Knowledge Entanglements

An International and Multidisciplinary Approach

Chong Ju Choi
and Carla C. J. M. Millar
with Caroline Y. L. Wong

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Also by Chong Ju Choi and Carla C.J.M. Millar

INTERNATIONAL BUSINESS: Emerging Issues and Emerging Markets

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Preface

Knowledge forms the basis for the foundations of markets, institutions and organizations. Investment in and exploitation of knowledge remains a key driver for innovation, economic performance and social well-being.

Different disciplines, especially in the social sciences, have different definitions of the term 'knowledge'. Economists often define knowledge as a resource, similar to science and technology; management researchers see the importance of knowledge as embedded within organizations; sociologists see the importance of knowledge in communities, societies and social networks. We have attempted to synthesize and integrate several of the social science disciplines in creating a more holistic understanding and appreciation of knowledge assets and resources in the 21st century.

Our use of the term 'entanglements' helps to describe the fact that the intangible aspects of knowledge are converted into tangible real economic and business outputs and resources through the interactions with organizations and institutions and hence that knowledge tends to have a past, present as well as future value.

The analysis of knowledge entanglements highlights some of the myriad ways that knowledge is engaged with, in particular the complexity, inalienability, context and dynamism of the knowledge processes. A reductionistic approach, seeking to reach an analysis in terms of discrete single strands, would have overlooked or understated this strength. Complexity does not seek to simplify but rather illuminate the entanglement of knowledge.

This book endeavours to make a number of knowledge strands more transparent whilst considering them within the complexity of entanglement. In this way, we attempt to gain greater clarity and understanding of the complexities involved in examining knowledge processes and aim to thereby gain further transparency.

We wish you enjoyment and fulfilment in reading *Knowledge Entanglements*.

CHONG JU CHOI
CARLA C.J.M. MILLAR
CAROLINE Y.L. WONG

Introduction

All that is alive tends toward colour, individuality, specificity, effectiveness, and opacity: all that is done with life inclines toward knowledge, abstraction, generality, transfiguration, and transparency.

Johann Wolfgang Von Goethe (1749–1832)

Since Spender and Grant's (1996) outstanding review of knowledge as a resource in strategic management, international business and management researchers have become greatly interested in knowledge as an asset and a resource. Management and organization theory researchers have followed Polanyi's (1966) distinction between explicit and tacit knowledge. Explicit knowledge is codified knowledge and thus similar to information (Spender and Grant, 1996). Tacit knowledge is more difficult to formalize, impart, exchange, or purchase because it resides in people's beliefs, experiences, values, organizational routines, and institutions (Inkpen, 1996). Polanyi (1966) termed the pre-logical phase of knowing as 'tacit knowledge' in stating that '*we can know more than we can tell*'. Yet the intangible nature of tacit knowledge does not diminish the vital part played by tacit knowledge in knowledge generation, transfer and dissemination (Senker, 1995).

The concept of knowledge has also been widely studied by information technology and innovation processes scholars and organization theorists, notable among them Nonaka and Takeuchi (1995) with 'The Knowledge-Creating Company', which drew on the earlier work of Michael Polanyi in distinguishing between tacit and codified knowledge.

The tacit nature of knowledge (it being primarily experiential and cognitive) and the different and extensive contexts in which knowledge is embedded (Polanyi, 1958) account for its dynamic processes. These distinct contexts surfaced as a result of the close linkages among the various actors and players which include individuals, entrepreneurs, firms or organizations and industries, as well as the state and countries.

In this regard, the concept of 'community of practice' is deemed useful by a number of scholars to account for the learning processes taking place within an organization (Brown and Duguid, 1991; 1998; Wenger, 1998). An organization's ability to create, develop, utilize and exchange knowledge as a resource within a network of social and technological relationships has become crucial to success in today's turbulent, uncertain, dynamically changing and globalized world. For example, the ease with which the various actors and capital move across borders in the global economy highlights the significance of location in knowledge management research.

The success of the organization depends wholly on its ability to perform each of these processes more effectively (Dawson, 2000). Such capabilities are the foundation of organizational success. In most cases, these capabilities are highly dynamic in order to respond to the changing environment of the organization and its interactions with various actors in the environment. Dawson (2000) argues that an organization's development must be centred around developing these dynamic knowledge capabilities on an ongoing basis.

The dynamic processes in which knowledge is embedded create 'knowledge entanglements'. These surface when knowledge, which is highly intangible and dispersed, is caught in the web of changing social, business and institutional contexts. Knowledge in the market place, for example, is caught in the web of exchange where the spheres of exchange have expanded to include markets, organizations, institutions and society. It is in these spheres of exchange where the tangible and intangible aspects of knowledge, its symmetric and asymmetric transfer and its diverse relationships are played out. Actors have to understand each other's institutional and social context and property rights. The role of institutions, formal and informal rules, the social context of business and society all interact to redefine how knowledge should be perceived. The interplay of knowledge and its multifaceted linkages creates complexities of its own, which account for the 'entanglement' of knowledge.

It is our conviction that the complexity, breadth and relevance of knowledge management requires a much broader and more multidisciplinary approach, incorporating research in social sciences such as economics, sociology, geography and institutional analysis, than has hitherto been provided. In this book we recognize that knowledge management has emerged as an interdisciplinary field of research that requires an integrative framework of analysis. It therefore seeks to examine the breadth, depth and 'entanglements' of knowledge as an asset in today's business environment and society and to highlight the complexities of knowledge in public and business arenas.

The seven main chapters of the book are organized to develop such perspectives of 'knowledge entanglements' from a macro to a more micro level of analysis. The following is a brief summary of the main chapters of this book.

Chapter 1

The fundamental characteristics of knowledge (it being explicit, tacit and dispersed) force it to have a string of problems, such as knowledge creation, appropriation, sharing and reproduction. Hayek (1945) points out that the intangible and random nature of knowledge makes it a difficult and complex resource to analyse.

The advent of the internet has resulted in knowledge having the characteristics of a public good and common pool resource. As such, the examination of knowledge should take into account collection and interdependent actions and decision-making (Hardin, 1982; Olson, 1965). Although management research on strategic alliances and collaborative partnerships has increasingly focused on the analysis of co-operation (Beamish and Killing, 1997), the related concepts of exchange and collective action that are fundamental to such co-operation have not been widely researched in management.

This chapter seeks to shed light on the complex processes of knowledge by analysing the relevant literature-to-date in applied economics, international business and the social sciences.

The nature of the exchange of and transactions in knowledge, which is relatively tacit and implicit (Polanyi, 1957) cannot be the same as that for the exchange of tangible assets such as capital, plants and equipment. Past economic research on knowledge has not analysed the nature and problems of collective action (Hardin, 1982; Ostrom, 1990) or those of measurement and identification. We believe that the intangible aspects of knowledge (Polanyi, 1957) and its dispersed nature in society (Hayek, 1945) require an in depth analysis of the spheres of exchange that exist for organizations, institutions, markets and society. International business research provides a framework of analysis for how knowledge as a resource requires management and organizational capabilities. Hence, knowledge management processes is fundamental in facilitating the sharing of explicit and tacit knowledge in organizations (Schlegelmilch and Chini, 2003). Marquardt (1996) views knowledge transfer as a key process in managing corporate knowledge, besides acquisition, creation, utilization and storage. Within a multinational corporation (MNC), subsidiaries can learn from each other and benefit from new knowledge developed by other units around the world. Singapore's MNC-led approach to technological learning is an interesting case study for analysis.

Institutional analysis is emerging as a dominant issue in several social science disciplines and requires multiple levels of analysis and knowledge of many sectors within societies (Hollingsworth, 2003). Knowledge-based resources and assets raise crucial questions regarding the effectiveness of particular formal legal institutions, as well as of informal institutions such as norms. The creation and transfer of an intangible resource such as knowledge require continuous exchange among actors (Burt, 1992). For such continuous exchange to occur, there is a need for actors to understand each other's institutional and social context. At its core, institutional theory examines the effect that an operating environment places upon a given organization or sets of organizations (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1987; Zucker, 1977, 1987).
(Major disciplines discussed: economics, international business and institutional analysis)

Chapter 2

This chapter adopts a macro perspective on knowledge complexity, illustrating the extensive contexts and important linkages that exist among technology-based industrial districts, corporations and public policy. The main insight is the difference between industrial districts that are formed slowly and for the most part spontaneously over time (e.g. Silicon Valley, US, and the area around Cambridge, UK) and those in which public policy has played an active role (e.g. Hsinchu Valley, Taiwan, and Sophia-Antipolis, France). It highlights the important role played by the State in diffusing process technologies to the local firms and the State's support of entrepreneurship in the Taiwanese business system. The Hsinchu Science-based Industrial Park (HSIP) is an example of an industrial cluster in which competition and vertical co-operation among local firms account for rising productivity, innovation and new firm formation (Porter, 1998).

