledge exchange and that this is normally in the interests of both (all) parties.

The second type of non-formalized interactions, viz spin-offs of new firms from existing firms or organizations and turnover and exchange on the labor market, are market interactions with obvious effects on the diffusion of knowledge and information. For a cluster – or any type of spatial or functional agglomeration – these market interactions are likely to have positive effects similar to those of formalized networks, i.e. they tend to spread best-practice and raise competition and average productivity. For the individual firm, the effects are dependent on

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3 Japanese firms’ “reverse engineering” is an excellent example of deliberate knowledge spillovers, without social links, through study of products produced in the West. However, the learning processes in the Japanese firms were highly dependent on an internal social capital adapted to these tasks.
whether the interactions are vertical or horizontal, on whether the firms are leading or lagging, and on the time horizon.

Vertical spin-offs from a firm, by employees forming a new firm with the purpose of being suppliers or customers of the original firm, have results in line with the vertical transaction-links above, in non-competitive interaction where the social capital formed in the original firm continues to facilitate knowledge spillover in both directions. However, if the new firm starts collaborating with a competitor to the original firm, the informal links for knowledge exchange are jeopardized. Similar conditions emerge if the spin-off is horizontal, i.e. if the new firm becomes a competitor to the original firm. Such spin-offs are negative for the original firm in the short run since it will lose some of its knowledge monopoly and employees and will face stiffer competition. If the spin-off gives the original firm increased incentives to respond to the stiffening of competition by means of innovations, and if the firm has the resources for such a response, the spin-off may be positive in the long run for the original firm as well. Here it should also be noted that the potential and incentives for spin-offs will vary with the original firm’s position in supplier-customer chains and other dependencies; dependencies that are also reflected in the internal and external social capital of the original firm. As a consequence, the potential for spin-offs from firms in flexible industrial districts should be higher than from firms in a corporate clustered group.

Another form of non-formalized market interaction having an impact on knowledge spillovers is labor market turnover. On a perfect regional labor market, labor is distributed so that maximum productivity is achieved. On an imperfect labor market, the rule is: the larger the labor market, the better the matching. In contrast to spontaneous spin-offs, which from the individual firm’s perspective are one-sided outflows of knowledge that the firm might lose its connections to, workforce turnover contains both outflows and inflows of knowledge. Workforce turnover is inflows and outflows not only of knowledge but also of social capital. Just as each firm has an incentive to optimize its blend of knowledge adapted to its activities, so also does it have an incentive to optimize its blend of social capital. A workforce with the optimum blend of social capital has the optimum amount and combination of external and internal links and values and attitudes adapted to the firm’s activities. Such a workforce is more likely to be found in spatial agglomerations where similar activities are going on. The conclusion is that labor market externalities consist of access to labor with not only the right knowledge but also the right social capital.

The Civil Society

The third and last type of informal knowledge spillovers is also the most intangible of the intangible externalities. The informal exchange of information and knowledge in the (local/regional) civil society, between individuals connected to firms or other actors, is a form of horizontal, extra-market interaction, whose extent and content is dependent on the size and diversity of the agglomeration, the
types of economic activities located there and the existing social capital of the civil society. Most of these correlations are almost self-evident: the amount of knowledge increases with the agglomeration’s size; the economic activities and their diversity influence the content of knowledge and information, etc. The factor whose connections to knowledge externalities need an expounded discussion is civil society’s social capital.

A civil society is basically something formed and maintained by people during their non-productive time. Voluntary public, club and other leisure activities are also what civil society’s social capital is focused upon. The networks and values of business life, i.e. of production, play a mainly hidden role in a civil society. In line with the fundamental differences between production and consumption, business life and civil society are based on different principles and belong to different spheres of human activity, with different networks and different norms and values. However, as the two spheres are populated to quite a considerable extent by the same people, i.e. the productive population, there are naturally certain informal interactions between them. These interactions can be divided into two types: a) those mainly based on norms, values, attitudes, etc. and b) those where these values, etc. have developed into the links and networks of a group of individuals. Both types constitute elements of the above-mentioned concept of place surplus.4

The first type of interaction comprises general approaches involving the importance of “spirit” and similar attributes to the economic development of a region. Putnam’s (1993a, 2000) view of the impact of civic society on the economy and Florida’s (2002) view of creativity as the factor constituting the important difference between one region’s economic performance and another’s are examples of such spatially connected approaches.5 Schumpeter too expressed opinions on the influence of the attitudes of a social environment towards entrepreneurship (see Chapter 6).

It is reasonable to assume that the attitudes current in the social environment which have an impact on the production environment in general are formed in interplay between the two spheres. A stable production sphere fosters stable attitudes in the civil society and vice versa. The old industrial regions of the world exhibit many examples of how this stability of business life and civil life created safe and predictable conditions for stable growth. On the other hand, when the industrial crisis came in the 1970s, these regions lacked the ability to change and, in Schumpeter’s words, “do something new.”

Thus, Schumpeter’s description of how the social environment counteracts changes in the production environment is the general picture. The dynamics of certain industrial districts, which seem to permeate civil society as well and are reported in a number of studies (e.g. Piore and Sabel 1984; Scott and Storper

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4 As discussed in Chapter 14, there are of course places with “place shortfall” and “place break-even” too.
5 Weber’s (1930) essay on the Protestant ethic is the classic example of this approach. Even though Weber focused on differences in norms and values attributable to religion, the cases he chose gave his essay a spatial dimension.
Tentative Conclusions

1989; Beccatini 1990), should in that case be regarded as exceptions to a general tendency (cf. Johansson 2004).

The other type of interaction in civil society with implications for business life is a result of the general values of the social environment, in which the values of communities, groups or sub-communities have developed into links and networks. While a community can in principle be based merely on some kind of shared values, to take the step towards the formation of informal networks of groups or sub-communities brings more stable relations between individual actors of the community – and affords a means of partly evading the reactions of general opinion. Spatial agglomeration as such provides a potential solution to the problem of profiting from the change-promoting elements of social capital and escaping the restrictive elements. This potential solution is based on the tendency of agglomerations to foster the emergence of diverse groups and sub-communities based on ethnicity, religion, industry and other interests. Florida (2002) and other scholars of creativity stress the importance of this tolerated diversity in a limited space and regard the interfaces between these groups as an importance source of creativity, innovations and economic development.

Within a group or sub-community with a positive attitude to innovation, an entrepreneur can find the support he needs to “do something new.” Outside this sub-community, the entrepreneur can pick up certain information and knowledge from other groups, provided that this knowledge is not too tacit and internalized. In this way, the agglomeration can afford the entrepreneur access to the social capital that support his activities the most while offering the best access to useful tacit knowledge. At the same time individuals in the established industries can maintain their communities, with their values and networks, without being confronted with the new.

Tentative Conclusions

From the analysis above it is possible to draw some tentative conclusions:

There are a number of different reasons for firms to cluster and/or locate in urban agglomerations, from pure labor market reasons to the need to become embedded in an entrepreneurial environment; from a wish to internalize knowledge and R&D in a closed network of actors to a wish to gain from flexible inter-firm relations and knowledge spillovers. Much of the current literature on clusters and similar phenomena has focused on a few of these motives, mainly those related to tacit actor- or space-specific knowledge and its spillovers between firms and other actors. Even if we leave aside the purely market-related reasons for clustering, there are important reasons behind clustering that are seldom observed and analyzed. One such reason was found in McCann and Arita’s (2004) study of semiconductor clusters: companies’ needs to internalize vital tacit knowledge and
R&D within a small group of close partners (and to shut out potential competitors). Proximity facilitates not only external spillovers but also internalization.\textsuperscript{6}

It is highly probable that the individual firm will find numerous reasons for clustering, some even contradictory. Regarding knowledge and information, the cluster may on the one hand give the opportunity to form closed partnerships in which vital tacit knowledge can be internalized. On the other hand, the firm may simultaneously be snapping up “semi-tacit” information and knowledge spillovers.

Both these motives are probably relevant for knowledge-intensive industries in which almost all investment consists of R&D and investment by definition is extremely sensitive to leaks of vital knowledge. Thus, each firm has strong incentives to internalize its vital knowledge to as few external actors as possible – and to bind these actors with strong ties. However, a firm also needs input of more general relevant information about the industry, and this information is fastest and most easily available through personal contacts, which in its turn is facilitated by proximity to these contacts. In this way, the cluster has the potential to satisfy both these apparently contradictory needs of a firm.

The different motives for clustering help to form a variety of social capitals within firms, within formal or informal groups of actors, and within spatial agglomerations. What these social capitals have in common are a certain proportion of values and links that internalize specific knowledge and buttress the firm’s/group’s solidarity, combined with a certain proportion of values and links that make possible the external exchange of non-vital information. The respective shares of the internalizing and externalizing components are dependent upon a number of factors discussed above, such as the firm’s size, type of production and its knowledge intensity, formal and informal external dependencies, the market, etc.

The knowledge being spilled over and exchanged in the processes analyzed above is to a varying degree tacit, i.e. it is partly non-formalized and dependent on informal links where attitudes and values govern both how it is generated and how and to which actors it is disseminated. In this way, social capital is a crucial factor in knowledge creation, knowledge internalization and intentional and unintentional knowledge exchange and spillovers.

Knowledge-intensive industries in their early stages of development consist mainly of small firms with R&D as their main activity. Their small size makes collaboration with other firms and research institutions a necessity. Firms at their stage of development are often dependent on public support in the form of R&D grants, venture capital etc, and public sector institutions may also act as the “demanding customer.” Thus, the “golden triangle” of collaboration between companies, research institutions and government seems highly relevant to the success of these industries. This means that the growing industries of the knowledge economy have a need to develop a more complex social capital compared with established, traditional industries.

\textsuperscript{6} However, as Johansson (2004) has pointed out, links over distance can substitute for proximity.
In order to underline the fact that social networks, trust and other factors that are linked to social capital are found not only in the civil society but also in industry and the public sector, the term enterprise-related social capital is used here to denote these phenomena. The enterprise itself, for obvious reasons, is the prime actor in the creation of its own social capital. Through its investments in internal and external links to various nodes/actors it forms and maintains the social capital it considers best adapted to its current and future activities. The prime internal actors of the enterprise are its management and employees. The enterprise’s external environment consists of many actors among whom customers occupy a unique position. Another key group of actors consists of partners and competitors of other enterprises. A further important component of an enterprise’s environment is formed by political decisions and measures. Organizations and pressure groups in the civil society constitute a third category.

Thus, in principle, three types of actor constitute this enterprise-related social capital:
- the enterprises themselves, their managements and employees and the enterprises’ organizations
- the politically governed sector
- civil society and its organizations

Two of the most important decisions regarding the social capital of the enterprise are its choice of management and employees and choice of location. The enterprise does not recruit management and employees solely on the basis of the professional knowledge and skills they possess. We can assume instead that enterprises of the knowledge economy increasingly need managers and employees with access to professional, social networks plus the ability to connect to and form such networks, both within and (mainly) outside the enterprise. This means that when the enterprise employs a manager or employee, it simultaneously rents the social capital of that employee. Thus, depending on the person’s assignments, a varying proportion of the salary can be considered as reimbursement for the social capital to which the manager or employee has access.

When the enterprise chooses its location, it is taking decisions about its social capital at the same time. The firm’s future access to competent employees, customers, partners, decisionmakers, etc, and its ability to establish economic and social links to these actors, is affected by its choice of location. In this way a certain share of a firm’s cost of premises can be considered as a cost of access to external social capital.
Our starting point is Burt’s (1992a p. 58) pronouncement: “Relations within and beyond the firm are social capital.” Table 5.1 constitutes a preliminary attempt to break down what we here call enterprise-based social capital into certain component parts. The basic division in the figure is between the enterprise’s internal and external social capital. The external social capital consists of three components, one being production-related (connected with production as the name implies), one environment-related (connected partly with production and partly with sales) and one market-related (connected with sales).

**Table 5.1.** Social capital of the enterprise broken down into different component parts.

<table>
<thead>
<tr>
<th>Social capital internal to the enterprise</th>
<th>The enterprise’s external social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production-related</strong></td>
<td><strong>Environment-related</strong></td>
</tr>
<tr>
<td>Links/relations to suppliers, product users, partners in cooperation and development</td>
<td>Links/relations to the local/regional environment, to political decision makers (incl. investment in lobbying), universities, (non-production-related links to) other enterprises</td>
</tr>
<tr>
<td><strong>Market-related</strong></td>
<td></td>
</tr>
<tr>
<td>General customer relations built through marketing, customer clubs, programs etc. and expressed in e.g. trademarks and goodwill.</td>
<td></td>
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</table>

**The Enterprise’s Internal Social Capital**

All actors in the enterprise, i.e. both management and employees, contribute to the formation of internal social capital. The internal management of an enterprise can in principle vary on a scale from total top-down governance to total self-governance. Top-down governance is often associated with simple manufacturing, frequently symbolized by the assembly line whose speed is decided from the top. Decentralized self-governance on the other hand is normally associated with more knowledge-intensive production, in which it is considered much harder to apply top-down methods successfully. In this perspective, every enterprise should adapt its position on this “management scale” in accordance with its position on a “simple manufacturing – knowledge-intensive production scale.” Expressed in another

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1 A term used in business administration and management for some of the concepts in Table 5.1 is “corporate culture.” The concepts of production-related and environment-related social capital in the table have affinities with the concepts of “relational capital”, which has been discussed and analyzed by *inter alia* Camagni (1995) and Capello (2001), and “innovative milieu” (Maillat 2001). In a spatial context these factors also have affinities with the concept of “regional milieu.”
way: the enterprise’s type of production creates the framework for internal social capital which is best suited to its own needs.

At this point, while not aspiring to present an exhaustive discussion of these problems we may glance here at two important aspects related to the enterprise’s internal social capital, viz its organization of work, and workplace relations.

As we noted above, the enterprise’s organization of work, whether dominated by hierarchical or horizontal principles, is dependent on the type of production. The typical industrial hierarchical organization was adapted to replaceable unskilled or low-skilled labor. The role of management was to organize work in a way that would maximize the productivity of such a workforce. The knowledge-gap between management and workers was one of several factors that obstructed the creation of positive vertical relations. What it helped to bring about instead was collective organization of the industrial working class accompanied by class struggle.

As manufacturing processes have gradually evolved towards higher complexity the need for higher levels of knowledge in the workforce has grown more urgent. Another manifestation of the knowledge economy’s expansion is the emergence of completely new sectors and branches. In both cases, increased competitive pressures bring increased demands for lower costs, product development and innovations. In this perspective, the importance of tacit knowledge and methods of converting it to codified knowledge has become increasingly evident. Both the creation and the codification of tacit knowledge are largely dependent on the organization of work.

The explicit distinction between tacit and codified knowledge was made by Michael Polanyi (1958, 1966). Codified knowledge can be defined as formalized, stored, written or digitalized information which can be used or tested by another actor than the one who formalized the information (provided the actor concerned has access to the information and the necessary competence to use it). “Tacit knowledge is defined as knowledge that cannot be obtained by a mere sum of codified (digitalized) information. It can be generated through intimate ‘indwelling’ (Polanyi 1966 p. 17) within a relevant local domain, or as personal knowledge through particular experiences and/or due to inherently personal qualities and competence; therefore it cannot become immediately available in open markets.” (Aoki 2001 p. 308).

The literature in this field has focused almost entirely on enterprises’ investments to commercialize tacit knowledge as codified knowledge. Very little attention has been paid to the question of how new tacit knowledge is created. However, many of the things an enterprise does in its organization of work can affect, whether intentionally or not, its creation of tacit knowledge.

As a consequence of the growth of the knowledge economy, therefore, simple top-down management becomes less and less efficient. Some other, more horizontal style of organization of work is needed. Two fundamental features of this kind of organization for knowledge-based production are the composition of basic units (teams, groups, units etc) and the formation and maintenance of links between units horizontally and between units and higher levels vertically.
The first aspect, the composition of teams and groups, consists of choosing people with complementary characteristics, without particular personal and/or social tensions between them. Compared with the archetypal workers on the assembly line, the worker in the knowledge economy needs both to communicate and to cooperate in order to meet new implicit demands for the creation of tacit knowledge. Whereas from the enterprise’s standpoint no fund or stock of social capital was needed among assembly line workers, a team or work group cannot fulfill its tasks unless there is a certain amount of positive social capital among its members. The enterprise can contribute to this in several ways: teambuilding courses, training, regular meetings etc, but a fundamental method is the choice of members of the team.

The second aspect, the formation and maintenance of links, is nothing novel in the vertical perspective (e.g. in the persons of foremen and supervisors). Horizontally too, in manufacturing production the assembly line used to be typically the link connecting the workers. However, the links of the knowledge economy are different in the sense that they do not merely distribute orders or (semi-manufactured) goods but also information and tacit and codified knowledge. As these links have more complex functions in the knowledge economy than previously, the selection, training and monitoring of the individuals constituting the links have become much more important for the success of the enterprise.

In contrast to tacit knowledge, codified knowledge can be regarded as an asset which the enterprise can use deliberately to increase its competitive power. The task is often formulated in terms of commercializing or capitalizing the tacit knowledge as a controlled input into the production process or a product in its own right. In order to succeed in this, a company needs to form links of trust between the bearers of the tacit knowledge – the work groups – and the “codifiers.”

In our terms the endeavor to transform tacit knowledge into codified knowledge is an attempt to institutionalize capital that is originally social and non-institutionalized. Not all tacit knowledge should be considered as social capital since some tacit knowledge is strictly personal. However, most tacit knowledge must be regarded as being created through social interactions, which makes it a part of social capital. From the enterprise’s perspective, this means that codifying knowledge should be considered mainly as an investment to enable use to be made of parts of the existing social capital in an enterprise, but not as an investment in new social capital in itself.

The organization of work does of course have an important impact on workplace relations, but these relations are also influenced to a considerable extent by other factors, such as national cultures (see e.g. Hofstede 2001). Market-adapted American workplace relations are based primarily on principles of rewarding the individual employee, accompanied by a corresponding hostility towards trade unions on the part of the enterprise. Contrastingly, Japanese workplace relations since World War II have centered on creating firm and durable relations between the enterprise, the employee and the local trade union, resulting in an almost non-existent labor market. The world’s two largest economies, representing these extremes, suggest that it is not the type of relations that determines their success, but rather their general acceptance.
The Enterprise's Production-Related Social Capital

The individual enterprise in any country must normally adapt its type of workplace relations to the cultural traditions of the country. However, this does not necessarily mean that the costs of these relations are higher for a Japanese firm – only that its methods of building relations are collective, not included in individual wages, and therefore more visible. In the American case, the individual reward through the wage could create the illusion that workplace relations are of less importance.

As well as these differences between countries in the way workplace relations are built, there are of course also common elements such as company parties and other forms of internal perquisites aimed at influencing the company’s spirit, culture and cohesion (Schein 1992). Thus, even though workplace relations vary considerably between countries, they are an indispensable component of the company's internal social capital.

The Enterprise's Production-Related Social Capital

A striking development in recent research is the discussion of inter-enterprise relations, especially relations between enterprises and their suppliers. This stands in sharp contrast to the traditional economic perspective in which the enterprise is a non-cooperative monolith which buys its input from suppliers and sells its output to customers. According to this traditional approach, the production-related networks of an enterprise are technical and economic, and exist only to fulfill the input and output services.

Today, this simplified view is sometimes referred to as production relations of the “Fordist” or manufacturing-industrial age, but that is not a correct description. Social networks, even among production actors, are not an invention of the knowledge economy. However, there are arguments claiming that they have become more important in the knowledge economy: “In a knowledge-based economy the perhaps most significant rent originates from the way in which the easy exchange of knowledge, only partly understood, between and among a constantly changing configuration of enterprises within the community dramatically enhances their innovative capabilities. Reducing your development to commercialization time is often worth virtually whatever you have to pay and social capital contributes by cutting the expenses and reducing the time needed to benefit from knowledge residing elsewhere. As innovative capabilities become increasingly important so does social capital.” (Maskell 2000 p. 116).

Maskell links social capital not only to the enterprise’s internal knowledge production (as we did in the previous section) but also to knowledge exchange between enterprises which have some kind of production-related links, whether temporarily or on a more long-term basis. Moreover, he explicitly links social capital to the innovative capabilities of enterprises. His argument is that social capital cuts expenses and reduces the time needed for knowledge exchange between enterprises.
These arguments may be developed further. Social, non-formalized links, between an enterprise (and its labor force) and enterprises with which it has production relations, enlarge the flows of knowledge and information between the enterprises. Feedback, from the enterprise to its suppliers and to the enterprise from its customers, is increased and speeded up. These links, based on acquaintanceship and trust, are of obvious importance in R&D projects aimed at developing new products or production methods. They are probably also essential in the minor, invisible development processes that go on in the everyday work of enterprises, constituting the groundwork of innovation. These arguments are summarized in Figure 5.1.

Fig. 5.1. Summary of production-related social links and their effects.

Figure 5.1 summarizes the positive effects on the enterprise of production-related social links. Of course it must be remembered that investments in such
links are subject to the usual assumptions of decreasing marginal utility – or even negative marginal utility if investments exceed the optimum.

There are a large number of studies dealing with the issue of firms’ external production-related social capital – even though other denominations than social capital are often applied. We give here an overview of some important contributions to the literature.

Sako’s (1992) analysis of trust in interfirm relations in British and Japanese electronics firms is a classic statement of the elements that we would include in social capital, though she does not use that term. Mutual trust is necessary if firms and their suppliers are to demand and give flexible responses to each other. She hypothesizes two kinds of contractual relations, Arm’s Length Relation (ACR) and Obligational Contractual Relation (OCR), which are not a dichotomy but ends of a spectrum. An ACR is an explicit written contract that spells out many contingencies before exchange begins and has a fixed period, at the end of which “exit” is easy; reciprocity must occur within the time period of the contract and is governed by detailed specifications. An OCR is a relation that encourages transactions to begin without writing down all the conditions and encourages parties to do more than expected and to refrain from exploiting the partner’s vulnerability; a firm may expect reciprocity only over a long period of time. OCR’s lead firms to make relationship-specific investments – often called “dedicated assets” in the management literature – and thus create high and prolonged interdependence, not easy to exit from; firms resolve contingencies on a case-by-case basis with appeal to fairness, social norms, and “the diffuse obligation of long-term relationships” (Sako 1992 p. 11), and they forgo opportunistic behavior.

Dyer (1994, 1996, 2000) has analyzed extensively aspects of trust in Japanese and U.S. auto manufacturing, and makes many of the same points as Sako does on selection of suppliers, transaction costs, sharing of knowledge, norms of fairness, and dedicated assets. He distinguishes “arm’s length approaches” and “partner approaches” (2000, p. 118). In discussing dedicated assets, Dyer emphasizes that they include human capital assets as well as plant and equipment, in the sense that suppliers’ engineers spend time in customers’ facilities. Trust and asset dedication mutually reinforce each other (Dyer 1994, 2000 Chap. 2). Fruin also describes the importance of supplier networks and relationship-specific assets in the context of a Toshiba production complex (Fruin 1997 Chap. 4) and also in the context of the Toyota firm (Fruin 1992 Chap. 7); he even uses the revealing phrase “The Purchasing Department as Entrepreneur” (1997 p. 101). Nishiguchi (1994) is another detailed source. Okamuro (2001) showed in an empirical study that Japanese carmakers, especially Toyota, absorb some of the risk of the suppliers who are very dependent on them, even though the supplier system has been undergoing changes.

Sako (1992 p. 22) notes the applicability of Albert Hirschman’s (1970) exit-voice spectrum to her own ACR-OCR spectrum. Helper (1993) also uses Hirschman’s spectrum to analyze supplier relations in the auto industry, remarking that for several decades U.S. auto assembly firms opted for a strategy of exit or threat of exit in dealing with suppliers; she also observes that exit and voice represent
different combinations of commitment and information exchange, exit being relatively low in both and voice relatively high in both.

In Sako's eyes ACR and OCR are two extreme points, and customer-supplier relations in practice are mixtures of ACR elements and OCR elements. For example, the ACR end is characterized by narrow channels of communication and little sharing of risk; the OCR end by multiple channels of frequent interaction between employees of the two firms, sometimes including off-duty socializing, and sharing of risk in the sense implied by a case-by-case resolution of unforeseen events (Sako 1992 p. 12). Sako helps clarify the mixture by also hypothesizing three kinds of trust: “contractual trust,” which is trust that contracts will be fulfilled; “competence trust,” which is trust in a partner’s competence; and “goodwill trust,” which is trust that the partner is morally committed to maintaining the trading relationship (pp. 36–40). The first two are what economists probably have in mind when referring to a firm’s general “reputation.” Those two are necessary for both ACR’s and OCR’s, but goodwill trust exists only in an OCR, and it is Sako’s goodwill trust that most scholars have in mind when they discuss business-related “trust.” (Sako and Helper (1998) point out that contractual trust is necessarily limited, because contracts can seldom foresee every contingency, thus leaving one partner subject to exploitation when it is vulnerable (p. 392).) Sako (1992) concluded that the latter two kinds of trust were much more lacking in Britain than in Japan; later on her extensive empirical analysis, with Helper, of supplier relationships in automobile manufacturing found that trust is generally more prevalent in the Japanese than in the U.S. industry, even after controlling for certain industry characteristics that would be conducive to greater trust in both countries (Sako and Helper 1998).

A relationship of goodwill trust requires extensive investment in the relationship and thus represents capital, and the discussion of interfirm relationships by scholars of business management is strongly reminiscent of other scholars’ discussions of social capital. In fact, where the customer is a large firm, the investment in trust may accomplish some of the same objectives as equity investment in the supplier, although trust seems to operate as an additional force even if there is an equity investment (Sako and Helper 1998 pp. 389, 406; Dyer 2000 p. 88). Firms expect the investment in trust to pay off in reduced search and transactions costs and reduced risk later. The relationship, while initially the result of interpersonal contacts, survives the departure of the people who initiated it (Sako and Helper 1998 p. 389). Trust is more likely when suppliers contribute to the design of the components they produce and when both parties invest in assets specific to the relationship, but Sako and Dyer both emphasize that trust, suppliers’ role in design, and asset specificity are all determined simultaneously with each other and none is exogenous (Sako 1992 p. 19; Dyer 1994, 2000 Chap. 2).

It is fundamental for Sako and many other writers that the occurrence of trust is not solely cultural. Shared values are necessary, so culture may play a role; Sako notes that “the willingness to be indebted to someone and to recognize high mutual dependence in action appears to come about more easily in less individualistic Japan than in Britain” (1992 p. 24). But much more than culture is necessary; also important are the technical nature of the goods and services being exchanged,
government policies and legal frameworks, the rate and stability of growth in demand, corporate strategy, the sources of finance, and the frequency of changes in ownership. Although Campbell (1995) points out that Japanese managers have some cultural advantage because they see human relationships as more important than material goods or abstract principles, and thus design their engineering and management practices accordingly, non-Japanese managers can learn to use similar practices effectively. Indeed, research in the 1990s showed that U.S. manufacturers, especially in the auto industry, have also been developing Japanese-style relationships with suppliers (Helper and Sako 1995; Dyer 1996, 2000 Chaps. 5–6, based on an extensive case study of Chrysler Corporation). It is also significant that Japanese automakers and U.S. suppliers to them have been able to develop trust (Sako and Helper 1998; Dyer 2000 Chap. 4). Nischiguchi also points out that the Japanese did not have similar subcontracting systems early in the 20th century, and finds his research supports the claim that the practices do “not necessarily [stem from] the economic agents’ cultural attributes” (1994 p. 49).

Liker et al. (1995) shed considerable light on the culture question. First, they state a common theme in saying the trust is not simply blind faith and mutual loyalty, rather it is a relationship of mutual dependence built up by each side’s relationship-specific investments, which are “deliberate, alert, and conscious move[s]” to bind the two sides together (1995 p. 188); “trust is a result of mutual dependence rather than a cause” (p. 185). Their discussion of “black box sourcing” vs. “built-to-print sourcing” is also very illuminating (pp. 152–4). “Black box sourcing” is how managers and business economists describe the practice of giving suppliers general specifications of a component and having them design the details, as opposed to “build-to-print,” in which the buyer designs the component and provides detailed blueprints to suppliers (Fujimoto 1999 Chap. 5 has a very detailed description of the black-box system at Toyota). Successful black-box sourcing – the term is originally American, not Japanese – requires trust and mutual dependence, but it requires much more as well: giving suppliers portfolios of components to design and produce, which helps reduce suppliers’ risk; clear and stable interface requirements; extensive sharing of information; early testing of prototypes; aggressive targets on cost reduction and prices, but a willingness to share risks and benefits of unexpected cost changes; and engineering and management practices that break a large system into relatively autonomous pieces – “self-contained chunks” (Liker et al. 1995 p. 162); similarly, Dyer (2000 pp. 171–5) refers to a “modularization” strategy. These practices are not limited to firms in Japan or any other single country.

The Enterprise’s Environment-Related Social Capital

The dividing-line between an enterprise’s production relations and its environment-related networks is not entirely clear-cut. In a spatial context, production relations also constitute, in principle, a component of environmental relations.
Therefore we here confine the enterprise’s environmental relations with other enterprises to relations that are not mainly technical-financial.

Even with this restriction, Maskell’s arguments involve the enterprise’s environment as well, since he speaks about “community.” This adds a spatial aspect to social capital. An enterprise’s costs, of knowledge and information among other things, are influenced by social capital via the degree of trust and climate of cooperation prevailing both in individual workplaces and between enterprises and actors in a region. Marshall described these relationships vividly in his celebrated account of the positive external effects which arise in industrial districts:

"The mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. Good work is rightly appreciated, inventions and improvements in machinery, in processes and the general organization of the business have their merits promptly discussed: if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas." Marshall (1920 p. 271).

For generations of economists, Marshall’s industrial districts were merely an odd marginal note in the classic textbook of microeconomics. However, Porter’s (1990) book on clusters marked a new and growing interest in the spatial milieu of enterprises (even though Porter 1990 considered clusters to be a functional, non-spatial concept as well). In the rapidly expanding literature on clusters, they are normally defined as spatially delimited industrial systems regardless of the size of enterprises, whereas industrial districts are defined as spatial agglomerations of SMEs in one or a few complementary industries. As noted above, both concepts are linked to production relations as well as to more general relations to the enterprise’s spatial environment.

The above-mentioned examples – Marshall’s industrial districts, Porter’s clusters and Maskell’s community – all have a bearing on an environment consisting of distance-dependent networks outside the individual enterprise’s control. A standard example of these network types as contributory factors explaining agglomeration phenomena is furnished by the IT industry in Silicon Valley. Enterprises emerge there and choose to locate there because “the air” is full of tacit knowledge and information (including gossip and rumors), potential partners and co-workers in the form of other firms; university researchers and students are there; competitors are there and it is easier to watch and learn from them if you are near them, and so on. Even if the enterprise does business with only a small fraction of all the other enterprises in the region and cooperates with just one research group, the presence of all the other enterprises and researchers constitutes a positive external effect, a social environment from which the enterprise benefits. The open, innovative spirit which characterizes these agglomerations until they mature and eventually become petrified is closely allied to the encouragement of entrepreneurship.

Thus, even though the environment is something that the individual enterprise cannot normally influence, it is itself influenced by its environment and does take measures to establish links to it. The enterprise builds networks with links mainly of three different types:
- Distance-dependent non-technical-financial links to other enterprises and R&D centers
- Links to politically-governed bodies in the community/region
- Links to the citizens of the local/regional civil society and their organizations

The fundamental steps to be taken in creating and extending networks of the first type are the location decisions by which the firm is established and expands. The enterprise chooses its environment under a set of given conditions, whether it is in Silicon Valley or the owner’s home town. The enterprise’s needs by way of establishing social links to other enterprises and R&D centers vary depending on the enterprise’s type of production (routine or knowledge orientated), the location of suppliers and market and so forth. It has been argued that a process of global “ubiquitification” has made wage level the most important location factor, thereby reducing the importance of the enterprise’s environment. However, the existence of place-specific experience, tacit knowledge and competence embedded in a region are arguments lending credence to the importance of the local/regional environment of the enterprise (Asheim 2003; Malmberg and Maskell 2003).

The second of these network types is an expression of the enterprise’s dependence on a predictable political-institutional infrastructure and the need for favorable political decisions, in both a medium-term and a short-term perspective. Those inclined to do so might see these networks as confirmation of the public choice theory, to the effect that politics does not work in accordance with its ideals. To achieve favorable decisions, to receive unofficial information off the record and so forth, the enterprise cannot restrict itself to allowing its individual employees to take part in the public debate and vote in elections and referendums. It is in the interest of the enterprise to establish social relations with public decision-makers, either directly or indirectly through branch organizations or lobbyist groups.

The third and last network type is a manifestation of an enterprise’s need to be embedded (Granovetter 1985) in a local social context. This need for embeddedness varies depending on the enterprise’s size, alternative locations, spacebound capital, type of production, type of customers, type of labor and other such factors. In general a small enterprise with spatially fixed capital and production for the local market has considerable incentives to build a strong social capital with the local environment. A large global enterprise, with alternative locations, low investments in spacebound capital and production for the world market, has much less compelling incentives. Even so, local units of global enterprises strive to nurture good local public relations through sponsorships and donations to local non-profit making organizations and similar causes. One possible reason is that the enterprise’s management and employees themselves are individuals with social needs. Some of these needs are often met by becoming accepted and respected as members of the local community. Contributions to local civil society and its organizations thus raise the status of both the enterprise and its employees and add to individual welfare. The affinities with public choice theory are in evidence here as well. Other reasons are mainly related to the market and sales of the enterprise (see below).
This subsection has discussed the enterprise’s environment in the distance-dependent perspective expressed in the theories of clusters and industrial districts. However, an enterprise’s environment can of course be interpreted as being much wider than the cluster/industrial district/community. Such an interpretation shows some of the arguments presented here, particularly companies’ needs for relationships with political decisionmakers, also to be valid at the national and transnational levels. These aspects are not dealt with here.

**Market-Related Social Capital**

Any enterprise has a number of methods available for creating, expanding and defending its market. One of them is to build some kind of trusted social relations with its customers. By creating relationships with customers in diverse ways (e.g., advertising, personal contact, customer clubs and programs), an enterprise attempts to exclude competitors from the network it has established. It can develop similar networks with suppliers. An established enterprise with strong customer and supplier networks can use them to shut out from the market even competitors who perhaps have newer and more productive physical and human capital. With this end in view the established enterprise may temporarily suspend renewal of its physical capital in favor of investment in social capital. Thus new enterprises have to find new, unestablished market segments or else break down parts of the established enterprise’s customer and supplier networks in order to force their own way into the market.

The enterprise’s customer relations efforts focus on customer enterprises (e.g., via external perquisites), on identified individuals (e.g. via clubs and programs with individual membership), and on the anonymous mass of customers with whom the enterprise has no personal relations (e.g. via advertising and promotion of trademarks). In this perspective charity and sponsorship of non-profit activities and events can be considered a form of marketing and investment in market-related social capital.

While links with “good” activities are positive for an enterprise’s reputation, being associated with “bad” deeds is negative. Increased consumer awareness of environmental, child labor and other issues of similar type have led many commercial enterprises to initiate a reorganization of their production and distribution networks. This is also a sign that customer relations can no longer be confined to offering anonymous products at the best price. Generally speaking, the increased importance - and market value - of trademarks provide testimony that customer relations are being increasingly influenced by considerations which must be regarded as social. It is no longer the product alone but also the customer relationship established by the company name and expressed in the trademark and goodwill that constitutes an enterprise’s market value.

However, including trademarks in the concept of social capital is not exempt from objections. A trademark is an asset which, unlike other forms of social capital, is actually not directly linked to a specific owner but can be bought and sold in
the same way as enterprises are bought and sold. While social capital in civil society consists to a varying extent of semi-public goods or club goods (see Buchanan 1965), enterprise-related social capital comprises social networks which the enterprise has built up and may dispose of as it wishes. Most of these social networks cannot be separated from the enterprise’s productive and/or financial activities, but of course they can be acquired, since an enterprise, or part of it, can be bought and sold. However, the trademark is an example of a type of social network that is not necessarily integrated with other activities of the enterprise. This type of social network is a private good, a piece of property in the legal sense of the term, and can therefore be directly valued on the market. Thus it is more correct to say that a trademark is based on an enterprise’s social capital but that it is transformed, institutionalized and commercialized in similar fashion to the conversion of tacit knowledge into codified knowledge.
6 Social Capital and Entrepreneurship

Introduction

The connection between sundry forms of social capital and economic change runs like a golden thread through both the economic and the sociological literature. Still, with the main exception of certain studies of ethnic groups or minorities (e.g. Kyle 1999), few contributions have explicitly discussed the link between social capital and entrepreneurship. However, certain authors on business economics are increasingly discussing aspects of these issues in terms of “corporate entrepreneurship” (Chung and Gibbons 1997) and “entrepreneurship as a collective phenomenon” (Johannisson 2000). Policy interventions aiming at strengthening the social capital of SMEs to support enhanced innovations have been investigated by Cooke and Wills (1999), who have operationalized and measured SMEs’ social capital in terms of integration, synergy, integrity, and linkage. Another methodological issue, i.e. the measuring of trust and its influence on firms’ risk behavior, has been considered by Nooteboom et al. (1997) and Nooteboom (2000).