This chapter draws on the literature on national innovation systems (NIS) most notably the work of Lundvall (1992), Nelson (1993) and Freeman (1987; 1995) to understand the link between national institutions, primarily at the macro- level and the innovative performance of firms and economies. Lundvall's works (1992) in particular focus on the specificity and interconnectedness of societal institutions and policies that have a bearing on the processes of learning and innovation.
(Major disciplines discussed: innovation systems, technology, and industrial economics)

Chapter 3

In recent times, urban areas such as major cities have come to be seen as crucial in the development and utilization of knowledge as a resource for such cities. Many talented knowledge workers in the consulting, investment-banking, law and science and technology industries are attracted to certain global cities not only because of the attractive work environment, but also their attractive social amenities. The mobility of capital and multinational corporations has highlighted the importance of location in knowledge management research.

This chapter focuses on recent research undertaken in social sciences, geography and urban planning, which converge towards a view of the increasing importance of knowledge work and knowledge professionals (Alvesson, 2001; Donaldson, 2001), thereby

reflecting the increasing value of scarce resources in the economy. There is extensive empirical work confirming the link between human capital and the economic growth of cities (Glaeser, 1998). More recent research has also linked the economic growth of cities with cultural capital (Simmie and Lever, 2002; Throsby, 1999). The intangible aspects of culture can be converted into commercial economic value and cultural industries are seen as crucial for the regeneration and continuing success of global cities. This analysis partly overlaps with the research in management on knowledge as an intangible asset and resource (Spender and Grant, 1996).
(Major disciplines discussed: geography, city and urban planning and international economics)

Chapter 4

The focus of this chapter is on understanding the nature of knowledge as an asset for value creation from a micro perspective. The firm is only one type of organization in society where knowledge plays a crucial role in creating value. This chapter analyses the household as an alternative example of an organization to illustrate that knowledge plays an equally vital role in this setting. Households are a prominent example of units in which social behaviour facilitates effective knowledge and value creation (Kogut and Zander, 1996) and where knowledge production, transfer and consumption take place.
(Major disciplines discussed: household economics, social anthropology, organization theory and consumption theories)

Chapter 5

In today's turbulent world, an organization's ability to exchange properly or share knowledge within a network of social and technological relationships is often crucial to success. This chapter considers knowledge exchange and its ethical implications.

The theory of exchange develops a 'dual sphere' approach that combines market and institutional factors as relevant when knowledge is exchanged and valuated. This dual sphere approach takes into account the tangible and intangible elements of knowledge as a resource. Three different types of knowledge situation are examined

from the perspective of exchange and they all reveal common ethical issues, such as trust and justice.
(Major disciplines discussed: social anthropology, institutional theory and consumption theory)

Chapter 6

This chapter focuses on knowledge measurement and the issue of knowledge appropriation. An organization's ability to measure and value knowledge as an asset has become important as it is one of the fundamental drivers of global success. This is especially true of service industries, which are increasingly knowledge-based in today's business environment (Coe, 2003a; Herbert *et al.*, 2003) and of those industries that deal with trade in products that are perceived as intangibles, such as software. While Greenfield (2003) has noted the interdependence of goods and services, we believe that researchers have neglected the interdependence and intermingling of services and knowledge.

In international business research it is assumed that resources or assets can be measured easily in terms of a market value or market price. This creates a complex problem for knowledge resources, as they have intangible aspects and characteristics. This chapter also highlights the importance of social context in assessing the role of knowledge resources.
(Major disciplines discussed: accounting, industrial economics and communication theory)

Chapter 7

This last chapter combines an application of knowledge complexity with that of disproportionate value creation in knowledge-based industries. It draws its arguments from complexity theory and presents the connection between complexity and organizational theories. It also argues that the principles of firm interaction are paramount, analysing how firms create and measure the value of knowledge in knowledge-based industries. This is in line with institutional analysis whereby institutions are seen as socially constructed templates for action, generated and maintained through ongoing interactions (Meyer and Rowan, 1977; Zucker, 1977). The focus is on how the operating environment affects a given organization or set of organizations (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1987; Zucker, 1977; 1987).

Our main conjecture is that indices (Jervis, 1985), or external truthful signals, can be used by markets to certify and rank the value of an actor's product or services. Such path-dependent effects can, as we show in Chapter 6 lead to winner-take-all (Frank and Cook 1995) results, where highly ranked actors gain a disproportionately large part of the market, or value, relative to other actors. In this chapter we focus on competition and our framework helps to illustrate the complexities of competition when both markets and institutions are integrated in the analysis.

(Major disciplines discussed: economics, competition theory, and complexity and value creation)

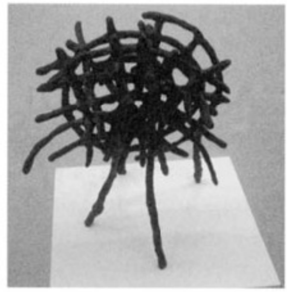
Conclusions

This chapter summarizes the major points covered in the book and draws conclusions integrating them. The 'entanglement' of knowledge requires the use of multiple lenses to understand the complex reconstructability and transparency of knowledge. Insights from other disciplines and their problem issues are also considered.

The entanglement of knowledge, with its complexity, inalienability, context and dynamism, constitutes its strength. A reductionistic approach, seeking to reach an analysis in terms of discrete single strands would have overlooked or understated this strength. Knowledge's complexity does not ask for simplification but rather for illumination of its entanglement.

This book endeavours to make a number of knowledge strands more transparent whilst considering them within the complexity of entanglement. Knowledge and the dynamics of knowledge are also seen as the major drivers that catapult people, groups of people or even states into breaking away from their 'bottom of pyramid' position. The book's concluding chapter provides suggestions for future areas of research.

Chapter 1
Knowledge and Entanglements
Knowledge Complexity in the Literature



Already in 1945 Hayek pointed out that it was difficult and complex to analyse knowledge as a resource due to its intangibility and randomness:

> *the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge...a problem of the utilisation of knowledge not given to anyone in its totality.*
>
> Hayek, 1945, p. 520

This would imply that the nature of transaction and exchange of knowledge cannot be the same as that of the exchange of tangible assets such as capital, plants and equipment because of the tacit and implicit aspects of knowledge (Polanyi, 1957).

This chapter seeks to shed further light on the complexity of knowledge and its creation and transfer processes by analysing the extant literature in applied economics, international business and the social sciences.

Because the fundamental characteristics of knowledge include its role as a public good and as a common pool resource (CPR), the analysis needs to take into account issues of collective action (Hardin, 1982) and interdependence among the actors. Past economic research on knowledge has not analysed the nature and problems of collective action (Hardin, 1982; Ostrom, 1990) or dealt with issues such as the problems of measurement and identification in relation to public goods. At the same time the intangible aspects of knowledge (Polanyi, 1957) and its dispersed nature in society (Hayek, 1945) require an in depth analysis of the spheres of exchange that exist for organizations, institutions, markets and society.

International business research provides a framework for analysing the management and organizational capabilities required for utilizing knowledge as a resource. Knowledge management processes are fundamental in facilitating the sharing of explicit and tacit knowledge in organizations (Schlegelmilch and Chini, 2003). Marquardt (1996) views knowledge transfer as a key process in managing corporate knowledge (besides acquisition, creation, utilization and storage). Within a multinational corporation (MNC), subsidiaries can learn from each other and benefit from new knowledge developed by other units around the world. Singapore's MNC-led approach to technological learning is an interesting case study for analysis.

Institutional analysis is emerging as a dominant issue in several social science disciplines and requires multiple levels of analysis and study of many sectors within societies (Hollingsworth, 2003). The creation and transfer of an intangible resource such as knowledge requires continuous exchange among actors (Burt, 1992). For such continuous exchange to occur, there is a need for actors to understand each other's institutional and social context. Transactions involving knowledge-based resources and assets raise crucial questions about the effectiveness of particular formal legal institutions, as well as of informal institutions such as norms. At its core, institutional theory examines the effect that an operating environment has upon a given organization or sets of organizations (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1987; Zucker, 1977; 1987).

Knowledge in Economic Theory

Traditional, neoclassically based markets depend on anonymous, frictionless exchange among many atomistic actors (Simon, 1992). This framework allows independent decision-making by actors, following the pursuit of individual rationality, and exclusive ownership and exchange of resources. A fundamental area where such analysis is weakest is that of public resources or goods, which depend on collective and interdependent actions and decision-making (Hardin, 1982; Olson, 1965). Public resources and the closely related area of common pool resources (CPR) require the analysis of such joint or nonexclusive ownership of resources (Barzel, 1997). Because of the fundamental characteristics that knowledge shares with public goods and CPR, it requires an analysis that takes into account issues of collective action (Hardin, 1982) and interdependence among the actors. Buckley and Casson (1976) and Magee (1977) argued that knowledge has the property of being a public good because it can be transferred at zero marginal cost.

In order for knowledge to be valuable, the actors must make available the knowledge in their possession to an extent and in a form that creates a viable, useable whole. This typically involves exchange transactions among the actors and throughout history various institutions have been developed to enhance the possibilities of exchange (Coase, 1992; Kogut and Zander, 1992; North, 1990). The concept of exchange is crucial for the social science research disciplines and it is especially relevant for analysing cooperative relationships (Burt, 1992). As a concept, it is broader in scope than that of the firm or networks but lacks a central definition within the social science disciplines (Toyne, 1989). In economics research, exchange involves a transfer of multipurpose money, and leads to self-gain for the actors in the exchange, as a general part of individual rational behaviour (Ostrom, 1990). To anthropologists, exchange is important in terms of the role it can play for a particular group of actors, or organizations (Toyne, 1989). In psychology and sociology research, exchange is seen as a joint outcome of a relationship between actors (Etzioni, 1988). However, all these strands of research take for granted that a particular, tangible object, asset or resource is being exchanged in the process.

Past literature, although emphasizing the importance of exchange, has generally referred only to exchange through efficient markets (Coase, 1960). The key element is that the market determines the valuation and price of tangible assets. This valuation serves as a universal, transparent mechanism to facilitate the exchange of such physical assets (Choi and Lee, 1997). Under market exchange of commodities, assets being exchanged are tangible, quantified and valued at a particular price (Gell, 1982). It is difficult, however, to determine a valuation for tacit, informal assets, such as knowledge, and thus the value is often determined on a context or situation specific basis or is specific to particular organizations or actors (Spender, 1996). The difficulties in valuing intangible assets such as knowledge (Millar, 2004) have also been discussed by scholars in accounting (Gu and Lev, 2003).

Knowledge in International Business

Spender (1996) and Grant (1995) have applied knowledge research to management and organizational success. This research on knowledge, carried out within international business research, touches on Coase's (1937; 1960) seminal ideas on the theory of the firm. This, in turn, has sparked a renewed interest in organizational science research, through theories of knowledge-based firms. The knowledge-based view of the firm (Conner and Prahalad, 1996; Kogut and Zander, 1993) suggests that knowledge is a primary resource and that social networks facilitate knowledge sharing within an organization. Multinational corporations (MNCs) are seen as network firms as they leverage their networks effectively to manage dispersed knowledge assets (Mudambi, 2002).

To be productive knowledge as a resource requires organizational capabilities (Grant, 1995). Gold *et al.*'s (2001) model of knowledge management capabilities includes knowledge infrastructure capabilities and knowledge process capabilities. Hence, knowledge management processes are important in facilitating the sharing of explicit or tacit knowledge in organizations (Schlegelmilch and Chini, 2003). As noted, Marquardt (1996) views knowledge transfer as a key process.

MNCs use knowledge both as an asset used directly and to help diffuse best practice among the network of knowledge-based businesses with which they interact. As an example, Singapore provides a good insight in an MNC-led approach to technological learning. The Singapore government's efforts in encouraging MNC investment in manufacturing in the 1960s have spawned a large supporting industry and induced substantial technological capability development among many local subcontracting and contract assembly firms (Wong, 1995; 1997). Many local firms have undertaken large in-house innovation efforts (Wong, 1999). In the early 1980s, an innovative scheme called the Local Industry Upgrading Scheme

(LIUP) was introduced to enlist the participation of leading MNCs by providing one of their technical managers to work full-time helping local suppliers to upgrade their process capabilities (Wong, 1999). This has promoted the transfer of technology and process management know-how from the MNCs. Research and development (R&D) collaboration between local firms and the MNCs was further expanded in the 1990s (Wong, 1999). Increasingly, the government is acknowledging the importance of product technology pioneering as a basis for technological capability development in the future. With this in mind incentives were given to help accelerate, establish and fund public research institutes, university R&D and MNC product R&D operations (Wong, 1999). Singapore has coined the phrase 'techno-preneurship' for the activity that is seen as the way to promote the growth of new technology start-ups. The government is constantly reviewing changes to existing business regulations to facilitate the growth of such techno-preneurship (Wong, 1999).

Knowledge in an Institutional, Social Context

Institutional analysis is emerging as a dominant issue in several social science disciplines and Hollingsworth (2003) posits that cross-disciplinary collaboration and team research is required in order to advance and integrate institutional analysis in a socio-economic paradigm. At its core, institutional theory examines the effect that an operating environment places upon a given organization or upon sets of organizations (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1987; Zucker, 1977; 1987). The institutional environment itself operates at two levels: an informal level which includes the prevailing norms, customs, mores, religion, and a formal level which includes the polity, judiciary, and the laws of contract and property (Williamson, 2000).

It is important to realize that the institutional environment has a bearing on the efficacy of contract and organization. As the creation and transfer of knowledge require continuous exchange among actors (Burt, 1992), knowledge-based resources and assets would be affected by the effectiveness of particular formal legal institutions and of informal institutions such as norms.

We can distinguish the model portraying atomistic markets which are driven by actors and their individual self-interest from the concept of social market exchange (Williamson, 1985) where the collective actions of actors, linked by a social bond, can affect the nature of exchange and the enforcement of agreements (Etzioni, 1988; Hardin, 1982; Olson, 1965). Past research on collective ownership and interests shows that groups or communities driven by social bonds and reciprocity based exchange can be limited in size (Etzioni, 1988; Hardin, 1982; Olson, 1965). Thus, in order to utilize knowledge as a resource, an economy may need to include an overall central combination of formal and informal rules, as well as individual groups within the society that have their own particular norms. Kogut and Zander (1993) assert that firms can be viewed as 'social communities that serve as efficient mechanisms for the creation and transformation of knowledge' (p. 627). In social communities with strong collective ideologies and cultures, there tends to be a greater emphasis on informal rules and norms, relative to formal or explicit rules (Olson, 1965; 1982; Schelling, 1984; Sugden, 1986). If the firm is to be seen as a social community (Kogut and Zander, 1993; 1995) built on formal and informal rules, subgroups within the community need to have their own particular norms. Such sub-networks of limited size within the whole social community allow the existence of social bonds and reciprocal exchange mechanisms.

This in turn develops a collective value system and social bonding towards the total social community (Etzioni, 1988), not just to certain parts of the community. For the firm as a social community to be successful in the creation and transformation of knowledge, the community will require mechanisms to 'exclude' non-members from the benefits and knowledge within the social community (Hardin, 1982). This line of thought is similar to that of the concept of club goods in law and economics. Here members of a community pay a club fee for membership, and share collective benefits, but at the same time exclude non-members from free riding (Olson, 1965; Ostrom, 1990; Sugden, 1986) on the resources and assets of the social community. Thus, the formation of such sub-networks and their club-like behaviour will encourage or limit the possibilities of entrepreneurial activity within a particular social community.

The linkages between knowledge and the three major disciplines in knowledge research are summarized in Table 1.1 below.