One circumstance which has attracted little special notice is that in many cases social capital can be defined not only in terms of a group’s/network’s formal or informal rules and norms, or as a factor determining preferences, but also by spatial relationships. We shall concentrate on the spacebound social capital that is dominant in a region’s business life or its civic society or among certain groups within a region, and which thereby functions as a public good (or “public bad,” which may nevertheless be “good” for certain actors/groups). We analyze the role of spatially limited social capital in producing local/regional entrepreneurship.

Three broad topics are explored:

1. Social capital as a characteristic of business and/or civic community, which facilitates or inhibits the kind of innovative, risk-taking behavior that is part and parcel of entrepreneurship. In this respect social capital acts as part of the resource endowment, favorable or unfavorable. Our thinking here is in the spirit of Coleman (1988, 1990).

2. Social capital as a community characteristic that enters directly into the utility function of an individual and gives satisfaction or dissatisfaction in itself, and which in turn shapes individuals’ behavior in important respects – in the broadest terms, behavior that represents the seeking-out or avoidance by those persons of certain social capital contexts. That is to say, individuals get positive or negative utility directly from the existence per se of social capital, and take certain actions – searching, escaping, moving, compensating – accordingly. In this
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connection of course we are especially interested not in individuals generally, but in individuals who are actual or potential entrepreneurs. Again it is clear that we should allow the direct role to be either positive or negative: a person may enjoy knowing that social capital exists in a community, or he may loathe its existence. Which it is depends on precisely what kinds of social capital – i.e. family/friendship ties, loyalties, networks, mutual commitments, trust, and loyalties – exist in the community. Our putting social capital into the utility function may appear superficially to be following Becker (1996 Chap. 1), but as we discover below there are in fact differences between Becker’s approach and ours.

3. Social capital as a community characteristic that facilitates or inhibits the community as a whole to act effectively as a collective entrepreneur, innovating in order to create business opportunities and also to solve other social problems. Social capital of this kind we call entrepreneurial social capital. Here we are theorizing in the spirit of Johannisson (2000), who says that entrepreneurship is a “genuinely and collective phenomenon” (p. 3) and our line of thought is also partly reminiscent of Putnam (1993a,b, 1995a,b,c, 1996, 2000). To repeat, it is obvious that the effects of social capital here can be either positive or negative, as indeed both Johannisson and Putnam stress.

In discussing these three main topics, we are emphatic in recognizing that the networks, mutual commitments, trust, and loyalties that characterize a community may inhibit entrepreneurship, individual or collective, rather than facilitate it. The reason is well known (see e.g. Durlauf 1999) and is the same as the reason why social capital in certain groups, as in gangs or criminals, can have antisocial effects. It is by now a commonplace criticism of the most naïve notions of social capital that it is not always socially productive. Close ties of family or friendship between individuals who are acting badly qualify as social capital, but the result is not welcome to the society as a whole. Such ties between individuals may well stifle entrepreneurship rather than encourage it.

If the characteristics of the community do in fact facilitate entrepreneurship, then we can speak of “entrepreneurship-facilitating social capital.” If, on the other hand, the characteristics inhibit entrepreneurship, then we can speak of “entrepreneurship-inhibiting social capital.” The adjectives “entrepreneurship-facilitating” and “entrepreneurship-inhibiting” merely suggest one or the other effect of social capital, one effect among many, and do not suggest that the social capital involved is separable from the other kinds of social capital that social scientists have written about.¹

¹ Flora and Flora (1993) and Flora (1998) have chosen another way of dealing with facilitating and inhibiting aspects of social capital. Since they consider social capital to be an abstract term that also contains negative aspects, and also because they find social capital hard to operationalize, they use the concept Entrepreneurial Social Infrastructure (ESI) for organizational forms that encourage collective action on behalf of tangible goals.
A Rereading of Schumpeter

For a discussion on entrepreneurship from a new angle (social capital) it is essential to return to Schumpeter’s classic work on entrepreneurship, *The Theory of Economic Development* (1934). Much of Schumpeter’s thinking can be conceived of as “received theory,” and in a sense we return to him with a newer theory in hand – that of social capital – looking for connections with the received theory. In addition to the value of a search for such connections, the experience of reading his vigorous language is valuable in itself.

His subject is “that kind of change arising from within the system which so displaces its equilibrium point that the new one cannot be reached from the old one by infinitesimal steps. Add successively as many mail coaches as you please you will never get a railway thereby” (1934, p. 64, italics in original; all further quotes in this section are from this work and only page numbers are cited).

What is involved is a “new combination,” which covers the following cases: introduction of a new good; introduction of a new method of production; the opening of a new market; the conquest of a new source of supply; the bringing into effect of the new organization of an industry (e.g. creation or destruction of a monopoly) (p. 66). The new combination is seldom a response to a change in consumers’ tastes: “the producer ... as a rule initiates economic change, and consumers are educated by him if necessary; they are, as it were, taught to want new things....” (p. 65). And it is usually “embodied” in a new firm rather than an old one: “in general it is not the owner of stage-coaches who builds railways” (p. 66).

“The carrying out of new combinations we call ‘enterprise’; the individuals whose function it is to carry them out we call ‘entrepreneurs’” (p. 74). Schumpeter admits he has a narrow view of “entrepreneur” and that the word often means something else in popular discussion and even in other economists’ writings. The reason is that “the entrepreneur’s essential function must always appear mixed up with other kinds of activity, which as a rule must be much more conspicuous than the essential one. Hence the Marshallian definition of the entrepreneur, which simply treats the entrepreneurial function as ‘management’ in the widest meaning ... does not bring out what we consider to be the salient point and the only one which specifically distinguishes entrepreneurial from other activities.... [One] is an entrepreneur only when he actually ‘carries out new combinations,’ and loses that character as soon as he has built up his business, when he settles down to running it as other people run their businesses” (p. 77f).

Not only are entrepreneurs different from managers and inventors, they are a special type: “the carrying out of new combinations is a special function, and the privilege of a type of person who are much less numerous than all those who have the ‘objective’ possibility of doing it.... entrepreneurs are a special type, and their behavior a special [theoretical] problem, the motive power of a great number of significant phenomena” (p. 81f).

At this point Schumpeter presses the point home, in a footnote added in the second edition (1926). He notes that the first edition of his book (1911) was “reproached with exaggerating and mistaking the peculiarity of this conduct and with
overlooking the fact that it is more or less open to every businessman.....” then disagrees vigorously: “The conduct in question is peculiar in two ways. First because it is directed towards something different and signifies doing something different from other conduct.... Secondly, [it] presupposes aptitudes differing in kind and not only in degree from those of mere rational economic behavior”. (p. 81, note 2) Earlier he had said: “If we choose to call the manager or owner of a business ‘entrepreneur,’ then he would be [one] ... without special function and without income of a special kind,” citing a French phrase of Walras’ (p. 45f).

Carrying out a new combination, on the other hand, is quite different: “Carrying out a new plan and acting according to a customary one are things as different as making a road and walking along it” (p. 85). The “mental freedom” to plan a new combination “is something peculiar and by nature rare” (p. 86). “Our type seeks out difficulties, changes in order to change, delights in ventures” (p. 93f).

Financing the new combination is a special problem. There must be a mechanism to “detach productive means (already employed somewhere) from the circular flow and allotting them to new combinations” (p. 71). Individual possession of wealth is seldom adequate – or at least that is “the rule ... [in] the fundamentally interesting case” (p. 69). Furthermore, since new firms are usually involved, the new combination “cannot like an established business be financed by returns from previous production” (p. 69). Schumpeter puts most emphasis on bank credit as the critical source of credit. The entrepreneur is one whose personality generally does not suggest “leadership” in the usual sense, and he does not succeed by convincing people his plan is good or creating confidence the way a politician would; rather “the only man he has to convince or to impress is the banker who is to finance him” (p. 89). In another place he notes that it is a commonplace that “talent in economic life ’rides to success on its debts’” (p. 70).

In this emphasis on bank credit Schumpeter of course seems very dated. He does mention at one point that if in fact we are not starting from a circular flow equilibrium then another source of finance is the profits from previous successful innovation – entrepreneurial profit (p. 72). But it is a passing remark and he makes little of it. Nowadays we recognize not only the importance of equity finance but also that of a particular kind of social capital created by past entrepreneurs who stand ready to reinvest entrepreneurial profit in new entrepreneurial ventures.

Turning now to the most concrete reason for rereading Schumpeter, if the entrepreneur is so different, how relevant can the social capital context be? In a sense we are looking to see if our modern theory has “cogs to grip the wheels of received theory” (p. 4), to use the very desideratum he said his own theory should have.

It turns out he has only a few remarks that are directly helpful, but they seem significant to us, and they support our own contention that social capital’s role

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2 Many contemporary authors who discuss Schumpeter emphasize that he first published the book in German in 1911 (Theorie der wirtschaftlichen Entwicklung), but the 1934 English translation is of the second German edition (1926), which is different in some details from the 1911 original – differences which Schumpeter clearly signals in various textual footnotes, one of the more important of them being the one just cited.
must be seen as ambiguous. First, we note he recognizes the importance of social norms in influencing individuals’ routine behavior: “the field of individual choice is always, though in very different ways and to very different degrees, fenced in by social habits or conventions and the like” (p. 91). Furthermore, one reason that entrepreneurial action is noteworthy is that: “The very nature of fixed habits of thinking, their energy-saving function, is founded upon the fact that they have become subconscious, that they yield their results automatically and are proof against criticism and even against contradiction by individual facts” (p. 86).

The language here – “energy-saving,” “automatically” – actually reminds us of some of the modern descriptions of how social capital makes everyday life and social interaction more manageable for every person who has access to it. However, he says such fixed habits become “drag chains when they have outlived their usefulness” (p. 86).

“In the breast of one who wishes to do something new, the forces of habit rise up and bear witness against the embryonic project.... [Then there is] the reaction of the social environment against one who wishes to do something new.... any deviating conduct by a member of a social group is condemned, though in greatly varying degrees according as the social group is used to such conduct or not.... This opposition is stronger in primitive stages of culture than in others, but it is never absent. Even mere astonishment at the deviation, even merely noticing it, exercises a pressure on the individual. The manifestation of condemnation may even come to social ostracism and finally to physical prevention or to direct attack.... Surmounting this opposition is always a special kind of task which does not exist in the customary course of life, a task which also requires a special kind of conduct” (p. 86f; Schumpeter made similar comments in Capitalism, Socialism, and Democracy (1950, p. 132)).

While we rest content with the laconic reference to social capital’s inhibiting effect, we believe that in some other passages Schumpeter missed a logical implication of it, namely in his discussion of the risk of entrepreneurship. He argues that risk never falls on the entrepreneur per se, only on the owner of the means of production or the provider of the money-capital that paid for them. He admits it is possible the same person who is the entrepreneur is also the provider of capital, but he insists on a methodological distinction, standard in economics, between the two functions (p. 75, 137). “Risk-taking is in no case an element of the entrepreneurial function” (p. 137). We think that here Schumpeter missed an obvious implication of his comments about social disapproval of entrepreneurial action. Surely it is a direct psychological “hit” when a person risks social disapproval and then suffers such disapproval because his or her entrepreneurial effort failed. No methodological straining can separate the person who suffers the psychological effects from the one who tried a new combination. Revealingly, Schumpeter’s very next sentence is: “Even though he may risk his reputation, the direct economic responsibility of failure never falls on him” (p. 137, italics added). How can a person’s reputation not be part of his economic welfare, or losing it not be the bearing of economic responsibility of failure?

Schumpeter may have linked the idea of risk of losing reputation with his notion that social condemnation comes “in greatly varying degrees according as the
social group is used to such conduct or not....” We believe that in some communities the “culture” is such that entrepreneurs are insured against loss of reputation; these communities ensure that failed entrepreneurs continue to have access to social capital even if their daring behavior fails.

Schumpeter also seems dated now because he neglects what we may call “collective entrepreneurship,” an idea advanced in one way or another by Johannisson (2000), Saxenian (1994), Markusen (1996), and many others. They suggest that regions have a “personality” that is the combined result of individual personalities, social and business interactions and networks, institutions, market structures, and, frankly, accident. Johannisson says that “multiple interpersonal dialogue, or ‘polylogue’” is a key to establishing a new venture (2000 p. 5). Personal networking by the entrepreneur is obviously involved, and Johannisson makes the interesting claim that personal networking is actually “congruent with a presumed strong need for independence among entrepreneurs.... [network ties create dependence, but] since this dependence (and network) is, as much as the venture itself, created by the entrepreneur her-/himself, it is not perceived as a straitjacket” (2005 p. 5).

According to Johannisson, the network ties are not only vertical, as in hierarchies, and horizontal, as in alliances between competitors or between firms and customers, but also “lateral,” (p. 8f; this trichotomy is implicit in many other studies). Lateral ties result when individuals in unrelated businesses interact with each other, and those individuals may be entrepreneurs, managers, or workers. Furthermore, lateral ties include interactions between business people and people outside the business world, such as public officials and media personnel. Silicon Valley is considered a noteworthy example. Schumpeter did not anticipate Silicon Valley as a generic or as a specific type.

Region-Bound Social Capital and Entrepreneurship

It may be useful to supplement the Schumpeterian perspective by bringing in Knight’s (1921) emphasis on risktaking as a quality of the entrepreneur and synthesizing the Schumpeter-Knight insight into a definition of entrepreneurship as the ability to create new combinations of production factors through experimenta-tion and risktaking. This definition is based on the traditional way of regarding entrepreneurship as an individual attribute. However, entrepreneurship has increasingly come to be regarded in modern entrepreneurship research as a result of interaction, as a social, a collective phenomenon based on mutual trust and obligations. In this perspective, Marshall’s industrial districts become “a qualified case of collective entrepreneurship,” a “self-organizing system” (Johannisson, 2000, p. 6).

The influence of social capital on supply costs was noted in Chapter 4. Generally speaking, lowered supply costs have a positive effect on entrepreneurship because they signify lowered costs of experimentation and risktaking as well. The open, innovative spirit that Marshall described expresses low (economic and so-
cial) costs of its activities. Human capital, being also influenced by social capital, plays an important role here as well.

We can therefore add several new links between social capital and producer surplus. First, social capital has direct effects on entrepreneurship. Both as an individual and a collective resource, social capital enables or disables entrepreneurial activities. Correspondingly, an individual’s preferences govern the extent to which he/she undertakes entrepreneurial actions. Second, social capital affects entrepreneurship through its influence on supply costs, not only directly but also indirectly via human capital. Then, entrepreneurship influences innovative ability, which influences revenues, which have effects on producer surplus. At all these stages there is strong feedback not shown in the figure. Innovative ability naturally has repercussions on future supply costs, entrepreneurship, and human capital. Revenues provide possibilities of investing in new financial, real, and human capital, which will change future supply costs. Revenues can also be assumed to have an impact on future entrepreneurship etc. Producer surplus can be expected to have positive repercussions over the entire region. Moreover, there are of course effects occurring between stages other than that of entrepreneurship; supply costs have a direct impact on the producer surplus, etc.

The approach taken in Chapter 3, whereby the relationship between positive and “negative” social capital in the form of competing networks was described, has obvious relevance here. Risktaking and experimentation involve both building on and breaking with prevailing norms and conventional wisdom, i.e. the existing social capital. This is nothing but Schumpeter’s well-known “creative destruction” (cf. also Fukuyama 1995). Expressed in network terms it means that the entrepreneur reshapes the networks by simultaneously a) utilizing certain links of an existing network, b) abolishing other links to certain nodes of the network, and c) establishing new links to new nodes. The relationship between the three processes varies from case to case. The entrepreneur’s ability to reshape or even defeat existing networks is of course affected by the costs entailed in doing so (supply costs) and by the knowledge and skill of the entrepreneur (human capital). Whether this ability is “in the air,” as Marshall put it, or concealed deep underground is determined by the social capital in existence.

To what extent, then, can entrepreneurship be led upwards from the “underground” into the “air,” and how can it be induced to stay there despite changes in the economy? One perspective which is virtually deterministic in all but the very long term has been adopted by North (1990), who discusses the influence of cultural heritage and development paths on economic growth in different nations and cultures. In a shorter – and spatially more limited – perspective, Krugman (1991a), Markusen (1996) and others have discussed the capacity for growth of certain industrial districts.

One of Krugman’s points is that regional specialization is “eternal” but that the successful regions come and go. There are many examples of once-successful industrial regions which have failed to change in step with changes in the economy. Although their problems lie several levels below North’s macro-orientated, track-bound development paths, they obviously have an excess of old and unproductive social capital alongside a shortage of the new and productive kind. The unproducu-
tive social capital of these regions consists of norms, values, knowledge, and preferences which once underpinned the growth of the old industrial structure but today find themselves at odds with the production structure existing and growing elsewhere. Grabher (1993) takes the Ruhr district as an example of such lock-ins of a region. Another example on a smaller scale is the Lolland region of Denmark, where entrepreneurship is inhibited by the traditional lifestyles of wage workers and self-employed, exporting farmers (Hjalager, 1989). As we observed above, similar examples of unproductive/counterproductive social capital are also to be found in enclaves as ghettos and mafia cultures, and in social capital that was established during the age of agrarian societies but has been preserved among certain actors and groups.

Markusen (1996) distinguishes four types of industrial district of which the Marshallian is the one which in our terminology has the strongest positive social capital. What is interesting in this connection is her example of Detroit’s transformation from a Marshallian district with a wide diversity of actors to a “hub-and-spoke district” in which far and away the dominant actor was the car industry. “The third Italy” has been particularly singled out as the foremost example of an agglomeration of Marshallian districts featuring small-scale, flexible specialization (Piore and Sabel 1984). However, Fukuyama (1995) holds that the existing social capital in the third Italy confines its activity to small-scale sectors and that problems of adaptation to economic change can therefore arise even there.

Entrepreneurship-Inhibiting and Facilitating Social Capital

There is much in the literature on inhibitions to entrepreneurship coming from community forces of the kind we could characterize as social capital influences. In the economic history literature, two classic studies of restraints on entrepreneurship in France extending over long historical periods are Landes (1949) and Sawyer (1952). Both these scholars emphasized close ties in conservative families that were unusually prominent in business, which reinforced other characteristics of the French social system. Sawyer noted the “carry-over of inherited family patterns into the important part of French business that has become identified with particular families….,” (p. 17), and he said, “Most conspicuous, perhaps, has been the relative absence of the kind of aggressive entrepreneurship requisite to the [Schumpeterian] process of ‘creative destruction’…. social and economic institutions have favored the preservation of the ‘community’ of producers or sellers…. Quite apart from the subtler social pressures more generally operative, conspicuous rebels … have found themselves destroyed by the economic community for trying to break the system” (p. 18).

While the French example illustrates our general point, we recognize that it shows merely one possibility. In some other countries, close-knit families or small groups have supported entrepreneurial innovation. Lamb (1952 p. 116), writing at the same time as Sawyer, noted that “Entrepreneurs … depend for their success on the measure of acceptance their values and goals of activity command from [soci-
ety]…. They tend to act in small groups, and to work out their value systems in such groups as family or clique,” but then he cited several men in the early period of the U.S. as examples of how extended family and clique had dramatically supported entrepreneurship.

An often-cited empirical study of the interaction between entrepreneurs’ motivations and the characteristics of their socioeconomic environment is Dubini (1989). Her study of Italian firms is noteworthy for two reasons:

1. She focused more narrowly on entrepreneurial firms than on self-employment and small business proprietorships in general, limiting her sample to firms “established for the principal purpose of profit and growth” (p. 15) and excluding farmers, craftsmen, and professionals.

2. She advanced the notion of sparse vs. munificent environments. A sparse environment lacks an “entrepreneurial culture and values, networks, special organizations or activities aimed at new companies … a tradition of entrepreneurship and family business … innovative industries” (p. 14), and it has weak infrastructures and capital markets. A munificent environment, on the other hand, has “family businesses and role models, a diversified economy … rich infrastructure and … skilled resources, a solid financial community, [and] government incentives to start a new business” (p. 14).

Dubini does not use the term “social capital,” in part probably because of the timing of her study. However, one can argue that the elements of social capital are implicit in the notion of the munificent environment, as suggested by the mention of networks and family businesses, and Dubini notes that access to other entrepreneurs is a positive factor in how the firms in her sample rated the environment (p. 21). An interesting finding is that entrepreneurs often had a goal of contributing to the welfare of their community as well as to their own income and satisfaction (p. 18).

Schell’s (1983) study of three North Carolina counties uncovered some qualitative evidence that a particular social and political climate promoted by a region’s “power elite” could foster or inhibit entrepreneurship (see also Schell and Davig, 1981). He attached special importance to whether the major community leaders themselves had personal attitudes similar to those of business entrepreneurs. The qualitative evidence consisted of informed comments in the press and from people interviewed, but the quantitative measure of entrepreneurial activity was by Schell’s own admission a very unsatisfactory one, namely the percentage growth in the number of businesses incorporated between 1966 and 1976. In the county that lagged by this measure, there was general agreement that the elite was dominated by executives of large established corporations or old established families, and Schell’s interviews of entrepreneurs revealed “no active linkage between [them] and the power elite; in fact, the relationship bordered on alienation” (p. 504).

Several recent scholars have made more comprehensive and direct statements about possible inhibiting forces from excessive links and close community ties. Triglia (1986, 1991) noted that in parts of Italy local entrepreneurs had a limited geographical range of vision. Indeed, they were suspicious of efforts to think be-
Social Capital and Entrepreneurship

Beyond the local scale because they saw their local networks as buffers against market forces and the power of the national state. Triglia emphasized the implications for social efficiency, in that local networks did not have the capacity to produce important collective goods, but to this we add that the limited vision of individuals may be seen as an example of excessive links or Schumpeter’s drag chains.

Crouch, Finegold and Sako (1999), referring to Triglia’s arguments, elaborate: strong trust in “purely interpersonal terms can inhibit the development of arrangements for institutionalized trust … [which exists] where A is willing to trust B not because he has personal, community knowledge of B … but because B is a representative of an institution … which A has learned to regard as trustworthy. Communities which rely very heavily on personal trust may find it difficult to make the transition to institutionalized trust. One consequence of this will be that they find it hard to have extensive dealings outside their immediate circle, which limits the size and scope of their activities” (1999 p. 168). It is interesting that Crouch, Finegold and Sako make this statement in a chapter on “local agencies for skill creation,” and we may regard skill creation as a kind of public entrepreneurial effort.

In a very trenchant discourse Grabher (1993) refers explicitly to the “weakness of strong ties” in warning of the dangers of dense and close networks, as exemplified in his provocative analysis of the decline of the coal, iron, and steel complex in the Ruhr region during the 1970s and 1980s. Grabher notes that firms in the Ruhr became too dependent on each other while insufficiently receptive to information and perspectives from outside, so that the area’s close interfirm linkages, and also public-private linkages, “turned into stubborn obstacles to innovation” and “locked-in” the area’s development to technologies and industries with unfavorable long-term prospects (p. 256). The attitudes responsible for this ossification were of course aggravated by the region’s overspecialization.

Grabher’s title phrase is evocative: “the weakness of strong ties.” It is of course a twist on Granovetter’s famous “strength of weak ties” (1973). The Ruhr, Grabher argues, suffered from the very strategies for fostering cooperation and reducing transaction costs that had been keys to its earlier success. Its adaptation actually endangered its adaptability. Adaptation took the form of investment, which proved too high ex post, in transaction-specific assets and relationships, and also actually took the form of continued innovation - but it was innovation in the wrong technologies and wrong industries. A “cognitive lock-in” aggravated the inability to escape established modes of thought and cooperation; firms had not invested enough in what Grabher calls “boundary spanning” functions (pp. 261, 263), or in “redundancy,” which is “the availability of unspecific and uncommitted capacities that can be put to a variety of unforeseeable uses … [which] enables social systems not just to adapt to specific environmental changes but to question the appropriateness of adaptation” (p. 265).

Finally, it goes without saying that in many cultures social capital reinforces general cultural forces that inhibit entrepreneurship by women.

What, then, are the characteristics of regions that succeed in reshaping their social capital in step with economic change? The answer is probably a more diversified social capital in which new growth and the closure of individual actor-
networks is continually going on. This implies social capital that is fairly heterogeneous but at the same time has a sufficiency of links between the various actors’ and groups’ own networks not to collapse into numerous competing funds of social capital at regional level (Grabher and Stark 1997).

Social capital that has been adapted to a particular production structure in a region is of great importance to that region’s growth and horizontal and vertical integration. But such social capital also helps to prevent the emergence of new entrepreneurs with competing networks associated with other kinds of production. Social capital needs to possess special characteristics if entrepreneurship in Schumpeter’s sense is to avoid being confined to a brief period of innovation followed by a long non-entrepreneurial period of adaptation and increasing efficiency. Among the most vital characteristics of region-bound social capital that can encourage entrepreneurship, therefore, are diversification and the ability to reorganize.

A prerequisite is probably a balance between the interests of the different nodes involved, i.e., the interests of no single actor/group should be dominant. Furthermore an optimal balance has to be dynamic, based on the principle that the vintages of social capital are renewed by replacing old unproductive networks with new ones and keeping old productive ones in good repair. This means there is a requirement for an optimal combination of both strong, longlasting links and weak, temporary ones between actors (Hansen 1998). It also involves an optimal balance, from the actor’s perspective, between internal and external links, which can be described from society’s perspective as an optimal balance between homogeneous and heterogeneous elements of social capital (Westlund 1999).

### Theoretical Models in Economics

The literature on “allocation of talent” reminds us that modeling entrepreneurship is a special case of a more general theoretical problem of modeling the choice between wage employment and self-employment, often called “occupational choice” (Lucas 1978; Kihlstrom and Laffont 1979; Evans and Jovanovic 1989; Baumol 1990; Holmes and Schmitz 1990; Murphy, Shleifer and Vishny 1991, to mention only a few items in what is a very extensive literature). Many models are models of “self-employment” defined very broadly – including professional practice or routine retail trade, for example – rather than entrepreneurship in the sense we are discussing. In empirical research, a broader definition is often required because data on self-employment are far more readily available than data on true entrepreneurship. In this literature, there is often no sharp distinction between people with “entrepreneurial vision” and those without it; any member of the population can become an entrepreneur. In models that focus on entrepreneurship in a narrower sense, individuals differ in entrepreneurial ability and perhaps in preferences concerning risk and/or nonpecuniary benefits and costs. However, when research is inspired by a particular set of data, a researcher may ignore nonpecuniary income simply because there are no good proxies for it in the data. In principle, nonpecu-
niary income is extremely important, not only for reasons suggested by Schumpeter but also because an entrepreneur is likely to have less leisure than a wage worker, so there can be negative as well as positive components to nonpecuniary income. Finally, we note that many models in this tradition do not model financing constraints on entrepreneurs, but some do.

We can convey some idea of the variety of approaches by noting the following: Lucas (1978), Kihlstrom and Laffont (1979), Baumol (1990), Holmes and Schmitz (1990), and Murphy, Shleifer, and Vishny (1991), include neither financing constraints nor nonpecuniary income. Evans and Jovanovic (1989) and Holtz-Eakin et al. (1994a, b) have financial constraints on the amount an entrepreneur may borrow, but not on who becomes an entrepreneur in the first place, and they do not include nonpecuniary income. Of course, if financial constraints affect the amount of income one can earn that may have an indirect effect on the choice to become an entrepreneur. The series of optimal taxation models in Boadway et al. (1991) have nonpecuniary income as a critically important variable, but not financing restrictions; in Boadway et al. (1998), anyone can become an entrepreneur but lenders charge different interest rates to different entrepreneurs, and there is no nonpecuniary income. Taylor (1998) has both credit constraints and nonpecuniary income; Taylor (1996) does not have such variables in the theoretical model, but includes (very imperfect) proxies for them as individual characteristics which, along with income differentials, predict the choice of self-employment.

This valuable literature focuses on topics such as the existence and efficiency of general equilibrium, aggregate growth, entry and exit of firms, and size distribution of firms. However, in our judgment a model that best allows for the incorporation of social capital is one which starts with the notions that relatively few persons have the entrepreneurial mindset, that they have specific “projects” in mind, and that they seek financing in an imperfect capital market. That approach might not model the selection of individuals — whether or not entrepreneurs are the most able persons in society — or the choice of sector, and thus might be silent on whether entrepreneurship has social returns equal to private returns — whether it increases social productivity or is merely the transferring of rent. On the other hand, unlike most models on allocation of talent, the approach would pay more attention to nonpecuniary income of the entrepreneur and to financing, which are important in an analytical approach inspired by Schumpeter.

A model that does pay great attention to both those features is one by Blanchflower and Oswald (1998, hereafter B-O). In this section we present a model based very closely on theirs, then indicate how one might modify it to reflect social capital. The model is essentially theirs, but with some changes, up to the point where we introduce social capital; in the following we will indicate parenthetically how we depart from them up to that point.

**The Basic Model**

Initially, a locality has a working population of size $N$, and no one thinks of entrepreneurship. Then, a fraction $\beta$ of the population become “visionary,” in the sense
of having vision or foresight, not of being a daydreamer or a utopian (B-O used the term “intrinsically entrepreneurial,” defined as having “the vision to see a range of feasible business projects” (p. 30)). Following Schumpeter, one expects $\beta$ to be quite small. Each visionary estimates with great confidence the profitability of one or more potential projects, but others in society – in particular, bankers – cannot describe the opportunities by a probability distribution, though they do know the capital costs of each project. Thus there is an important asymmetry of information, where “information” includes confidence of profitability. The projects require different amounts of capital, $k$, but each requires exactly one entrepreneur’s personal involvement (a very standard assumption in the literature). We use “project” to mean a potential project, “launch” to mean an actual investment, and “entrepreneur” to mean a visionary who actually launches a project (“launch” is our own term, not B-O’s).

Visionaries are so confident of their projects that they ignore risk. This confidence is a notable feature of the model. Knight (1921 p. 270) noted that “confidence and venturesomeness … act along parallel lines and are little more than phases of the same faculty …” Manove and Padilla (1999) discuss at length the likelihood of entrepreneurial optimism, noting that overoptimistic expectations are a widespread human trait documented by cognitive psychologists’ studies, and cite supporting literature. See also Taylor (1998) for an empirical discussion of optimism among budding entrepreneurs.

Each project has an expected profit, measured before payment of interest on debt, according to a strictly increasing function:

$$S = S(k), \text{ where } S'(k) > 0$$

Any entrepreneur who launches a project will have to employ labor additional to his or her own, so launches will raise labor demand and increase the working population (here we depart from B-O, who specify a fixed population and assume that a project employs no labor other than the entrepreneur’s own). Wage rates may be exogenous if the locality is small and faces a perfectly elastic labor supply because of migration. If wages are endogenous, then of course $\pi$ is a function of wages as well. (More on this below, when the labor market is being considered.) For the moment, assume each project is conceived as a package of some optimal amount of capital, which is $k$, and some optimal units of labor and any other variable inputs.

In equilibrium, the “marginal launch” is the one with the lowest profits and thus the lowest $k$ of all the launches. Denote its $k$ as $k^*$. All projects having $k > k^*$ are launched, because they have higher profits, so visionaries will seek them eagerly because they are allocating the single fixed “person unit” they possess: competition by entrepreneurs for projects ensures that the projects with the highest profits per entrepreneurial unit are the ones that are launched. We assume each visionary looks at the whole array of projects, rather than having only one “pet project” at the start. This seems realistic, although it does mean there is no explicit apparatus to match particular launches with particular visionaries. Projects with $k < k^*$ are not launched, because none is attractive simultaneously to both a visionary and a financier. As we shall see, $k^*$ is a crucial endogenous variable, depending on the
degree of entrepreneurial vision in the population ($\beta$), on visionaries’ opportunity costs, and on the availability of financing.

Visionaries seek loans from banks and similar lenders. All loans are unsecured, the nature of projects being such that no lender regards their assets as security. Some fraction $\alpha$ of the population have personal or family assets of $k^*$ or greater, i.e., sufficient to cover the investment costs of the marginal launch. Call these persons Group I. They include visionaries and nonvisionaries. It is essential to think of “family” as including extended family and friends, as we know from the financing of entrepreneurs in certain ethnic groups (Basu and Parker 2001 have a model in which there is family financing in addition to bank loans, and family loans are based on both altruistic and selfish reasons; they also have an empirical analysis of ethnic financing ties in Britain). Since an entrepreneur may be a former employee of a larger firm that will become one of his customers, some of the personal assets may be from labor earnings in that firm, and friends may include former coworkers. A person in Group I could finance all of $k^*$ out of his own funds, but if he or she turns out to be an entrepreneur he may not do so; instead he may use some of his assets as collateral for a bank loan. He has a choice whether to seek a loan, and we assume that if he does so he will get it. The fraction $\alpha$ is endogenous, for it depends, in the way described below, on the distribution of $k^*$: the number of people able to self-finance the marginal project depends on just how costly the marginal project is.

The remaining fraction $1-\alpha$ of the population, Group II, would have to borrow at least some funds for a launch, but only a fraction $z$ would be successful if they sought financing; $z < 1$ because financiers insist on more collateral than Group II people possess. This lender resistance is not because they have no clues at all about the nature of the projects, but is simply a rational response to imperfect information. Blanchflower and Oswald say the entrepreneurial opportunities are “by their nature, such opportunities [as] are not within the vision of most other kinds of individuals (such as bankers approached for loans)” (1998, pp. 30-1). In another place they put it neatly, saying there is “asymmetric information – about whether a project is good – between bankers and those individuals in the population who were born with entrepreneurial vision” (p. 32).

So far, unsecured loans are the only possible finance other than personal or family wealth. For the entrepreneur, using debt as opposed to outside equity has two aspects: one is increased risk due to financial leverage, the other is independence from other equity investors. We discuss the implications of venture capital investing via equity later.

The fraction $\beta$ is the same in Group I as in Group II. The proportion $\epsilon$ of the initial population who become entrepreneurs, is:

$$e = \beta \alpha + \beta z(1-\alpha) = \beta [\alpha + z(1-\alpha)]$$

It is the proportion of visionaries, $\beta$, multiplied by the sum of the probability they have sufficient capital plus the probability they can get a loan if they have not. The number of entrepreneurs and launches is $eN$. The fraction of visionaries who become entrepreneurs is $e/\beta = \alpha + z(1-\alpha)$. 

One suspects a tendency for the launches with the highest $k$ and thus the highest profits to be by entrepreneurs with access to the most capital, partly because each visionary has just one “person unit” to supply, and partly because richer visionaries can self-finance more easily and also can offer more collateral to lenders. However, nothing in the formal model assumes a high rank correlation between $k$ and personal assets, and that seems desirable because a visionary’s other skills, not just his assets, are relevant in matching people with projects and persuading lenders.

The Labor Market

As noted earlier, one might assume wage rates to be unchanged after launches, because labor supply, via immigration, is perfectly elastic at the original wage rate. That seems an extreme assumption, so ideally a better alternative would be to specify both labor demand – the change in which is a function of the entrepreneurial launches – and labor supply – which is a function of the original population plus any immigration in response to increased demand. Since our main concern is to illuminate the role of social capital, we do not specify the labor market in detail, but we do assume that labor supply is not perfectly elastic, so that wages rise by some amount. That rise becomes very important in a later argument below. We assume the immigrants include no visionaries.

(Our approach on the labor market is different from B-O’s: they assume population is absolutely fixed, and entrepreneurship forces up wages entirely because of the supply effect when entrepreneurs leave the wage-labor sector; however, they are inconsistent in not allowing the increase in wages to feed back on the profitability of projects. That would be consistent only if each entrepreneur employed no one other than himself, as in the case of self-employment rather than entrepreneurship more narrowly conceived. B-O move back and forth fairly freely between “entrepreneur” and “self-employed” without making distinctions, and their empirical analysis is based exclusively on data for self-employed people. Also, a fixed population is not an appropriate assumption in our case, since we are concerned with social capital in a geographical locality.)

The Typical Entrepreneur

We now describe the typical entrepreneur, ENT. Group II entrepreneurs must seek loans, and some fraction of Group I will seek them voluntarily, but that in itself does not specify the terms of the loans. It is necessary to spell out financing details. Faced with capital requirement $k$, ENT finances some fraction $\delta$ out of his own funds and borrows the remaining fraction $1-\delta$ at interest rate $d$. The fraction $\delta$ obviously may depend on lenders’ financing constraints which we do not model explicitly (see Evans and Jovanovic (1989) for one of the most important discussions), so it is not entirely the entrepreneur’s own choice. His personal assets before the launch amount to $M$, and after the launch he retains $M-\delta k$ in non-
entrepreneurial assets, on which he earns a rate of return $c$. The parameters $\delta$, $d$, and $c$ are exogenous, which is certainly a weakness, but making them endogenous in a plausible way would complicate things considerably.

If ENT were a worker instead of an entrepreneur, money income would be:

\[ y_w = w + cM \]

where $w$ is the wage in ordinary employment. It is conventional to model the entrepreneur as a single individual rather than a member of a family with more than one wage earner. However, in empirical work it is common to recognize that nuclear family status is important. A nuclear family might have worker income higher than $w$, which might also reduce the perception of risk of entrepreneurship (see discussion in Holtz-Eakin et al. 1994b).