Table 1.1 Knowledge and the three major disciplines relevant for knowledge research

Research disciplines	*Objectives of disciplines*	*Units of analysis*	*Major factors*	*Approaches to change and development*	*Linkages to Knowledge Research*
Economic theory	Understanding firms, markets and the nature of competitive success	Industry or even the national economy	The concept of a market-based exchange	Austrian approach accepts dynamic change; neoclassical approach is more static	Knowledge as a public good and common pool resource and therefore subjected to the spheres of exchange
International business	Understanding the dynamic interaction between firms and governments in a global context	Companies (firms), in regional, national and global contexts	The role of individuals or entrepreneurs within firms, and within the national economy	Continuous change is seen as the only certainty in the global business environment	Knowledge as an asset and primary resource of the firm, thereby subjected to issues of organizational capabilities
Institutional, social context legitimacy	The role of institutions, formal and informal rules, and the social context of business and the society	The nature of the social context and the role of institutions	Institutions, including formal legal rules, as well as informal social conventions and legitimacy	Both formal and legal rules interact with informal social conventions to create change	The role of knowledge creation and transfer in society, thereby subjecting it to the nature of exchange in the institutional and social context

Knowledge Entanglements: Sub-networks

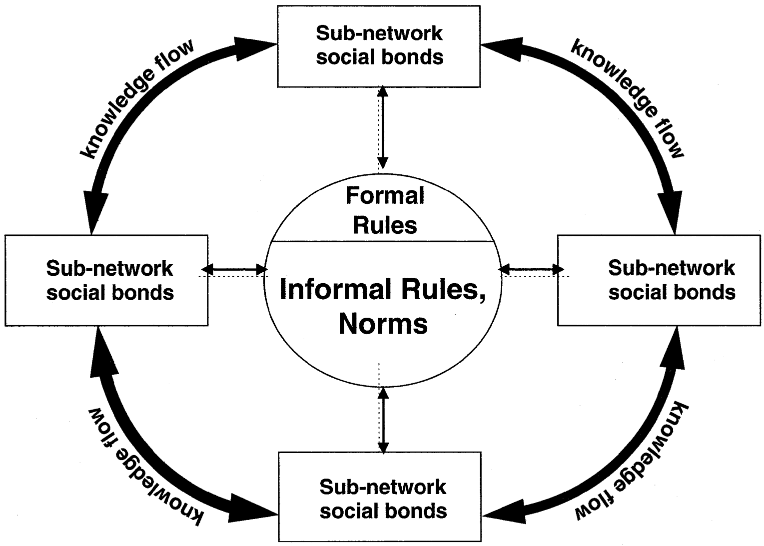
The intangibility of knowledge and the importance of social and institutional context create 'knowledge entanglements' in that the role of institutions, formal and informal rules and the social context of business and society interact leading to a need to redefine the traditional perception of knowledge. Norms and rules influence the institutional arrangements that co-ordinate economic actors such as markets, states, corporate hierarchies, networks, associations and communities (Hollingsworth, 2003). This is consistent with Etzioni's (1988) argument that societies employ diverse co-ordinating mechanisms to govern a society.

The way in which knowledge interacts, with its multifaceted linkages, creates complexities of its own. As indicated above, research on collective ownership and interests also showed that groups or communities driven by social bonds and reciprocity-based exchange tend to be limited in size (Etzioni, 1988; Hardin, 1982; Olson, 1965) and, hence, in order to utilize knowledge as a resource, an economy may need to have an overall central combination of formal and informal rules, and have individual groups within the society that have their own particular norms. Such sub-networks of limited size within the economy will allow the existence of social bonds and reciprocal exchange mechanisms; actors in such subgroups or sub-networks are linked indirectly to all other actors in the network system. This in turn develops a collective value system and social bonding with the total network system (Burt, 1992; Choi *et al.*, 1999), not just to the sub-networks.

These sub-networks are a basis for encouraging knowledge sharing (Spender and Grant, 1996) in turn enhancing the effectiveness of the community. This is shown in Figure 1.1 below.

Sub-networks centre around other communities, and in line with Olson's (1965) and North's (1990) analysis of institutions, formal and informal rules, the entrepreneur may play a role in the social bonding and continuous developments of such sub-networks. For example, in Taiwan, the existence of the Hsinchu Valley facilitates the creation of the community of entrepreneurs, who in turn can improve knowledge sharing (Spender and Grant, 1996) through such sub-networks.

Figure 1.1 Knowledge entanglements: the role of sub-networks and formal and informal rules (adapted from Choi *et al.*, 1999)



This chapter has set the scene for gaining an insight into the complex processes of knowledge use, transfer and exchange by analysing the relevant literature in applied economics, international business and the social sciences. The next chapter will examine knowledge and the state.

Chapter 2
Knowledge and the State
Industrial Districts and Entrepreneurship

The State has been seen as crucial for the phenomenal economic success of capitalism in Asian countries such as Korea and Taiwan (Amsden, 1989; 2001; Wade, 1990). Entrepreneurship on the other hand has been seen to flourish in countries in which free markets operate, and where the state's role has been minor, such as in Hong Kong (Redding, 1990).

This chapter shows that the role of the state and entrepreneurship are not mutually exclusive. For instance, the state played a major role in nurturing entrepreneurship in Taiwan, through the development of Taiwan's industrial and science parks. In particular we focus on the Hsinchu Science-based Industrial Park (HSIP), an industrial cluster in which the combination of competition and vertical co-operation among local firms accounted for rising productivity, innovation and new firm formation (Porter, 1990). The State has been instrumental in diffusing process technologies to the small and medium-sized enterprises (SMEs). The national innovation system (NIS) adopted by Taiwan is one in which indigenous SMEs are promoted and the development of public research institutes to facilitate technology assimilation/transfer and co-operative R&D (Wong, 1999) is encouraged. Literature on this NIS, most notably the work of Lundvall (1992), Nelson (1993) and Freeman (1987; 1995), seeks to understand the link between national institutions, primarily at the macro level, and the innovative performance of firms and economies. Lundvall's work (1992) in particular focuses on the specificity and interconnectedness of societal institutions and policies that have a bearing on the processes of learning and innovation. Network ties and social bonds that span borders have allowed US-educated engineers from Taiwan to keep close to state-of-the-art technology and leading-edge markets in the United States (Saxenian and Hsu, 2001) and this transnational community boasts as its key assets shared information, trust and contacts (Portes, 1996).

All these related research topics had great relevance for entrepreneurship in Asia in the late 20th century. The purpose of this chapter is to understand more about knowledge through an analysis of the role which entrepreneurship and innovation played in Taiwan becoming a major player in the global economy (Buckley, 2002). Furthermore, to examine the role of the state in nurturing entrepreneurship and innovation in Taiwan, and the implications of this for research in international business.

The chapter is set out as follows. It starts with the synthesis and integration of entrepreneurship theories and their linkages to international business research. Taiwan being the country of focus, it provides the context of research on East Asian business systems such as those found in Korea, Taiwan, Hong Kong and Singapore. We consider the continuing debate on the drivers of economic and business success in these four countries. This is followed by an in depth analysis of Taiwan's business system, which will be examined together with the role played by entrepreneurship and state support of entrepreneurship. Finally, we will draw some conclusions for international business research, paying attention to Buckley's (2002) insightful point on the need to understand the processes by which countries are able to enter the global membership of mature, developed capitalist economies.

Asian Entrepreneurship and International Business

In the 1990s, international research in business schools increasingly put entrepreneurship on the agenda as an important research topic (Casson, 1990; 1996). The topic of the role of the entrepreneur in business success is truly one that requires interdisciplinary research, including consideration of issues and findings in the international business field. Here, our analysis starts with economics, including Schumpeter's (1934) well-known works on creative destruction. Researchers we consider include Kirzner (1997) who, in developing a more adaptive approach to entrepreneurship, more recently showed the potentially strong linkage between Schumpeter-style Austrian economics and international management and business research.

Second, interest in entrepreneurship research in business schools has been fuelled by the global importance of technology in business success. This development has resulted in clusters, or groupings, of firms existing closely together in industrial districts – a phenomenon first analysed by Alfred Marshall (1920), the British economist, and later by geographers and regional specialists such as Storper (1997), Saxenian (1994) and Saxenian and Hsu (2001). Major examples of such clusters include Silicon Valley in California, United States; Cambridge University Science Park in the UK; Sophia-Antipolis Technology Park in Nice, France; and the Hsinchu Industrial Park in Taiwan.