As an entrepreneur his money income is:

\[ y_E = \pi(k) - d(1-\delta)k + c(M - \delta k) \]

The last term is zero if he invests all his assets in the launch. The opportunity cost of being an entrepreneur is, in money terms, $c\delta k$. But being an entrepreneur earns nonpecuniary income – sense of independence, thrill of competition, sense of accomplishment, etc. – so it is really utility that matters. Let $U_E = $ ENT’s utility as an entrepreneur and $U_w = $ utility if he were a worker instead. Then:

\[ U = U(x, A) \]

(5a) $U_W = U(x_w, A_o)$

(5b) $U_E = U(x_E, (A_o + \Delta A))$

where $x = \text{vector of market goods and services consumed and } A = \text{a composite variable capturing utility from nonmarket goods, such as environmental amenities, available in fixed supply; } A_o = \text{level of } A \text{ available as a worker, } \Delta A = \text{net addition to the composite variable attributable to the satisfaction or dissatisfaction of being an entrepreneur. Conventionally, } \Delta A \text{ is assumed to be positive in such a model, because of the value of independence and the thrill of competition, but conceivably it could be negative, for two possible reasons: the loss of leisure, mentioned earlier; disapproval by the local community, which might be high especially where social capital is strong. It is essential to distinguish } x_E \text{ from } x_W \text{ because ENT’s consumption pattern is likely to differ in the two situations. For one thing, money income may differ, and, for another, the different level of amenity will induce substitution effects on } x. \text{ One of our numerical examples in the appendix illustrates this effect, based on a CES utility function (B-O have a simple linear utility function).}$

In equilibrium, it must be true for every entrepreneur that

\[ U_E \geq U_W \]

a constraint that specifies that even a visionary will not become an entrepreneur if his or her pecuniary plus nonpecuniary rewards from entrepreneurship are lower than the opportunity cost (in utility terms). Movement into wage employment is always available, so no one will be an entrepreneur if $U_E < U_W$. Thus opportunity cost is another factor that limits entrepreneurship, in addition to the limitations of vision and of capital.

It is more useful to specify (6) in terms of the indirect utility function, $V$, which shows the maximum utility a consumer can achieve, by optimizing behavior, as a
function of money income, \( y \), the vector of prices of market goods, \( p \), and amenities, \( A \) (\( V \) and \( U \) equal each other if the \( x \) in \( U \) is the optimal consumption bundle). Thus we rewrite the equilibrium condition as:

\[
\begin{align*}
(7) & \quad V_E \geq V_W \\
(7a) & \quad V_W = V(y_W, p, A_o) \\
(7b) & \quad V_E = V(y_E, p, (A_o + \Delta A))
\end{align*}
\]

For any entrepreneur it is possible that in equilibrium (7) is an inequality, so that he earns a rent. Indeed it is possible for all entrepreneurs to earn a rent, even the “marginal entrepreneur,” i.e. the entrepreneur in the marginal launch. How might we describe the rent in quantitative terms? We cannot use the difference \( V_E - V_W \), because \( V \) is in arbitrary utility units, but we can get a suitable measure in monetary terms from the expenditure function. The expenditure function is defined as the minimum money expenditure a consumer would have to make, assuming optimizing behavior, in order to achieve a specified utility level, as a function of that utility level, prices of market goods, and amenities. Differences in expenditure functions between two situations are standard ways of measuring differences in quality of life, cost of living, etc. (see Bolton 2002 for a theoretical application to measure “place surplus”). If he were a worker, the entrepreneur would achieve utility level \( V_W \) by optimizing his consumption. As an entrepreneur, the minimum expenditure he would need to achieve that same utility level is \( EXP_E[V_W, p, (A_o + \Delta A)] \), or \( EXP_E \) for short. But his actual entrepreneurial income = \( y_E \). If \( V_E > V_W \), then \( y_E \geq EXP_E \), and the difference \( y_E - EXP_E \) is a monetary measure of his rent. Note that this difference is not simply \( y_E - y_W \); indeed, the entrepreneur might earn a rent even if \( y_E - y_W \) is negative, because \( \Delta A \) substitutes for money income. Again, our appendix gives a numerical example based on a CES utility function.

Therefore an alternative to (7) is

\[
(8) \quad y_E \geq EXP_E(V_W)
\]

for every entrepreneur. That is, money income must be no less than is needed to reach the same utility level attainable as a worker.

**Increase in Vision or Ease of Financing**

One implication of opportunity cost is that an increase in \( \beta \) or \( z \), ceteris paribus, will not necessarily increase permanently the number of entrepreneurs. There will be an initial increase, but that will raise \( w \), thus raising opportunity cost, and it will also lower profits on launches. If the initial equilibrium is one in which (6) is a strict equality, then the increase can be sustained only if new launches can be found that provide higher entrepreneurial income – pecuniary and nonpecuniary – than the new entrepreneurs could earn as workers. However, we have assumed that the only projects still available are ones for which \( k \) is lower than \( k^* \), so \( \pi(k) < \pi(k^*) \), even before any adverse feedback from higher wages to profits. Therefore, the only way such new launches and new entrepreneurs can be found is if new entrepreneurs have profit opportunities, favorable financing, low opportunity costs, or a high valuation of independence, as reflected in \( \pi(k^*) \) or in the \( d, \delta, c \), and pa-
rameters and the $M$ and $\Delta A$ variables. It is of course possible to add assumptions (as Blanchflower and Oswald do, implicitly) to ensure this. On the other hand, if the initial equilibrium is one with rents, then an increase in $\beta$ or $z$ can increase the number of launches under certain assumptions concerning the distribution of $k$, and one of our numerical examples in the appendix shows that.

The variable $\alpha$ clearly is an important endogenous variable, because it determines the size and composition of Group I, the part of the population in which entrepreneurship is constrained only by limitations of “vision,” as opposed to Group II, in which both vision and finance are limiting. Therefore we must specify its determination. It depends on $k^*$:

$$\alpha = F(k^*)$$

This dependence can be extremely complicated, but a simple example will illustrate: if the distribution of assets $B$ in the population is rectangular between $B = 0$ and $B = B_{\text{MAX}}$, then $\alpha = 1 - \left[\frac{k^*}{B_{\text{MAX}}}\right]$. For example, if the distribution of assets is rectangular between 0 and 250,000, and $k^* = 200,000$, then $\alpha = .20$, meaning that 20 per cent of the visionaries could entirely self-finance the marginal launch. The relationship of $\alpha$ to $k^*$ is generally much more complicated than in this example, because the distribution of assets in the population is undoubtedly much less simple, perhaps something like lognormal. Thus $\alpha$ depends on both the distribution of assets in the population and the distribution of $k$ in the collection bundle of projects. (Blanchflower and Oswald recognize the endogeneity of $\alpha$, but, in our opinion, do not stress it sufficiently.)

**Incorporation of Social Capital**

The emphasis so far is on access to financial capital in the form of loans, just as in Schumpeter. There is extensive support in the sociological literature for the claim that social capital facilitates the founding and later success of new firms (see Brüderl and Preisendörfer 1998 for a survey of literature and one empirical test of entrepreneurs in one region of Germany). Yet the formal model above (nor B-O’s empirical testing of their version) includes nothing resembling a measure of social capital. There is no “community support,” that is, social approval or tolerance of innovative behavior, which social capital might provide in its role as a resource. Blanchflower and Oswald say that “empirically [the probabilities $\beta$, $\alpha$, and $z$] may be assumed to depend upon … personal characteristics … and a set of regional and industrial characteristics” (1998, p. 33), but the list of variables they consider contains no community characteristics that proxy social capital or personal ones that proxy the individual’s involvement in the community and “access” to social capital. They recognize the value of adding some theory about how $z$ is determined but do not go down that road (p. 31).

We believe the basic framework, with its emphasis on access to “capital,” is quite promising, if one expands capital to include social capital and also expands finance to include equity finance. Thus we suggest some ways to improve it. One important step is to allow $\Delta A$ to include any discomfort from social disapproval of
behaving in a novel way. The intangible costs are a function of various characteristics of the social milieu, the potential entrepreneur’s social “connections,” and the tolerance of the community for innovative behavior. We have referred earlier, for example, to the inhibiting effect in many cultures on entrepreneurship by women. We might assume that while financial capital is necessary, financial capital cannot defray any of the intangible psychic costs. Another change is to make $z$ a function of social capital, since social capital will affect the likelihood that lenders will lend or that members of the community (not family or friends) will supply equity finance; the idea here is that social capital affects the likelihood that others will trust entrepreneurs’ assessment of profitability.

We can formalize these ideas as follows: A fraction, $\beta$, of the persons in a community are “visionary,” but of these only a fraction $\gamma$ finds the social milieu supportive, or, if there is social disapproval, can tolerate the social disapproval; thus only the fraction $\beta\gamma$ of the community will consider investing their own funds in an entrepreneurial launch or seek external financing to do so. The fraction $\gamma$ depends on both the social characteristics of the community and personal characteristics of the visionaries.

$$\gamma = G(S, R)$$

where $S$ and $R$ are vectors of social characteristics and personal characteristics, respectively; we emphasize our claim that some characteristics of what is commonly called “social capital” have positive effects and some have negative effects on $\gamma$, so $S$ is a vector rather than a single composite variable called “social capital.”

The fraction $z$ captures both external debt and external equity finance, and it too depends on both personal characteristics of the visionary and social characteristics of the community. In principle, $z$ also depends on extra-community factors, since in practice “venture capital” in the form of equity comes from both local and wider sources (for that matter, so does loan finance – many entrepreneurs, for example, borrow heavily on credit cards):

$$z = Z(S, R, T)$$

where $T$ is a vector of extra-community variables. Again, some items in $S$ have positive effects and some negative. Possible positive effects are financial support of entrepreneurs by ethnic communities, easier entrée to banks and other lenders (Blumberg and Pfann, 2001), and the important sources of information from coworkers in a firm where the entrepreneur was formerly employed (Renzulli, Aldrich, and Moody, 2000).

The $Z$ function may be very different from the $G$ function, and $\partial Z/\partial S_i$ may be very different, perhaps even have a different sign, from $\partial G/\partial S_i$ for the same characteristic $i$ in $S$. For example, assume characteristic $i$ is the proportion of the population that has had some prior experience or contact with a failed entrepreneurial launch – “contact” in the sense of helping to finance or having other business dealings with the launch. Then $\partial G/\partial S_i$ may well be zero or positive, but $\partial Z/\partial S_i$ negative.

In this framework the proportion, $e$, of the original population who become entrepreneurs is:

$$e = \beta \gamma \alpha + \beta \gamma z(1- \alpha) = \beta \gamma (\alpha + z(1-\alpha))$$
Mathematically (12) is similar to (2), except that now social capital affects $\gamma$ and $z$. Thus in this amended model, as in the original one, it is possible to have a vision-constrained or a capital-constrained equilibrium in which even the marginal entrepreneur earns a rent, but now the parameter $\gamma$ is relevant along with $\beta$, $\alpha$, and $z$, and community characteristics are also factors because they affect $\gamma$ and $z$.

As an additional refinement, one might want to distinguish between debt and equity as types of external finance, modeling them separately in $z$ rather than just their sum. This seems useful for three reasons: 1. Debt and equity are substitutes for each other, within limits; 2. The role of social capital in the supply of the two may be different; 3. The differences between debt and equity may offer a chance for empirical testing of the role of social capital, since debt-to-equity ratios of entrepreneurial firms may be observable characteristics – which is not to say data on the ratios are easily collected!

Such a refinement is rather difficult, however, because ideally we would have to incorporate many kinds of simultaneity: between the demand and supply of debt, between the demand and supply of equity, and between the market for debt and the market for equity (as in the theory of the “cost of capital”). On the entrepreneur’s side, some simplification is possible because the proportion of equity automatically equals one minus the proportion of debt (assuming, that is, that there is just one kind of debt and just one kind of equity, which is actually a big simplification in a world where entrepreneurs borrow at different maturities and with different security, use both tax-exempt and taxable debt, and avail themselves of both convertible, preferred and common equity terms). But the model would nevertheless be quite complex, and we leave it to a future paper. We mention it here because we suspect that social capital makes a difference to the relative use of debt and equity.

An interesting effect of social capital comes from effects on residence. An entrepreneur, by virtue of mindset and/or the nature of the new business, may be tempted to leave the community. However, his prospects of obtaining finance – both loans and venture capital equity – are increased by long-time residence in the community, which increases his or her access to local social capital (Glaeser, Laibson, and Sacerdote 2000), and of course local lenders and investors have a strong interest in his remaining there. If the entrepreneur’s community involvement then contributes to local social capital, there is a dynamic feedback: persons with the entrepreneurial mindset who stay on because financing requires it may contribute their own investments in local social capital, and perhaps in a way that avoids some of the dangers of narrowness that Grabher and others have worried about (see discussion above).

As always, we must recognize the negative effects social capital may have. Some of the sociological literature is helpful on the entrepreneurship question. In their seminal study of immigrant groups, Portes and Sensenbrenner (1993) discuss “bounded solidarity” and note: “The solidarity and enforcement capacity that promote ethnic business also restrict the scope of individual expression and the extent of extracommunity contacts. … The greater the social capital produced by bounded solidarity and community controls, then the greater the particularistic demands placed on successful entrepreneurs and the more extensive the restric-
tions on individual expression” (p. 1341). Portes (1998) and Sandefur and Laumann (1998) also point out that if the community expects successful members to aid less successful ones, there is extensive free-riding on the success, which affects incentives to take risks and to expand.

**Venture Capital**

Both Schumpeter and models such as Blanchflower and Oswald’s seem dated because they omit venture capital. B-O admitted that venture capitalists exist but assumed explicitly that they are not prevalent enough to eliminate the information asymmetry (1998, p. 33), so that their entrepreneurs rely entirely on loans and their own funds. This is clearly an unacceptable assumption. In addition to an extensive literature in the business economics and finance fields, there are recent theoretical models using more abstract economic theory (see Keuschnigg, 2000, Keuschnigg and Nielsen, 2000). Our concern here is only to indicate briefly how venture capital complicates the role of social capital.

Venture capitalists provide equity finance, monitor their investments carefully, and typically also provide extensive advice. They screen investments carefully, require the entrepreneurs they invest in to do the same, enforce more professional management, and add to the entrepreneur’s incentives by linking his or her rewards to the firm’s performance and also by staging investments (see Klausner and Litvak, 2001 for extensive detail). In one sense these features reduce the fundamental information asymmetry and thus substitute for local social capital in reducing that asymmetry. On the other hand, it is well known that venture capitalists concentrate their investments to a large degree, though certainly not wholly, in relatively narrowly bounded geographical regions (Klausner and Litvak, 2001), so it seems likely that local social capital still plays a role in their willingness to perform their multiple functions of finance, monitoring, and advice. To put it another way, venture capital facilitates entrepreneurship most in those regions and localities which have venture capitalists in the first place, and local social capital should be a regional characteristic that attracts venture capitalists. This geographic boundedness, however, may be in course of being reduced by the recent development of networks of venture capitalists operating collectively on a wider geographical scale. Klausner and Litvak (2001) also point out that the venture capitalist must protect his own reputation in order to attract entrepreneurial interest. A locality or region with strong social capital should contribute to the community of interest between venture capitalists and the visionaries in quest of finance.

**After the Startup**

Social capital has a role not only in financing the new firm but also in its ongoing operations during its early life, and any theoretical approach incorporating social capital must recognize this, especially in view of the extensive literature on such matters as interfirm relations that we summarized earlier. The new firm, whose
startup was a result of innovation, needs to *continue* to innovate, and that requires effective management-labor relations, supplier relations, ongoing research, and “organizational learning” (Cole, 1995). Organizational learning includes learning from customers and suppliers as well as from in-house activities of the firm's own employees. Integration of suppliers is especially important because a new firm probably has a small core management team, it being a product in the first place of a single individual or a small group of individuals. It must rely on suppliers in order to exploit its first-start advantage and to expand. Some of the most important innovations in its product actually will be innovations by suppliers, and over time it may modify the basic conception of its products to take advantage of specific capabilities of suppliers.
7 Social Capital and Innovation: Actors and Policies

Introduction

Making something new, improving the quality and characteristics of existing products or producing things more cost-efficiently are three of the ways in which economic growth is created. Of the three, it is only the last that can be considered connected to neoclassic theory, in the form of optimum combination of the given production factors under given technology. Changes of technology, the source of the two other ways of creating economic growth, do not happen through variations in the quantities of factors but by the setting up of new production functions through different types of innovations, or what Schumpeter (1934, 1950) called new combinations of production factors. This definition also conveys by implication an understanding of the heterogeneity of the concepts of labor and capital and the possibility of combining an infinite number of labors and capitals in an infinite number of combinations. Thus, studying innovation and economic change requires other approaches than those of traditional mainstream economics.

A number of such approaches have emerged during recent decades: clusters and innovation systems being the most well-known. Even though the approaches are often connected to Marshall’s (1880/1920) notion of industrial districts, their theoretical base lies outside traditional economics. Moreover these alternative approaches largely lack the rigor of formal theory and can be regarded as conceptual frameworks still in their early stages of development (Fischer and Fröhlich 2001). However, important contributions to the formalization of these approaches are Krugman (1991b, 1995) and Fujita and Thisse (2003).

Within the discipline of economics, the concept mostly associated with the new approaches is that of externalities. As in Chapter 4, we base our discussion on the distinction made by Johansson (2004) between firms’ intra-market and extra-market externalities. The two types of externalities have an impact on different activities of a firm. Whereas, according to Johansson, intra-market externalities affect a firm’s transaction costs and productivity, extra-market externalities affect a firm’s access to information and knowledge spillovers, i.e. its innovation potential. In both cases, space forms an important restriction implying agglomeration economies. Both intra- and extra-market externalities are distance-sensitive (as most contact-intensive activities are) and space forms a restriction for the spatial reach of such externalities as transportation across space involves a cost. This chapter focuses on the second type of externalities, the extra-market externalities,
and how they contribute to the emergence of new combinations of production factors in a regional context. More precisely, it investigates the influence of social capital on innovation, and on the actors and policies influencing innovation.

**Innovation and Social Capital**

The theories of (national and regional) innovation systems, clusters, industrial districts and triple helix have in common the focus on interaction between a number of key actors. The industrial district approach, like certain of the many cluster approaches, concentrates solely on firms’ interaction, while other cluster approaches, the innovation systems approaches and the triple helix approach underline the interaction between at least two, but often all three, of the key actors in the innovation process: companies, public sector bodies and universities. However, this view of innovation, as a result of interaction of actors with different tasks and different principles of production and exchange (see below), is a relatively new standpoint. Historically, innovation activities seem to have had quite different characteristics from those of the complex systems of today.

**From the Lonely Genius to Innovation Nodes**

The history of technology and its economic applications is full of examples of individual inventors who came up with groundbreaking prototypes and methods that were rapidly commercialized into successful products. Even though we possibly can find some examples of lonely great geniuses in the computer industry, there is no doubt that the individual inventor belonged to a particular economic era; an early industrial era that lasted until about World War I. Most of the world-leading corporations of today stem from that era – an era when a single innovator could build up a company from a prototype or a method.

The interwar years can be viewed as a period of transition from “individual inventor capitalism” to “corporate innovation capitalism.” Figure 7.1 shows that albeit the gap between patents assigned to corporations and patents assigned to individuals in the U.S. increased slowly after 1900, the former increased rapidly after 1945, while the number of patents issued to individual remained practically constant for the rest of the century. After World War II innovation activity seems to have entered a new stage. With a larger public sector after the war and increased demand for, among other things, military security and transportation infrastructure, governments of the developed world began to act as a demanding customer of private corporations. The most extreme example of this is probably what was denominated the space- and military industrial complex in the U.S. which had its counterparts in other countries.
Some Swedish examples of this symbiosis between government and state-owned companies on the one hand and private companies on the other are: state owned Vattenfall (hydroelectricity) and Asea (today ABB, generators and other electrical equipment); Televerket (former state telephone monopoly, now TeliaSonera) and Ericsson (switchboards and other telephone equipment); the state railways and Asea (electric motors) and the air force and SAAB (combat aircraft). The common denominator in these so called “development couples” was a state monopoly (complete or partial) which because of its secure position could make long-term, costly R&D investment and act as demanding customer for the (at that time Swedish-owned) private companies (Sörlin and Törnqvist 2000).

Another example of intimate collaboration between government and private companies is the Japanese system after World War II; the system of collaboration for which the concept of innovation system was coined. Freeman (1987) noted important differences between the Japanese national system of innovation and industrial policies in other countries. Like Johnson (1982) and Lakshmanan (1994) he stressed the role of MITI, the Ministry of industry and trade, in identifying strategic future key technologies and actively promoting company R&D in these technologies.

Even though there were important differences between the American, Swedish and Japanese innovation systems during this period, they had in common the intimate cooperation between government and industry in certain key technologies. Government was a demanding customer with strong resources for R&D, which was performed in cooperation with private companies. Only certain special fields of university research were involved in this cooperation. The innovation systems of late industrialism were mainly a system with two actors: government and private companies.
The industrial crisis of the 1970s can also be considered a crisis for “corporate innovation capitalism.” According to Figure 7.1, the number of patents assigned to corporations in the U.S. diminished between 1975 and 1990. Thereafter, an even sharper increase took place in the number of corporations’ patents. It is possible to interpret this “patent explosion” as a new stage of innovation activity related to the theories of knowledge society (Andersson and Strömquist 1988), Mode-2 society (Gibbons et al. 1994; Nowotny et al. 2001) and triple helix (Etzcowitz and Leydesdorff 1996). In spite of their different perspectives and focuses, the three theories have in common a stress on the new role of knowledge and knowledge-producing organizations in society.\(^1\) Knowledge has been transformed from one of several resources in production to “the predominant part in the creation of wealth (…) in all manner of economic activity” (DTI 1998). While the main value of the typical manufacturing firm resided in its physical capital, the value of a knowledge-intensive firm is in its intellectual property. Whereas the manufacturing firm sells tangible products for consumption or refinement, the knowledge-intensive firm’s products consist of R&D products, including patents, with a potential for being commercialized and profitable. Innovation, defined as new combinations of production factors, has become the core of the knowledge economy.

However, the innovation activities of the knowledge economy differ fundamentally from those of the early industrial period. Innovation activity in the knowledge economy is a collective process in which people and organizations have to cooperate. This is the circumstance highlighted in the “macro” theories of innovation systems with three actors and that of triple helix.

At the micro level, innovation activity in the knowledge economy seems to require a permanent flow of new information and knowledge, which in practice means a flow and exchange of people in the innumerable innovation processes of everyday life (see e.g. Kobayashi and Takebayashi 2000). As has been pointed out by many scholars, this gives the great cities a special role as knowledge and innovation nodes. Their size creates a diversity that makes specialized supply and demand – and new combinations of both categories – possible. This means that the knowledge economy not only creates another type of innovation than did the late industrial society. It also changes the spatial allocation of production factors. As the great cities become centers for the increasingly important production factor human capital, they also emerge as stabilizing factors in the global economy where knowledge is footloose but human beings and the organizations of knowledge are much more rooted. To (partly) quote Markusen (1996), the great cities are sticky innovation nodes in a space where information and knowledge “slip” around.

\(^1\) Here it should be noted that in line with North (1990) we make a distinction between organizations (firms, governmental organizations, universities and NGO:s) and institutions (laws and regulations, formal and informal rules of the game).
Why Care About Social Links?

A conclusion from what is said above is that innovation over time has become an increasingly complex process. It is an exaggeration to say that innovation in the early industrial period was only a process of merging technology and capital in the course of providing the innovator with financial resources to start production. Access to capital, finding the right customer and getting the innovation accepted were essential factors in the 19th century too. In the knowledge society, however, innovation activities can be broken down into a large number of stages from basic research, via e.g. development, testing, licensing, marketing and sales to final use, each of them requiring a particular partner for e.g. financing. One way to express the differences between innovation activities in the two periods is to say that they differ substantially in the number of actors involved, in the number of links between them, and in the amount of knowledge and information being distributed between the actors.

The emergence of spatial clusters and regional innovation systems can be viewed as an expression of the intra- and extra-market externalities and their distance-dependency. In the transfer of tacit and codified knowledge (i.e. knowledge spillovers) social capital constitutes a ubiquitous but multifaceted factor.

As noted in Chapter 4, Johansson (2004) has pointed out that knowledge transfers take place through two types of processes: on the one hand deliberate, formalized transaction-links, agreements, networks and other club-like arrangements between firms and firms and other actors, and on the other hand unintended knowledge spillovers between firms or between firms and other actors, caused by non-formalized interactions.

In both these two types of processes, social links and the norms and values associated with them play an important role. The reason is simply that good social relations facilitate knowledge transfers while absence of relations or bad relations do not.

Regions are differently circumstanced for dealing with this contingency. Diversified metropolitan regions consist of a number of co-located sectoral clusters that often do not have any more in common than the use of the regional infrastructures and certain regional markets. Apart from that, each cluster has its own links, viz those external to the firm but internal to the cluster and those between the clustered firms and the rest of the world. The relations of each cluster are formed in accordance with the stages of innovation, types of production, positions in the product life cycles, etc. In this way a metropolitan region can accommodate competitive clusters in both expanding and declining sectors.

If small regions contain any clusters, it is with few exceptions only a single one. Regardless of the sector of the cluster – expanding or declining – the small

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2 The problems involved in getting an innovation accepted can be exemplified by John Ericsson’s steam fire-engine, which when it was successfully demonstrated in London in 1829 caused such anxiety in “The London Fire Brigade” - to all intents and purposes a guild with a monopoly of firefighting - that it was rejected by the committee in charge (Goldkuhl 1961).
regions’ development is highly dependent on the quality of the cluster’s social relations. Smoothly functioning internal and external social relations facilitate acquisition of knowledge and information about e.g. changes in demand, new methods, etc, as well as of credit. Smaller regions, being dependent on one cluster, are in general more vulnerable and more dependent on good relations between all relevant regional actors.³

Who are these actors who build and maintain this essential social capital? This question is dealt with in the next section.

Social Capital on Three Levels

The theories of innovation systems and triple helix concentrate on the interplay between different types of organizations. However, organizations represent only one of three levels at which social capital can be analyzed. Individuals build organizations and together those levels form a society. This section discusses the social capitals built by the actors on the three levels and how these social capitals are based on the fundamental needs and aims of these actors.

Organizations and Their Social Capital

Since analyses of and policies for innovation are focused primarily on organizations, it may be appropriate to start the discussion on this level. According to the policies based on modern innovation theories, the three types of organizations – firms, universities and government – should cooperate in order to meet the needs of the knowledge economy. Universities should provide the knowledge; government should provide favorable institutions and development resources; firms should provide resources and know-how for commercialization. However, a dilemma is that the three actor blocs are based on different principles of exchange, which are reflected in different rules of the game. Following Polanyi (1944) it can be argued that a firm bases its activities on a market principle where profit is a necessary ingredient. For public government, which has the power to collect individuals’ and organizations’ resources and redistribute them, the basic principle is redistribution. The third type of organization, the academy (or university), is for its part historically dominated by a third principle, viz. reciprocity – a mutual exchange of knowledge and ideas. Academy-produced knowledge is by tradition neither sold on a market nor taken from one actor and given to another, but exchanged and valued by equals (peers) without any losses.

It goes without saying that organizations with such important differences build social capital with very dissimilar networks connecting different types of actors and based on different norms and attitudes. As pointed out in Chapter 1, firms and

³ In a study of determinants of economic growth in the Swedish municipalities, Eliasson, Westlund and Fölster (2005) found that the importance of business-related social capital decreased with municipality size.
public government build their internal and external social networks with different ends in view. Private firms make their deliberate investment in social links to fulfill their basic mission: to earn money. Public government has a fundamental need to legitimize itself since it collects money to use and redistribute it. In order to legitimize its activities it builds social links with citizens and organizations. However, both in private firms and public government, unintentional social links emerge as a result of deliberate investment in economic, technical and administrative links.

In spite of the fact that the academy is financed in a number of different ways, it has an international, joint identity with missions, objectives and norms. This academy-internal social capital is an important reason behind the academy’s relative independence vis-à-vis other actors in society. It is on the other hand a potential obstacle to collaboration with organizations having other missions and social capitals.

These three types of organizations build social capitals deliberately and contribute to unintended, spontaneous social capital-building as well. Depending on the organization’s mission, certain norms, values and attitudes are developed, which in their turn govern the extension and allocation of the organization’s internal and external links.

Analogously to the increased complexity of innovation activities over time, discussed above, it can be argued that organizations’ social capitals have become more and more complex. The assembly line – the archetypical symbol for manufacturing industrialism – required few social skills of its workers, not even a common language. In contrast, work in a consultancy company of today requires ability to cooperate, build networks and even to have certain attitudes. People without this social expertise do not get access to the social capital of these companies of the knowledge economy.

<table>
<thead>
<tr>
<th>Activity</th>
<th>University</th>
<th>Government</th>
<th>Firm</th>
</tr>
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<tbody>
<tr>
<td>Education &amp; Research</td>
<td>O</td>
<td>(o)</td>
<td>(o)</td>
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<tr>
<td>Public infrastructure and service</td>
<td>(o)</td>
<td>O</td>
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<tr>
<td>Product development and production for profit</td>
<td>(o)</td>
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Table 7.1. The traditional activity of the three types of organization, O, and the activities expected by modern innovation policies (o).
distributed within the social networks have also become more composite. The same can be said about the academy. As long as the university employed a small elite of researchers and students, it was easy to maintain its identity, values and networks. With increased resources and increased demands from the resource-providers, the university’s tasks have multiplied, as have its networks.

Thus, the fact that the three types of organizations discussed are based on different missions results in different social capitals. These social capitals are an outcome of both intended and unintended investment. Over time, along with the development from industrial society to knowledge society, the social capitals of organizations have become more complex. Without considering the different missions and the differences in social capital of the three types of organizations, modern innovation policies prescribe that they should interact and create innovations. The problem is described in Table 7.1. The traditional activities of the types of organizations are marked with an O. The consequence of innovation policies is that actors of the three organizational types should partially expand their activities into the fields traditionally sustained by the other types of actors. Successful fulfillment of these expectations demands new strategies for combining the organization’s core activity, O, with the new activities (o) which, with few exceptions, it has not been involved with previously.

The theories behind the modern innovation policies are most likely based on empirical observations of a certain expansion of the organizations’ activities outside their traditional fields. There is some evidence, for example, that government in many countries is acting less redistributionally and with more of a growth orientation. Universities are increasingly facing a situation where they either have to cut back or act more entrepreneurially. As the knowledge economy expands companies experience stronger incentives to collaborate with universities. However, the traditional norms, values and networks, i.e. the existing social capitals of each type of organization, are formed in accordance with their traditional activity and not changed from one year to another. Thereby the established social capitals of the organizations constitute intangible obstacles to the implementation of modern innovation policies.

Social Capital of the Individual

The needs of an individual are different from those of an organization. A primary need of a human being is some form of safety. This influences many actions: work is not only an activity for reward but also a form of conduct which, through colleagues, contributes highly to social safety; in their leisure time people socialize with friends, raise a family, etc. In short: individuals construct every day a fund of social capital with relatives, friends and workmates. Relationships are built; values and norms are formed to create the necessary stability and safety in a world of uncertainty.

The social capital formed by individuals at their workplace falls into the category of spontaneously created organizational social capital. This social capital is not controlled by the organization, but as it is built on workplace relationships it
Social Capital on Three Levels

has a varying degree of (positive or negative) impact on the organization’s innovation potential.

From the traditional perspective of economics it is hard to find any arguments for the impact on innovation of the social capital which individuals build during their leisure time. By definition, working time is production but leisure time is consumption, and for that reason there is more cause to expect innovations to happen on working time. However, as was stated in the introduction to this chapter, traditional economics may not be the best tool for analyzing innovation and economic transformation. Moreover, it can be hypothesized that the sharp dichotomy between production time and consumption time (work and leisure) of the industrial economy is increasingly being dissolved in the knowledge economy. Informal discussions, information exchange, evaluations, negotiations, etc associated with production activities go on during people’s leisure time. This would mean that individuals’ social activities during their leisure time contribute to the formation of a place surplus (see Chap. 4) which may indirectly have an impact on the development of innovations, their commercialization and diffusion.

Concerning the individual’s social capital, we should also note that some of the social capitals created by groups of individuals are indeed destructive of innovation and growth. One obvious example is the social capital of members of criminal gangs. Another example is what are sometimes called “unemployment cultures” in deindustrialized or low developed areas. Both are examples of social capitals which have emerged from fundamental needs for safety and which in the given situation are experienced as positive for the individuals concerned – without contributing to positive innovations or economic growth.

Society’s Social Capital

We have established that social capital is built by organizations and individuals, i.e. units with some kind of autonomous power of decision. Organizations also include public government. However, society in its general meaning, consisting of all individuals and organizations, has no deciding power of its own. In what sense is it then possible to talk about society’s social capital?

The answer is that society’s social capital can be described as the lowest common denominator of all the networks, norms and values existing among all individuals and organizations in society. Thus, a homogeneous society has a “strong” societal capital while a more heterogeneous society has a “weaker” social capital.

One example of a strong societal social capital is the Swedish “local industrial community spirit” (bruksanda) which characterized small and mid-sized localities with a single dominant manufacturing industry during the industrial epoch. A spirit of common interest, formed through demands and counter-demands, resulted in the local factory taking responsibility for the welfare of their employees and their families in exchange for the loyalty of the families to the local factory. Other enterprises, apart from the necessary local service businesses, were potential competitors for the labor force and were regarded as unnecessary. As a consequence, entrepreneurship and the establishment of new enterprises were not supported by
the norms and values of the local industrial community spirit. Consciously or subconsciously both factory and workers opposed the emergence of new economic actors. During Sweden’s late industrial era, the local industrial community spirit served as a local expression of the ideology behind the successful Swedish Model of stable growth and national understanding. On the other hand this spirit has been a critical problem for these communities during the structural adjustment since the 1970s. When the context changed, the communities needed actors to renew both the local industrial structure and the local social capital. However, the local industrial community spirit has largely blocked the emergence of such agents of renewal.

The Swedish Model, of which bruksandan was one component part, had its glory days from the 1930s to the early 1970s. Since then, Sweden has become globalized and the knowledge society has replaced the manufacturing-industrial society. Sweden has also become much more diversified in a number of respects, not least concerning lifestyles. This has triggered the formation and inflow of social capital on a huge scale, involving young people, immigrants, people in new professions, etc. In this sense there is certainly no shortage of social capital in Sweden. However, on the societal level, be it a city, a region or the whole nation, the social capital has been weakened, with fewer common denominators than during the days of the Swedish Model.

This conclusion is well in line with Putnam’s (2000, 2001) finding to the effect that the social capital of the U.S. – and probably also of other parts of the developed world – has been weakened. But Putnam’s measurements of social capital in the U.S. are per se a good reason to question his earlier claims (Putnam 1993a) of a general correlation between social capital on the societal level and economic development. In spite of several decades of weakened social capital (by Putnam’s measures), the U.S. experienced remarkably strong economic growth in the 1990s – a circumstance that stands in complete contrast to what Putnam (1993a) found in his study of Italy up to the 1970s. The reason is probably that Putnam’s measures of social capital are focused on the homogeneity of society. Measured in this way, the American regions that scored highest were homogeneous, stagnating, depopulating regions with limited immigration during recent generations. Consequently, expanding metropolises such as Los Angeles showed a very low social capital by Putnam's measures.

A reasonable hypothesis could be that Putnam’s homogeneous social capital in general stood in a positive, mutual, self-reinforcing relationship with economic growth during the late industrial period, which in most developed countries (such as Italy) lasted up to the 1970s but in e.g. Japan lasted until about 1990. During this period, economic growth was generated by mass production based on improvement of old technologies through increased capital intensity of production, without any need for pioneering innovations. The decline of industrial society coinciding with the emergence of the knowledge society has changed these conditions dramatically. Computerization and other applications of digital technology along with other emerging technologies have brought groundbreaking innovations back as an essential ingredient for growth. In other words: new groundbreaking combinations of production factors have once again emerged as important.
It can be assumed that the amount of “new combination” is dependent on the quantity and quality of production factors, including the bearers of human capital. This would mean that societies with a certain degree of diversity would favor the emergence of new combinations. In that case a social capital of some degree of heterogeneity would be best suited for the current stage of the knowledge society. Since metropolitan regions are often the most diversified, this may explain why they are normally the centers of growth in the knowledge economy. However, diversity without coherent forces would end up in anarchy. Other characteristics, such as mutual tolerance, are needed to make fruitful use of diversity. This line of reasoning corresponds to that of Florida (2002).

Even though Florida (2002, 2005) avoids using the term social capital – in order to distance himself from Putnam (1993a, 2000) – his contributions center on the role of social norms and values, the networks that are based on them, and their impact on regional dynamics. However, Putnam’s and Florida’s theories about the influences respectively exerted over regional growth by homogeneous social capital and by diversity and tolerance do have this much in common, namely that a large number of links in the cause-and-effect chain are only assumed but not investigated. Moreover, a weakness in both Putnam’s and Florida’s hypotheses is that they only deal with the social capital of civil society. The social networks and norms of companies and the other actors of clusters and innovation systems are remarkably absent from their hypotheses.