The industrial clusters of both Silicon Valley and Hsinchu are ones in which the combination of competition and vertical co-operation among local firms has given rise to growing productivity, innovation and new firm formation (Porter, 1998). Both regions boast high rates of entrepreneurship and hundreds of small and medium-sized enterprises alongside larger technology companies with multiple backward and forward integrative linkages (Saxenian and Hsu, 2001).

Third, we recognize the importance of social and institutional variables, which include regulative, cognitive and normative factors (Scott, 2001) affecting business success. In some senses, this area of research has been driven by globalization and the increasing attention to studying business, or the firm, in the context of a national business system (Whitley, 1992) and of seeing the firm in a broader business environment. According to Whitley (1993), the distinctiveness and integration of national business systems and innovation systems depend greatly on the extent to which institutions within the nation states are standardized and mutually complementary in governing the constitution and behaviour of economic actors. In achieving this national homogeneity of institutional arrangements positive action by the nation state is seen as having a critical influence.

Our analysis distinguishes more than one type of national business system that can lead to economic and business success (Albert, 1991; Dore, Lazonick and O'Sullivan, 1999; Whitley, 1992). We consider a number of these systems, such as the market-based system of the United States, the more government-intervention-based system, as in Japan (Thurow, 1992) and a more socially based system, as in most continental European countries (Albert, 1991). We review the evidence on Taiwan; although it is driven by technology industries such as computers, semiconductors and electronics and is Asia's fourth-largest economy after Japan, Korea and China (Yu, 1998), not much academic business school research has been carried out on the country. Whereas the Japanese and Korean business systems were analysed in depth in such works as Amsden (1989) and Fruin (1992), and there has been an abundance of recent research on China (Child and Tse, 2001), Taiwan has not been covered much by international business school researchers. The few works in the academic literature on entrepreneurship in Asia focus on Hong Kong, and how merchant-entrepreneurs in Hong Kong (Chau, 1993;

Table 2.1 Schools of thought on East Asian economic success

School of thought	*Major frameworks*	*Key literature*
International free trade	• neoclassical international economics • global free trade and comparative advantage • low cost of labour • macroeconomic factors	Balassa (1982) Bhagwati (1991) Krugman (1991; 1993)
Growth theory, development	• outward export orientation • import substitution • traditional economic growth theory • some industrial policy	Pack (1987; 2001) Pack and Westphal (1986) Westphal, Kim and Dahlman (1985)
The State, institutional change	• governing the market • strategic trade policy • co-ordinating prices and information • microeconomic factors • international political economy • institutional analysis	Amsden (1989; 1997; 2001) Amsden and Chu (2003) Rodrik (1997) Olson (1996) Wade (1990)

Mackie, 1992; Redding, 1990) have played a crucial role in the manufacturing sector's success there.

A number of theories have been developed in the social sciences and management disciplines on the rapid industrialization and economic growth in Asia. The key frameworks are summarized in Table 2.1 above.

Asian Entrepreneurship Theories and Disciplines

Entrepreneurship is an area that tests the breadth of multidisciplinary analysis. The *Concise Oxford Dictionary* defines an entrepreneur as: 'a person who undertakes an enterprise or business with the chance of profit or loss; a contractor acting as an intermediary; the person taking effective control of a commercial undertaking' (from the French *entreprendre*, to undertake).

This set of definitions points towards an entrepreneur as someone looking for rewards but taking some risk, someone who links different people and resources for commercial reasons, or someone in control of a business. The definition can be broader and the dictionary examples include 'a person who organises entertainment especially musical shows' – the musical entrepreneur (*Oxford Dictionary*, 2000). In the following sections, we focus on the three areas of business entrepreneurship and review it from the standpoints of the relevant disciplines, especially in terms of their relevance to international business research. The three disciplines are: applied economics, management, and social and institutional analysis.

Entrepreneurship and Applied Economics

The importance of entrepreneurship research in business schools, and the increasing research on the topic in disciplines such as management, international business and institutional analysis have indirectly illustrated the potential role of applied economic theories in relation to entrepreneurship. Schumpeter's (1934) famous concept of 'creative destruction' and the insights of other more recent works, such as those of Kirzner (1997) and Jacobson (1992), have helped to clarify the differences between the Austrian approach to economic theories and the neoclassical theories associated with research schools such as the University of Chicago (Simon, 1990a). In terms of entrepreneurship research, we believe that the traditional neoclassical economics frameworks do not allow for an approach that is sufficient to analyse the richness and complexity of entrepreneurship within the Asian business system.

However, the Austrian school of economics, with its institutional (North, 1990) linkages seems much more relevant for the analysis of Asian entrepreneurship. Schumpeter (1934), Kirzner (1997) and the Austrian school of economics tended to emphasize the important linkages between economic theories and the social environment, hence giving due importance to understanding the nature of the firm (Coase, 1934; 1960) as well as the entrepreneur's role in economic development. In contrast, the neoclassical approach to economics tends to view the market as the dominant force, without much analysis of what goes on inside the firms or of the role of entrepreneurs. The path-breaking work of Nelson and Winter (1982) and their evolutionary theory of the firm and economic change, have tried to combine both approaches to better understand the internal mechanisms of firms. These various schools of economics have been reviewed in depth in Miller and Garnsey (2000), especially in the context of technology.

The study of entrepreneurial choice and development has evolved by using the theories and methodologies of established social sciences such as economics, sociology, institutional analysis and psychology. Such methods need to be developed to be able to take account of the complexity of the dynamic and changing variables as well as the high level of uncertainty (Chen, 1997; Yu, 1998), which characterize entrepreneurship. Statistical methods often used in neoclassical economic research, developed for studying predictable linear production functions or processes, may not be applicable to the study of entrepreneurship, which is typically a non-linear and discontinuous process (Jacobson, 1992). It can be argued that in an emerging scientific paradigm, the emphasis should be placed on developing qualitative conceptual models which help to 'ground' theory in reality (Whitley, 1992). Through this chapter we would like to achieve a better understanding and provide a more transparent grounding for the theory of entrepreneurship and of entrepreneurship-based business or economic success. We do this in the context of research that is emerging in studies on entrepreneurship, and will illustrate it with applications focusing on the success of

Taiwan – thus encouraging comparative business research within the context of the Asian business environment (Dunning, 2000).

It was Joseph Schumpeter (1934) who long ago pointed out the vital role of entrepreneurship – the finding of new combinations of resources – in organizations. The individual entrepreneur is able to take risks, innovate and make progress both in good times and in the face of adversity. The same abilities are pervasively evident in some vibrant organizations today (Baden-Fuller and Stopford, 1992; Bhide, 2000). Just as evidence for entrepreneurship can be deduced from advances made by mature organizations, the phenomenal economic and business success in the five developed Asian economies – Japan, Korea, Taiwan, Hong Kong and Singapore – supports the anecdotal reports of their 'entrepreneurial' activity, allowing them to grow economically at rates approaching 10 per cent for over 30 years (World Bank, 2000).

Entrepreneurship and Management

While the broad concerns of sociological and psychological research in the entrepreneurship and small firm fields have often focused on the question of 'Which individuals will start their own small firms, and why?', another body of thought has been developed in the management and administrative science literature (Bhide, 2000). This deals with the types of managerial behaviour associated with entrepreneurial organizations, defined as those which create and exploit new opportunities for profit and growth, in the process of redeploying resources in the pursuit of these opportunities (Sandberg, 1992; Stevenson and Sahlman, 1989). Fundamental to this body of thought is the view that there is a difference between entrepreneurial management and administrative management, the latter being associated with merely overseeing the pattern of routinized behaviours (Nelson and Winter, 1982) and existing resource allocation within the organization in response to known and existing opportunities.

Within the Asian context, however, countries such as Japan, Korea, Taiwan and Singapore are seen to have government agencies that are 'entrepreneurial' in their behaviour, promoting a type of dynamic opportunity-driven and innovative approach to business, industry and competitiveness (Amsden, 1989; Chau, 1993; Mackie, 1992; Vogel, 1991; Yu, 1998). For example, in 1980 in Taiwan the government and economic policy-makers played a crucial role in the foundation for the Hsinchu Science-based Industrial Park to encourage technology-based entrepreneurship and to help develop the Taiwanese business system (Amsden and Chu, 2003).