Public Policies for Economic and Social Innovations

Policies on Different Spatial Levels

So far in this chapter, innovations have been treated solely from an economic perspective. However, analogously to Chatterjee and Lakshmanan (2005), who distinguish between economic, social and political entrepreneurship, we can also make a distinction between economic, social and political innovations. In the remainder of this chapter we deal with the first two of these types of innovation, viz economic and social.

In the previous section we identified three sources of social capital: individuals, organizations and society. If social capital has come to play an increasingly important role in innovation as the innovation system have become more complex, there are obvious reasons for asking what public policies can do to encourage the formation of social capitals with the most favorable possible characteristics for nurturing innovation and growth.

Starting with the social capital of individuals, it can be argued that the individual as a member of a family, neighborhood and leisure clubs generally gets connected to, and forms his/her own links to get connected to, social networks which accord with his/her basic preferences. From the perspective of innovation and growth there are often no motives for public policies to improve the social capital
of individuals. However, there are many examples of social networks and values that diminish the potential for innovation and growth. Networks based on ethnicity, religion, neighborhood, etc. may on the one hand act as critical support structures for their members’ economic activities. Businesses based on ethnicity can often exploit particular niches and often have low transaction costs. On the other hand, these networks with their particular norms and values may simultaneously lead to lock-ins in low-productivity activities and non-efficient utilization of resources. Thus, there may be good arguments for policies aiming at creating new links to improve access to new networks for certain categories of individuals.

As regards organizations, we have already shown that they are the prime builders and maintainers of their own social capital. Concerning public sector organizations’ social capital, it is self-evident that this is governed by public policies. In the case of the social capital of firms and other organizations independent of government the influence of public policies is much smaller, but there are laws and regulations which affect the activities of organizations, their social capital-building included.

From the perspective of innovations and growth, what would be the motives for public policies aimed at influencing organizations’ social capital? The answer lies in the increased complexity of innovation processes discussed above. Innovation is no longer dependent solely on the combination of production factors but also on actors. The role of policies in this respect is in general terms to facilitate actors’ interaction – individuals’ and organizations’ interaction with government included. The question is just: how?

On the national level, the role of governmental policies is mainly indirect. Government can establish good relations with national organizations and leading individuals; change and adapt laws, regulations and taxes; create platforms and gather actors, etc., thereby contributing to improvement of the “innovation climate.” More direct effects on innovation may issue from direct initiatives and projects with selected actors. On the other hand, such direct initiatives from above have a higher risk of failure through lack of information and (tacit) knowledge possessed by other actors.

At regional and local level, government can play a much more direct role in getting the actors of innovation together and promoting good relations between them, i.e. “creating” and supporting clusters. However, a problem is that the leading actors of today are not necessarily those of tomorrow. Companies which have their expansion phase behind them may also have their most innovative phase behind them. The same holds for large established organizations. Thus, governmental innovation policies at regional and local levels may easily fall victim to path dependencies and promote a social capital that opposes innovation. Schumpeter’s comments on the negative reactions of the social environment towards entrepreneurs and innovators, quoted in Chapter 6, have great relevance here too.

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4 The post-war Japanese National System of Innovation was according to Johnson (1982) and Freeman (1987) a successful example of national innovation policies with such direct effects on innovations.
Schumpeter’s arguments are of course based on the fact that innovations often bring *creative destruction* that strikes certain actors. This circumstance makes governmental innovation policies at regional and local level more complicated than they are normally assumed to be.

However, perhaps a bigger problem with current policies on economic and social innovation is the above-mentioned fact that the three types of actors have different missions, different core-activities and consequently different norms and values. Innovation policies are normally based on the assumption that the actors in the desired cooperation have a common denominator large enough to motivate the investing of resources in long-term cooperation. Investment of these resources may in itself be seen as a proof of that common denominator, and innovation policies seem to be built on the assumption that the projects strengthen this common denominator automatically. The issue of the cooperating actors’ social relations and norms and values is normally not considered in innovation and cluster policies. Instead, these issues receive attention mainly in social and welfare (i.e. redistribution) policies. This problem is illustrated by three Swedish examples.

**Three Swedish Examples**

VINNOVA, the Swedish agency for innovation systems, was launched in 2001 and has an annual budget of approximately $140 000 000. A substantial part of its resources are allotted to various R&D programs. One of these programs, VINNVÄXT, gives up to 50% support to selected long-term (10 years) regional innovation projects. Among the selection criteria are two factors which can be linked with relations and values: the leading actors of the region should support renewal and there should exist a shared vision. A fundamental idea of the program is triple helix-cooperation between the three actors: business, government and academy. However, the problems inherent in the different missions, norms and values of the three actors are not considered.

In the projects that so far have been granted assistance the perceived common denominator is reflected in the actors’ investment of their own resources. Apart from investment in the projects’ own trademarks and information, there are very few features of relation-building and other activities that can be compared with individual firms’ investment in corporate culture. One exception is the project for the biotech cluster in Uppsala, which contains ideas about pub evenings for actors in the biotech sector. The program is simply based on the idea that the common denominator exists, that it is sufficiently strong in itself and that there is no need for particular investment in social relations, joint norms and values for the actors in the projects.

A second example, a Metropolitan Policy Program for deprived urban neighborhoods in the three biggest cities, was launched by the Swedish government in 1998. The overall goals of the policy are to improve the prospects of the Swedish metropolitan regions for long-term sustainable growth, primarily by promoting new job opportunities, and to eliminate social, ethnic and discriminatory segregation. It might be expected that in order to achieve these goals, action would
be taken to encourage local innovation and entrepreneurship. However, hardly any projects on these lines have been launched. Instead, a large number of other projects have been initiated in various areas. A substantial proportion of the projects concentrated on issues related to social capital, aiming for example to strengthen the cohesion of the neighborhood by changing attitudes and building links between different groups and individuals. Instead of building social capital associated with production, the metropolitan policy has focused on social capital associated with consumption, i.e. people’s leisure, living and culture. Instead of building links between the deprived neighborhoods and their inhabitants and the rest of the metropolitan regions, activities have concentrated mainly on the purely local neighborhoods.

The third example is the National Delegation for Regional Cooperation on Higher Education, active 2002-2004. The delegation gave financial and supervisory support to projects whereby universities, public sector bodies and companies collaborated in the development of new education and training courses adapted to the regional labor market, and also to more general “platform-building” for possible future collaboration between the three actors. Even though social capital-building was not an explicit aim of the delegation, the official evaluation of the delegation’s work concluded that in practice the delegation supported the forming of new social capital through the creation of new relationships between regional actors. The evaluation found that this implicit aim was successfully fulfilled in many projects, but that in many cases there was great uncertainty as to whether the collaboration would continue when the project grants were exhausted (Westlund, Deiaco and Johansson 2005).

The three examples illustrate the dilemma of current sectoral policies: on the one hand growth policies through cluster- and innovation policies, without understanding of the role of social networks, norms and values; on the other hand policies aiming at growth and social equalization through building local social networks and joint norms and values, while lacking understanding of the role of innovation, entrepreneurship and the intraregional labor market; on the third hand support for short-term projects without any strategy suggesting how to develop the newly established networks of collaboration.

**Concluding Remarks**

Innovation has become an increasingly complex process with an increasing number of interacting actors involved. One of the features which facilitate this interaction is positive social relations between the actors. In the wake of the emergence of the knowledge economy new theories, such as those concerning clusters and regional innovation systems, have stressed the region as the spatial level at which innovation processes take place.

The actors of the economy mainly form their social capitals themselves. Whereas most actors act solely in accordance with their own needs, government is the only actor that must take the “public interest” into consideration. Thus, gov-
ernmental policies have a central role in the forming and reforming of regions’ social capital. The impact of this circumstance has so far fallen mainly on social and welfare policies, but policies for economic transformation and growth have been influenced very little.\textsuperscript{5}

Thus one conclusion is that research into the social capital generated by the actors in the innovation system would shed new light on critical aspects of these processes. One of these critical aspects is that the three actor blocs of innovation systems and triple helix have different missions and base their activities on different principles. The fact that government today is already launching policies for clusters, innovation systems and triple helix in itself constitutes a strong argument for such research.

\textsuperscript{5} The fact that policies for social capital focused on social policies in a broad sense is also reflected in Halpern’s (2005) extensive discussion of policy implications of social capital.
8 Why Compare Sweden, Japan and USA/California?

Three Countries in the Global Knowledge Economy

For a study that aims to compare social capitals in the ongoing transformation from a manufacturing-industrial society to a knowledge society, there are certain advantages in comparing countries/states at a similar economic and technological level. Despite many differences which will be discussed below, Sweden, Japan and the U.S. are highly developed industrial economies which in many respects are among the world leaders as regards development of the knowledge economy. The three countries have figured among the top ten in the National Innovation Index ever since 1980, the first year of measurement. They are among the global leaders in terms of e.g. the proportion of scientist and engineers in their workforce and R&D spending as a percentage of GDP (Institute for the Future 2000). They are also among the leading countries in their development of information- and communication technologies.

In terms of economic growth, Japan showed remarkable development in the period 1950-1990, particularly up to 1970, but even during the latter two of these decades Japan outperformed both Sweden and the United States. As shown in Figure 8.1, this pattern changed after 1990, when the U.S. economy took the lead. After two decades of slow GDP growth, the Swedish economy boomed during the second half of the 1990s. Explanations of this new growth in America, Sweden and other countries have cited the rapid development and applications of information- and communication-technologies in particular and the knowledge economy in general.

From a broader societal perspective too, there are large differences between the three countries, deriving from the different historical development paths of Europe, North America and East Asia. Industrialization in its classical form took place in Europe, and Europe was also the part of the world in which the class struggle between labor and capital became most accentuated. Capturing the state power by violence, crushing the political enemy and establishing a dictatorship to create (temporal) social peace became the “solution” in several countries (e.g.

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1 The National Innovation Index was created by Michael Porter and Scott Stern for the U.S. Council on Competitiveness. The index measures innovation capacity and includes R&D expenditures, patenting activity, openness to international trade and other variables (Institute for the Future 2000).
Russia, Italy, Germany, Spain). However, even before the Russian revolution of 1917, the social democratic parties of Western Europe started to develop strategies for transforming society without an armed revolution. After World War II, the aim was reformulated over time to mean transforming the state to a welfare state within the framework of an existing market economy. The welfare state would solve the social problems caused by industrial capitalism. Nowhere in the world was this vision implemented so thoroughly as in Sweden. At the turn of the millennium, Sweden still led the world in government expenditure as a percentage of GDP (60%), with Japan at slightly over 35% and the U.S. slightly below 35% (OECD).

The Welfare State

Thus, Sweden is the country that has developed the industrial society’s welfare state the furthest. Sweden does not represent a European average, but rather the most extreme example of a European idea-tradition of the “good state.” This means that we in Sweden, more than in other countries, should be able to observe certain problems in the transformation of social capital from industrial society to knowledge society. What kind of social capital has this large public sector created? What impact has the large public sector had on the social capitals of the pri-
vate sector and the third sector? How compatible are the social capitals of the three sectors with the needs of the emerging knowledge economy?

**The Land of Opportunity**

The industrialized United States of America were built up by generations of European immigrants during the 19th and early 20th centuries. To the U.S. came young men and women, determined to create a better future than it was possible to achieve in their native countries. They had left the combination of landlord power, rigid class barriers and the supremacy of established churches in Europe. In the U.S. it was not your background that governed your future. These opportunities created a mentality, a social capital and a behavioral pattern different from what existed in Europe. The pre-industrial slave economy of the American South came increasingly into conflict with developments in the North. The civil war solved this political and economic-structural conflict.

Individual freedom but also a strong civil society and a significantly smaller public sector than in Europe became central features of the American industrial society. However, as the American welfare society developed after World War II, the public sector increased. After the industrial crisis of the 1970s, many of the individual states even developed industrial policies with European features such as subsidies to newly establishing industries. California, the biggest state, has resisted these “Europeanizing” tendencies to a certain extent. More than the other states, California represents the American dream in which fame and fortune are the reward of the winners. California is still an important immigrant state but the young immigrants now working hard to make their fortune there come from Asia and Latin America. For several decades California has been the world-leading center of information technology and the state’s young biotech industry is among the most advanced in the world. Just like Sweden compared with the rest of Europe, California does not represent the American average state but rather the state that has developed and utilized the archetypical American characteristics most successfully.

Compared with other states and countries, we in California should be able to observe the transformation of social capital from industrial society to knowledge society in a competitive society where traditions and the past put relatively few restrictions on the actors. What kind of social capital have these characteristics created? What advantages has California in terms of social capital in the transformation to the knowledge society, compared with the other two countries? What kind of problems have been observed during this transformation?
The Asian Forerunner

The history of Japan has few similarities with Sweden’s and California’s. A hundred and fifty years ago Japan was a very backward country in economic respects. After the Meiji restoration, an industrial revolution was initiated from above, based on intimate collaboration between the state and the growing industry groupings. In contrast to the general European pattern, the Japanese industrial revolution incorporated and adapted traditional Japanese values and culture. Industrialization in Japan became a nationalistic duty up to 1945 and a national endeavor under democracy. While “more European than Europe itself” in the sense of government’s influence over industrial development, the size of Japan’s public sector is just slightly larger than that of the United States’.

On the one hand “groupism” and informal networks, on the other hand strict hierarchies in all sectors of society characterize Japan even during the transformation to a knowledge economy. While the manufacturing industries of Western Europe and the U.S. were severely hit by the crisis during the 1970s and some sectors by its aftermath in the 1980s, Japanese industry was to a great extent able to avoid the crisis by more efficient production processes, improvements of existing techniques, and by innovation, the latter mainly in the consumer electronics sector. This meant that Japan up to 1990 developed the most advanced industrial economy in the world. It is highly probable that the specific social capital build-up in Japan was what made this late industrial boom possible. However, one consequence of the fact that Japan developed the industrial economy to perfection and got its industrial crisis almost twenty years later than Europe and the U.S. could be that its current social capital is less adapted to the needs of the knowledge economy. To what extent is this interpretation correct? What features of Japanese society act as obstacles to the knowledge economy’s growth? Or are there any arguments suggesting that Japan – as it fashioned its special style of industrial society, blending its own traditions with foreign institutions and knowledge – will succeed in finding its own way to the knowledge society?

What Aspects of Social Capital Should be Compared?

Based upon the analysis of the enterprise-based social capital in Chapter 5, three aspects of social capital were selected for comparison. However, as the comparison is based on states/countries and not on individual enterprises, the aspects selected for investigation are somewhat broader than the components listed in Table 5.1. The focus lies on certain aspects of the general relational systems, of which the individual enterprises are parts.

The first aspect is relations on the labor market. This includes both employer-employee relations in the individual enterprise as well as what are usually called industrial relations, i.e. relations between trade unions and employers and their federations. In the individual firm, employer-employee relations are the core of the internal social capital of Table 5.1, while industrial relations and norms on the
labor market in general belong to the environment in which the firm forms its social capital. Employer-employee relations and industrial relations of very different characteristics have been cited as an explanatory factor underlying Sweden’s strong economic growth of 1945–70, Japan’s industrial miracle of 1945–90, and the growth of the American Sunbelt after 1980. However, relations and norms between employers and employees in the individual firm or between the parties on the labor market in general, are a field in which there are large differences between the three countries. Chapter 9 aims to shed some light on the question whether quite different labor market relations really can help to explain economic growth.

The second aspect centers on relations and norms associated with innovations and economic-structural renewal. As noted in Chapters 4–7, a number of concepts fall into this category: innovation systems, R&D systems and triple helix, and also entrepreneurship. These concepts are principally associated with the production-related social capital of Table 5.1. The actors in the processes of structural renewal – enterprises, capital institutions, government, and universities – have differing roles and importance in the three cases studied. Chapter 10 aims to give a picture of how relations, norms and institutions of the systems for economic growth and structural renewal were formed under the industrial economy, and of the challenges which the knowledge economy presents to these systems.

The third aspect concerns the civil societies of the three countries. Putnam (1993a) stresses the importance of the civil society, not only for a healthily functioning democracy but also for economic growth. The basic argument is that a strong civil society fosters trust between its members – and trust lowers the costs of transactions, credits, information, surveillance, etc., thus contributing to economic growth. From the firm’s perspective, the civil society is strongly connected to the environment-related social capital of Table 5.1. However, the impact of the civil society on the business world is not self-evident and it probably varies for different types of firms. In the tradition of Putnam, civil society’s strength is often measured in membership and number of non-governmental or non-profit organizations (NGOs and NPOs). Measured in this way, the size and structure of the civil societies differ between the three countries studied. Chapter 11 gives an overview of these differences and discusses civil society’s role in economic development.

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2 As is the case with many other societal concepts, the terms “civic society” or “civil society” has no single definition. For a comprehensive discussion of the concepts, see Ehrenberg (1999). In this study we focus on the “civil society” concept and use the working definition adopted by the Centre of Civil Society of the London School of Economics: “Civil society refers to the set of institutions, organisations and behaviour situated between the state, the business world, and the family. Specifically, this includes voluntary and non-profit organisations of many different kinds, philanthropic institutions, social and political movements, other forms of social participation and engagement and the values and cultural patterns associated with them.”

(http://www.lse.ac.uk/collections/CCS/what_is_civil_society.htm 2004-01-08).
9 Social Capital Expressed in the Form of Labor Market Relations

Labor Market Relations in Sweden

Up to the beginning of the 1930s the Swedish labor market was characterized by severe class struggles that reached their climax with the shooting of five striking workers in 1931. This became a signal for misgiving and both sides realized the need for a new strategy. In 1938, after two years of negotiations, Sweden’s central employers’ federation and the federation of blue-collar unions signed the “Saltsjöbaden agreement” – named after the location outside Stockholm where the agreement was signed. The agreement was formally merely a settlement of how negotiations between the parties were to be conducted. More important was the “spirit” it created which, in principle, meant that the trade unions accepted the capitalistic production system while the employers accepted the trade unions as an equal negotiating party and both sides held back from conflict in favor of negotiations.

According to Rothstein (2003), there had been institutionalized cooperation between the parties even during the many years of conflict and this was an important reason for the signing of the agreement only seven years after the shootings. These institutions were not created by the parties of the labor market but by the Swedish state, which by the early 20th century had already started to accept the organized working class as a legitimate part of society. In this respect Sweden differed from the larger European states (and the United States). These institutions contributed substantially to the creation of trustful relations between the parties.\footnote{Nycander (2002) also came to similar conclusions.}

With the exception of a communist-dominated national strike of metal workers in 1945, labor market relations in Sweden were peaceful until 1969 and conflicts were solved by negotiation. Not only were the relations between the central trade union organization and the central employer’s association trustful and peaceful, the contacts between the social democratic government and the leading industrialists were also mutually convivial. In the 1950s an active national labor market policy was implemented with the aim of moving labor out of low-productive, stagnating branches such as the textile industry and into the expanding metal industries. Another important feature of the Swedish labor market model was its centralized, top-down nature. Collective bargaining between the federation of blue-collar trade
unions and the central employers’ association was the rule. Agreements were made at national level for all industries and implemented at local level.

Thus employer-employee relations in individual enterprises were fashioned after a centralized, collective model, with the state playing an active role in reducing frictions on the labor market. The years 1945-70 were characterized by a very rapid growth of the Swedish economy. However, the Swedish model for the labor market had its limitations. It was much of a “one-size-fits-all” model. In retrospect it is easy to characterize it as a model that promoted growth in the established, big industries within the existing business structure. Growth of new enterprises in new sectors seemed unnecessary as long as growth in the established sectors continued. The model and its spirit had no solution to the structural crisis that hit Sweden in the 1970s.

The problems for the Swedish labor market model coincided with the industrial crisis of the 1970s but another important factor underlying less trustful industrial relations was the radicalization of the Swedish Social Democratic Party and trade unions. The 1970s and early 1980s were characterized by strong radical beliefs that planning, legislation and central “wage earners’ funds” would guarantee a national society without business cycles, crises and social problems. A number of labor market measures were introduced, increasing job security among other things. The most far-reaching step was the “wage earners’ funds” that were intended to be built up out of a defined share of the companies’ profits to form a fund with which to buy shares in the companies themselves. In the long run, this would lead to some sort of “socialization” of the enterprises.

This radicalization created a strong anti-socialistic resistance among employers, particularly among small enterprises. The Saltsjöbaden spirit faded away and the dominant influence which the federation of trade unions and central employers’ association had enjoyed on the labor market at national level ceased to exist in the 1980s.

Since then, relations on the Swedish labor market have undergone a significant transformation. The most important feature of this process is decentralization and even individualization of bargaining and agreements. Relations on the labor market are much more extensively formed within each individual enterprise. This development has mainly taken place without resistance from the trade unions, which have adapted smoothly to the new conditions. Trade union membership density is still very high in Sweden\textsuperscript{2} – 82 \% of the workforce – a fact which can be partly explained in terms of the view that membership is a type of “insurance” in that the union watches your interests during reorganizations or cutbacks. Another explanation is that non-membership is regarded by fellow employees as unacceptable free-rider behavior.

Hence, the centralized top-down system which permeated the labor market down to the individual workplace is now history. Employer-employee relations have gradually been decentralized and individualized. However, government still tries to play an active role as administrator of the comprehensive social security systems.

\textsuperscript{2} See Nelander and Lönnros (2000).
As in other developed countries, working life in Sweden in the early 21st century is characterized by increased responsibilities for the individual employee or groups of employees. In this perspective, the decentralization and individualization of labor market relations in Sweden can be interpreted as an adaptation to more knowledge-based production processes in which the individual employee, with his unique skills, is far less interchangeable than he was in the industrial production processes. If this is correct, the social capital expressed in relations and attitudes on the Swedish labor market has taken some significant steps towards facilitating further development of the knowledge economy.

### Japanese Labor Market Relations

Several scholars have adduced cultural-historical explanations of the particular labor market relations in Japan. According to Zhang (1998) the industrial structures of Japan are influenced by a traditional group culture. Lifetime employment, the seniority wage system, enterprise-based unionism (company unionism) and quality circles are some of the postwar expressions of this at enterprise level. The large business groups, the keiretsu, with intimate relationships between industrial enterprises, banks and insurance firms, may be regarded as another expression of Japanese group culture. On a national level, “groupism” has resulted in the relative absence of a power center in society: “...bureaucracy, business and Liberal Democratic Party (LDP) have established an intimately interrelated triangle.” (Zhang 1998 p. 142).

Zhang (1998) emphasizes that Japan seems to have had a capacity for adapting its group culture to societal changes. On the one hand the Japanese group requires total devotion of its members and a high capacity for cooperation. On the other, an individual can change group when circumstances change. It is groupism that persists, not necessarily the particular group. The celebrated Japanese sociologist Tadashi Fukutate, concluded concerning the development of the old Japanese ike family system that “the workplace has been the one area in postwar Japan where familialistic groupism has remained” (Fukutate 1989 p. 215).

Lifetime employment and the seniority wage system are generally considered as a post World War II phenomenon caused by shortage of skilled labor, and it was also during this period that the great expansion took place. From popular depictions of the Japanese economy it is easy to get the impression that lifetime employment is the rule. However, only about one third of the workers in the private sector are lifetime-employed.

These cornerstones of Japanese employment relations have their pre-history. During Japan’s industrialization skilled workers came from craft trades. However, compared with craft trades, jobs in industry were of a much more repetitive character. The skilled craftsmen “reacted by demanding increased employment security from factory owners in the form of lifetime employment and payment based on length of service in order to ensure the maintenance of their standard of living” (Keegan 1995). The majority of skilled workers up to World War I were provided
by a master craftsman. This *Oyakata* system had a monopoly of skilled labor and the master craftsmen became middlemen between laborers and factory owners. After World War I the shortage of skilled labor forced the enterprises to recruit directly and train the workers within the factory system. The *Oyakata* resisted this, but some of the master craftsmen joined the industries in promising lifetime employment and payment based on seniority (Keegan 1995).

The third Japanese peculiarity in the field of industrial relations, viz enterprise-based or company unions, experienced a great boom during the early years after World War II under the Supreme Command of General MacArthur. Emancipation of workers was an explicit feature of the democratization policies of the Allies. The easiest way of fulfilling this demand was to form unions in each factory, a measure facilitated by the earlier existence of wartime factory production committees (Keegan 1995; Kuwahara 1993). The relation between company union and company has been that “a veritable partnership in goals, methods, and means has been negotiated and renegotiated … and this accomplishment has depended on contributions and initiatives from both labor and management…. Reciprocity hinges on balance, equity, and fair recognition; these can be encouraged and enhanced but they cannot be mandated or legislated…. the post-war environment of industrial relations has evolved in the direction of a kind of organic solidarity between labor and management. Interdependencies bind the two” (Fruin 1992 pp. 174-5).3 Dore and Sako (1998) characterize Japanese firms as learning organizations and underline the importance of attitudes: “A lot depends on attitudes – the modest acceptance that everyone has much to learn, the acceptance by all supervisors that teaching is a part of every supervisory role. Those attitudes, in turn, are much dependent on the social characteristics of Japanese enterprises which, as compared with enterprises in Anglo-Saxon countries, are rather more like communities and rather less like markets …” (1998 p. xix).

There are good arguments for saying that the enterprise-related social capital expressed in employer-employee relations was among the factors contributing to the very rapid economic growth in Japan in 1945-1990 and in Sweden from the mid-1930s to 1970. The industrial crisis of the 1970s caused severe structural problems in Sweden, which are still not solved in certain regions. The employer-employee relations in existing industries were not of much use since growth was dependent on new industries in new sectors. It is almost self-evident that the good employer-employee relations in Japan contributed to its continued industrial success until 1990; but after that, this social capital, built up during the manufacturing-industrial age, was unable to prevent the recession.

Japan is probably the country where industry has applied the principles of industrial management most extensively and developed them furthest. The employer-employee relations that were developed in Japan are very different from those of the United States. However, research by e.g. Campbell (1995) shows that the attitudes of Japanese and Americans are far more similar than might be ex-

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3 This description shows the strong enterprise-internal social capital in a Japanese company, but it could in fact be a description of the social capital of a company in the Swedish local industrial districts during the age of industrial society!
pected. It is their behavior that is different because of differences in structures and organizations. The operational principles of Japanese firms “appear designed to foster loyal behavior … Techniques that Japanese managers typically use are not mainly aimed at workers’ attitudes. Rather they are aimed at behavior … The relationships among these [just-in-time assembly line] workers have been changed in a way that forces the desired behavior, regardless of whether their attitudes are happy and cooperative or quite surly. The same technique can work with relationships among companies” (Campbell 1995 pp. 315 and 317). This can be interpreted in two ways. On the one hand, the management principles of Japanese firms – internal and external – seem to constitute highly advanced forms of industrial management rather than being adapted to the knowledge economy. This should mean greater problems for Japan to adapt easily to the needs of the knowledge economy. On the other hand, if Japanese manufacturing management consists of compelling a desired behavior, adaptation to more knowledge-oriented production processes is – in this respect – “just” a question of management, i.e. developing a groupism for the knowledge economy.

As in other countries, much attention has been given to the organized relations between trade unions and enterprises in Japan. However, trade unions have been organized mainly in manufacturing industry and only the permanently employed are normally accepted as union members. With the decline of manufacturing industry and an increasing proportion of part-time and temporary employees also in this sector, the proportion of union members in the workforce was only 20.7% in 2001.

Today, in the early years of the new millennium, it seems clear that lifetime employment and the seniority wage system are slowly being loosened up and replaced by more flexible systems. The benefit of having a permanent workforce was obviously great and it was worth while to retain its loyalty through economic incentives during reindustrialization after World War II and the ongoing stages of industrial progress. The companies’ in-house education, featuring on-the-job training and job rotation, secured a continuous flow of learning from older to younger employees and an accumulation of knowledge and skills within the company. However, the seniority system seems to have tended to discourage innovation and risk-taking, qualities needed in structural transformation periods. Studies of Japanese companies indicate that the seniority system promotes employees who do not fail at their tasks while those who are willing to take risks are generally not promoted (Ellington 1995). A system built for established sectors in stable growth periods is not adapted to periods with new sectors and rapid structural changes.

Today, Japan’s structural problems, such as the inflexible labor market, the dominance of old, large companies, lack of entrepreneurship, senior wages in excess of labor productivity, etc. put hard pressure on reforming these institutions into which companies and employees invested so much social capital during the industrial era. Two of the best-known institutions embodying industrial society’s employer-employee relations in Japan no longer correspond to the needs of either the companies that have created them or of the Japanese economy.
However, other features of the Japanese employer-employee relations system, such as the in-house education with on-the-job training and job rotation, have contributed to the successful combination of individual learning and organizational learning that has characterized Japanese industry. It has been argued, probably correctly, that the emphasis has been on organizational learning at the expense of individual learning and creativity (see e.g. Cole 1995), but the most modern western management techniques, such as empowerment management, have undoubtedly been inspired by Japanese experiences.

The task can be formulated as being not only to change relations, attitudes and their institutional expressions within the given structures but also to retain the many elements that have a development potential and simultaneously make the necessary changes in the social capital and its institutional expressions to be able to form an economic structure that promotes new businesses and new sectors of the economy. Changing institutions and relations on the labor market and in the enterprises is a necessary but not a sufficient prerequisite of these structural changes.

**Labor Market Relations in the U.S. and California**

More than perhaps in any other developed country, employer-employee and industrial relations in the United States have been shaped in accordance with laissez-faire ideals. Trade unions have generally encountered very stiff opposition from employers, and in contrast to e.g. Sweden, the government has been hostile to trade unions over long periods, as they have been considered competitively restrictive. In the United States the government did not establish any institutions where trade unions and employer organizations might meet and slowly build relations of respect and trust. In this environment of resistance, the American trade unions became considerably more militant organizations than their Swedish and Japanese counterparts.

Union membership was at a high around 1950 with 33% of the workforce in the peak year 1953. As late as 1975 it was 28% (Putnam 2000). With decreasing employment in manufacturing and strong employer resistance in many new sectors, union membership density has steadily decreased since 1975 and was 14% in 1999 (Nelander and Lönnros 2000). In 2001-02 almost half the union members in the U.S. were working in the public sector or in health care. However, union density varies strongly between different parts of the U.S. In 2001 New York topped with 27.7% while the lowest density was found in North Carolina with 4.3%.

American companies have none of the institutionalized solutions that were developed in Sweden and Japan, which are usually considered to have made great contributions to their economic growth. Neither the trustful relations with trade unions at local level, job security for their employees, nor advanced organizational learning characterize American companies. However, this does not seem to have had any negative effects on economic development after World War II, and during the 1990s the U.S. has outperformed both Europe and Japan. Has this happened
because or in spite of labor market relations? Can one type of labor market relations contribute to growth in one cultural context and another type of relations help growth in another?

First it must be stressed that having hostile attitudes towards trade unions is not the same as having hostile relations with employees. But instead of building relations with their employees as a collective, American companies have focused on the individual and in particular on management officers. Instead of concentrating on job security and organizational learning as measures to promote competitiveness, American companies and their employees have laid stress on rewarding individual initiatives and efforts. The term “Human Resource Management” represents not only an academic sub-discipline but also the predominating approach to labor market relations in the U.S. The competitive but replaceable individual has been the key to competitive companies. On a labor market with a traditionally high turnover, American companies have focused on strong management and replaceable labor. This can be illustrated by a comparison of American and Japanese approaches to disseminating best practices within the company, which is shown in Table 9.1.

Table 9.1. American and Japanese approaches to spreading best practice in the company.

<table>
<thead>
<tr>
<th>Characteristic U.S. approaches</th>
<th>Characteristic Japanese approaches</th>
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<tr>
<td>Focus on individual learning for selected (mainly management) employees; assuming it is translated into organizational learning</td>
<td>Focus on organizational learning through standardization and improvement routines</td>
</tr>
<tr>
<td>Reliance on formal training</td>
<td>Reliance on on-the-job training</td>
</tr>
<tr>
<td>Reliance on hierarchical structure to identify and diffuse best practice</td>
<td>Reliance on peer-to-peer learning</td>
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Thus, the American model of employer-employee relations is much more of a pure market model than its Japanese (and Swedish) counterparts. Superficially, the American market model seems to have been most successful in nurturing general economic growth in the emerging knowledge economy after 1990. However, without detailed examination it is not possible to say how much of the American growth is caused by rationalization and cost-cutting in mature sectors and how much by growth of the knowledge economy. Moreover, it can be questioned to what extent the knowledge economy has adopted the employer-employee relations of the traditional American model. A possible hypothesis is that U.S. industrial companies have been good both at traditional rationalization and at adopting new technology to traditional production, while the same time the high-tech sector has been able to expand with a type of industrial relations in which American and Japanese features are mingled.

If this is the case, the expansion of the high-tech industries in certain parts of the U.S., and in certain parts of California in particular, may have some connection with a capacity for organizational diversity. While many mature sectors of
the American economy have kept the traditional style of employer-employee relations or even reinforced them, the most knowledge-intensive sectors have been able to develop company and cluster cultures consisting of a blend of the best of American and Japanese features. Job mobility within the cluster can be compared to job-rotation within the Japanese firm. The horizontal relations within companies and the cluster as a whole can be compared to Japanese intra-firm relations. In this case, Silicon Valley and California have spontaneously developed “Japanese” methods while retaining job-hopping and other appropriate features of the traditional American culture of industrial relations.

Conclusions

The three countries studied built up different national systems of labor market relations in the manufacturing-industrial economy. These systems were based on historic cultural factors – the existing social capitals with relations and norms – but were naturally also adapted to the new industrial production system. In Sweden, a strong centralized state with roots going back to the 16th century, the state played an active role in the shaping of industrial relations and employer-employee relations. In Japan, a tradition of groupism, hierarchies and mutual obligations formed a very decentralized system with common norms. In the United States, industrial relations and employer-employee relations were based on market criteria in which the individual’s competitiveness on a flexible labor market was the basic security.

Each of these systems worked very well as long as the industrial society worked well. Thus, an important conclusion is that these successful industrial economies were able to devise relations and norms for the industrial production system that were in conformity with their national historical and cultural traditions, i.e. they were able to form a social capital for the labor market with sufficient homogeneity and tolerance to avoid devastating large-scale conflicts.

It is highly probable that this conclusion is also relevant in the current transformation to a knowledge-based economy. Importing foreign models without adapting them to national characteristics has never been successful. Devising usable norms and relations for the knowledge economy’s labor market cannot be done without allowing for historic-cultural factors – and even in the age of globalization these factors are deeply rooted in national life.
Growth and Institutions in Sweden

In a structural perspective, Sweden’s industrial economy was built up in three phases to an increased structural diversity. The first phase, during the second half of the 19th century, was characterized by raw materials-based industrialization, principally sawmills, textile industries and food processing industries. The second phase began towards the end of the 19th century and expanded in certain areas until the 1960s. It comprised two distinct groups of which one continued on the raw materials-based path (mainly pulp and paper mills, ore extraction and steelworks). The other group emerged from the activities of a number of Swedish entrepreneurs, especially in engineering: Ericsson’s telephones and switchgear, de Laval’s separators, SKF’s ball bearings, Dahlen’s gas accumulator, ASEA’s electric motors, generators and transformers etc. The third phase started during the interwar period and consisted of applications of international innovations such as automobiles and aircraft plus the emergence of a large number of small sub-contract engineering enterprises. An important component of this third phase was also the borrowing of modern American management and rationalization methods, e.g. time studies.

Sweden’s early, raw materials-based industrialization depended on imported innovations and was comparable to that of many other countries, although Sweden’s abundance of timber determined the relative structure. On the other hand, the innovative Swedish engineering industries were in many respects unique, being based either on Sweden’s own innovations or on knowing how to develop foreign innovations. In both these processes, the establishment of institutes of technology in Stockholm (Royal) and Gothenburg (Chalmers’) in the middle of the 19th century, and their training of engineers, was of profound importance. The third wave of industrialization too was based on the engineering knowledge that had been built up by formal education and practice.

As in other countries, industrialization was accompanied by the emergence of modern commercial banks. However, a Swedish peculiarity was the concentration of industrial and banking power that the Wallenberg family gradually managed to achieve. The family did not restrict its activities to these two fields but also acted as builders of the industrial society. The Stockholm School of Economics was founded on their initiative and the Wallenberg Foundation is one of the biggest Swedish private research foundations. As the leading bank-industry group, the
Wallenbergs became the most important norm-setters in Swedish industry. Long-term, responsible ownership contributed to economic stability and growth.

The government’s role in promoting Sweden’s industrialization has been considered important in a number of fields. The Act of 1842 introducing compulsory schooling for all children reflected an early realization of the needs of an emerging new society. The above-mentioned institutes of technology educated industry’s leaders. Railroads were built as a combination of state national lines and municipal/private regional lines on such a scale that at the outbreak of World War I Sweden had more than twice the length of railroad per inhabitant compared with any other European country.

Thus the building of the education and transport infrastructure in Sweden differed somewhat in degree but not in kind from that of other industrializing countries. The peculiarities of the Swedish government were more to be found in the intimate informal relations established between the cabinet and leading industrialists, most especially the Wallenbergs, after World War II. The social democratic government and the social democratic leaders of the blue-collar trade union federation found resemblances between their strategy for growth and welfare and the Wallenbergs’ stable, long-term industrial growth strategy. Economic growth was a prerequisite for achieving the social democratic goal of social welfare and equal distribution of that welfare, of which a big public sector was the most important instrument. A labor market policy with features such as retraining and grants for migrating to districts of industrial expansion facilitated the transfer of labor from low-productive agriculture and forestry to high-productive manufacturing industry. When this was not enough to secure the supply of industrial labor, a regional policy of grants for industries establishing in areas of labor redundancy was introduced in 1965.

With the exception of the Stockholm School of Economics, higher education has been a public-sector matter in Sweden. So has most of the funding of basic research. The cost of higher education and research has risen steadily since the 1950s. The expansion was mainly caused by the enlargement of the public sector and the consequent increased demand for teachers, health care personnel, social workers, officials, etc, along with this growing sector’s demand for research. Industry-oriented basic research has been conducted mainly at the institutes of technology and to a certain extent in the faculties of medicine. Applied R&D on the other hand has been handled almost solely within industry itself.

A peculiarity of Swedish industry-oriented research has been the limited importance of institutes of applied technological research. Instead a “Swedish model” style of cooperation between industry and research was developed. A fundamental characteristic of this model was a public/state customer and a private company that developed new technology and products. This was particularly confined to areas of infrastructure where state companies, state monopolies and the national defense built up intimate, long-term relationships with private companies, to a large extent within the Wallenberg group. This long-term cooperation was of great importance for technological development in the major companies. However, from the standpoint of structural transformation, the model had severe shortcomings in
that it was unable to contribute help towards the creation of new enterprises in new technological areas (Sörlin and Törnqvist 2000).

Whereas the three waves of industrialization were characterized by Swedish innovations and their entrepreneurial application side by side with foreign innovations, the period from World War II to the 1970s was characterized by optimum refinement and administration of industrial growth. Only two entrepreneurial innovations emerged into prominence in this period: Rausing’s Tetrapak and Kamprad’s IKEA. Swedish industry concentrated mainly on completing the development blocks established during the second and third industrializing waves. Government’s economic policies focused on smoothing out business cycles and clearing short-term bottlenecks. Growth seemed to be taken for granted. Increasing attention was given to the distribution of wealth and expansion of the public sector. When the industrial crisis hit Sweden in the 1970s, the public sector was allotted a new task, namely providing temporary jobs for the unemployed.

In the long-term perspective depicted here, a shift of norms and relations concerning innovations and structural renewal started in the early postwar years and emerged clearly to view in the 1970s. The Wallenbergs exploited the crisis of the 1930s to consolidate their leading industrial position and were thereafter in a division of their own, with national competitors only in certain fields. Both for them and for the social democratic government, the postwar period was a harvest time during which long-term investments in physical, human and social capital bore much fruit. In a way similar to that whereby the bruksanda had cemented temporarily successful relations and norms in local industrial districts, successful but maturing industries and policies created predominant norms and relations on a national level. In both cases a false impression of reassuring reliability and control of development emerged. The entrepreneurship that once had built the local industrial districts, the innovative engineering industries and the social democratic party was slowly replaced by administrative, stabilizing management. The crisis of the 1970s saw the demise of this national consensus. A major conflict in 1980 showed that relations between employers and trade unions had deteriorated considerably. Industrial renewal seemed a very distant prospect in the stagnant economy of that time.

Three major factors underlie the expansive structural changes that have taken place in Sweden since 1980: (1) deregulation of financial and other markets, among them telecommunications, (2) intra-industry R&D principally in telecommunications and pharmaceuticals, and (3) a high level of education and relatively equal income distribution creating a high demand for IT products, software and services among enterprises, public administration and large segments of the population.

The first factor, deregulation, provides an example of important policy measures that have achieved very dynamic effects in certain areas. The reason why deregulation started taking place in the 1980s was partly a reaction to the international liberal market trend. However, another possible interpretation is that the political system, which had relied so heavily on public sector solutions, had the ability to learn from its mistakes and the courage to try new solutions. Although
deregulation also had negative effects – an overheated, inflationary capital market that ended up in the financial crisis of the early 1990s – there is reason to stress its impact on entrepreneurship in the private service and telecommunications sectors.

The second factor, intra-industry R&D in a small number of successful multinational Swedish companies, principally in telecommunications, electronics, motor vehicles and pharmaceuticals, has contributed to expansion in these sectors. In 1999 among EU and other leading countries including the U.S. and Japan, only Germany had a higher share of its workforce in industries at high or medium-high technology level\(^1\) (EU 2001).

Partly associated with the expansion caused by R&D, particularly in telecommunications, are the consequences of the third factor, the high and relatively equal level of education and the relatively equal income distribution (Institute for the Future 2000). Sweden and the other Nordic countries are characterized by a high demand among enterprises, public administration and large segments of the population for Information- and Communication Technology (ICT) products, software and services. Governmental policy, including subsidies to employees purchasing a PC through their employer and to broadband cable-laying, has contributed to the rapid and comprehensive penetration of Swedish households by ICT. The ICT sector, with a large number of small startups, is also the only new sector that has mainly emerged outside the old, established companies.

Understanding and intimate cooperation between the state, the big, often multinational companies and the trade unions were cornerstones of Sweden’s successful model during the industrial epoch. As long as the industrial system was expanding the model was successful. However, the model and its actors were unable to manage a smooth transition to the new paradigm of the knowledge economy. There are indications that the problems of transition have been more intractable in Sweden than in many other countries. For example, Sweden fell from fourth to seventeenth place in GDP per capita between 1970 and 2001.

One established sector is an exception in having been able to develop new knowledge-intensive products: telecommunications has managed a transition to mobile nets and to broadband. Another established sector, pharmaceuticals, is becoming increasingly dependent on biotechnological research. The ICT sector grew substantially during the 1990s and the use of ICT has penetrated all sectors. Even so, Sweden’s labor productivity was on average 10 percent below that of leading competitor countries in 1998. The main explanation of this lag is the service sector, which employs about 75 percent of the labor force and is 12 percent below average (Kokko and Gustavsson 2003)\(^2\), while labor productivity in several manufacturing sectors is highly competitive.

The knowledge-based economy has expanded substantially, especially in the Stockholm region. The Stockholm region is also the region with the highest entrepreneurial activity, measured in terms of startups per capita. However, Sweden

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\(^1\) Industries included in this definition are: aircraft, computers, office machinery, electronics, telecom equipment, pharmaceuticals, instruments, motor vehicles and other vehicles, machinery and chemical products.

\(^2\) The competitor countries were Denmark, Finland Italy, Norway, Germany, UK and USA.
Sweden ranked only number 31 of 37 countries in total entrepreneurial activity, in the Global Entrepreneurship Monitor (GEM) Report 2002 (Reynolds et al. 2002). Only between two and three per mille of the 37,430 new companies established in 2002 were a result of R&D carried on at universities (ITPS 2003). This low level of entrepreneurship in general and in the centers of society’s knowledge production must be interpreted as indicative of prevailing norms of the industrial economy, and also as an indication of the traditional role of the universities (see below).

The venture capital industry of Sweden was started by governmental agencies towards the end of the 1970s. It was not until the end of the 1990s that a sharp increase in private investments took place. Government VC funds are now primarily directed to enterprises in their early developmental stages. According to a report from PricewaterhouseCoopers, Sweden in 1999 ranked third in the world in venture capital investments as a share of GDP. Swedish VC-firms invested over 11 billion SEK, which equals 0.57 percent of GDP; this is about double the European average, only the United Kingdom having invested more with 0.86 percent of GDP. In the US, venture capital investments in 1999 equaled 1.14 percent of GDP. Swedish VC-investments rose to 19 billion SEK in the record year 2000 but have fallen sharply since then. Of total Swedish VC-investments in 2000, 41 percent were made in the Stockholm region. The largest VC-investments in 2000 were made in branches of production, service and automation of manufacturing industry. A common apprehension is that the weaknesses of the Swedish venture capital sector are not in projects, ideas and capital supply but in resources in terms of management skills (www.vencap.se 2003; ITPS 2002).

In addition to the IT policy described above, the Swedish state’s policies for transition to the knowledge economy have focused on research and higher education. In terms of GDP for the year 2000, Sweden was a world leader. (Kokko and Gustavsson 2003). During the 1990s a number of new regional universities and colleges were founded and the number of students was increased by 50 percent. In 1997 the Swedish parliament added a third task to the universities’ two traditional functions of education and research, viz that of cooperating with the rest of society. The universities and colleges have increasingly come to be regarded as an engine of national and regional development and growth. The national agency for innovation systems, VINNOVA, founded in 2001, considers the universities to be key actors in the creation of regional innovation systems.

However, if the universities are to work as an efficient engine of growth – as the Swedish government wants – it is highly probable that they will need to partly redefine their roles. On the other hand, it is likely that politicians and officials do not wholly understand the universities’ particular need for a degree of autonomy in order to be innovative and critical while playing the expected role of stimulating economic growth. The problem can be expressed in terms of an absence of social capital adapted to the universities’ new role. This lack of the “right” social capital exists not only between universities and the rest of society but also within the universities.

The universities have built their elevated status by claiming a unique position of objectivity and science. They have imbued generations of researchers with sci-
Scientific ideals and built a strong body of (international) social capital with common norms and strong internal links. One of these norms has been integrity and resistance against external pressure. Entrepreneurship and external cooperation on other premises than the universities’ own have not generally figured among these norms. Thus even the university, which can be considered the main actor in the transformation to a knowledge society, has a social capital which is largely not geared to government’s expectations and strategies for promoting the knowledge economy. This is hardly surprising.

The universities’ most usual method of responding to the state’s demands has been to form ad hoc bodies working alongside traditional research and education, such as collaborative units, technology transfer units, holding companies and research parks. This is in itself a reflection of the difficulties involved in combining external tasks with ordinary activities. The individual researcher normally lacks incentives to add another task to research and education. External tasks earn no academic merits. A fundamental change in the incentive structures would probably be necessary for external collaboration to develop into an integrated component of the universities’ activities.

However, the most efficient incentives are normally economic, and in this respect the Swedish legislation concerning commercial exploitation rights applicable to university research ought to be a strong incentive for university researchers. Based on the ideals of freedom of research developed by Wilhelm von Humboldt, the so-called “university teachers’ privilege” exists in Sweden and a number of other European countries. The privilege consists of the fact that inventions resulting from publicly funded research are owned by the inventor, i.e. the university researcher. This should, in theory, promote the commercialization of research results. However, it has been questioned, by the OECD (2002b) among others, whether the individual researcher in practice can deal with the processes of patenting and licensing. Still, the system does have strong support inside and outside the Swedish world of academia, the main arguments being that the current system works fairly well and that building an efficiently functioning system of some form of technology transfer units would require heavy investment (Sellenthin 2004).

Thus Sweden, the country with the largest governmental sector in the world, seems to have taken several important steps away from the industrial economy and towards the knowledge economy. The service sector employs about three quarters of the labor force. Higher education and research are given high priority by the government and its industrial policy agencies. Use of the Internet and mobile telecommunications is among the most widespread in the world and Stockholm experienced a remarkable IT-boom in the end of the 1990s. The venture capital industry is the third largest in the world as a percentage of GDP. On the other hand, regional and social tensions are increasing, indicating that large groups are feeling slighted. Industrial, regional and labor market policies do not show any apparent effects. The absence of entrepreneurship reflects remaining industrial-societal values. In short: Sweden has abandoned many of the industrial society’s norms and relations, but only certain groups and regions have developed new attitudes and networks. Sweden has still not built the common values and networks of a new national social capital for a knowledge society.
The Japanese Innovation System

A popular general explanation of the remarkable economic growth in Japan up to 1990 has been the Japanese “culture” of economics and politics. The explanation has focused on different phenomena e.g.: the intimate cooperation between government and industry, the well-developed cooperation between large companies and sub-contracted small and medium sized enterprises (SMEs), the long-term relationships and business reciprocity of the Keiretsu system, the loyalty of employees to their enterprise, the positive attitudes to education, etc. An explanation on a much more general level is that economic growth is the result of applications of the Confucian culture in modern Japan (Zhang 1998).

Seen in this latter perspective, the explanations of Japan’s extraordinary industrial growth focus on different aspects of the enterprise-related social capital. If these explanations are wholly or partly correct, the question that arises is how Japan was able to create a social capital which supported industrial growth so successfully. Zhang (1998) points out that although these are common features in Japan and China, the Confucianism of the two countries is different. While the Chinese applications of Confucianism have supported a relatively higher degree of individualism, the Japanese interpretations of that creed have resulted in a strong group culture and loyalty to the group. This group culture provided the basis of nationalism when the West challenged Japan in the 19th century. Catching up with the West by learning and accomplishing rapid industrialization became a matter of national pride. The traditional group culture harmonized extraordinary well with the Japanese industrialization strategy.

Education and the import of foreign technology were cornerstones of this strategy. Concentration on education became an important feature of Meiji Confucianism (in contrast to the earlier Tokugawa interpretations). Meiji Japan accepted the traditional Chinese Confucian meritocratic practice of free mobility of people through education and abolished the caste system.

Zhang’s conclusion – interpreted in our terms – is that Confucianism has been an important foundation-stone of Japan’s social capital during the industrial era. However, it is particular interpretations of this religious-philosophical foundation that have formed a social capital so well adapted to the task of learning from and catching up with the West.

The shaping and reshaping of Japan’s social capital has been achieved on a general level by interwoven measures of policies and business. The national state became the modernizing agent after the Meiji restoration, but the modernization took place under market-economic conditions, in close symbiosis with the business elite and with nationalism as ideology. The state concentrated on education, technology transfers and physical infrastructure but also on “actively promoting the normative orientations towards a more individualistic exchange economy and by creating new social and economic institutions…” (Lakshmanan 1994 p. 106).

After World War II, the Japanese government – and in particular the Ministry of International Trade and Industry (MITI), now called the Ministry of Economy, Trade and Industry (METI) – has pursued an active industrial policy in intimate
cooperation with the big corporations. These national policies have been the base for the social capital, with networks and values, which has been developed in the Japanese civil society and in the enterprises.

In the 1980s, Japan’s industrial policies became a model for the rest of the world. Freeman (1987) coined the term “national innovation system” in his analysis of Japan’s postwar economic development. He defined this as networks of institutions “… in the public and private sector whose interactions initiate, import, modify and diffuse new technologies” (Freeman 1987 p. 1).

According to Freeman, the Japanese innovation system was built on a close collaboration between government and the large corporations. It was characterized by four attributes. First, the active role of MITI in giving priority to selected new technologies that would transform business life and supporting the use of these advanced foreign technologies and the development of new technological solutions in the companies. Secondly, the Japanese tradition of improving imported technology, “reverse engineering”, meant a strong integration of R&D, design, production and marketing. Thirdly, the educational system had a strong focus on science and technology. Fourthly, Freeman also stressed features of industrial relations - treated here in an earlier section - as giving potent incentives to personal involvement in technology improvement and productivity growth in every company.

Perhaps the most notable feature of this innovation system model was the absence of direct linkages between university/institute research and the companies. Central government officials selected the technologies to which priority was given, and central and regional government officials played the key role as brokers and directors of resources for R&D and commercialization of R&D. This top-down system demanded much knowledge and strategic ability on the part of the officials. It is possible that the increased flows of information which have resulted from information- and communications technologies may help to explain the problems in maintaining the efficiency of this centralized innovation system.

The starting point for Japanese industrial and technological policies was to import and use R&D results from other countries. Consequently efforts were focused on applied research, mainly carried out within companies. Basic research at the universities played a very limited role in Japan’s postwar innovation system. “On of the major characteristics of Japan’s innovation system is the apparent absence of academic contribution” (Yoshihara and Tamai 1999 p. 348). Several scholars have adduced historical reasons for this.

Before World War II, university research in certain fields was an integral feature of Japan’s war preparations. After the war, the Allies ordered the Japanese leaders to abolish the old institutions and establish new ones. At the same time, leaders of the academic community were emphasizing autonomy and showing reluctance to cooperate with industry, while industry and government focused on importing technology. Big corporations were starting their own research laboratories and recruiting engineers from the universities. Prior to the mid-1960s “… some corporate researchers even boasted that the university was unnecessary for industrial research and development in Japan” (Hashimoto 1999 p. 241).
Just the same, cooperation between industry and university seems to have been more comprehensive than is shown in official figures. The cooperation that went on was informal and based on personal networks between professors and industry leaders. “In a labor market that was short of skilled labor, ties to university professors were very important to firms for success in recruiting. In exchange for access to students, industry contributed human and physical resources to the university laboratory. Professors also worked with firms as advisors, using as intermediaries industrial and professional associations…” (Hane 1999 p. 25). When the Ministry of Education (Monbusho) introduced a program for joint university-industry research 1982, it was based on existing informal practices and networks that had evolved. On example is that the central actor was not the university or the department, but the individual professor (Hane 1999).

The very low number of patent applications submitted by universities – a common measure of technology transfer – indicates an absence of university-industry cooperation in Japan. However, this aspect too seems to understate the extent of this cooperation. Recent research shows that professors normally transfer the title to their inventions to private companies in exchange for grants and donations. According to Monbusho, total grants and endowments to national universities from the private sector accounted for ¥87.7 billion in 1996 – 26 percent of total university income. An important reason to this practice is the high direct and indirect transaction costs associated with patenting and maintaining patent rights. Hence, as regards patents too, the system is built on informal links and exchanges (Yoshihara and Tamai 1999).

Thus research shows that the Japanese university-industry linkages are stronger than is indicated by the official picture. However, the fact that these linkages are often informal is more or less a proof that they have not been officially accepted. It is hard to believe anything else than that this has had a limiting effect on university-industry collaboration.

The Japanese government has taken action in several ways to hasten university-industry cooperation. The so-called privatization of the Japanese national universities, converting them to entities with a more independent position, which took place in 2004, was a measure aimed at abolishing formal obstacles to university-industry collaboration and making the universities keener to respond to the requirements of government and industry. Other examples are the law to promote technology transfer from universities to industry (the TLO Act) 1988 and the law on special measures for industrial revitalization (the so-called Japanese Bayh-Dole Act)3 1999. Even if there are obvious problems in evaluating the effectiveness of single measures, there are clear indications of a strongly increasing collaboration (from a very low level). The number of university startups has shown a strong increase since 1996 (METI 2005); university-industry joint research projects have increased from 1139 in 1990 to 6767 in 2002; 36 technology licensing units have been established (even though all of them still suffer from losses) (Odagiri 2004); the number of biomedical patents assigned to government institutes and universi-

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3 Regarding the original, American Bayh-Dole Act, see p. 131.
ties has increased sharply since 1997, as have the patents filed jointly by corporations and universities (Okada, Nakamura and Tohei 2005).

Japan has the highest rate of patent applications per inhabitant among the big OECD countries (in the whole OECD, only Sweden has a higher rate) (OECD 2002). As regards Japanese product innovations, however, these are mainly concentrated on consumer electronics. Japanese industry has applied itself to improving and developing existing products rather than creating completely new ones. If the same holds true for knowledge – i.e. that Japan should be better at applying and adapting existing knowledge than it is at creating new fields of knowledge – this could explain why creativity is not a word immediately associated with Japan.

The relative absence of innovation and creation of new knowledge may have something to do with the Japanese education and research system. Japan’s expenditure on education as a percentage of GDP is in fact among the lowest in the OECD. On the other hand, Japan is well above the average for tertiary education attainment as a percentage of adult population and has the highest score in student performance among the OECD countries. There seems to be discontentment with the research and education system nevertheless. Omori (2001 p. 90) describes these problems in the following way: “Japan’s education system continues to emphasize obedience, diligence and homogeneity, traits that were of great value while Japan was catching up to other industrialized nations. But since Japan has become one of the front-runners of the world economy, people with creativity, leadership and heterogeneity are needed. Previously successful methods of mass production of automobiles could not be so easily applied in an area of high technology, because the essence of the latter lies in creative ideas, not in the efficiency of production processes.”

It would be reasonable to hypothesize that the change from an industrial to a knowledge economy is facilitated by startups of new enterprises in the new sectors. In the above-mentioned International Global Entrepreneurship Monitor Report 2002, Japan had the lowest ranking of all 37 countries (Reynolds et al. 2002). Japan’s National Institute for Research Advancement has claimed that Japan is characterized by “… a culture and climate of low mobility of human resources, lack of tradition in allowing the failed to rise again, and relative lack of societal prestige for entrepreneurs” (NIRA 1997, quotation from Hane 1999 p. 37).

The alternative to starting new enterprises in a period of transition is that the established enterprises extend their activities to the new sectors or organize set-ups within the Keiretsu system. This seems to be the predominating Japanese strategy, but it is not obvious that it is the optimum strategy. Established enterprises have formed institutions and cultures adapted to their main activity. Successfully starting up new activities may be problematic within institutional and cultural frameworks formed for other purposes. Hannan and Freeman (1977, 1984) have shown that organizations often resist changing their basic technologies and structures. Christensen (1997) has dubbed this resistance based on earlier success the “innovator’s dilemma.” Castilla et al. (2000 p. 223) conclude: “… upgrading of a regional economy occurs especially through new organizations rather than through transformation of existing ones (…) Any region whose institutions or networks re-
sist spin-offs or new entrants may face stagnation.” Thus, the relative lack of startups of new enterprises may constitute a serious problem for Japan’s transition to the knowledge economy.

An essential factor affecting innovation potential, economic renewal and the success of entrepreneurship is access to venture capital and venture capitalists. It would be hard to overestimate the importance of venture capitalists in the growth of the IT industry in the U.S. In Japan, the rise of venture capital firms since the end of the 1980s was principally due to an excess of cash and a need to find new business opportunities. However, the investment philosophy and practices did not change very much (Hane 1999). The venture capital firms have mainly acted as investment companies and have been considered as “affiliates of financial institutions [being] notorious for investing only in companies that are on the verge of going public” (Nikkei Weekly 1996). In contrast to their American counterparts, Japanese venture capital firms have rarely provided support services such as management, marketing, recruitment, relation building, etc. (Institute for the Future 2001). The explanation seems to be a combination of business and management traditions and government regulations. Until 1994 venture capital firms were not allowed to have representatives on the boards of companies – a circumstance that undoubtedly must have had a negative impact on willingness to invest. New companies’ entry to the stock market has been severely regulated, involving additional obstacles for Japanese venture capital firms. Japanese entrepreneurs also seem to have comparatively little trust in the business financing system. When a firm has reached the phase of initial public offering (IPO), in Japan original founders normally own a much larger share of the company than in the U.S. The consequences of this are a smaller input of know-how and capital from outside, in general slower growth, smaller size at the time of IPO and a more introvert firm (Fasol 2002).

Thus in the field of venture capital too, institutional norms and practices in Japan seem to have been less well adapted to promoting entrepreneurial innovative activities. However, statements from Japanese venture capital firms indicate that they are increasingly beginning to work like their American counterparts. The gap that still exists between Japan and the U.S. can be illustrated by the fact that venture capital investments in the U.S. 2002 were about 15 times greater than in Japan (PricewaterhouseCoopers 2003; Nakamura 2003).

Finally, the fundamental unit of an innovation system is of course the enterprise. It is in the enterprise that knowledge and recourses are transformed and commercialized into saleable products. In accordance with the deeply rooted group culture, Japanese enterprises have been characterized as striving to internalize “as much as possible,” this being reflected inter alia in strong corporate cultures, in-house central research institutes, comprehensive enterprise-internal tacit knowledge, floor level decisionmaking and lifetime employment. Motohashi (2003) calls this “a ‘go it alone’ business practice, whereby a firm relies on its in-house tacit knowledge to develop new ideas and build up competitive advantage.” Survey results show that Japanese enterprises are very good at using their internal tacit knowledge, but that they do not make effective use of formal knowledge out-

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4 Interview with Mr. Yoshihisa Abe, UFJ Capital Osaka Branch, December 1st, 2003.
side the enterprise. According to Motohashi, this was an efficient model that worked well for a long time, but the galloping IT revolution has changed this:

“The flow of publicly available information via the Internet is growing much faster than the flow of internal company information (…). The efficiency of exchange of confidential information between enterprises is also notably higher thanks to improved information networks. This qualitative change in the nature of information makes it easier for corporate management to make use of external information and it also encourages enterprises to exchange more information with specific outside entities. The result is a network-based model of management that creates win-win situations and offers comparative advantage” (Motohashi 2003).

This development has so far had its strongest impact in the electronics industry, where integrated manufacturers have been replaced by specialized firms which work together in dynamic supply chains. This has given comparative advantages to the American form of network-based innovation system, while “the effectiveness of the Japanese model (under which different sectors must spend a lot of time to get in synch with each other) is on the decline” (Motohashi 2003). In a recent study, Motohashi (2005, p. 593) draws the conclusion that the “Japanese system of innovation is in a process of adjustment toward a dynamic and network-based system, characterized by active external collaboration with various parties to the process of innovation.”

Motohashi’s views correspond very closely to our general hypothesis on the transformation to the knowledge economy and the need to change institutionalized and non-institutionalized networks, including social capital. The Japanese enterprises’ great advantage during the late industrial epoch – their ability to use and create new tacit knowledge within the company and commercialize it as products – is no longer enough. To succeed in the knowledge economy, companies seem to need new combinations of tacit and formal knowledge – and new combinations of internal and external networks.

The above-mentioned problems – and other problems of the Japanese economy – were targeted in The “Hiranuma Plan” of May 2001 and other recent METI-documents (e.g. METI 2001 and 2002). As well as reform of the innovation system, promotion of new businesses and SMEs, clusters, personnel networks, female labor force participation and civilian activities such as non-profit organizations are included in the plan. Another example is the Ministry of Education and Science’s (MEXT, previously Monbusho) program for Centers of Excellence, aiming to strengthen selected university research groups to world-class level. These initiatives can be interpreted as meaning that the Japanese government aims to promote the creation of new institutional, corporate and civil networks and norms, better adapted to economic growth – but at the same time they can also be interpreted as attempts to continue traditional policies of informal guidance while “just” changing the areas in focus. Nevertheless, most observers seem to be of the opinion that the role of government has changed in the direction of formulating indicative plans, organizing think tanks and disseminating information.

Paradoxically, it is not impossible that this new role of the central government could partly explain the moves of headquarters to Tokyo from other metropolitan regions, especially Kansai, which has been happening during the 1990s and the
2000s. As long as government’s primary role was informal guidance, the contact pattern did not need to be so frequent. Government’s increased role as information source in a still firmly regulated business environment has made it more important for the big companies to have close connections with it so as not to miss important but often informal information.

Several aspects of Japanese society must be regarded as leading the world in the transition to the knowledge society. The educational level is high and science and technology are given maximum priority. University-industry linkages are by no means as negligible as official figures indicate. The innovation systems which European countries are currently aiming to develop originate partly in Japan. Japan is the leading product innovator in the expansive sector of consumer electronics and has the highest rate of patent applications per capita among the big OECD countries. Japan has a large number of metropolitan regions with strong purchasing power, and these constitute potential markets for products in early stages of the product cycle.

However, Japan seems to be lacking in some of the essential features of the knowledge society, primarily creativity and individualism, both of which qualities are intimately bound up with entrepreneurship. Japan’s long-term strategy of being a follower and an improver of foreign innovations – in combination with traditional “hierarchical groupism” and risk aversion – has come to a dead end when there is no one to follow. The crucial question is how much of the relations, norms and institutions of the systems for economic growth and structural renewal which were formed under the industrial economy are able to contribute to the knowledge economy’s growth.

USA and California – The Knowledge Economy’s Cradle

The United States is certainly not a country without governance, law and regulations, but in certain areas the well-known American characteristics of anti-government culture, spirit of free competition, non-hierarchical spirit of equality, individuals’ rights, etc. seem to play an important role. Relations on the labor market were discussed above. Another example is the norms and relations of the systems for economic growth and structural renewal. From a regional perspective, it is possible to characterize the USA as a country of 50 competing experiments.

According to the GEM-study cited above, entrepreneurship – an attribute often associated with the U.S. – is considerably higher in the U.S. than in Sweden and Japan (Reynolds et al. 2002). A special American characteristic is also the positive attitude to technological development and innovations. The production line was perhaps the most significant of these innovations during the industrial era and a manifestation of how America took the lead early on in developing high-

5 USA was ranked 11 of 37 countries in Total Entrepreneurial Activity, with mainly developing countries ranked higher. Only two developed countries, New Zealand and Iceland, were ranked higher than the U.S. (Reynolds et al. 2002).
productive manufacturing methods. A market with a relative scarcity of labor and – in contrast to large parts of Europe – almost non-existent resistance against labor-saving methods, contributed to the rapid emergence of productivity-increasing methods.

In parallel with the development of production methods, American companies also took the lead in developing product innovations in many fields and in the rapid adaptation and improvement of external innovations. A fundamental component in the latter respect is company information retrieval. Table 10.1 compares the American and Japanese approaches.

Table 10.1. American and Japanese approaches to company information retrieval.

<table>
<thead>
<tr>
<th>Characteristic U.S. approaches</th>
<th>Characteristic Japanese approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel movement across firms</td>
<td>Learning from customers, competitors, long-term employees and employees of keiretsu members</td>
</tr>
<tr>
<td>Specialized personnel assigned to task</td>
<td>Mobilizing largest possible number of employees to meet outside challenge</td>
</tr>
<tr>
<td>Heavy use of consultants</td>
<td>Cooperative corporate activities</td>
</tr>
<tr>
<td>Strong role for professional associations</td>
<td>Push from government</td>
</tr>
<tr>
<td>Mergers and acquisitions</td>
<td>Spin-offs from established companies, licensing technology</td>
</tr>
</tbody>
</table>


The differences between the two approaches are obvious. While government initiatives have been important in Japan at company as well as national level, this has, with few exceptions, not been the case in the U.S. The exceptions are military industrial spending and governmental financed education and research.

The positive attitude to technology that permeates American society has been reflected in large grants to higher education and research from both private donors and government. Compared with the European academic ivory towers’ focus on education of public servants and basic, intra-academic research, American research became much more applied and utility-oriented. There are a number of examples of early university-industry cooperation at local and regional level which still continue in many cases (see e.g. Rosenberg 1998). And it is no coincidence that it was in the U.S. that Frederick W. Taylor wrote and published his famous “Scientific Management” as early as 1911.

Important driving forces behind the increasing R&D cooperation between government, universities and industry were the two World Wars and the Cold War, of which latter the “space race” against the Soviet Union constituted a component part. An explanation to the relative sensitivity of American universities to the demands of government and industry was probably their greater dependency on external financing compared with European universities (Lowen 1997).

While governments in Japan and Sweden focused on state-supported R&D linked solely to the big corporations, the U.S. federal R&D subventions were channeled towards smaller companies as well. This happened in two ways: by offering such a large amount of application opportunities that even small companies
found it worthwhile doing development work in order to get a contract; and by placing orders with many small firms that would compete for the best solution (Mowery and Rosenberg 1998).

In 1980, the Patent and Trademark Act Amendments of 1980 (the Bayh-Dole Act) established a uniform patent policy for all federal research funding. The law stipulates that universities hold proprietary rights over inventions made during federally funded research. “In return, universities are expected to file for patent protection and to ensure commercialization upon licensing. The royalties from such ventures are shared with the inventors; a portion is provided to the University and department/college; and the remainder is used to support the technology transfer process” (CSURF 2005). Prior to the Act, the federal government had 28,000 patents, of which only 5 percent (i.e. about 1,400) were licensed to industry for commercialization. In the single year of 2000, approximately 4,300 licenses were issued. Prior to the Act, fewer than 250 patents were assigned to universities per year. In 2000, over 3,000 patents were issued to universities (Henderson and Smith 2002). The Economist (2002) has referred to the Act as "perhaps most inspired piece of legislation to be enacted in America over the past half-century."

Thus, the general opinion seems to be that the Bayh-Dole Act has been a key factor underlying the strong economic growth associated with the rise of the knowledge economy in the U.S. However, scientific evaluations of the Act’s effects are very few. Two exceptions are Henderson et al. (1998) and Mowery et al. (2001). The latter study concludes that the Act hastened patenting and licensing activities at many universities. On the other hand, the increased commercialization of academic research has largely taken place within the single field of biomedical research, and increased resources for that field have contributed to increased patenting and licensing. Moreover it is mainly in the biomedical field that the small proportion of patented inventions which have produced the lion’s share of revenue accruing to the universities are to be found (Mowery et al. 2001).

The development of the American system of higher education and research has often been described as mainly unplanned. Feller (1999) considers four features as particularly important: decentralization, competition, regionalism and the coupling of research and graduate education. The last feature is the only one it has had in common with the European and Japanese systems. The U.S. has deliberately refrained from building a federal university system. Instead it has been left to private initiatives along with the states to fashion a decentralized system from below. Competition and rapid adaptation of new technology have been the everyday life of American universities. An oft-cited example is MIT’s course in electronics, which started in the fall semester of 1882, after the introduction of the dynamo in the same year. Stanford University’s role at the R&D frontier of Silicon Valley’s IT industry since the 1960s is another example. The role of universities in regional development has just recently become a subject of European regional policies. In the U.S. “...the idea that universities should have a regional function took firm root from the beginning” (Nevins 1962 p. 23). “Colleges and universities have historically been sources of community boosterism and regional pride” (Feller 1999 p. 79).
The differences between American universities and their Swedish and Japanese counterparts can be expressed in terms of social capital with norms and relations. The decentralized, competitive and regionally embedded American universities have had much stronger incentives – and formal authorization – to interact and collaborate with external actors. Several factors have contributed to this. American universities compete not only by academic criteria, but also in an external market for students and research grants. Research results and former students’ careers have been important features in universities’ marketing to recruit students. Cooperation with local business and government has been necessary to increase budgets and thereby increase output. In the utility-oriented American culture, universities have been forced to show viable results from their governmental and private grants, to a much higher degree than in Europe. In the competition between states, counties and regions, universities have long been considered a key actor.

During recent decades there has been a relative shift of economic activities in the U.S. from the Northeast and Midwest to the South and West. The industrial crisis that hit the Rustbelt especially hard was one of the factors contributing to this shift. Among others which have been cited are low union density and therefore lower wages in the South, or people’s preference for living in a warmer climate.

The growth of high-tech industry in Silicon Valley has been attributed to cultural differences between companies and the civil culture of America’s east and west coasts, the latter being considered less formal and less hierarchical. In contrast to the East, exemplified by Boston’s high-tech cluster Route 128, the West in general and Silicon Valley in particular have been characterized by a culture of mobility, job-hopping and bias against hierarchical, vertical integration. This has been an important factor behind knowledge transfers between firms and startups (Saxenian 1994).

Gilson (1999) has suggested an alternative explanation for differences in knowledge transfer between firms in different parts of the U.S., viz differences in the legal infrastructures, especially the rules governing the enforceability of postemployment covenants to refrain, for a specified period of time after termination of employment, from competing with a former employer by working for a competitor or by starting a new business. “Postemployment covenants not to compete have the potential to restrict seriously the movement of employees between existing firms and to start-ups and, hence, to restrict seriously employee-transmitted knowledge spillovers. California prohibits covenants not to compete; Massachusetts [where Boston is situated] enforces them” (Gilson 1999 p. 578). While property rights have been more of a central issue in the legal infrastructure of other parts of the U.S., California’s legislation has focused on individual freedom and the right to compete.

The importance of the social networks of Silicon Valley has been emphasized by Castilla et al. (2000). They divide the networks into three categories: a) networks of access and opportunity; b) networks of power and influence; and c) networks of production and innovation. The labor market exemplifies the first category: “Workers’ social connections are considered resources that yield economic returns in the form of better hiring outcomes. Employees hired through social
networks tend to quit less, experience faster mobility inside an organization, and perform better than those recruited through other means” (Castilla et al. 2000 p. 220). The second category is exemplified by venture capitalists, who act as brokers, management consultants and recruiters. “Many start-ups and spin-offs are founded by engineers who are naïve about management; venture capitalists can access an informal and formal network of experts to further the long-term viability of newly created firms. Further, venture capitalists often (re)organize the boards of directors of their start-ups, sometimes reducing the role of original founders and even severing the original founders from their own creation…” (Castilla et al. 2000 p. 221f). Concerning the last category, the authors state that particularly in high-tech industries “… social networks help transmit information and knowledge among different firms and individuals and produce information.” In regions like Silicon Valley, with a rapidly changing environment where innovation is essential “… it is not an exaggeration to say that effective social networks determine a firm’s chance for survival” (Castilla et al. 2000 p. 222).

The first modern venture capital firm in the U.S. was connected to MIT in Massachusetts (Lerner 1999) but California and Silicon Valley in particular soon took the lead and can to a large extent be considered the cradle of America’s (and the world’s) venture capital industry. In 2002, 42.3 percent of the venture capital invested in the U.S. was invested in California (PricewaterhouseCoopers 2003).6 Thus, in this field too, California has been a forerunner in developing new institutions with a special social capital for capitalizing in new technology.

Castilla et al. (2000) show that the venture capital firms of Silicon Valley consist of two clusters. One of these is composed of firms with strong interconnections. Many of the oldest and most influential firms form part of this cluster. Several of these firms have common founders. The firms of the second “cluster” have much less contact with other VC firms. According to the authors, it is possible that the firms of this cluster are more integrated with activities outside the venture capital sector, among them the technical sector itself. This finding shows that Silicon Valley does not consist of one network and that although the professional networks of Silicon Valley are dense, they are not dense everywhere.