The dynamics of a corporate life cycle (Jacobson, 1992) are such that once a business reaches a certain size, the owner begins delegating managerial tasks and decentralizing control of the business, at which point growth 'takes off' and eventually the business matures into its optimal organizational structure (Casson, 1990). However, the owner is then faced with the problem of maintaining the business' entrepreneurial spirit in a more bureaucratic organization. The Taiwanese computer firm Acer faces such a situation today. There may be lessons learnt from Taiwan in how public policy can maintain such an entrepreneurial spirit within technology districts (Chen, 1997; Yu, 1998).

In summary, managerial theories of entrepreneurship focus on the forms of managerial behaviour which are associated with entrepreneurial, opportunity-seeking organizations. The focus of work on entrepreneurial managers is on their policies and actions rather than their personal attributes and influences (Bhide, 2000). Entrepreneurial management is regarded as a process of pursuing opportunities in response to problems which arise for managers at certain points in a business's development.

The crucial role in international business research is to place the theory of entrepreneurship in the context of a broader global business environment (Casson, 1990; Miller and Garnsey, 2000). This has led to attention to the importance of studying regions, such as Asia, and to our research into trying to better understand the role of entrepreneurship in a particular Asian country, namely Taiwan.

Entrepreneurship and Institutional, Social Context Legitimacy

The institutional and social legitimacy of a new corporation, or of an entrepreneur, can often be reinforced by social conventions, which further encourage entrepreneurs and their organizations to succeed. Conventions are patterns of behaviour that are customary and self-enforcing (Lewis, 1969; Schelling, 1984; Young, 1996). According to Young, 'conventions with direct economic implications include industrial and technological standards, accounting rules, forms of economic contracts...almost all economic and social institutions are governed to some extent by convention' (Young, 1996, p. 105).

Conventions can be created in two ways. They can be created formally by a central authority, for example, the establishing of a new law after the French Revolution, decreeing that horse-drawn carriages in Paris be driven on the right (Young, 1996). Conventions can also become established informally, gradually over time through precedent, custom and path-dependent individual and social choices (Arthur, 1994; David, 1985; Lewis, 1969; Schelling, 1984). We believe that the existence of networks among entrepreneurs and entrepreneurial firms helps to create and sustain entrepreneurial conventions and best business practices in social communities.

When, in 1980, the Taiwanese government, in collaboration with the banking and business community, established the Hsinchu Science-based Industrial Park this helped to encourage entrepreneurship in the Taiwanese business system. The Taiwanese public policymakers created a convention favouring particular business practices (Amsden and Chu, 2003; Saxenian and Hsu, 2001). This is similar to examples of the government creating or stimulating a particular social convention. In the case of establishing a more formal convention, such as the earlier example of the French government decreeing that horse-drawn carriages in Paris be driven on the right, the result was that the costs of co-ordination and communication were reduced. This occurred without necessarily taking into account whether this was the most efficient way to do so, or whether the new formal convention incurred high costs of changing existing conventions, rules and co-ordination systems. Under such formal convention establishment, there is no need for the parties involved to have shared values, experiences and identities; all they need to do is to accept the central authority, as well as the social practices that follow from the central authority's decision.

In 1980, Taiwan, through the Hsinchu Science-based Industrial Park, created conventions that helped the country to legitimize entrepreneurship (Etzioni, 1996). The entrepreneurship thus stimulated created positive feedback effects (Arthur, 1994; 1996) on entrepreneurship throughout the country as certain choices were repeated by others and, as practice was gained, the examples became more salient or prominent and easier to follow (Arthur, 1994; David, 1985; Young, 1996). Hence, it was not necessarily shared identities or values that led to lower co-ordination and communication costs, but 'shared knowledge' in that the parties had similar common knowledge about the history and accumulated precedents.

We believe that trust is a further factor of significance in that it can reduce some of the measurement costs of business transactions in a rapidly growing economy. During the 1960s Taiwan was an emerging economy with relatively low levels of income. The enforcement of business contracts (Choi, 1994) would have required methods that might be different from enforcement mechanisms in a more developed, high-income business setting. The entrepreneur may have played a key role in being a focal point (Schelling, 1984) for such business transactions to be co-ordinated. An analogous point on the role of the entrepreneur in replacing the market has also been made in the context of Hong Kong, by researchers such as Mackie (1992) and Yu (1998).

Entrepreneurship: The Taiwanese Business System

The three schools of research – economics, management and institutional, social legitimacy – and their diverse research approaches are relevant for understanding entrepreneurship in the global business environment. Combining these approaches is especially relevant in the case of Taiwan because of the dynamism and the nature of its business and its economic development since the 1970s. We feel that not in any business, industry or country is a single theory or model of entrepreneurship likely to be able to capture all the relevant aspects of such phenomenal change and success.

Linkages to Asian Business Systems Research

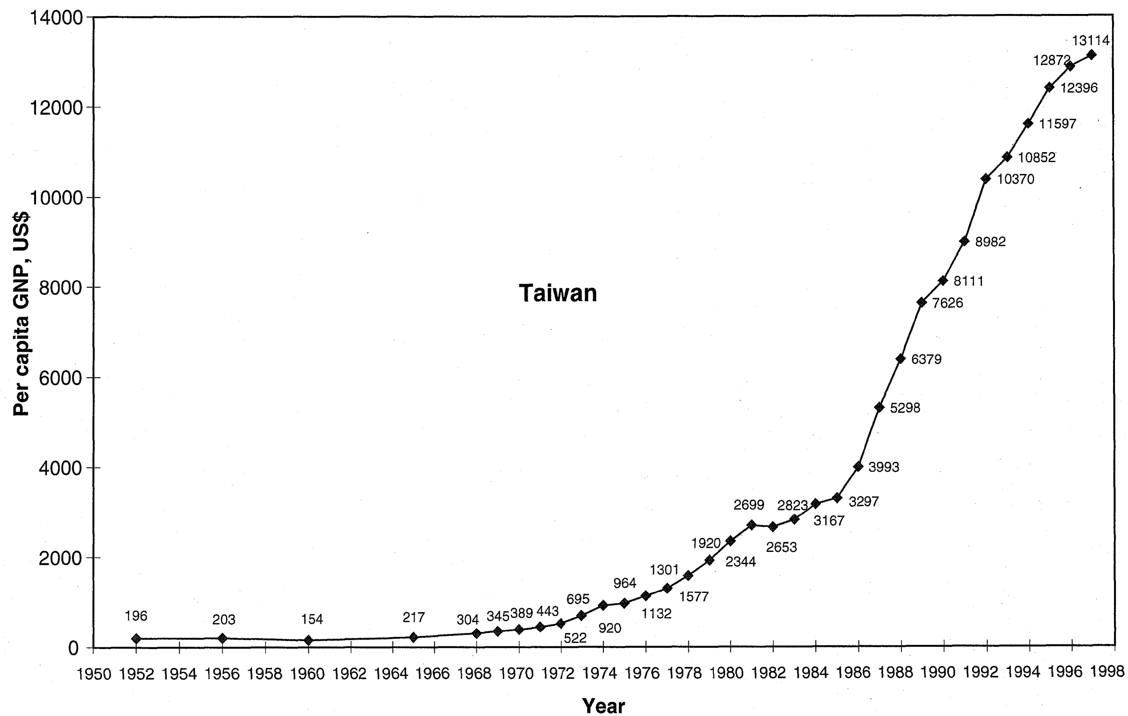
Many researchers have attributed the outstanding economic and business success of some of the largest Asian economies, namely Japan, Korea and Taiwan, to the role of the government in intervening in the free market (Amsden, 1989; Wade, 1990). In the year 2001, there were five mature or developed economies in Asia, defined as economies with a per capita annual income of over US 10,000 dollars (World Bank, 2000): Japan, Korea, Taiwan, Hong Kong and Singapore. Among these five countries, Hong Kong could be seen as an example of a smaller, city-state economy of 6 million people that relied on the government as well as private initiative (Yu, 1998). Economic and business research on Hong Kong tends to emphasize this focus on the private sector and free markets, using theories such as those associated with the University of Chicago school of thought to explain the economic success (Cheung, 1983).

Other works such as those by Chen (1988) and Chau (1993) attribute Hong Kong's economic success to the social and business environment, including the conditions existing for the potential role of entrepreneurs. In line with the latter works, we posit in this chapter that the economic and business success of Taiwan cannot be explained solely by the traditional neoclassical economic theories (Cheung, 1983) nor by management theories based on management approaches in large, established corporations. The role of the entrepreneur and that of technology are crucial to Taiwan's economic and business success. Taiwan's phenomenal economic growth over the last 30 years is shown in Figure 2.1 below.