These examples above indicate that social capital and culture, as well as institutions, in California have been particularly favorable for expansion of knowledge-intensive sectors and for related factors such as entrepreneurship. California, and Silicon Valley in particular, is often considered the prototype of the knowledge economy. Yet it is important to stress that the Californian knowledge economy has its center in certain particular sectors and its applications in many sectors, but that some layers of the diversified Californian economy are hardly knowledge-based at all. Those aspects of the Californian economy and the social tensions they imply are rarely given a thought when California is being considered the model.

Moreover, it is one thing to take the lead in economic development but another thing to retain it. Gerschenkron (1962) discussed with historical examples why countries have failed to stay in the lead of industrialization and what advantages late successors have gained from this. An interpretation of some of Gerschenk-

6 The share was approximately the same before and during the peak of 2000.
ron’s arguments in modern terms is that transfers of technology and institutions occur between leaders and followers and that a process of ubiquitification takes place in which the followers can gain from lower costs of labor, real estate, etc.

Both in the U.S. and the rest of the world there are a number of regions studying California’s development and trying to copy or learn lessons from the Californian example. Codified knowledge spills over, as do institutional innovations such as venture capital firms. Venture capital firms grew up in Silicon Valley, but they have now spread to other American high-tech regions, and the venture capital firms of Silicon Valley have also established themselves in these other regions. Thus, there are a number of circumstances to suggest that California could be overtaken one day by other American states.

California’s more durable advantages could be inherent in certain features of the social capital it has developed. Non-institutionalized networks and the tacit and/or disembodied knowledge that is distributed in them are impossible to copy or move (see e.g. Malmberg and Maskell 2003; Asheim 2003). From this perspective the decisive variable for retaining the lead is the region’s ability to stay creative.

Conclusions

The analysis indicates that up to now the United States, especially California, leads the world in terms of growth and innovation in the knowledge economy and also of the corresponding norms, relations and institutional/organizational expressions of these developmental processes. A simple conclusion could be that Sweden and Japan should do their best to copy the Californian model. However, such a conclusion would probably be misleading.

These two countries developed successful but different models for growth in the conditions of manufacturing-industrial economies, models built on their cultures, traditions and existing social capital. Both Sweden and Japan learned much from American innovations and production methods and developed own innovation systems – long before the term was coined – but these lessons were adapted to the countries’ individualities.

Today Sweden and Japan have to unlearn much of what was taken for granted during the industrial era. The Swedish and Japanese governments are taking measures to facilitate the growth of the knowledge economy by institutional changes: deregulation, increased grants for higher education and research, encouragement for university-industry cooperation, increased attention to the need for venture capital, etc. Non-institutionalized social capitals are much harder to change by means of simple policy measures such as allocating resources and forming institutions. Nonetheless the social capitals of the two countries are changing; new values, norms and networks are slowly replacing the industrial ones. Does this mean that policies are unable to influence the kind of social capitals which have been discussed here? Not necessarily.
In contrast to the U.S., government both in Sweden and Japan has a tradition of “helping” the economic actors to form platforms, relations and networks. A modern expression of this is the establishment of VINNOVA, the new Swedish agency for innovation systems. It is possible that government's role in changing social capital lies mainly in this field. The crucial question in that case is: which actors should be prioritized? A policy for innovation systems in a growing knowledge economy must in many regions be directed towards actors other than those playing the leading parts today.
11 Civil Society’s Social Capital

Some Quantitative Figures

During the 1990s various aspects of the civil society received increased attention both in academic research and in the public debate. The works of Robert Putnam mentioned earlier underlined the importance of civil society as a source of social capital and thus a contributor to both democracy and economic growth. At the same time but independently of Putnam’s work, the Johns Hopkins Comparative Nonprofit Sector Project started publishing a large series of reports on the nonprofit sector in more than 20 countries. In the economic restructuring of the industrialized world, the welfare state was being called into question while nonprofit and voluntary organizations were being seen as actors that could take over certain public social services. Another source of interest in the civil society was the fall of communism in Central and Eastern Europe and the “vacuum” left behind when there was no civil society in place to take over when the state changed its role. Thus, political interest in the civil society has emanated from three different perspectives: democracy, economic growth and welfare/public sector/state cutbacks. However, we restrict ourselves here to the economic growth perspective.

As noted above, nonprofit/voluntary and non-governmental organizations might be considered the “core” of the civil society, but just like the private and public sectors, the civil society too consists of phenomena which are more difficult to measure than the number of organizations and/or their members. One ingredient of the civil society is its social capital, i.e. its social networks with norms, attitudes, values, etc. There are obvious methodological problems in combining quantitative measures of networks with qualitative variables such as attitudes into a single measure of civil society’s social capital (see Chap. 2). Most studies have “solved” this problem by focusing either on networks or on attitudes. Here we start with the quantifiable variables, i.e. the organizations, and thereafter we present a discussion on the influence of the qualitative aspects.

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1 It should, however, be noted that Putnam does not use the term “civil society” but the concepts “civic community”, “civic culture” and “civic engagement”. As “civic” normally is considered a more limited concept connected to duties of citizenship, and “civil” is a broader term covering non-business and non-governmental activities, we here include the term “civic” in the concept of civil society.

2 Results from the Johns Hopkins Project are presented in, among others, Salamon and Anheier (1996) Salamon et al. (1996), Salamon et al. (1999) and Salamon, Sokolowski and List (2003).
Neither the quantitative nor the qualitative aspects are free from problems per se. The definitions of organizations belonging to the civil society differ between countries. Nonprofit sector is mainly an American concept. The Swedish _folkrörelse_ (popular movement) and the Japanese _koeki hojin_ belong to the same sphere, but are not defined in exactly the same way. The Johns Hopkins Project used a common definition of nonprofit sector organizations in all countries and the results of this project are therefore the best that are available for making international comparisons.

Table 11.1 contains some comparable figures showing the nonprofit sectors’ relative size in the three countries studied during the first half of the 1990s. As regards both share of total employment and share of GDP, Sweden has the lowest share and the U.S. the highest. The nonprofit sector’s share of employment in the U.S. is more than double its share in Japan and more than three times greater than Sweden’s nonprofit sector. However, the differences in share of GDP are smaller. Considering the large size of the public sector in Sweden, the nonprofit sector’s small share of employment and GDP is hardly surprising. On the other hand it is not possible to explain the differences between Japan and the United State in terms of size of the public sector.

**Table 11.1. Nonprofit sector’s share of total employment and GDP in Sweden (1992), Japan (1995) and the United States (1995).**

<table>
<thead>
<tr>
<th></th>
<th>Employment</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>7.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Japan</td>
<td>3.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>United States</td>
<td>2.5%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Source: Salamon et al. (1996); Salamon et al. (1999); Lundström and Wijkström (1997).

Table 11.2 shows another important difference between the three countries, viz. with regard to the nonprofit sector’s proportion of paid and unpaid voluntary work in the three respective countries. The big difference here also seems to be between Sweden and the other two countries. While unpaid volunteers perform only 25 percent of the work in the Japanese nonprofit sector, as much as 76 percent of the work in Sweden’s nonprofit sector is done by unpaid volunteers.

**Table 11.2. The nonprofit sector’s voluntariness rating. Full time equivalents (FTE) of paid work, unpaid work and share of non-paid work in the total work performed in the nonprofit sector in the three countries.**

<table>
<thead>
<tr>
<th></th>
<th>Paid work (full time equivalents)</th>
<th>Unpaid work (full time equivalents)</th>
<th>Voluntary degree (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden (1992)</td>
<td>83 000</td>
<td>270 000</td>
<td>76%</td>
</tr>
<tr>
<td>Japan (1995)</td>
<td>2 100 000</td>
<td>700 000</td>
<td>25%</td>
</tr>
<tr>
<td>United States (1995)</td>
<td>8 600 000</td>
<td>5 000 000</td>
<td>37%</td>
</tr>
</tbody>
</table>

Source: Salamon et al. (1999); Wijkström and Lundström (2002).

Table 11.3 underlines even more the importance of unpaid voluntary work in the Swedish nonprofit sector compared with the other two countries. Sweden’s
voluntary work related to the population is two thirds greater than the United States’ and more than five times greater than voluntary work in Japan.

Table 11.3. Voluntary work per capita in the three countries.

<table>
<thead>
<tr>
<th></th>
<th>Voluntary work (FTE) per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden (1992)</td>
<td>3.18 %</td>
</tr>
<tr>
<td>Japan (1995)</td>
<td>0.56 %</td>
</tr>
<tr>
<td>United States (1995)</td>
<td>1.90 %</td>
</tr>
</tbody>
</table>

Source: Salamon et al. (1999); Wijkström and Lundström (2002).

How can these huge differences be explained? Table 11.4 probably offers an important explanation. Whereas the countries have similar percentages of important activities such as education and social services, Japan and the United States have more than 40 percent of nonprofit employment in health care compared with Sweden’s 3 percent. Sweden, on the other hand, has almost a quarter of its nonprofit employment in culture, sports and recreation and almost 15 percent in professional activities (trade unions, employers’ federations, etc.), while Japan’s and the U.S.’s shares of these activities are much smaller. If we just look at the non-paid voluntary work in Sweden, almost half of it (44.5 percent) is performed in cultural, sporting and recreational activities.

Table 11.4. Nonprofit work divided into various fields of activity in the three countries.

<table>
<thead>
<tr>
<th></th>
<th>Sweden paid work %</th>
<th>Sweden non-paid work %</th>
<th>Japan paid work %</th>
<th>United States paid work %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture, sports, etc</td>
<td>24.0</td>
<td>44.5</td>
<td>2.9</td>
<td>6.5</td>
</tr>
<tr>
<td>Education</td>
<td>20.7</td>
<td>2.0</td>
<td>21.0</td>
<td>19.1</td>
</tr>
<tr>
<td>Health care</td>
<td>3.3</td>
<td>0.0</td>
<td>44.1</td>
<td>41.1</td>
</tr>
<tr>
<td>Social services</td>
<td>12.0</td>
<td>4.5</td>
<td>15.6</td>
<td>12.0</td>
</tr>
<tr>
<td>Development, housing</td>
<td>6.1</td>
<td>3.5</td>
<td>0.3</td>
<td>5.6</td>
</tr>
<tr>
<td>Advocacy, politics</td>
<td>6.8</td>
<td>17.5</td>
<td>0.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Religion</td>
<td>6.0</td>
<td>9.0</td>
<td>6.5</td>
<td>11.2</td>
</tr>
<tr>
<td>Professional</td>
<td>14.7</td>
<td>13.5</td>
<td>4.7</td>
<td>2.6</td>
</tr>
<tr>
<td>Other</td>
<td>6.4</td>
<td>5.5</td>
<td>4.9</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: Salamon et al. (1999); Lundström and Wijkström (1997); Wijkström and Lundström (2002).

Health care is a highly professionalized activity in developed societies. Thus it is quite logical that countries with a large share of nonprofit activities in health care also have a professionalized nonprofit sector. In Sweden, where health care is almost solely a task for the public sector, voluntary activities in sports and leisure organizations and other interest organizations, e.g. trade unions, dominate the nonprofit sector.³

³ This explanation has also been discussed by Wijkström and Lundström (2002).
Thus, both the size and the structure of the nonprofit sector differ between the three countries and so therefore do the civil societies. However, it is hard to find any indications that the differences in the civil societies – measured in this way – should have had any impact on economic development in the respective countries. A strong, independent civil sector has traditionally been an American characteristic, while Japan’s smaller nonprofit sector has been regulated by central and local government to a high degree. The largest civil sector activity in the U.S. and Japan, health care, has in Sweden been a governmental task ever since the Catholic Church was nationalized during the Reformation of the 16th century (Wijkström and Lundström 2002). In spite of the organizational differences of their civil societies, the three countries experienced high growth during the industrial era.

In other words, it seems hard to find any support for the idea that the civil society, measured in terms of its organizations, their absolute and relative size and the amount of voluntary work, has any significant impact on economic growth in the three countries. But of course, the civil society cannot just be measured quantitatively. The attributes of civil societies and their social capitals can differ considerably even though their quantitative measures may be similar. Moreover, in accordance with the general hypothesis that the knowledge society needs a social capital different from that of an industrial society, it can be assumed that the knowledge society needs a civil sector with new qualities. These qualitative aspects are discussed in the following subsections.

Sweden’s Civil Society

The rise of Sweden’s popular movements coincided with the rise of industry in the 1870s. The popular movements were formed with the deliberate aim of changing and improving conditions in the early industrial society. The free church, temperance and labor movements were the three causes that dominated the early days. Consumer cooperatives and voluntary health insurance societies were also coming into being before the turn of the century in 1900. However, the great expansion of the Swedish nonprofit sector took place between 1930 and 1970, often with support from central and local government under social democratic control. The national blue-collar workers’ federation doubled its membership to one million; white-collar workers’ unions started up in the 1930s and experienced a steady increase; the national sports association increased its membership from 200,000 in the early 1930s to almost 3 million in the 1990s, to cite a few examples.

As noted in the previous subsection, this expansion was confined to certain activities of the nonprofit sector. Moreover, the activities’ relative strengths changed over time. The temperance movement was the predominant popular movement around 1900 but declined thereafter, at first relatively but then in absolute num-

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4 During the earlier part of the 19th century, elite associations mainly focused on charity work could be regarded as a kind of predecessor to the popular movements that emerged during industrialization (Wijkström and Lundström 2002).
bers as well. The free churches too experienced a steady decline during the second half of the 20th century. Certain fields of social care originally started by voluntary associations were taken over by the expanding public sector. As in other countries, new social movements such as environmental and international solidarity organizations have increased in importance since the 1960s (Wijkström and Lundström 2002, Rothstein 2003).

During the economic downturn of the 1990s, public sector cutbacks increased the workload of nonprofit associations concerned with social care. At the same time there are general indications of decreasing member activity although the large nonprofit organizations of Sweden do still play an important role (Lundström and Svedberg 1998).

What role then does the civil society and its organizations play with regard to economic growth and structural change in Sweden? Westlund (2003) investigated the importance of the “social economy” – defined as cooperatives, mutual companies, associations and foundations – on the Swedish labor market and found that it had lost about a third of its jobs during the 1990s. However, most of this decrease happened through change of juridical form. Established cooperatives and foundations in e.g. retail trade and the bank sector were converted to stock companies. A very limited expansion of jobs took place in voluntary organizations and in new, small cooperatives, mainly running kindergartens.

In a study covering Sweden’s 289 municipalities, Zakrisson (2001) tested four different measures of civil culture, among others societal engagement, measured in election participation and organizational activity, measured in the number of voluntary associations per capita. The four measures showed such distinct differences that it was not possible to construct a combined index. The measures of societal engagement and organizational activity even showed significant negative correlation. Zakrisson did not make any formal test of the correlations between the measures of civil culture and the municipalities’ economic development, but she did find that the municipalities most characterized by organizational activity were situated in small, sparsely populated areas and had a relatively low average income and a small percentage of university educated people.

Thus, the few studies that exist on connections between nonprofit organizations and economic development in Sweden after 1990 do not give any support to the thesis that differences in organizational activity are related to differences in economic development. The impact of civil society on economic variables may happen through qualities like trust, spirit and tolerance, but apparently not through the level of organizational activity. A study by Westlund et al. (2003) in which qualitative aspects of civil society’s social capital in two peripheral, sparsely populated municipalities were compared supports such an interpretation to a certain extent. Other studies of connections between civil society’s social capital and economic factors are lacking in Sweden.
Japan’s Civil Society

The Japanese civil society and its organizations show certain similarities to its Swedish and American counterparts. As shown above, the Japanese nonprofit sector employs a slightly larger percentage of the labor force than does its Swedish counterpart, and it concentrates on health care just as in the U.S. However, there are also important differences.

A common opinion is that the development of civil society in Japan has been hampered by an unusually imperious state (Schwartz 2003). Since World War II the official nonprofit sector in Japan has consisted of legally well-defined organizations. Government at central and local level has exercised a strong influence over these organizations and the bulk of their incomes have come from the public sector and service fees. Formally independent, these organizations have acted in symbiosis with the government. The last twenty years, particularly since the Kobe earthquake in 1995, have witnessed another type of nonprofit organization, basically consisting of local grassroots groups and involved in environmental issues, advocacy, and community and international issues. Until 1998, these groups had no legal status and received little public support. However, the strict regulatory environment is still considered a major obstacle to the growth of the civil society (Schwartz 2003).

In contrast to the U.S., and to a lesser extent Sweden, voluntary nonprofit activities are increasing in Japan. However, part of this increase is ascribable to government grants to schools for involving pupils in voluntary activities. Thus the increase of the nonprofit sector in Japan is a result of both top-down policies and bottom-up commitments.

One feature of the Japanese civil society seldom mentioned or studied consists of the local community and residential networks activated by women while the menfolk are at work. It is highly probable that these networks of “invisible” women have played an important role in shaping the social capital of the Japanese civil society – not least because the work situation of many Japanese men does not allow much time for civil activities.

The Japanese civil society has been studied even less than the Swedish and American, and there have been no investigations into its connections with economic growth. If, as suggested above, the civil society of Japan to a certain extent has been kept afloat by housewives during the absence of men at work, this could be interpreted as indicative of a very weak relationship between civil society and the economy. On the other hand it is possible to argue that this civil society has created very favorable conditions for the men to concentrate on their jobs, thereby contributing to economic growth. If the westernization of Japan continues, among

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5 It is highly plausible that the situation in Japan’s metropolitan regions can be compared with Lehmann’s (1996 p. 25) opinion on career-regions like Cambridge, MA and Washington D.C.: “Work absorbs all the energy. It is what people talk about at social events. Community is defined functionally, not spatially: it’s a professional peer group rather than a neighborhood. Hired hands, from nannies to headmasters to therapists, bear more of the civic-virtue load than is typical.”
the things we may expect are a growing proportion of married women on the labor market and a westernized labor market without lifetime employment. These two trends would mean a loss of identity for a large part of the Japanese population. In this perspective the growth of voluntary engagement in Japan's civil society might be interpreted as a search for new identities.

Civil Society in USA and California

Even though the civil society has roots extending far back in history (Ehrenberg 1999), the United States is traditionally regarded as the seedbed of the modern civil society. An observer frequently cited is the French aristocrat Alexis de Tocqueville, who visited America in 1831–32 and three years later wrote:

“Americans of all ages, all stations in life, and all types of disposition are forever forming associations. There are not only commercial and industrial associations in which all take part, but others of a thousand different types… Nothing in my view deserves more attention than the intellectual and moral associations in America.” (Tocqueville 1835/1969, quoted from Putnam 2000 p. 48).

Putnam’s (2000) comprehensive exposition of the American civil society shows that civil engagement, measured among other ways in terms of membership of nonprofit organizations, philanthropy and work on community projects, reached its peak in the 1960s and declined thereafter. Volunteering is the only activity that has increased. This increase is mainly caused by a growth in participation by senior people over 60 years of age, and also, though to a less degree, by people under 30.

Simultaneously with this decline in most voluntary civil engagement, employment in non-profit organizations has increased. Between 1980 and 1995 employment, measured in full time equivalents, grew at an annual rate of 3.6 percent, with almost similar growth rates for the 1980s and the first half of the 1990s (Salamon et al. 1996; Salamon et al 1999). The predominant sources of income of the U.S. nonprofit sector are fees and charges, which in 1995 accounted for 57 percent of the revenues. The percentage of fees and charges also rose during 1990-95. Reductions in government subvention have forced the nonprofit organizations to become more market-oriented and commercialized. There seems to be “…a steady broadening of the gap between what nonprofit organizations have had to do to prosper and grow and what popular mythologies have expected them to do to retain public support. The result has been a virtual crisis of legitimacy for America’s nonprofit sector…” (Salamon et al. 1999 p. 280).

Even though nonprofit sector employment figures indicate an expansion of the American civil society, this expansion seems to have happened through increased professionalization and market orientation and decreased civil engagement. Thus, the nonprofit sector’s professional growth does not contradict Putnam’s findings.

However, the crucial issue from our point of view is whether, and if so how, the social capital of the American civil society will have had an impact on the knowledge economy’s growth. Several American scholars have questioned the notion of
a linkage between the social capital of the civil society and economic growth and renewal. Florida (2002) cites statistical analyses, covering one hundred American regions over a period of more than three decades. The analyses revealed no evidence that the social capital of the civil society would have led to regional economic growth; the correlations were in fact negative. Florida therefore dismisses “social capital” as a variable contributing to economic growth and instead focuses on his own concept of “creative capital,” which showed good correspondence with regional economic growth. This creative capital is defined through indexes for talent, tolerance and diversity. Without going into details, Florida’s creative capital can be interpreted as a combination of certain measures of human capital (educational level) and what we in our terms would designate as qualitative (tolerance) and quantitative (diverse networks with “weak ties”) aspects of a community’s social capital, over and above civil engagement and size of the nonprofit sector. This means that Florida’s criticism of “social capital” as an explanation of economic growth is directed against the simplest variants of civil society’s social capital. Florida’s results can in fact be interpreted as evidence of the importance of other aspects of social capital, both in the civil society and in the business world.

A study by Cohen and Fields (1999) of social capital in Silicon Valley lends further support to this interpretation. According to their view, Silicon Valley is:

“…an economic space built on social capital, but it is a vastly different kind of social capital than that popularized by the civil engagement theorists. In Silicon Valley, social capital can be understood in terms of collaborative partnerships (…) related specifically to innovation and competitiveness. It is the networks resulting from these collaborations that form the threads of social capital as it exists in Silicon Valley. What these networks of innovation in Silicon Valley share with the networks of civil engagement is simply and only a common network-like structure. There is virtually nothing in the history of Silicon Valley to connect its networks of innovation to a dense civil society” (Cohen and Fields 1999 p. 109).

Instead, Cohen and Fields claim that the important social capital of Silicon Valley consists of focused, productive interactions among a number of actors and institutions: the leading universities, U.S. government (as research financier and lead-user), venture capital firms, law firms, etc. They also stress the labor market as having particular characteristics – no stigma in leaving a big company to launch a startup, rapid turnover and recruitment of talent – reflecting a certain social capital. In other words, Cohen and Fields’ view on Silicon Valley’s social capital bears many resemblances to our concept of business-related social capital.

Also, American figures presented by Putnam (2001) and his research team suggest that civil engagement and economic development may not be spatially correlated. In a study of 30,000 Americans in 40 communities, rural and/or stagnating regions scored highest for civil engagement while rapidly expanding metropolitan regions scored lowest. One explanation of this might be that the focus on civil society excludes the sectors of society where economic growth is created – business life. Putnam’s perspective is that of the political scientist and is concentrated on democracy issues. Moreover in the U.S. there are very few studies dealing with the relationship between enterprises, their business success and their embedment in their local environment – of which the third sector is often an important compo-
One interesting exception is a study by Kilkenny et al. (1999), which in an empirical test showed the significance of reciprocated community support in the success of over 800 small businesses in small towns of Iowa. Using logistic regression, they found that the interaction effect of an entrepreneur’s service to the community, reciprocated in community support of the business, was the single most significant determinant of business success among dozens of indicators and characteristics of the managers, the businesses, and the communities. Thus, these results support the view that local initiatives in the civil society may help to create a favorable local environment, milieu or culture for business and entrepreneurship.

The Interplay of Civil Society and Business Life

The underlying assumption in Putnam’s works is that trust and other “good” elements of civil society’s social capital, are being transmitted without major hindrances to other parts of society, e.g. business life. If this assumption is correct, a fundamental question is how does this transmission take place, i.e., what kind of interplay exists between civil society and business life?

The answer may be that the interplay takes place through individuals who are participants in the business world during working hours and a part of the civil society in their leisure time. The validity of this supposition is determined by the extent to which civil society and the business world are based on similar norms and values. This is probably the case on a very general level. There are good reasons to believe that there is a correlation between e.g. the degrees of corruption prevailing in central sectors of civil society such as politics on the one hand and business life on the other.

But there are also reasons to stress the differences between civil society and the business world. In line with Polanyi (1944) we can argue that civil society is based on principles of reciprocity and redistribution while business life is based on a market principle. This means that beyond the basic norms which are shared by the whole society, there are fundamental differences between the values of civil society and those of the business world. Values and norms cannot easily be transmitted from one sphere to another since the identities of the respective spheres are based on different principles.

Thus there seem to be strong arguments against the hypothesis that civil society’s social capital has a positive impact on economic variables. The suppositions that there are close connections between civil society and the business world and that differences in civil societies’ social capital are also reflected in the social capital of the business world are hard to confirm both in theory and in practice. Putnam (1993a) did find a strong correspondence between “civicness” and economic development of the Italian regions, but these findings have not been confirmed in other countries. One explanation might be that Italy, for historical reasons, is a special case. It is probably impossible to find any other developed country with such huge differences between the civil societies of its regions. If this is true, the regional disparities in civicness in other countries might in general be
too small to have any significant impact on the business world’s transaction-related costs. However, there is one perspective which is often neglected in the discussion of the civil society’s impact on economic variables, and that is the market. On the market, the individuals of the civil society are consumers choosing between the products of the business world.

The individuals’ choices of products are not only determined by the price but also by various types of social considerations, preferences, norms, values, etc. These social considerations are as a rule influenced by the information the individual receives from the social environment, including the civil society’s organizations. In this way, the civil society influences sales of products and, indirectly, the behavior of enterprises.

The business world is increasingly developing strategies to handle trends and preferences in the civil society and use them as a competitive device. Multinational retailing companies such as IKEA and The Body Shop have marketed themselves via an ethical profile. Palmås (2004) analyses how Volvo during the 1990s started to use “contra-experts” from NGOs and interest groups to facilitate picking up on news, views and ethical sensitivities in the civil society with the aim of incorporating them positively in Volvo’s innovation activities. Palmås sees Volvo’s methods as one example of a general drive by large companies to establish forms of cooperation with the civil society so as to minimize the risk of falling victim to changes in their industry brought about by "contra-experts" by actually harnessing the changes to their own advantage. Palmås claims that this interplay between companies and the civil society results in the emergence of new types of actors: “activist-employees,” “hybrid-consultants,” “hybrid-activists” and “expert interest groups.”

In this enterprise perspective, the civil society is influencing the business world through consumers and citizens. But this is not taking place at local and regional level, nor is it based on stable values and long-term trust. It does not have any impact on transaction-related costs either. Instead, the civil society’s influence is strongly connected to globalization, is based on changes in values and preferences, and is expressed in changes in consumption and citizens’ activities on the one hand and, on the other, in companies’ product innovations and design.

However, in the regional perspective discussed by Florida (2002), the civil society’s impact on regional development is assumed to make itself felt through those local/regional “spillovers” from civil society to business life, in a way similar to that hypothesized by Putnam. The difference in this respect between Florida’s and Putnam’s views is that Florida stresses diversity and heterogeneity of networks and values, supported by tolerance and leading to creativity, while Putnam emphasizes the homogeneous qualities of networks and values, which contribute to understanding and a reduction of transaction costs.

6 However, intra-regional differences in civicness in metropolitan areas, e.g. between inner-city ghettos and prosperous districts, might very well be of such a magnitude as to achieve a correspondence between civicness and economic development level.
Both enterprise and the region have two strands of argument to the effect that civil society influences the economy. In Putnam’s view, this happens mainly through shared norms and values, distributed in dense but open local/regional networks, resulting in stability and trust that reduces costs for the enterprises, the collective development of these latter thus becoming the region’s development. In line with this view it is also possible to argue that this “overspilled” trust has positive effects on information exchange between enterprises and thus on innovation. According to the other view, here exemplified by Palmås and Florida, civil society influences the economy by producing change to which enterprises and regions must react. Enterprises which develop methods of observing, absorbing and utilizing civil society’s changing trends in their innovation processes acquire a competitive advantage. Regions which develop a tolerant and diverse civil society become more attractive to creative people and show a more positive development compared with regions with a homogeneous civil society.

A possible interpretation is that the two strands of argument are referring to different types of societies. In line with the hypothesis presented in Chapter 1 and the discussion in Chapter 7, a stable, homogeneous civil society is a civil society primarily adapted to the manufacturing towns and cities of the mature industrial society. Correspondingly, a changing, diverse, heterogeneous civil society is a civil society essentially adapted to the metropolitan regions of the knowledge society.

In accordance with this argument, it has been claimed that the crisis of civil society, of which Putnam found evidence in the U.S., merely reflects a downturn of the civil social capital of the industrial society, whereas other, new forms of (civil and business) social capital are developing in the emerging knowledge society. The internet, cellular phones, etc. offer new networks for social interaction among young people, who do not find many of the traditional organizations very exciting. Certain sports, e.g. bowling, have been losing popularity while others, e.g. soccer, have been rapidly gaining it in the U.S. (Lehmann 1996). Another argument is that of e.g. Cohen and Fields (1999), that in the knowledge economy’s career communities, formal and informal professional networks are replacing organized civil networks.

Probably no one would deny the importance of a strong and open civil society for democracy. This importance is in itself a sufficient argument in favor of the attention which the concept of civil society has received since the beginning of the 1990s. As shown in this section the civil society also exerts influence on the development of enterprises and regions. However, in the emerging knowledge society, it is not necessarily the type of civil engagement, number of organizations and stable norms, values and networks that Putnam has focused upon that contribute to economic development. Instead, there are indications that it is a civil society characterized by tolerance and diverse norms, values and networks.
Introduction

This chapter studies and compares the social capitals of one of the most knowledge-intensive industries, the biotech industry, in Sweden, Japan and California. As pointed out in Chapter 1, the biotech industry is one of the most extremely knowledge-intensive industries, differing fundamentally from traditional manufacturing industries in several respects. While the main value of a manufacturing firm resides in its physical capital, the value of a biotechnology firm is in its intellectual property. Whereas a manufacturing firm sells tangible products for consumption or refinement, a biotech firm’s products consist of R&D products, including patents, with a potential for being commercialized and profitable. Instead of final products, a biotechnology business is focused on a number of intermediate outcomes, such as knowledge production for increasing the knowledge base, firm creation as a proof of commercial potential in research, and business development in the form of expanding R&D and/or bringing selected projects closer to commercialization (Nilsson 2001). In these respects, the biotech industry represents an extreme case of tendencies which are found in several sectors of the knowledge economy. With the continuing expansion of the role of knowledge in the economy, it is plausible that certain tendencies in the biotech industry of today will become general tendencies in the knowledge economy of the future.

Biotechnology, Concepts and Clusters

Concepts, Definitions and Peculiarities

Even in prehistoric times, man was already using biotechnical methods such as collecting and selecting seeds for planting and selective breeding to improve livestock. Beer brewing, wine fermenting, bread baking with yeast, and yogurt and cheese making with lactic acid-producing bacteria are other examples of early use of biotechnology. The term biotechnology was coined as early as 1919 by the Hungarian engineer, economist and government minister Károly Ereky, who defined the products of biotechnology as being made “from raw materials with the aid of living organisms” (Fári et al. 2001, quoted in DeVol et al. 2004 p. 12).
There is no unitary, international definition of biotechnology, a fact reflected among other things in the very heterogeneous statistical data covering the field. Perhaps the most all-encompassing definition was formulated by the United Nations Convention on Biological Diversity:

"Biotechnology is any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use" ([http://www.free-definition.com](http://www.free-definition.com)).

The term *Life Science* is a broader concept, with a number of partly different definitions, one of which is “any of the branches of natural science dealing with the structure and behavior of living organisms.” A third term, *bioscience*, is often given the same definition and is used synonymously with life science. ([http://www.thefreedictionary.com](http://www.thefreedictionary.com)).

All three concepts are used not only in scientific contexts but also as terms denoting industrial activities. Several authors make a similar distinction as between the scientific fields, defining biotechnology as a narrower term and bioscience as a broader one. One example is DeVol (2000), who considers bioscience industries as consisting of applications of biotechnology and other life sciences, plus medical devices, instruments and software. Related service industries and supplier/vendor companies are normally included in addition. Pollak (2002) uses a more narrow definition, including only applications of DNA science and technology plus medical devices in the bioscience industries. However, in everyday usage, *biotechnology industry* (or biotech industry) is the term most often employed, being then mainly applied synonymously to the broader definitions of bioscience industries.

![Diagram of product development process in biotech drug development](source: Ernst & Young LLP, Biotechnology Industry Report: Convergence, 2000)

**Fig. 12.1.** Example of product development process in biotech drug development.

As noted in the introduction, the biotech industry differs in several ways from industries in general. The main value of a biotech firm is its intellectual property; its products consisting of R&D products, including patents; it is one of the most
research-intensive industries in the world, etc. Figure 12.1 shows that the time from early research to final product is extremely long in certain biotech sectors such as drug development for example. This entails special problems when it comes to financing. Therefore biotechnology has a particular need for venture-capital financing in the early phases of product development, in which normal credit institutions do not invest.

An International Comparison

A number of international overviews of the biotech industry have made their appearance over recent years (Pammolli and Riccabone 2001; Allansdóttir et al. 2002; Deloitte & Touche Tohmatsu 2002; OECD 2003). A common view is that the US is in the lead of the industry’s quantitative development and that the industry is growing worldwide in spite of short-term fluctuations.

However, international comparisons are problematic for several reasons. The national studies on which the comparisons are based often have different definitions of biotechnology.\(^1\) As noted in the previous section, biotechnology is e.g. sometimes used as another term for life sciences, sometimes as a particular category of life sciences. It has also been suggested that some studies include companies without employees whilst other do not (Sandström and Norgren 2003). Another problem is what should be defined as a “pure” biotech firm. In a comparison of biotechnology in Japan and the US, Zucker and Darby (1994) showed that of all 246 enterprises they defined as biotech firms in Japan, only 5, i.e. 2 percent, were new firms at that time. The remaining 98 percent were subunits or subsidiaries of preexisting firms. In the US, 68 percent of the biotech enterprises were new firms. One of Zucker and Darby’s explanations for the extremely low number of startups in Japan in 1994 was a culture and incentive system discouraging entrepreneurship. Also, Japan recently had the lowest rankings in international entrepreneurship comparisons (Reynolds et al. 2002). The predominating Japanese strategy for developing new sectors has so far been that established enterprises expand their activities to new sectors (see Chap. 10).

In 2002, nine years after Zucker and Darby’s study, the bio-related startups (called “bioventures” in Japan, having less than 300 employees) registered by the Japan Bioindustry Association (JBA) numbered 334 firms (JBA 2003b). The number of preexisting firms engaged in biotechnology activities is not known. Thus, even though the number of biotech startups in Japan has increased considerably as it has in other countries, it is obvious that different entrepreneurship cul-

\(^1\) A report published by the California State Library states e.g.: “Good statistics about the bioscience industries can be hard to come by. Because of their newness, some of its sectors, particularly in biotechnology, are not well-reflected in the system of industrial classification used by the U.S. census and other government agencies. As a result, much of the available data comes from private sources, and different sources use different definitions and methods.” (Pollak 2002 p. 29).
tures make international comparisons of the number of companies and employees in some degree misleading.

According to Figure 12.2 the United States in 2000 had about 1400 biotech companies, i.e. almost as many as the next five competitor countries put together. Japan was second in the world in the number of companies. Sweden was number nine in the world and number four in Europe. Other sources confirm Sweden’s fourth place and the approximate number of Swedish companies, but have quite different figures for most other European countries (Pammolli and Riccabone 2001; Allansdóttir et al. 2002).

![Fig. 12.2. The number of biotech companies in various countries 2000.](source)

A survey of the US Department of Commerce illustrates the problem of defining which companies should be regarded as biotech companies. A survey population of 3,189 companies was collected by membership in trade organizations and suggestions from state and federal agencies. Of the companies responding to the questionnaire only 53 percent confirmed that their activities corresponded with the survey’s definition of a biotech firm (U.S. Department of Commerce 2003).

As regards the number of companies per head of population, Sweden was the world leader with a figure more than double that of the countries placed two and three, i.e. Switzerland and Canada (OECD 2003).

The problems of definitions are also reflected in figures for the number of employees in the biotech industry. The Biotechnology Industry Organization (BIO) refers to Ernst & Young’s biotech reports and states that in the U.S. 198,300 were employed in the industry in 2003 and 194,600 in 2002 (BIO 2004). The Milken Institute reports that in the ten largest U.S. biotech clusters (where most of the U.S. biotech activities are concentrated), 103,000 people were employed in the biotech industry and 214,000 in the life sciences in 2002, according to the insti-
tute’s definitions (DeVol et al. 2004). According to the California Healthcare Institute, 225,000 persons in California alone were employed in what was called the biomedical industry (Pollak 2002).

The number of quantitative estimations of the biotech industry in Sweden and Japan is much smaller than in the U.S. As a result there are not so many conflicting figures. In what was the first survey of its kind (December 2002) according to the Japan Bioindustry Association, the number of employees in the above-mentioned 334 “bioventures” was estimated to be 6,757 (JBA 2003b). Sandström and Norgren (2003), probably the most reliable source on the Swedish biotech industry, report 3,975 employees in 183 small and medium-sized biotech firms (<500 employees) in 2001. The total pharmaceutical and medical sector in Sweden employed about 30,000 people.

An alternative way to compare countries’ biotech performance is to study patents and patent applications. Patents are often the only commercial output of biotech firms, since many of them have no other activity than R&D. By selling patents or licensing rights to other firms, they sell the right to exploit their inventions. Statistics about countries’ biotech patents may therefore be an indication of the industry’s level of development.

Figure 12.3 shows biotech patents from the United States Patent and Trademark Office (USPTO) 1990 and 1997. The US had the highest numbers of patents. Japan was second in both years. Sweden had a more modest ranking in patents compared with the number of firms. Concerning the growth of biotech patents, the OECD average growth 1990-97 was 11 percent. The Czech Republic, Spain and Korea had the highest growth (more than 25 percent). The growth of the United States was above the OECD average, while both Sweden and Japan were well below the average growth (OECD 2003).

To sum up, this international comparison shows that the size of the biotech industry in different countries varies with the definitions used, with the measures used and with the differences in entrepreneurial culture. However, the US seems to be the undisputed leader in absolute figures, with Japan in second place by most measures. Sweden ranks among the leading European states after Germany, the UK and France. In terms of growth rates, a number of “new” countries are at the top.

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2 The JBA stresses that the Japanese definition of bioventures differs from those used in the U.S. and in Europe (JBA 2003a).
3 Two companies with more than 500 employees, Amersham Biosciences with about 1450 employees and Biovitrum with 550 employees, were not included in the study. Thus, in total about 6000 people were employed in the Swedish biotech industry in 2001.
4 For a detailed explanation of different measures, see OECD (2003).
Note: The priority year refers to the first patent filing worldwide; which is the closest to the invention date.

**Fig. 12.3.** Biotechnology patents granted by the USPTO for priority years 1990 and 1997.

**Biotech Industry Clusters in the Three Countries**

**Sweden**

Sweden’s biotech industry is normally regarded as concentrated in four clusters, Stockholm, Malmö/Lund, Uppsala and Gothenburg. The empirical study of social capital reported in Chapter 13 comprises companies in all of the four clusters and some located outside them. It should also be pointed out that Stockholm/Uppsala is a single joint cluster in many respects. The close proximity to one another of Stockholm and Uppsala (65 km) has resulted in an integration of the two cities’
labor markets. Biotech and supporting companies (e.g. financial actors) in Uppsala increasingly tend to regard Stockholm-Uppsala as one cluster, while actors in regional government and Uppsala University view Uppsala as distinct (Teigland et al. 2004). However, since available biotech statistics do make a distinction between the two cities, we here present these non-summarized figures.

Table 12.1. Number of employees in the Swedish biotech industry 2001, by cities/clusters and sectors.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Stockholm</th>
<th>Malmö/Lund</th>
<th>Uppsala</th>
<th>Gothenburg</th>
<th>Other</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceuticals &amp; Medicine</td>
<td>742</td>
<td>612</td>
<td>318</td>
<td>271</td>
<td>54</td>
<td>1997</td>
</tr>
<tr>
<td>Bioproduction</td>
<td>154</td>
<td>260</td>
<td>8</td>
<td>2</td>
<td>134</td>
<td>558</td>
</tr>
<tr>
<td>Tools &amp; Supplies</td>
<td>108</td>
<td>23</td>
<td>385</td>
<td>61</td>
<td>11</td>
<td>588</td>
</tr>
<tr>
<td>Environmental biotech</td>
<td>5</td>
<td>16</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>Functional food &amp; feed</td>
<td>112</td>
<td>25</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>147</td>
</tr>
<tr>
<td>Agrobiotech</td>
<td>5</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>603</td>
<td>620</td>
</tr>
<tr>
<td>All sectors</td>
<td>1126</td>
<td>936</td>
<td>726</td>
<td>338</td>
<td>815</td>
<td>3941</td>
</tr>
</tbody>
</table>

Note: 11 companies, started in 2001 and with a total of 34 employees, were not included in the regional breakdown.

The development of the Swedish biotech industry has to a large extent been a result of the development of “user industries.” This means that the growth of the health-care sector and pharmaceutical industry from the 1960s and onwards and these industries’ close links with proliferating medical research have formed the basis of the modern biotech industry in Sweden. À propos of this, regional innovation systems in pharmaceutical/medicine-related biotechnology emerged in the regions where the leading academic research hospitals were located. This is reflected in the fact that pharmaceuticals/medicine in the predominant sector of the biotech industry is in both the largest clusters, Stockholm and Malmö/Lund, as well as in Gothenburg. Of the four major clusters, only Uppsala has its highest share of employment in another sector, namely tools & supplies, but even there pharmaceuticals/medicine is the second largest sector.

In terms of numbers employed, the second largest sector in Sweden is agrobiotechnology, concentrated in a few plant improvement companies in the countryside outside Malmö/Lund. Tools & supplies, concentrated in Uppsala as men-
tioned above, and bioproduction, concentrated in Malmö/Lund and to a certain extent Stockholm, are the third and fourth sectors in size.

In the period 1997 to 2001 the total number of employees in the Swedish biotech industry increased by 47 percent, and concentration in the four main clusters increased during the period. However, the regional variations in growth were considerable. Uppsala had the highest growth with 174 percent, followed by Gothenburg with 107 percent. In Stockholm the rate was 51 percent and in Malmö/Lund 36 percent.

In all four of the leading clusters, connections between one or two pharmaceutical firms and medical faculties seem to have been important for the emergence of the modern biotech industry. One of the most cited examples is the collaboration between Pharmacia and Uppsala University, which started as early as the 1940s and intensified when Pharmacia relocated its operations from Stockholm to Uppsala in 1950. After the merger between Pharmacia and Upjohn in 1995 approximately 200 research and managerial positions were relocated from Uppsala, which was regarded as a serious blow to the city. However, some years later it was argued that Pharmacia’s withdrawal had resulted in an entrepreneurial biotech boom when resources and expertise were released (see Teigland et al. 2004). This popular myth has been questioned by Waluzewski (2003), but the importance of the long-term cooperation between Pharmacia and Uppsala University for the emergence of the Uppsala biotech cluster seems undisputed.

**Japan**

As pointed out above, the Japanese biotech industry consists in principle of two more or less interrelated spheres: biotech-related activities in large, established companies and new, small biotech firms, bioventures. No statistics are available on the size or share of “pure” biotechnology in the former. For the latter, there are the aforementioned surveys by the Japan Bioindustry Association (JBA). Table 12.2 shows these firms distributed by regions in December 2002 and 2004.

As shown in Table 12.2, almost half (48 percent) of the bioventures were concentrated in the Kanto region in 2004. However, a higher growth rate in the other regions resulted in a shrinking share of the total number of bioventures for Kanto, compared with 2002. Nineteen percent were located in Kansai in 2004 compared with 16 percent in 2002, and 11 percent were located in Hokkaido. The most common field of operations in 2002 was “pharmaceuticals & diagnostic product development” (94 ventures) followed by bioproduction (78 ventures) and bioinformatics (41 ventures) (JBA 2003b).

For several practical reasons, the empirical study reported in Chapter 13 was restricted to biotech companies in the Kansai region. The biotech industry of Kansai is focused around three fields: drug development, regenerative medicine and advanced analysis devices (Kansai Bureau of Economy, Trade and Industry 2003).5

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5 The selection of firms for the empirical study was not governed by this sectoral concentration.
Table 12.2. Number of bioventures in Japan in December 2002 and 2004, distributed by regions.

<table>
<thead>
<tr>
<th>Region</th>
<th>2002</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanto (Greater Tokyo)</td>
<td>191</td>
<td>224</td>
</tr>
<tr>
<td>Kinki/Kansai (Osaka, Kobe, Kyoto)</td>
<td>55</td>
<td>89</td>
</tr>
<tr>
<td>Hokkaido</td>
<td>32</td>
<td>50</td>
</tr>
<tr>
<td>Kyushu &amp; Okinawa</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Chubu, Tohoku, Chugoku &amp; Shikoku</td>
<td>35</td>
<td>66</td>
</tr>
<tr>
<td>Japan in total</td>
<td>334</td>
<td>464</td>
</tr>
</tbody>
</table>


United States

By the mid-1990s more than 100,000 people were already employed in the American biotech industry. As shown in Table 12.3 this number has almost doubled in ten years. However, the number of companies has shown a much smaller increase, indicating that this variable is not the best measure of development.


<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales*</td>
<td>28.4</td>
<td>24.3</td>
<td>21.4</td>
<td>19.3</td>
<td>16.1</td>
<td>14.5</td>
<td>13</td>
<td>10.8</td>
<td>9.3</td>
<td>7.7</td>
</tr>
<tr>
<td>Revenues</td>
<td>39.2</td>
<td>29.6</td>
<td>29.6</td>
<td>26.7</td>
<td>22.3</td>
<td>20.2</td>
<td>17.4</td>
<td>14.6</td>
<td>12.7</td>
<td>11.2</td>
</tr>
<tr>
<td>R&amp;D Expenses</td>
<td>17.9</td>
<td>20.5</td>
<td>15.7</td>
<td>14.2</td>
<td>10.7</td>
<td>10.6</td>
<td>9.0</td>
<td>7.9</td>
<td>7.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Net Loss</td>
<td>5.4</td>
<td>9.4</td>
<td>4.6</td>
<td>5.6</td>
<td>4.4</td>
<td>4.1</td>
<td>4.5</td>
<td>4.6</td>
<td>4.1</td>
<td>3.6</td>
</tr>
<tr>
<td>Public Companies</td>
<td>314</td>
<td>318</td>
<td>342</td>
<td>339</td>
<td>300</td>
<td>316</td>
<td>317</td>
<td>294</td>
<td>260</td>
<td>265</td>
</tr>
<tr>
<td>Companies</td>
<td>1,473</td>
<td>1,466</td>
<td>1,457</td>
<td>1,379</td>
<td>1,273</td>
<td>1,311</td>
<td>1,274</td>
<td>1,287</td>
<td>1,308</td>
<td>1,311</td>
</tr>
<tr>
<td>Employees</td>
<td>198,300 194,600 191,000 174,000 162,000 155,000 141,000 118,000 108,000 103,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

*Amounts are U.S. dollars in billions.  
Sources: Ernst & Young LLP, annual biotechnology industry reports, 1993–2004. Financial data based primarily on fiscal-year financial statements of publicly traded companies.

As shown in Figure 12.4, California is the American state with far the highest number of biotechnology companies. The Californian biotech industry is concentrated in two large agglomerations, the Bay Area and Greater Los Angeles, and a
more concentrated spatial cluster at San Diego. We shall give here a short description of the emergence of the San Diego biotech cluster.

What is known today as the Scripps Institution of Oceanography (SIO) was founded in 1903 and was the first life-science research body in the region. In 1955 the predecessor of the Scripps Research Institute was founded. In 1960 the Salk Institute for Biological Studies was established, as was the San Diego campus of the University of California (UCSD) the following year. The founding of UCSD was a result of organized lobbying with the vision of creating an “MIT of the West” (DeVol et al. 2004).

In the legend of San Diego’s biotech boom, the city’s first fully-fledged biotech company, Hybritech, plays a decisive role. Founded in 1978 by former Stanford researchers Ivor Royston and Howard Birndorf (recruited to UCSD the year before), and bought by the big pharmaceutical company Eli Lilly eight years later, Hybritech was the cradle for more than a dozen entrepreneurs, who 25 years after Hybritech’s start had founded more than 50 firms (DeVol et al. 2004).

San Diego’s biotech boom is often described as the shining example of collaboration between academies, research institutes, hospitals, industry, venture capitalists and government – a collaboration in which the barriers between the different actors are low, permitting people to change positions. One of Hybritech’s founders, Howard Birndorf, has described the dense biotech networks of San Diego in these words:

“I think that the fact that there’s venture capital, management talent, and entrepreneurial attitude here in San Diego, coupled with the fact that you have these major research institutions within three square miles supports the whole reason that this cluster is here. Additionally, the networking here through the programs such as [UCSD’s] Connect and BIOCOM have created a situation where starting a company is like falling off a log. The network is so in place for not just the money, but the facilities and the legal support, both corporate and patent, the lab supplies, you name it. Everything is here, easily available and even if somebody has no clue as to what this is, there are so many people here that do know now and can help somebody who wants to do it.”

---

6 Founded in 1985 at the urging of San Diego’s business community, UCSD Connect is regarded as one of the nation’s most successful regional programs linking high-technology and life science entrepreneurs with technology, money, markets, management, partners, and support services.

7 BIOCOM is a life science industry association representing more than 450 member companies in San Diego and Southern California.

Source: Ernst & Young LLP (2004).

**Fig. 12.4.** Number of US and Canadian biotech companies by region 2003.

### Policies for the Growth of Biotech Industries in the Three Countries

**Sweden**

The fact that Sweden is among the world’s ten countries having the highest numbers of biotech companies and is number one in the world for companies per inhabitant would seem to suggest that biotechnology is an area being given highest priority in Swedish industrial policies. However, this is not the case. There are no governmental agencies focusing especially on biotechnology and there is no national coordination among the actors whose aims include supporting research, commercialization, cluster building, capital access and other fields of development of the industry. This fragmentation of actors with different responsibilities goes all the way up to the national government, where research in biotechnology comes under the Ministry of Education while development of the industry comes under the Ministry of Industry.
However, certain aspects of public policies have had an important influence on Sweden’s position in the global biotech industry. Sweden has a long tradition of high-level, publicly financed medical research, which has contributed both to Big Pharma’s expansion from the 1970s onwards and to the expansion of the new biotech industry. The strong expansion of public health care from the 1960s to the 1980s had several effects on the life science industries: it generated demand and resources for new research, not least clinical research.

Research councils and foundations, together with the general university funds, are the main financiers of biotechnology research in Sweden. In 1997, the total funding of microbiological and biotechnological research from all sources amounted to SEK 510 million ($69 million)9 (Sandström et al. 2001). According to a report by the European Commission (1999) comparing biotechnology research in seventeen European countries, Sweden exhibited three peculiarities:

- Research financing is provided by a large number of actors, including charities.
- The Swedish research funding system is more focused on science than technology with weak links between science and technology policies.
- Funding is based on open calls for proposals, is based on peer reviews, and is mainly oriented towards the universities. There are no biotechnology research institutes and no national research programs giving priority to certain areas, nor is there any other coordination of funding.

In many countries, biotech is the subject of vigorous public debate in a number of different fields, not least stem cell research. Attitudes, ethical and religious values and even fears among the public are often reflected in legislation and regulations as to what kinds of research are permitted. In this respect, Swedish regulations are considered to be among the most progressive of those countries with the most developed biotech industries (SwedenBIO 2004).

Government support for commercialization, cluster building and capital access is provided by a number of national agencies all of which have a much broader focus than just the biotech industry. NUTEK, the business development agency, gives grants and loans for startup and seed-financing of new companies. In 1999 biotech companies received 13 percent of the available funds, while their share was considerably lower in the preceding years (Sandström et al. 2001). Other public agencies providing venture capital are ALMI Business Partner, the Technology Link Foundations and the Swedish Industrial Development Fund. VINNOVA, the agency for innovation systems, gives priority to 18 “growth areas” of which four are related to biotechnology (pharmaceuticals and diagnostics, biotech supply, biomedical engineering and innovation in foods). Among other projects, VINNOVA focuses on supporting incubator programs and dynamic regional innovation systems. VINNOVA also supports competence centers – aimed at strengthening the links between academic research and industrial R&D – of which a few are biotech-related, and university centers of excellence. Four “knowledge platforms,” of which biotechnology is one, are also given priority. Thus, a number of national actors have been involved without much coordination in the Swedish policies for strengthening the biotech sector.

9 Average exchange rate 1997 was SEK 1= $ 0.1312 (www.oanda.com).
The resource issues are highlighted by the biotech industry’s organizations, which stress the shortage of seed capital and venture capital. Regarding research, the total public research funding of biotech and medicine research in the United States in 2003 was 50 percent higher than the per capita funding in Sweden. As a member of the European Union, Sweden has access to the EU frame programs. However, bureaucratic application processes, multi-partner requirements, etc, mean that these programs are not readily available for SMEs. Industry organizations also claim that Sweden is losing ground as a number of other countries are increasing their efforts to promote the growth of the biotech industry (SwedenBIO 2004; Regeringskansliet 2005).

Japan

A general opinion among actors in Japanese biotechnology is that they are lagging 10-15 years behind the U.S. and Europe\(^\text{10}\) in many respects. It is possible to interpret this lag as a reflection of Japan’s problems in transforming its economy from a manufacturing-industry based economy to a knowledge-based one. The Japanese industrial innovation system was founded on an intimate collaboration between government and big companies in which government provided R&D grants for developing selected technologies. However, in Japan as in other countries, big companies prefer to invest in good securities and not in insecure potential innovations. The Japanese innovation system – so successful in industrial production – showed its weaknesses when innovations were dependent on university research and risk-taking by small entrepreneurial enterprises. Both the formal institutions and the informal social capital of the Japanese economy have constituted severe obstacles to a smooth transformation to a knowledge economy (see Chapters 9–10). As a consequence, biotechnology research has not led to a substantial number of startups as in other countries. Instead, the established big companies in biotech-related branches set up biotech units within their existing frameworks. Moreover the Japanese government has hesitated over the prospects for biotechnology. Although the budget for life sciences’ R&D doubled between 1995 and 2000, the budget for life sciences in Japan in 2002 was less than 1/7 that of the U.S. (Biotechnology Strategy Council 2002).

In July 2002 a Biotechnology Strategy Council was formed and in December 2002, the Japanese Prime Minister Junichiro Koizumi himself – a sign of the importance the Japanese government now attaches to the sector – announced guidelines for a national biotechnology strategy containing 200 detailed action plans. The strategy spans the entire biotechnology sector, from more than doubling the biotech research budget for the next five years to strengthening the hitherto inadequate collaboration between universities and industry and between disciplines; from promoting startups and improving institutions for intellectual property and

\(^{10}\) Personal interview with Director Yashima Takehiro, Kansai Bureau of Ministry of Economy and Trade (METI) 2003-12-02; Director Mitsuru Miyata, Nikkei Business Publications, quoted in “BiotechSweden”, No 4, 20 April 2004.
venture capital to assisting cluster-building and fostering a more thorough public understanding of the issues at stake (Biotechnology Strategy Council 2002).

Koizumi’s biotechnology strategy can be regarded as an example of the Japanese type of large-scale, centralized, top-down policies. However, the content of the strategy shows that the government is ready to try new methods and solutions. The conclusion must be that Japan has formulated one of the most ambitious and comprehensive biotechnology policies in the world. It remains to be seen at what pace it will prove possible to implement the policy and achieve the expected results.

USA and California

Ever since the early days of DNA research in the 1970s, the United States has been the world leader in the field of biotechnology. This holds both for academic research, industrial R&D and commercialization of the findings.

In 2001, U.S. academic R&D expenditures on biotech sectors totaled $16 billion. The National Science Foundation is one important financier of academic bio-tech research, allotting grants totaling more than half a billion USD in 2003. By far the largest funding agency for biotech R&D is the National Institute of Health, which provided $17 billion to biotech and medical R&D in 2002 (DeVol et al. 2004). In contrast to the situation in e.g. Sweden, where “research” is considered to be an activity that should take place at universities, a substantial proportion of NIH’s and related agencies’ funds are available for SMEs. A federal law states that every federal government department has to allocate a certain percentage of its budget to Small Business Innovative Research (SBIR) grants. Any company fulfilling certain conditions can apply for these grants, which assist mainly with costs of R&D, personnel training, overheads and some equipment. Another important federal program is the Small Business Technology Transfer (STTR) program, aimed at extending the participation of small businesses in federal R&D and encouraging private sector commercialization of technology.

Thus, the general picture is that biotechnology is a sector given high priority in federal policies. However, one area of biotechnology in which certain activities are questioned is that of issues related to ethics and religion. The anti-abortion movement and other conservative religious groups have played a major role in resistance to research on stem cells from human embryos. Stem cells are “unspecialized” cells which can generate healthy new cells and tissues. As a result, they have the potential to provide life-saving cures for many different diseases and injuries, including diabetes, cancer, heart disease, Alzheimer’s, multiple sclerosis, HIV/AIDS, Parkinson’s, ALS, osteoporosis and spinal cord injuries. Since 1995, research on embryonic stem cells has not been supported by federal funds. Since 2001, it has been permitted to make federal grants for research on stem cell lines that existed prior to September 2001, but not to new ones. In practice this meant

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11 Personal communication with CEOs of Californian biotech companies.
that only 21 stem cell lines were available for research. More than 100 new stem cell lines have been produced since 2001 (Nilsson 2004).

As a consequence of the resistance to stem cell research both in several states and at federal level, other states have seen this as an opportunity to support this research in order to promote economic growth and public health. The largest investment has been made in California, which at the time of the elections of November 2004 approved a $3 billion bond issue to fund stem-cell research. The $295 million in annual funding, spread over ten years, is being channeled via the creation of the California Institute for Regenerative Medicine. Grants and loans for research and facilities will be made to academic and non-profit research institutions, teaching hospitals, and commercial entities that have demonstrated success in therapy deployment. All grants and facilities funded by the Institute must be located in the state of California. Besides the expected effects on health, the investment aims at making California the undisputed leader of stem cell research in the world.\(^\text{12}\)

The new institute did not fall from the sky. As noted above, California is already the state with the highest number of biotech companies. Three of the six largest biotech clusters in the U.S. are situated in California and 43 percent of the biotech workforce is concentrated in that state (ITPS 2004). As early as the year 2000, Governor Gray Davis launched the California Institute for Bioengineering, Biotechnology & Quantitative Biomedical Research (QB3) as one of four institutes for science and innovation. QB3 has been built up by a collaborative effort involving the University of California (UC) system and the bioscience industries. The institute employs more than 100 scientists housed in a new building at Mission Bay in San Francisco, the new UCSF campus that forms a part of a public/private biomedical research park, in a new building at UC Berkeley, and in two new facilities at UC Santa Cruz. A number of other academic-industry collaborations supported by the state are also found in other parts of California (Pollak 2002).

According to a survey by the Biotechnology Industry Organization, as of 2001, ten states had developed or begun developing strategic plans for biotechnology. California does not have a comprehensive strategy for the biotech industry, but the wide diversity of initiatives indicates that biotechnology is among the industries assigned the highest priority in the industrial policies of California (Pollak 2002).

Thus, in comparison with Sweden and Japan, the public policies (and private initiatives) for growth in the biotech industry in the United States in general and California in particular are by far the most highly developed. This holds good with respect not only to the amount of resources invested but also to industry-academy-government collaboration.

\(^{12}\) Another state supporting stem cell research is New Jersey, which together with California and New Hampshire is the only state so far permitting broader research into embryonic stem cells than federal law permits.
13  The Biotech Industry’s Social Capital: An Empirical Study

Introduction

A questionnaire based on the theoretical structure outlined in Chapter 5 was sent out to biotech companies in the three countries in 2003. A detailed account of the survey is found in the Appendix to this chapter. Here we restrict ourselves to noting that the Japanese companies participating in the study showed some differences compared with their Swedish and American counterparts. Because of the differences in entrepreneurship culture discussed in Chapter 10, development of biotech activities within existing firms in related sectors has been the predominant strategy for nurturing the biotech industry in Japan. Not until the Japanese government’s new biotech strategy was launched in late 2002 was a rapid increase in the number of startups considered a primary goal. Thus, because of the limited number of startups and after consultation with the Osaka office of the Ministry of Economy and Trade (METI), the Japanese questionnaire was sent out both to startups and to traditional companies with biotech activities.

A General Picture of the Enterprises Investigated

As shown in Table 13.1 the average number of employees in the participating firms varied considerably. The Kansai firms had the highest number of employees, about six times as many as an average Swedish firm. The growth rate also exhibited substantial differences. The number of employees in the Californian firms more than doubled (+127 percent) between 2000 and 2002.1 The small Swedish firms increased by 31 percent, while the Kansai firms remained constant. Turnover varied roughly in accordance with the average size of the companies, but as shown in Table 13.2, turnover per employee fell in all three areas during the period of study. The largest decrease, 15 percent, was found among the Kansai firms, which also showed an absolute fall in turnover. In Sweden and California, the average fall in turnover per employee seems to have been caused by the increase in number of employees.

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1 This is a much higher figure than the average US growth of 12 percent shown in Table 12.3, and suggests a possible bias. Companies with higher growth may have felt stronger incentives to answer the questionnaire.
Table 13.1. Average number of employees and turnover in 1000 USD\(^2\) in the companies in 2000-2002.

<table>
<thead>
<tr>
<th></th>
<th>Employees</th>
<th>Turnover</th>
<th>Employees</th>
<th>Turnover</th>
<th>Employees</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>16</td>
<td>1 572</td>
<td>16</td>
<td>1 274</td>
<td>21</td>
<td>1 935</td>
</tr>
<tr>
<td>Kansai</td>
<td>121</td>
<td>40 052</td>
<td>121</td>
<td>35 263</td>
<td>121</td>
<td>33 848</td>
</tr>
<tr>
<td>California</td>
<td>48</td>
<td>7 776</td>
<td>84</td>
<td>15 796</td>
<td>109</td>
<td>17 053</td>
</tr>
</tbody>
</table>

Table 13.2. Average turnover per employee in USD 2000-2002.

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>101 141</td>
<td>77 741</td>
<td>94 203</td>
</tr>
<tr>
<td>Kansai</td>
<td>331 367</td>
<td>290 576</td>
<td>280 189</td>
</tr>
<tr>
<td>California</td>
<td>162 943</td>
<td>187 858</td>
<td>156 504</td>
</tr>
</tbody>
</table>

The Swedish firms had the highest costs per employee for education/seminars/courses and the Japanese firms the lowest. R&D as a share of turnover was 79 percent in the Swedish companies and 66 percent in the Californian, both reflecting the industry’s strong reliance on R&D. The Californian figure is lower than the US average in 2002 of 84 percent. However, the R&D share is relatively volatile between the years (in 2001 the US average share was 73 percent, see Table 12.3). Thus, the lower Californian figure for 2002 can be interpreted as a temporary deviation, but it is also possible that the Californian companies taking part in the study have reached a stage where different kinds of marketing have become more necessary. The Japanese firms did not provide any authentic figures for R&D costs. Nor, in accordance with Japanese company culture, did they answer other questions that they considered sensitive (see below).

Table 13.3. Costs in USD for education/seminars/courses, R&D and internal and external entertaining, all per employee, plus R&D as share of turnover, 2002.

<table>
<thead>
<tr>
<th></th>
<th>Education costs/employee</th>
<th>R&amp;D/employee</th>
<th>R&amp;D share of turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>672</td>
<td>74 499</td>
<td>79%</td>
</tr>
<tr>
<td>Kansai</td>
<td>145</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>California</td>
<td>317</td>
<td>102 807</td>
<td>66%</td>
</tr>
</tbody>
</table>

\(^2\) The Swedish and Japanese currencies have been converted to US Dollars by the average exchange rate for each year respectively. Exchange rates from [www.oanda.com](http://www.oanda.com)
Enterprise-Internal Social Capital

The enterprise-internal social capital was measured in four ways; staff stability (i.e. inverted staff turnover) in 2002, management’s opinion concerning the importance of organized internal seminars/courses and informal knowledge exchange within the company respectively, and the companies’ investment in internal entertaining. The results are shown in Table 13.4.

<table>
<thead>
<tr>
<th></th>
<th>Staff stability</th>
<th>Importance of internal seminars</th>
<th>Importance of informal knowledge exchange</th>
<th>Internal entertainment/ employee</th>
<th>Share of firms’ spending on internal entertainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>93%</td>
<td>31%</td>
<td>73%</td>
<td>$277</td>
<td>80%</td>
</tr>
<tr>
<td>Kansai</td>
<td>95%</td>
<td>82%</td>
<td>91%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>California</td>
<td>89%</td>
<td>46%</td>
<td>89%</td>
<td>$229</td>
<td>83%</td>
</tr>
</tbody>
</table>

The Japanese companies scored highest in all the three measures they replied to, thereby supporting the general view of Japanese firms’ strong focus on internalizing relations. With the three measures taken together, the Californian firms indicated a higher internal social capital than the Swedish. The Swedish firms had almost as high staff stability as the Japanese, but in the other two measures, Sweden scored lowest. The Californian companies had the lowest staff stability, lending support to another piece of conventional wisdom: that of the flexible American labor market. In contrast to these differences between Californian and Japanese firms, the Californian firms valued informal knowledge exchange within the company almost as highly as the Kansai firms. The Swedish firms spent somewhat more on internal entertaining than the Californian, but both areas had a high proportion of spending companies.

External Production-Related Social Capital

The companies’ external production-related social capital was measured by questions about employees’ expertise nets, companies’ methods of recruitment, R&D with external actors and the importance of external knowledge exchange. In the case of questions with several alternative answers, it was allowed to check several alternatives. There are large differences between the regions as regards the number of alternatives checked. For example, with respect to employees’ external expertise nets, the Californian companies checked the highest number of alternatives (4 per company) while the Japanese firms checked the lowest number (0.6 per company). The Swedish companies checked an average of 1.6 alternatives. These dif-
ferences are approximately the same for the other questions with several possible answers, presented in this and the following section.

Table 13.5 shows the company managements’ opinions about the sectoral and spatial location of their employees’ informal expertise nets. A number of observations merit notice.

Swedish employees' networks are most closely orientated towards the universities in their own region. Regarding both universities and companies, Swedish employees have at least as strong links to foreign actors as to corresponding extraregional Swedish units. The employees of the Kansai companies are distinguished by having no foreign links to any of the sectors and by having slightly stronger links with extra-regional actors than with actors in the Kansai region.

Table 13.5. Managements’ opinion concerning the sectoral and spatial location of their employees’ informal external expertise nets (relative frequencies in percent for each region) and the importance of these nets (percent).

<table>
<thead>
<tr>
<th>Universities</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>In region</td>
<td>In nation</td>
</tr>
<tr>
<td>Sweden</td>
<td>33</td>
</tr>
<tr>
<td>Kansai</td>
<td>13</td>
</tr>
<tr>
<td>California</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Government agencies</th>
<th>Importance (all nets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In region</td>
<td>In nation</td>
</tr>
<tr>
<td>Sweden</td>
<td>5</td>
</tr>
<tr>
<td>Kansai</td>
<td>14</td>
</tr>
<tr>
<td>California</td>
<td>8</td>
</tr>
</tbody>
</table>

The Japanese employees also have the highest share of links to government agencies. The Californian employees have the most even distribution of networks between the sectors and spatial levels. As regards the managements’ opinion concerning the importance of their employees’ competence nets, the Swedish and Californian firms showed similar shares; more than 80 percent of the companies felt these personal expertise nets to be important. Half of the Japanese companies found their employees’ expertise nets important.

The results lend support to several views often expressed about Japanese firms and making reference to the relatively strong connections between Japanese firms and governmental agencies as well as to the very national character of the Japanese innovation system. However, certain Swedish results are worth noting. The high proportion of contacts with universities in the companies’ own region compared with other contacts implies that many of the Swedish firms are new startups, close to university research but with a long way to go to the ultimate market. The very low proportion of contacts with Swedish governmental agencies is also worth noting.
Whereas Table 13.5 gave information on employees’ expertise nets, Table 13.6 presents managements’ opinions concerning the companies’ entire external knowledge exchange, i.e. including managements’ external expertise nets. As in the former table, the Swedish firms valued the nets for informal external knowledge the highest, but here the Californian and Kansai firms showed equal proportions of positive responses. A possible interpretation of the Kansai firms’ higher share in this table might be that the Japanese firms are more focused on managements’ (than the employees’) knowledge acquisition via their personal networks. The differences for the Californian firms are harder to interpret. Table 13.6 also shows managements’ opinions concerning the importance of formal seminars/courses in cooperation with external actors. Here the Kansai firms had the highest proportion, indicating that this form of official cooperation is accepted and fairly common in Japan. Correspondingly, the relatively low proportion among the Californian firms may indicate a lower valuation of this formal type of knowledge exchange.

Table 13.6. Managements’ opinion concerning the importance for the company of a) the company’s (incl. management) informal external knowledge exchange, and b) seminars/courses in cooperation with external actors. Percentage of companies.

<table>
<thead>
<tr>
<th></th>
<th>The company’s informal external knowledge exchange</th>
<th>Seminars with external actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>71</td>
<td>44</td>
</tr>
<tr>
<td>Kansai</td>
<td>57</td>
<td>49</td>
</tr>
<tr>
<td>California</td>
<td>57</td>
<td>37</td>
</tr>
</tbody>
</table>

The relative frequencies of methods used in the recruitment of new employees are presented in Table 13.7. Of the different methods, recommendations by current employees and the use of personal contacts are here considered as indications of strong external production-related social capital, while advertisements in the daily press or technical and professional journals, the use of recruitment agencies and recruitment campaigns at universities are indications of weaker external production-related social links and networks. Measured in this way, the disparities of production-related social capital between the companies of the three areas are not particularly wide. Recommendations by employees and personal contacts are the most frequent recruitment methods in all the three areas and most common in Sweden. Of the indications of weaker social capital, recruitment agencies are used most in Japan while Swedish companies prefer advertisements. Recruitment campaigns at universities are used most by the Californian companies and least by the Swedish ones. It may be worth noticing that although the Californian firms are located in regions characterized by world-leading education and research in biotechnology, they still have the highest frequencies for recruitment campaigns on university campuses outside their home region.
Table 13.7. Relative frequencies (percent) of methods used in the recruitment of new employees.

<table>
<thead>
<tr>
<th></th>
<th>Advertisements</th>
<th>Recruitment Agencies</th>
<th>Campaigns at local universities</th>
<th>Campaigns at national universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>22</td>
<td>12</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Kansai</td>
<td>11</td>
<td>24</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>California</td>
<td>17</td>
<td>15</td>
<td>13</td>
<td>9</td>
</tr>
</tbody>
</table>

Professional relations are one source of social relations. Thus, production-related social capital can be considered as a by-product of e.g. R&D cooperation, but the cooperation can also be a result of existing social capital. In both cases, R&D cooperation with external actors is an indication of certain components of production-related social capital. Table 13.8 shows that as many as 95 percent of Swedish companies engaged in some form of external R&D cooperation in 2000-2002. Almost 80 percent of the Californian but just over a third of the Kansai companies featured such cooperation. The results testify to the internalized structure of the Japanese firms. However, it can be assumed that the very high Swedish figure is caused by the fact that the Swedish firms are also the smallest in size and have the most pressing need to cooperate on R&D.

Table 13.8 also shows the proportion of companies which have written and published articles in domestic and/or international biotech journals and the proportion which have done this in cooperation with external actors. Publishing articles can be considered as a form of marketing and should thus normally be regarded as a form of market-related social capital. However, this particular type of marketing is not primarily directed towards customers but towards potential and existing partners in R&D, venture capital, grant-giving public agencies, etc. Therefore we here consider the publication of articles as a form of investment in production-related relations. More than 70 percent of the Californian and Swedish firms had made such investments in 2000-2002, compared with not more than one out of seven Japanese firms. More than half of the Swedish and Californian firms, but only one tenth of the Japanese, had produced articles in cooperation with other actors.

External entertaining too should normally be considered as building market-related relations. However, because of the special character of the biotech industry it is reasonable to regard external entertaining as investment in social, production-related relations. A vast majority of both the Swedish and Californian firms spent
money on external entertaining, but average Swedish spending per employee was twice as high as the Californian.

**Table 13.8.** Proportion of companies investing in certain production-related external relations, 2000-2002. Percent.

<table>
<thead>
<tr>
<th>R&amp;D cooperation</th>
<th>Published articles</th>
<th>Published articles in cooperation</th>
<th>Proportion of firms spending on external entertaining</th>
<th>External entertaining/employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>95</td>
<td>71</td>
<td>55</td>
<td>86</td>
</tr>
<tr>
<td>Kansai</td>
<td>36</td>
<td>14</td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>California</td>
<td>78</td>
<td>75</td>
<td>53</td>
<td>83</td>
</tr>
</tbody>
</table>

One of the most striking differences between the companies in the three areas studied is in the role played by government financial support. Contrary to what would be expected, neither Sweden with its large public sector and comprehensive industrial policy nor Japan with its centralized industrial policy of technological planning has the highest proportion of companies receiving government assistance. Forty-three percent of the Californian companies – a proportion about three times higher than for Swedish and Japanese companies – had received government financial support during 2000–2002. The main reason is probably the special features of the US innovation system mentioned in Chapter 12: federal government departments have to spend a certain share of their budget on Small Business Innovative Research grants (SBIR). A few companies have also received grants from the state of California.

**Table 13.9.** Percentage of companies receiving financial support from government agencies 2000-2002.

<table>
<thead>
<tr>
<th>Government support</th>
<th>Sweden</th>
<th>Kansai</th>
<th>California</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15%</td>
<td>13%</td>
<td>43%</td>
</tr>
</tbody>
</table>

**Environment-Related Social Capital**

As pointed out in Chapter 5, the social capital related to the regional environment consists in principle of networks with links of three different types:
- Distance-dependent, non-technical/financial links to other enterprises and R&D centers
- Links to politically governed bodies in the community/region
- Links to the citizens of the local/regional civic society and their organizations
In order to get a brief, approximate picture of the importance of these networks, questions were asked about the companies’ contacts with branch & lobby organizations and officials and politicians. The firms’ philanthropy/sponsorship costs, recruitment patterns and location reasons were also investigated.