Besides the general areas of research on entrepreneurship, technology and knowledge, social and institutional environment and international business, some other studies on Asian business success have touched on the research we cover in this chapter. Yu (1998) shows the importance of the entrepreneur in Hong Kong's economic success. His research focus is on making a clear distinction between two types of Austrian economic tradition and their implications for economic development – distinguishing between the creative destruction of Schumpeter (1934) and the later adaptive response of Kirzner (1997). This research on Hong Kong discusses these two strands of economic thought; however, it does not take into account the social, institutional context or the implications for management and business strategies. Our research, on the other hand, goes further and provides a synthesis of a number of applied economic theories taking account of the importance of knowledge and technology in the international business environment.

Redding (1990) and Chen (1997) analyse the issue of overseas Chinese entrepreneurship, that is, the role of the Chinese entrepreneurs who left mainland China in the 1950s and settled in other countries in Asia, including Hong Kong, Singapore, Thailand, Malaysia and Indonesia. This research was done from a purely sociological angle, taking into account the important role of the family and seeing entrepreneurship as driven by family-based management styles and structures (Chen, 1997; Redding, 1990; Whitley 1992). The research makes an important contribution to understanding

Figure 2.1 Taiwan's economic growth rates (adapted from Taiwanese Ministry of Finance, 2003)



part of the entrepreneur's environment but neglects the importance of access to knowledge, particularly technology, and the financing of such technology, which was crucial for the success of many such overseas Chinese companies. We address this element by showing the linkages among technology, entrepreneurship and the changing international business environment.

The role of government, and of government intervention in the market, has been widely researched in works such as Wade (1990) and Amsden (1989). This research illustrates the importance of government regulations for businesses, especially as regards encouraging exports to global markets. Works by Fruin (1992) and Amsden (1989) further reinforce our knowledge of the importance of the government in Asian countries such as Japan and Korea. Taiwan, however, has more or less been left out in these studies. We contend that the economic and business success of Taiwan has occurred thanks to two elements. On the one hand we see the element of government intervention such as was the case in Japan and Korea, and on the other hand a form of private initiative and free market approach, allowing and encouraging entrepreneurship to flourish, such as was the case in Hong Kong (Yu, 1998).

Taiwan and International Business Research

As noted, the majority of international business research on Asian business systems and on Asian corporations has focused on Japan and Korea. The diversified conglomerate structures of these countries including the 'Keiretsu' in Japan and the 'Chaebol' in Korea have been widely researched in such works as Amsden (1989) and Fruin (1992). Taiwan's political entanglement with China, including her potential merging, as occurred in Hong Kong, has made it more complex to analyse the country in terms of social science and international business. However, Taiwan is a country with a per capita income as high as many a West European country (US 17,000 dollars in 2003) and has a population of 24 million people. Existing research tends to focus on the institutional environment, government-business relations, and the role of the state (Wade, 1990). We hope to provide a more comprehensive picture that takes into account Taiwan's history and institutions, as well as the 'entrepreneurial mind' of the Taiwanese business people.

The Taiwanese business system is different from that of other Asian countries, and a hybrid for several reasons. First, in terms of the relation between the government and entrepreneurship, it is a hybrid between Japan, Korea and Hong Kong. Its government is unafraid of, or even enthusiastic for, intervention, as in Japan and Korea (Amsden, 1989; Fruin, 1992) but it has a business system that encourages entrepreneurship, similar to the more laissez-faire system in Hong Kong (Yu, 1998). The widely researched, large and diversified conglomerates of the Keiretsus in Japan and the Chaebols in Korea have helped create an impression that such large, diversified conglomerates would also exist in Taiwan. But Taiwan shares similarities to these countries only in terms of broad, government-business relations. The importance of small and medium-sized enterprises in Taiwan is more akin to the overseas Chinese companies (Chen 1997; Redding, 1990) in countries such as Hong Kong, Malaysia and Thailand.

Second, in terms of corporate governance, Taiwanese companies tend to rely on the stock market as well as on the banking sector. Recent growth in corporate governance research has shown the important distinction between two systems; the Anglo-Saxon system, such as practised in the United States and the United Kingdom (Albert, 1991), which is primarily driven by stock market valuations. And, on the other hand, the more communitarian system where longer-term finance, particularly from banks, is a key driver, such as is found in Japan and in continental European countries (Choi *et al.*, 1999; Michel and Hambrick, 1992; Roe, 1994). Within Asia, Japanese and Korean corporations have tended to rely primarily on bank finance, whereas companies in Hong Kong have tended to rely more on the stock market (Chen, 1995; Redding, 1990). Taiwan, again, is a hybrid in relying on both systems of finance.

Third, a key distinction for Taiwan within Asia is the dominant role and importance of technology and knowledge as resources. The Hsinchu Science-based Industrial Park and technology valley set up by the government in the 1980s is an example of successful government regulation and intervention that has allowed the rapid development of technology and of entrepreneurs who could rely on such technology for economic and business success. From Whitley's (1999) national business systems (NBS) framework, Taiwan exemplifies a state-controlled economy that does not inhibit innovation.

Literature shows that public and private initiatives to support innovation and entrepreneurship include organizing industrial clusters in science parks, promoting university-industry collaboration and providing seed capital through venture funds (Koechlin and Liu, 2003). Government strategy to support private entrepreneurship includes a large number of small, flexible and innovative companies (Kraemer *et al.*, 1996).

In Taiwan, the government also carried out research and development, transferred technology to the private sector, conducted market intelligence for private sector use, and provided engineering and technical manpower (Kraemer *et al.*, 1996). The state played an especially important role in diffusing process technologies to the SMEs in the early stage (Wong, 1999). The diffusion of knowledge was enhanced by the small size of manufacturing firms in Taiwan that provided an environment in which local employees could envisage leaving and starting their own firms (Pack, 2001). The large -scale development of public research institutes also assisted in the facilitation of technology transfer and assimilation and co-operative R&D promotion in support of the indigenous SMEs (Wong, 1999). As such, there are similarities to the government-driven technology district in Sophia-Antipolis, in southern France (Miller and Garnsey, 2000).

Asian Capitalism and Industrial Districts

Speaking at the 2000 World Congress on Information Technology, Carly Fiorina, then CEO of industry giant Hewlett-Packard said: 'From our tiny start in 1970, we have grown to a $4.5 billion purchaser and partner with Taiwan in the year 2000. We see the words "Made in Taiwan" come to mean high quality, world class technology' (Taiwan's Ministry of Finance, 2000). Taiwan ranks as the world's third-largest IT provider after the United States and Japan (Saxenian and Hsu, 2001; Amsden and Chu, 2003). In 2000, the island exported high-tech and telecom products worth 45 billion dollars worldwide – a 20 per cent increase from 37 billion dollars the previous year, according to Taiwan's Ministry of Finance (2000).

The Taiwanese economic miracle (average real GDP growth of 8.6 per cent, 1952–2002) has transformed an agricultural society to an economy that boasts a diversified industrial base with a growing service sector (Amsden and Chu, 2003; Chen, 1997; Saxenian and Hsu, 2001). Fundamental to this is technology, which laid the foundations for Taiwan's industrial district set up in 1980: the Hsinchu Science-based Industrial Park. In the 1950s, economic growth was centred on improvements in agriculture combined with a government policy encouraging the development of import-substitution industries such as fertilizers, textiles and cement. In the 1960s the government changed its course as export industries were to be the new engine of growth. The export success at that stage of economic development enabled Taiwan to move to more capital- and technology-intensive industries (Wade, 1990). In the 1970s and 1980s, with rising wages, Taiwan's comparative advantage declined in labour-intensive textiles and consumer goods assembly, necessitating the transition to secondary import-substitution industries such as steel, petrochemicals and manufactured goods industries for export (Kim and Nelson, 2000; Wade, 1990).

The 1980s saw the birth of perhaps the most significant public policy to determine Taiwan's future economic and business success – the creation of the Hsinchu Science-based Industrial Park. In the 1990s, Taiwan's exports were dominated by technology-related industries, giving Taiwan the position mentioned earlier as number three exporter of IT products in the world after the United States and Japan. Taiwan's success is very much credited to a co-ordinated government strategy to support private entrepreneurship in a large number of small, flexible and innovative firms (Kraemer *et al.*, 1996).