Table 13.10 shows Californian firms in the lead for contacts with branch organizations and public decisionmakers, and for philanthropy/sponsorship as well. However, the proportion of companies expending money on philanthropy/sponsorship was fairly equal in all the three areas studied, possibly indicating that the incentives to be embedded in the local/regional civil society do not vary much between the three countries. The Japanese companies did not respond to the questions about branch organizations and contacts with decisionmakers.

**Table 13.10.** Proportion of firms participating in branch & lobby organizations, having contacts with public decisionmakers (officials and politicians) and expending money on philanthropy/sponsorship, 2002.

<table>
<thead>
<tr>
<th></th>
<th>Branch &amp; lobby organizations</th>
<th>Contact with officials &amp; politicians</th>
<th>Sponsoring charities or events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>54%</td>
<td>52%</td>
<td>31%</td>
</tr>
<tr>
<td>Kansai</td>
<td>-</td>
<td>-</td>
<td>38%</td>
</tr>
<tr>
<td>California</td>
<td>61%</td>
<td>75%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Table 13.11 furnishes additional support to the conception of Swedish companies’ regional embeddedness. Recruitment from universities and firms in the home region is entirely predominant where Swedish companies are concerned. Regional recruitment is the main source of new labor in companies in the two other regions as well, but to a lesser extent. The Kansai firms recruit from Japanese universities outside the region as much as from intra-regional firms, while recruitment abroad is unusual. The Californian firms have the most dispersed recruitment pattern, even though they rely mainly on recruitment from the home region.

**Table 13.11.** Relative frequencies (percent) of source of firms’ employee recruitment.

<table>
<thead>
<tr>
<th></th>
<th>Universities in the region</th>
<th>Domestic universities</th>
<th>Foreign universities</th>
<th>Firms in the region</th>
<th>Domestic firms</th>
<th>Foreign firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>47</td>
<td>5</td>
<td>5</td>
<td>35</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Kansai</td>
<td>35</td>
<td>36</td>
<td>0</td>
<td>18</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>California</td>
<td>27</td>
<td>12</td>
<td>2</td>
<td>35</td>
<td>15</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 13.12, showing the reasons for the companies’ choice of location, reveals several notable differences between the regions. The most important reason for the Swedish firms was that the founder(s) was/were living in the region, followed by the proximity of research institutes and universities (R&D centers). The founder(s’) residence was the most important reason for location in the case of Californian firms as well. Quality of life was the second most important reason, followed by proximity to other firms. The firms in Kansai valued infrastructure for
transportation and communication the highest, followed by proximity to customers and the quality of life in the region. The only factor that seemed to be of equal value to the companies of the three regions was the supply of competent labor. Proximity of venture capital and availability of financial assistance in return for locating in the region were generally of least importance, but Californian firms valued closeness to venture capital more highly than did firms from the other two regions. The same holds for the Kansai firms as regards financial assistance for location.

**Table 13.12.** Relative frequencies (percent) of the reasons for the choice of location of the company.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Founder’s residence</th>
<th>Other firms</th>
<th>Customers</th>
<th>Competence (Human Capital)</th>
<th>Venture Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>36</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Kansai</td>
<td>11</td>
<td>5</td>
<td>16</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>California</td>
<td>21</td>
<td>15</td>
<td>4</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>R&amp;D Centers</th>
<th>Transport &amp; communications</th>
<th>Quality of life</th>
<th>Regional financial assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>24</td>
<td>7</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Kansai</td>
<td>7</td>
<td>23</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>California</td>
<td>12</td>
<td>6</td>
<td>16</td>
<td>3</td>
</tr>
</tbody>
</table>

The location of the company founder’s residence has long been confirmed by Swedish studies as the most important reason for location of the company (see e.g. Lorendal 1974) and is thus not peculiar to the biotech industry. The Swedish firms’ close links to university research are once again underlined by the importance they attach to the proximity of research centers. In contrast, the location of the Kansai firms seems to be influenced very seldom by where R&D centers are located. One thing the Swedish and Japanese firms have in common seems to be their low valuation of proximity to other firms. Quality of life as a location factor seems fairly important for Californian and Kansai firms but not for the Swedish ones. A plausible explanation may be that in many respects regional differences in Sweden tend to be small.

**Market-Related Social Capital**

Several activities associated with marketing such as external entertainment, publishing articles, sponsorship and philanthropy have been discussed in the sections above. In business in general, such activities would be considered as investment in diverse fields of market-related social capital. However, in the case of the biotech industry – at least in its current stages – many companies, in particular the small ones on which this study is focused, are still in an R&D period, without anything
to offer the market. Therefore these activities should be regarded here primarily as investment in relations with existing or potential partners and the segment of the firm’s environment that consists of civil society.

**Connections Social Capital – Economic Performance?**

Earlier studies by Cooke and Clifton (2004) and Westlund and Nilsson (2005) have revealed indications of a positive relationship between certain measures of social capital and firms’ economic development. Correlation analyses were carried out in order to test possible connections between the various measures of enterprise-related social capital presented above and the changes in the biotech companies’ turnover (sales) and number of employees over time. However, no significant correlations, positive or negative, were found in any of the three countries. Does this mean that social capital is of less importance in the biotech industry compared with the “ordinary” firms analyzed in the two studies referred to? Maybe the hypothesis of the increased importance of social capital in the knowledge economy is erroneous? Probably not.

Explanations do exist for the absence of correlations between the social capital variables and the biotech firms’ economic development. In fact the problem with the empirical study being reported on here is the limited time span, the years 2000–2002. A longer time period would have been desirable but as the biotech industry is a new industry with many new companies, extending the investigation period to an earlier starting point would have reduced an already small number of firms still more. Moreover, the chances of finding figures showing the economic performance of companies are reduced with time.

These types of problems affect studies of companies in all branches. However, the peculiarities of the biotech industry make time an even greater problem. As was shown in Figure 12.1, the product development process in biotech drug development is normally about 15 years. Other sectors of the biotech industry have long development processes too. This means that the activities in biotech firms may be proceeding as planned – and they may have developed excellent internal and external social capitals – but the results in economic terms do not show up until 5–10 years later!

**Summary and Discussion**

The findings of the empirical study can be summarized in the following points:

With very low staff turnover and very high valuation of internal knowledge exchange, the biotech companies of Kansai confirm the general picture of Japanese firms’ focus on internalization. Relatively speaking, the Japanese biotech companies’ strongest social capital seems to be the firm-internal social capital. The opposite seems to be the case for the Swedish companies, which in our measures
scored lowest. The differences between the areas studied indicate the possibility of substituting one type of enterprise-related social capital for another.

The external production-related social capitals of the Swedish and Californian firms have several similarities. Managements of the companies of both regions value their employees’ competence networks highly. A large proportion of the companies cooperate with external actors in R&D. The companies market themselves towards potential partners, credit institutions and government agencies by publishing scientific articles to a similar extent. These activities are much more internalized in the Kansai companies, which in these respects seem to have a less developed external production-related social capital.

The Swedish companies deviate from their Japanese and Californian counterparts in other aspects of production-related social capital and also in terms of environment-related social capital. This holds both for the spatial extensions of their relations and for the actors they have relations with. Concerning the employees’ competence nets and the firms’ recruitment, the Swedish firms seem to apply local/regional internalization that can be depicted as a spatial counterpart to the Japanese firms’ corporate internalization. Another peculiarity of the Swedish firms is their limited contacts with government at various levels, reflected in the employees’ competence nets and the low proportion of companies receiving government financial assistance. Given that the Japanese companies, whose proportion in receipt of such assistance was also low, are mainly older companies only partly engaged in biotech activities and a few bioventures (to which government gives priority), it seems as though the Swedish biotech companies are the ones most isolated from and least supported by industrial policies.

The Swedish companies’ local/regional internalization and screening off from government contacts may be explicable in part by the company population, consisting of young, small, research-oriented firms which at their current stage mainly need contacts with some researchers at the local university and one or two fellow firms. However, a supplementary explanation might be the traditional Swedish research policy, according to which universities are supposed to do “everything” and industrial research institutes hardly exist. In a research-intensive field such as the biotech industry, industrial policies and innovation policies have been replaced to a certain extent by policies for university research. As a consequence, Swedish biotech firms have little to gain from contacts with government. The result is that the Swedish biotech clusters have many and dense links between firms and universities, but few and sparse links between these two actors and government. This situation does not sit well with the theoretical ideal of a cluster and the corresponding theories of innovation systems and triple-helix cooperation.

The absence of a national strategy for development of the Swedish biotech sector is also reflected in a lack of coordination between research and the commer-

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3 The Japanese government’s strong focus on creating a support structure for bioventures is illustrated by statements from these. A management representative of one of the fastest growing biotech companies in Kansai, for example, stated when interviewed that without support from METI’s Osaka office, the company would not have been able to grow in the way it had (Personal interview in Kansai, 2003-12-01).
cializing of research. Apart from the activities of (mainly) VINNOVA, policies for biotech development are very oriented towards university research. Of the three pillars forming an ideal innovation system, government seems to be the weakest pillar in Sweden.

If this explanation is correct, then one of the three pillars of the Swedish biotech innovation system must be partly missing. The “missing pillar” of innovation policy is also discussed in Japan, but there it is the university that is considered to be partly missing. As far as the biotech industry is concerned, this view is partly supported by the empirical results of the study. The employees of the Kansai firms do have stronger contacts with other companies and government than with universities, and a relatively small proportion of the firms cooperate in R&D (with universities, research institutes or other firms). Apart from this, just as in other industries, the peculiarity of the Japanese biotech innovation system seems to be its national character.

A general impression of the Californian companies taking part in the study is their well developed social capital, both internally and externally, with its spatial extensiveness and its extension to different actors. The Californian firms score high in measures of enterprise-internal social capital but at the same time have diversified external networks and relations. In spite of their location in three of the world’s leading biotech regions, their networks are the most spatially extended. In contrast to the Swedish and Japanese firms, the Californian firms seem to have well-developed relations with both academy and government. Contrary to the conventional wisdom regarding American trade, a far higher share of the Californian biotech firms received government assistance than the Swedish and Japanese.

Finally, this empirical study has revealed clear indications that the connections between social capital and biotech firms’ economic performances do not disclose themselves in the short run. Investments in social capital are often long-term, and their outcomes, particularly in the biotech industry, may not appear until many years have elapsed.

**Growth Policies in a Global Knowledge Economy**

In Chapters 9–11 the role of social capital in the transition from industrial economy to knowledge economy in three economically advanced countries was discussed. The discussion focused on a) employer-employee relations in a broad sense; b) norms, relations, institutions and organizations connected to innovations and economic growth and renewal; and c) the social capital of the civil society.

The analysis showed that during the industrial epoch the three countries built distinctive - but in terms of growth successful - models with wide dissimilarities of social capital and its institutional and organizational expressions. In the transition to the knowledge economy it is the American, particularly the Californian, model that has been the most successful so far. The competitive, more flexible and more globalized Californian society seems to have offered the most fertile soil for the efflorescence of the knowledge economy.
However, compared with the Swedish and Japanese models with social capitals and formal institutions and organizations of considerably greater homogeneity, the Californian/American model is not a model but a number of models, sometimes coexisting, sometimes competing, each with its particular social capital and formal institutions and organizations. These Californian/American models seem to differ between industry and region to a much larger extent than is the case in Sweden and Japan. Given the advanced supply and demand conditions which, in the form of high levels of education/research and consumption patterns exist in all of the three countries studied, this special American institutional/organizational diversity seems to have created strong incentives and few obstacles to the expansion of the knowledge economy.

The systems of the industrial society were mainly national systems. The growth of the knowledge economy along with globalization has rendered obsolete many of the national components of societies’ social capital and formal institutions and organizations. A tentative general conclusion therefore is that the diversity of the Californian/American society has contributed to the growth of high-tech industry and other applications of the knowledge economy. This has so far happened in a relatively small number of regions which have been able to combine diversity and tolerance.

If this conclusion is correct, this means that Sweden and Japan face problems in coexisting with the global knowledge economy principally because of the homogeneity of their societies. National systems are no longer adequate to the task of obtaining information rapidly, developing it creatively and making productive use of it. The continued growth of the knowledge economy in Sweden and Japan – and economic growth in general – depends on the countries’ ability to transform their social capital and formal institutions and organizations in a way that

- facilitates import and integration of existing, external knowledge
- produces new knowledge based on acquired, existing knowledge
- combines and transforms different knowledge into product innovations
- combines and transforms different knowledge into marketing innovations

Diversity and tolerance appear to be crucial component parts of a social capital that maximizes knowledge import, knowledge production and innovation. The policy ramifications of such a conclusion are wide and imply that successful innovation systems and economic growth are dependent on a number of policy fields. In that case, the great challenge would be to devise a strategy in which not only industrial policy, but also policies for, e.g. education, research, immigration, culture and health become integrated aspects of the national growth policy in the global knowledge society. Such an interpretation is well in line with the “third generation policy of innovation” launched by the European Commission, which stresses innovation policy as a necessary ingredient in all policy areas (Lengrand et al. 2002).

The comparison of the biotech companies’ social capitals in the three areas studied leads to the tentative conclusion that American innovation policies in general and Californian policies in particular are the ones most adapted to the theories of innovation systems, knowledge clusters and triple helix. It is beyond the scope of this study to say to what degree public policies have contributed to American
and Californian biotech industries being the world leaders. However, if the modern theories are even partly right, these policies must have had some impact.

Both Sweden and Japan are taking action to improve their systems of innovation. Sweden has set up a national agency for innovation systems in all industries. The Government Bill on research policy presented in March 2005 increases resources to this agency and the agency has proposed a national biotech strategy. Biotechnology is one of the prioritized research areas in the Bill. Japan has launched a comprehensive biotech strategy and is “privatizing” the public universities into semi-public bodies so as to increase the universities’ incentives and opportunities to collaborate with private companies. The outcome of these actions remains to be seen.

Appendix: The Empirical Data

The empirical study is based on questionnaires sent out to biotech companies in June/July 2003 (California), September 2003 (Kansai) and January 2004 (Sweden). Drafts of the questionnaire were discussed with representatives of companies, branch organizations and government agencies in Sweden and California and with researchers in Japan. After the discussions, the questionnaire was revised to take account of the opinions expressed.

The Californian questionnaire was administered by the Swedish Office of Science and Technology in Los Angeles and dispatched to 556 companies identified as members of biotech organizations in the Bay Area, the Los Angeles region and San Diego. Of these 556 companies, 70 had wrong addresses or were impossible to contact for other reasons. In spite of several reminders by mail, telephone and e-mail, no more than 36 companies (7.7 % of the remaining 466 companies) returned the questionnaire with usable replies. The low response rate means that it is impossible to regard the replies as representing anything more than figures and opinions of the participating companies – even though some of the replies indicate that the firms responding to the questionnaire share some well-known general characteristics of American firms.

The Kansai questionnaire was administered by the School of Civil Engineering of Kyoto University. It was distributed to 800 companies selected by the Osaka office of the Ministry of Economy and Trade (METI). Because of the limited number of startups in Japan, the Kansai questionnaire was sent out both to startups, traditional companies with biotech activities and companies planning to launch some form of biotech-related activities. 101 questionnaires with replies were returned, representing a reply rate of 12.6 %.

The Swedish questionnaire was administered by the Swedish Institute for Growth Policy Studies. It was sent out to the 131 companies, out of 185 registered by VINNOVA as biotech companies in 2001 (Sandström and Norgren 2003), for which it was possible to find postal, web or e-mail addresses in 2004. Addresses were sought in the Corporate Database of Karolinska Institutet’s Centre for Medical Innovations, the Swedish Biotech Industry Guide (http://biotech.idg.se
industryguide/) and the Internet. Of these 131 companies, 17 had incorrect addresses, had been bought up or merged, had changed activity or had been closed down. Of the remaining 114 companies, 56 replied to the questionnaire, representing a reply rate of 49.1%.
A Concept of Economics

In the introduction to this book it was noted that a veritable explosion of social capital research had taken place in a large number of academic disciplines since the beginning of the 1990s. The misgivings about social capital being a fad (see e.g. Ostrom 2000), have not been substantiated. In economics too, the discipline in which the strongest opposition to the new concept has been raised, social capital seems to be increasingly accepted, as is evidenced by the fact that social capital has been included in the classification of the Journal of Economic Literature (JEL code Z13).

However, the issue raised in this book is whether the concept of social capital should be taken literally as a member of the “capital family” and thus applied to economic analyses of all types of social networks and relations, or whether it should be limited to denoting certain features of the civil society, which is how the concept is treated by Putnam (1993a, 2000). This book has presented theoretical and empirical arguments, based on fundamental economic theory, for the former view.

Since researches into social capital have been conducted mainly by economists within the “Putnamian” tradition and with a focus on civil phenomena, the stance adopted in this book implies a much more comprehensive role for social capital within the economic disciplines. The quantity and quality of social capital available play an important role in individuals’ and organizations’ investment decisions and other allocations of resources. These investment decisions in their turn maintain and transform the social capitals of individuals and organizations. Just as knowledge in general improves decisionmaking, so it may be assumed that increased knowledge and insights about social capital would improve individuals’ and organizations’ decisionmaking.

A major theme of this book has been the working hypothesis that the knowledge economy requires a social capital different from that of the manufacturing-industrial economy. Chapter 1 presented the basic arguments for this hypothesis in a comparison of key features of the two economies. If we still assume that the hypothesis is correct – and we have adduced sound arguments for doing so – it has to be acknowledged that this book does no more than present introductions to a number of issues for further research.

Accordingly this final chapter, basing itself on the results and findings of the book, discusses some important issues for further research in the economic disciplines concerned with various types of organizations (firms, public sector bodies
and non-governmental organizations) and spatial communities (places, cities and regions.

**Social Capital of Organizations**

**The Diversity of Organizations**

Of the three main types of organizations, this book has principally focused on the private firm. There are obvious explanations for this. The firm is the primary organization of the economy and our analysis is based on the standpoint that social capital is an economic concept. However, there are good reasons to consider the other two main types of organizations, public and civil society organizations, and special cases such as the academy, from the social capital perspective as well.

In principle, it should be possible to analyze the social capital of any organization by methods similar to those discussed for the firm in Chapter 5. Table 14.1 shows for organizations the equivalent information to that in Table 5.1, which presented the basic component parts of the firm’s social capital.

**Table 14.1.** Social capital of organizations broken down into different component parts.

<table>
<thead>
<tr>
<th>Organization-internal social capital</th>
<th>The organization’s external social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links/relations imbued with attitudes, values, norms, traditions etc. that are expressed in the form of:</td>
<td></td>
</tr>
<tr>
<td>- Internal “spirit”</td>
<td></td>
</tr>
<tr>
<td>- Internal symbols</td>
<td></td>
</tr>
<tr>
<td>- Climate for cooperation</td>
<td></td>
</tr>
<tr>
<td>- Methods of codifying knowledge, product development, conflict resolution, etc.</td>
<td></td>
</tr>
<tr>
<td>Activity-related</td>
<td></td>
</tr>
<tr>
<td>Links/relations to suppliers, customers, clients, partners in cooperation and development</td>
<td></td>
</tr>
<tr>
<td>Environment-related</td>
<td></td>
</tr>
<tr>
<td>Links/relations to the local/regional environment, to organizations of the other two types, and (non-activity-related) links to other organizations of the same type</td>
<td></td>
</tr>
<tr>
<td>Market-related</td>
<td></td>
</tr>
<tr>
<td>General relations to the anonymous mass of (actual and potential) customers and clients, built through marketing, customer/client clubs, programs, etc. and expressed in e.g. trade-marks and external symbols</td>
<td></td>
</tr>
</tbody>
</table>

As was argued in Chapter 7, different types of organizations have different objectives and this is reflected in their activities and their social capitals. Based on the hypothesis of the new social capital of the knowledge society, this book has analyzed what is perhaps the most extreme of the knowledge-intensive industries, the biotech industry, and has shown, especially in the case of California, its complex and far-reaching networks across sectors and space. The results support the thesis that the actors of the knowledge economy are increasingly building more multifaceted and advanced social capitals.
Other forms of organization than firms seem to be changing their activities and identities under the influence of the knowledge society too. Starting in the 1980s, a long wave of privatizations has swept over the public sector of Western and Eastern Europe and Asian nations such as Japan. Government’s role is changing, as is its relations to the citizenry. Diminishing trust in politics and government, expressed among other things in decreasing electoral participation in most countries, clearly signals an erosion of the social capital of the democratic institutions built up mainly during the industrial epoch.

The fundamental problems for the democracy of the knowledge society are that knowledge is an unevenly distributed resource and that some groups lack access to the societal social capital. One aspect of this has been expressed in the concept of the “digital divide,” normally interpreted as a gap between those who have access to the digital nets and those who have not (see e.g. Norris 2001).

Regarding the civil society, Putnam (2000) has presented extensive evidence of decreasing membership of civil associations in the US and he draws the conclusion that social capital is declining. Similar trends seem to preponderate in most developed countries. It has been argued that discussion groups, chatrooms and other forms of Internet communication have at least partly replaced the loss of civil association activities. However, even if Internet activities were to replace associational activities in a quantitative sense, it would still be necessary to analyze the qualitative consequences of these new means of interaction. It can be argued that another facet of the “digital divide” problem is the increased fragmentation, “depublicification” or “clubification” of society. This development, facilitated and augmented by the Internet, makes the common denominators of society smaller and smaller. Thus, even if every subgroup of society preserves or even strengthens its own social capital, the societal social capital is weakened.1

The riots in Paris in the fall of 2005 can be interpreted as a result of the fragmentation and new types of divides of the knowledge society. Thus, from the perspective of democracy, new links between citizens and government and between various groups of citizens, based on new values, need to be developed in order to secure democracy in the knowledge society.

In principle, the academy or university can formally belong to any of the three main types of organization yet still perform the same functions. Just like organizations in general, the academy is facing great changes. These changes are often described as a process of transition from Mode 1 to Mode 2, in which Mode 1 constituted the traditional, intra-scientific, intra-disciplinary production of knowledge, while Mode 2 characterizes the socialization of the production of knowledge. According to the latter approach, the production of knowledge is being pursued to a growing extent in a form of cooperation not only between disciplines but also with parties outside the academic world – users of research who also participate in and determine the relevance of knowledge, and contribute to quality control (Gibbons et al. 1994). The production of knowledge according to Mode 2 involves a clear

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1 In that case, Putnam’s claims of a weakened (societal) social capital are correct, albeit his arguments can be questioned.
break with the role that the university has successfully built up. It means that universities are forced to take external factors into consideration when posing questions and deciding research methods; that research focuses on both theory and application; and that its quality and utility are also subject to external assessment. Put briefly: the universities would be forced to abandon their position “above” the interests of society and to become a stakeholder, certainly a stakeholder with special skills, but nonetheless a normal participant among other participants in the public sector and national economy.

It can – and should – of course be questioned to what extent the Mode 2 “vision” will be realized, but it is nevertheless an expression of changed and enhanced expectations imposed on the academy by both government and the private sector. If the academy is to be able to satisfy these expectations, then norms, values and networks, i.e. the social capital, must be changed. However, the expectations differ in strength depending on discipline and former achievements. Also in this respect biotechnology seems to be a forerunner. Recent research shows that spillovers from academic research to industry in the US are overwhelmingly concentrated in the field of biotech/biomedical research (Branstetter and Ogura 2005). Thus, it is possible that the knowledge economy’s expansion will lead to increased differentiation of the academy and perhaps even to divergent social capitals within the academy.

The indications and examples given above of new social capitals in various types of organizations – emerging as the knowledge society develops itself in different fields – constitute new and important challenges for research into organizations. The social capital approach will doubtless bring new insights and knowledge to this research.

Internal and External Social Capital

“Why are there these ‘islands of conscious power’”, Coase (1937) asked regarding the existence of firms. Since the market with its price mechanisms is generally the most efficient institution for resource allocation, why are there firms within which market transactions are eliminated and replaced by planned coordination? Coase’s answer was that there are costs associated with the use of the price mechanism and that planned coordination within the firm could reduce these transaction costs.

Coase’s theory has attracted renewed interest in the organizational changes of the firm spurred by information technology and other expressions of the knowledge economy. Outsourcing, “friendly” and “unfriendly” spin-offs, personnel leasing, temporary undertaking, project organizing with internal and external participants, etc, are examples of increasingly fluid borders between the firm and its external professional networks (see e.g. Ekstedt et al. 1999). Technological progress has lowered many transaction costs and made these organizational changes possible; increased competition and the need for continuous innovation have made them necessary.

These changes have brought new challenges to the firm in the knowledge economy, above all the need for increased knowledge about the market – or more cor-
Social Capital of Organizations

rectly: the markets for inputs and intermediate or final products respectively. The firm can increasingly be regarded as a network of coordinated nodes in the persons of its managers and employees. These nodes possess human capital and have access to links to external professional/social networks. Various nodes of these networks are temporarily connected to the firm. In order to get the most appropriate and efficiently functioning linkages with the firm’s activities, the social qualities of the nodes, their “affinity,” gradually become more important.

Another related aspect is that the internal node of today – the employee or manager possessing human capital and access to links to external professional/social networks – might tomorrow be an external node possessing and having access to the same links. For the firm this tendency means an increased need to pay attention to its internal and external social capital. For the internal and external nodes – managers, employees, partners, collaborators, etc – this development signifies a greater need for access to links to relevant professional/social networks in order to be attractive enough to stay connected to the networks.

There are examples of research touching upon these fields, primarily in business sociology (see e.g. Castilla et al. 2000), but they lack the social capital approach. Using this approach would give new insights into the emergence, development and organization of firms in the knowledge economy.

Measurement of Social Capital Stock and Depreciation

The problem of measuring investment in social capital was among the topics discussed in Chapter 2. We here offer some concluding remarks on the measurement of firms’ and other organizations’ stock of social capital, while similar issues for the civil society are discussed in another subsection later on in this chapter.

Trademarks and goodwill as capitalized expressions of a firm’s (or organization’s) market-related social capital were analyzed in Chapter 5. This means that for many (mainly larger) firms, there exists an estimated market value of that component part of their social capital, no matter whether the trademark is a result of the firm’s own activity or purchased. Estimating the value of the other components of a firm’s social capital is a much trickier task. In principle, there are two other values that remain to be estimated:

- The value of management’s and employees’ links to external professional/social networks and their ability to connect to and/or form such networks
- The value of company spirit and other internal relations

The first point is expressing three latent abilities of the firm: 1) its potential for organizing its production, marketing and sales to an optimum combination of internal and external nodes (cf. above); 2) its potential for receiving and collecting inputs for its innovation processes, and; 3) its potential for developing these inputs into innovations in cooperation with external partners (cf. above). In all three cases the potential is a result of both the quantity and the quality of links and nodes.
The second point is an expression of the firm’s potential for 1) organizing the internal parts of its production, marketing and sales in the most cost-efficient and/or profit-maximizing way; and 2) developing innovations within the firm.\(^2\)

As was briefly discussed in Chapter 5, it would in theory be possible to estimate the part of an employee’s salary which represents recompense for the social networks whose links he has invested in. In the same way it would be possible to estimate a firm’s expenses for maintaining or improving its (positive) internal relations. However, to calculate the aggregated, accumulated stock of these investments simply does not seem possible. Thus the only reasonable way to estimate the value of the stock of external networks and internal relations seems to be by having recourse to methods similar to those used in estimations of trademarks and goodwill. This is a task for both academics and people in the branch.

**Social Capital in Macroeconomics**

The traditional production factor approach is a wholly quantitative method. The problems inherent in such an approach were unintentionally spotlighted by Solow (1957) when he found that only 12.5% of growth per capita in the U.S. 1909-1949 was attributable to growth of labor and capital. Several scholars, among them Denison (1962) and Griliches (1963), argued that a large share of the growth, which Solow explained in terms of technical progress, in fact was embodied in new capital goods, meaning that the quality of (physical) capital was improved. The theory of human capital was launched almost simultaneously (see Chapter 2), indicating that as regards the other production factor as well, viz labor, the qualitative aspects were assigned an increasingly important role. Neither physical capital nor labor could be treated as homogeneous units any longer.

In the network approach on which our analyses of social capital are based, individuals and groups create links of networks with various objectives. Throughout this book we have upheld the view that it is not primarily the quantity of links in a network or the number of networks that determine their impact on growth or welfare. Just as in the cases of physical capital and human capital, it is mainly the qualitative characteristics of social capital that decide its effects.

Of course this means problems for the measurement of social capital. Many of the “measures of social capital” used in empirical studies have focused on the number of civil organizations or the size of their membership. But their impact on economic growth could sometimes have as little significance as, say, that of the number of looms for automobile production. Certain capital produces certain kinds of (material or non-material) yield; other capital produces other kinds. Social capital shares this measurement problem with the other, non-financial capital forms.

But the qualitative aspects of social capital still seem harder to measure empirically. While vintage approaches can, in part, capture qualities of physical and hu-

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\(^2\) It should of course be underlined that all these potentials are also affected by other factors, primarily management’s and employees’ human capital.
man capital, and educational level can capture another quality of human capital, the quality of social capital at the macro level lies even more in its diversity, and thus in its adaptation to the long- and short-term needs of the various economic actors. Thus, perhaps the only possible way to estimate the economic value of firms’ social capital stock on the macro level would seem to be to aggregate the individual firms’ valuations of trademarks and goodwill and supplement them with estimated values of external networks and internal relations (cf. above).

Then what about the social capital of the civil society in a macro perspective? Should not that social capital be included in aggregate production functions as well? In principle the answer is yes. However, there are several arguments for not including them on this level. First, as argued in Chapters 3 and 7, the higher the level of aggregation, the less is the common denominator of a society’s social capital. Second, while it would be possible to estimate the values of the components of the social capital stock of firms and aggregate these values, it may be questioned (as remarked in Chapter 2) what an aggregation of individuals’ civil social capital investment is really a measure of (other than time expended on organized leisure activities).

Thus it seems as if civil society’s social capital – particularly at macro level – must be measured in some other way if it should be measured at all. The approach employed in some studies (Knack and Keefer 1997), of using results from value surveys of such intangibles as trust and tolerance, can be combined with various measures of diversity (cf. Florida 2002), and this is probably the most promising way forward on the macro level.

**The Byproduct Problem**

As noted in Chapter 3, both Coleman (1988) and Putnam (1993a) consider social capital to be primarily a byproduct of other activities. Without using the social capital concept, Granovetter (1974) too points out that valuable information (about jobs) is a byproduct of networks for other activities and not a result of “rational calculation of the costs and benefits of getting information.” In this book we have claimed that social capital is both a result of deliberate, rationale investment and an unintended byproduct of other activities.

The social networks of a firm too are a result of both intentional and unintentional investment, the latter consisting of investment in economic (production and transaction) links and the social links being a byproduct. Therefore it is necessary to distinguish between these two investments. Moreover, the unintentional investments that cause social links to evolve as a byproduct are in principle measurable in two ways: either through the company’s direct investment in economic links or through individuals’ investments in social links which have their origins in the economic links.

Measuring individuals’ social networks in one company is both time-consuming and dependent on the company’s consent. Measuring individuals’ social networks in a population of companies is still more difficult. For this reason, it
is with few exceptions only possible to measure firms’ indirect investment in social capital by their investment in economic links constituting the base from which social links emerge as a byproduct. It goes without saying that these measurements are much weaker indications of social links than direct investment. It may even be questioned whether there are any stable correlations between economic links and the size and strength of social links.

In a pilot study of an industrial park in a mid-sized Swedish city, Westlund and Nilsson (2005) measured firms’ direct investment in social links and in economic (production and transaction) links, the latter being expected to result in social links as a byproduct. Their analysis showed significant correlations between some of the investment in social links and the companies’ growth (in numbers of employees) but no covariance between the measured economic links (e.g. work-related contacts, cooperation with other firms, etc) and the companies’ growth. Their conclusion was that there was no reason to believe that the quantity and quality of these social links would be proportionate to the investment in the economic links and that only direct investment in social links can give a correct picture of social capital.

Even though this was the conclusion of just one study, it clearly shows the byproduct problem. How should the connections between economic links and social links be studied? Is it at all possible to measure the impact of economic links on social links in a larger scale, above case-study level? Apparently not for the type of problem referred to above. However, concerning other aspects of relations between networks with various objectives, Jackson (2005) has pointed out that advances in information and communications technology have made large and detailed interaction patterns of various networks available. Jackson (2005 p 62) also suggests that “modeling the interaction between different overlapping network structures could potentially lead to new insights…”

**Game-Theory Approaches on Social Capital**

Linking the conceptual-descriptive, non-formalized theory of social capital with the rigorous, formal world of game theory may seem like an insurmountable task. Constructing a formal model is indeed a different process from formulating a conceptual framework. However, even if the approaches are very dissimilar, this should not conceal the fact that to a large extent they focus on similar phenomena, i.e. social networks, their formation, the interaction within and between them, and the results of the interaction. One example is Jackson’s (2005) conclusion that if networks produce utility, a game-theory approach can be employed to model link formation via the decisions of self-interested maximizing actors. This example shows that applying game theory could be one way to formalize certain aspects of social capital theory, in this case the shaping of social networks.

Game-theory approaches to the modeling of social networks can also be employed in analyses of the outcomes of social capital. These types of models become by necessity more context-specific. Jackson (2005) gives several examples of instances where game-theory models can help to explain various outcomes of
social networks in very divergent fields, such as trade, labor markets, behavior and learning and the dissemination of both information and diseases. In these cases it is possible to include preferential variables, i.e. variables expressing some type of preference, norm or value, which have an impact both on the forming of the network and on the outcomes.

Thus, albeit rooted in very different scholarly traditions, the theory of social capital and game theory should be capable of being combined. Such a fresh combination of approaches would be a very interesting scholarly innovation.

The Role of Space in the Global Knowledge Economy

In the above section on social capital in an organizational perspective, social capital was considered an “organizational good,” or “club good,” to use Buchanan’s (1965) expression. When in this section we discuss further research from a spatial perspective, social capital is instead regarded a spatial good.

Albeit spatial concentration of certain activities is certainly not a new phenomenon, it can hardly be a coincidence that clusters, industrial districts and other spatial agglomerations have received so much attention in research and policies simultaneously with the growth of the knowledge economy. As discussed in Chapter 4, firms have a number of (sometimes contradictory) reasons for clustering.

On the other hand it is often argued that the process of globalization threatens to erode localized capabilities, particularly in high-cost areas, thereby undermining the competitiveness of firms in such locations. The current rapid growth of industry in China and India, not all of it low-tech, is regarded as evidence of this. Another process of “ubiquitification” is the increased codification of knowledge, facilitated by technological advances and resulting in much faster dissemination of much larger amounts of knowledge. Does this mean that clustering is losing its importance after all?

Among scholars in these fields, there seem to be a fairly unanimous view that this is not the case. According to them, as well as the purely economic advantages of clustering, much knowledge, both tacit and in some cases codified, is “sticky” since it is embedded in a spatial context (see e.g. Asheim 2003; Malmberg and Maskell 2003).

This should mean that places with demanded, embedded knowledge (there is much non-demanded knowledge) have an initial advantage which enables them to thrive – if they have the ability to learn, refine their knowledge and innovate. Moreover, it can be argued that many activities in the knowledge economy require a permanent process of development of everyday innovations in order to keep up with the competition, and that this requires not only a large number of personal contacts and learning capacity, but also certain attributes which to a large extent are spacebound. In line with the discussion in Chapter 4, these attributes are here given the common designation place surplus.
Place Surplus – Specialized Clusters and Diversified Regions

In Chapter 4, following Bolton (2002) place surplus was defined as the sum of consumer and producer surpluses of a spatially limited area. Basically, the reason for using the term place surplus is the notion that consumers’ and producers’ perceived utility varies in infinite combinations, and that places’ capacity to fulfill all these preferences and needs varies. In line with this reasoning every individual and organization may be presumed to perceive a place surplus in certain places and “place break-even” and “place shortfall” in other places. In these terms migration is a movement from a place with shortfall to a place with surplus in the light of the preferences and needs of the individual.

A large part of the place surplus can be expressed in pure economic terms: wages and other incomes, costs and tax level, profits, etc. Another ingredient of the place surplus consists of access to goods, services, inputs and markets, which can also be calculated in monetary terms relatively easily. The third element of the place surplus consists in principle of the social networks and the norms, values and lifestyles which are connected to them – that is to say, the social capital of the place.

The above-mentioned three component parts of place surplus are associated in principle with all the spatial issues discussed in this book: clusters and industrial districts, the firm’s environment-related social capital, spatial externalities, pre-conditions for entrepreneurship, Putnam’s civil community and the relative distribution of Florida’s creative class, etc. Focusing on the third component of place surplus, the spacebound social capital, and bearing in mind the hypotheses of Andersson and Strömqvist (1988) and Florida (2002), it can be argued that metropolitan regions which can combine their diversity with tolerance – i.e. locations where a lot of parallel social capitals for different needs and preferences can coexist peacefully – generally offer the best prerequisites for a dynamic knowledge economy.

However, it should be underlined that these claims are based on theoretical assumptions and a relatively small number of studies. The possibilities for empirical studies of spacebound social capital and clusters, entrepreneurship, innovation, diversity, tolerance, lifestyles and creativity, are almost too many to count. There is also a need for further development of the theory of place surplus, its measurement and applications.

Moreover, it is important not to focus merely on the place surplus and social capital of metropolitan regions. Smaller regions generally have less diversity than the metropolitan region but may have other strengths with significant influence on their total place surplus.
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