Industrial Districts, Multinational Corporations and Entrepreneurship

Last century Alfred Marshall (1920) first proposed the notion that similar economic activities would benefit from spatial clustering. He noticed that many small firms could exist together harmoniously in spatial clusters and derive benefits similar to those of large firms, with whom each individual small firm could not possibly compete. Marshall (1920) referred to these benefits as economies of agglomeration, which are generated by the close proximity of firms within the cluster. These economies, labour market pooling, input sharing and knowledge-spillovers (Marshall, 1920), arise from shared access to common factors of production and the efficient dissemination of knowledge within the cluster. In recent years there has been a resurgence of interest in industrial districts as viable modes of production in today's global economy. Contemporary theorists such as Porter (1990), Pyke and Sengenberger (1992) and Storper (1995) have proposed a number of reasons why spatial clustering is a necessary requirement of flexible production modes. It has been suggested that the key elements which determine the success of industrial districts are the propagation of a collective identity, a shared business culture and the development of co-operative relationships based on trust (Beamish and Banks, 1987; Beamish and Killing, 1997; Storper, 1995).

However, this research focuses more on why firms are located together than on the social or network effects of such clustering behaviour. Current research in international business and entrepreneurship, however, does not address in detail the potential role of the state in the creation of such industrial districts (Casson, 1990; 1996), or even the creation itself. One exception is Miller and Garnsey (2000) who compare the differences between the creation of Cambridge, United Kingdom, and Nice/Sophia-Antipolis in France. Also, there has been very little research on technology-based industrial districts in Asia, especially in Taiwan. The collective identity which is formed in social and cultural terms may involve a moral or ideological commitment to maintaining the well-being of the community, so that rational decision-making, bound or otherwise, is directed at serving the community's best interest rather than self-interest (Bourdieu, 1990; Storper, 1995). In the case of Taiwan, the companies in the Hsinchu science and technology valley constantly worked with economic policy-makers in determining the overall success and future of the companies in the industrial district.

The government and public policy-makers helped to encourage a national export culture. The main objective of the industrial district has been to meet competitive global challenges through the speed of development of differentiated quality products, the rapid innovation of new production methods and the flexibility of adjustment to new global business circumstances. As analysed by Miller and Garnsey (2000), it has taken several decades for the technology clusters to develop in Cambridge, United Kingdom, and Sophia-Antipolis, France, and there are not many successful industrial districts in the world. The fact that Taiwan achieved this in 20 years, from 1980 onwards, is an amazing success story of entrepreneurship, government intervention and industrial districts (Hobday, 2000; Pack, 2001).

What then is the form and function of entrepreneurship in industrial districts? As analysed by Casson (1990; 1996), the entrepreneur can help to 'connect' or bring together the various aspects of a business system (Choi *et al.*, 1999) ranging from finance and technology to infrastructure creation. The collective identity and inter-firm linkages which naturally develop among the technology firms within a territorially defined socio-economic culture eliminate the major problems of protecting knowledge and controlling opportunistic behaviour that branches of a single company would face in globally dispersed multinational production (Kogut and Zander, 1992). In the case of Taiwan, the State played a fundamental role in creating this collective identity based on a global export strategy for the Hsinchu science and technology valley.

Any entrepreneur, in setting up a new company and working with a new technology, must constantly make decisions under ambiguity and uncertainty. Therefore, a study of entrepreneurship must take into account the substantial role played by such uncertainty in terms of decision-making, measurement of value and technology (Casson, 1990; 1996). Industrial districts can help companies to overcome such barriers as uncertainty, infrastructure and financing. It took Cambridge, United Kingdom, and Sophia-Antipolis, France, nearly 50 years for a successful technology district to develop (Miller and Garnsey, 2000). Taiwan's Hsinchu science and technology valley achieved similar results in 20 years. This is an example of the potential acceleration role played by the collaboration between public policy-makers and the business community. The role of the State in Asian capitalism has been widely debated in the social

Table 2.2 Three encompassing factors in East Asian economic success

	FDI	*The State*	*Entrepreneurship*
Korea	No	Yes	No
Taiwan	No	Yes	Yes
Hong Kong	Yes	No	Yes
Singapore	Yes	Yes	No

sciences and management literature (Amsden, 1989; Fruin, 1992; Wade, 1990). The role of the State, along with entrepreneurship and foreign direct investment is compared, in the major Asian economies, in Table 2.2, above.

The State and Industrial District Creation

There are two major ways in which technology-based industrial districts can be created. First, and this frequently occurs, they can be created over time, based around a major research university; for example, Silicon Valley, which has benefited from the technologies developed within universities such as Stanford in the USA (Saxenian, 1994) and Silicon-fen, which benefited from the technologies and knowledge generated by Cambridge University in the UK (Miller and Garnsey, 2000). Second, they can be created and regulated through government intervention, which may subsidize high technology companies to locate in a particular part of the world. The best example of this is Sophia-Antipolis in southern France, which has now attracted over 1,500 high-technology companies (Miller and Garnsey, 2000). Taiwan's technology district, the Hsinchu science and technology valley, is a hybrid of the more university-based system of Silicon-fen, Cambridge, United Kingdom, and Silicon Valley, United States, and the more government–business collaboration system in Sophia-Antipolis, France.

In terms of the role of public policy and government, the Hsinchu Science-based Industrial Park has some similarity to the successful case of Sophia-Antipolis in southern France. As in France, the Taiwanese government, working closely with domestic companies, encouraged foreign companies to develop their technology in the Hsinchu district (Hobday, 2000; Pack, 2001). But unlike Sophia-Antipolis, France, which encouraged well-developed technology companies to locate there, the Hsinchu science and technology valley also encouraged the creation of new technology and SMEs, as well as encouraging the export of products based on new technologies to the global economy. If, indeed, such geographical factors are driving foreign direct investment and firm decisions towards location and strategy, they have substantial implications for public policy and the role of the state as well as the collaboration between government and business towards such firm decisions (Lenway and Murtha, 1991).

The majority of the research carried out on industrial districts and geographical locations has been based on situations and systems within the United States (Krugman, 1996; Saxenian, 1994). Thus, there is an assumption that managers or labour in general will be highly mobile across regions. However, the immobility of labour was a key issue that could have prevented the success of Taiwan's Hsinchu science and technology valley. In many Asian countries, including Taiwan, in terms of employment managers tend to prefer to stay within their traditional home towns or cities, or prefer to be located in the capital city (Amsden and Chu, 2003; Chau, 1993; Yu, 1998). Uncertainty about the permanence or merits (financial or career-wise) of a relocation weighs heavily on the manager's mind.

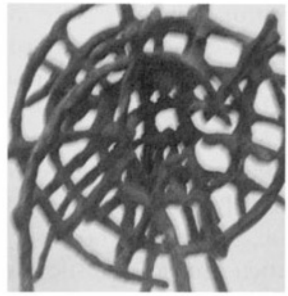
In Taiwan, the entrepreneur helped to overcome such uncertainties, especially in what was rapidly becoming an emerging business environment. Researchers such as Chau (1993) and Yu (1998), in their analysis of Hong Kong, have also shown that overcoming uncertainty was crucial for business success during the rapid economic development of Hong Kong throughout the 1970s and 1980s. In this sense, we believe the entrepreneur takes on the role of a knowledge co-ordinator between economic public policy-makers in government, and the business and financial community in the Hsinchu Science-based Industrial Park.

This chapter highlighted the macro perspective on knowledge complexity, illustrating the extensive contexts and important linkages that exist between technology-based industrial districts, SMEs, larger corporations and public policy. It illustrated this by highlighting the important role played by the State in diffusing process technologies to local firms and the State's support for entrepreneurship in Taiwan's business system. The Hsinchu Science-based Industrial Park is an example of an industrial cluster in which competition and vertical co-operation among local firms account for rising productivity, innovation and new firm formation (Porter, 1998).

Chapter 3

Knowledge and Cities

A Resource-based View



Urban areas such as major cities are crucial in the development and utilization of knowledge as a resource. Many talented knowledge workers in the consulting, investment-banking, law and science and technology industries are attracted to certain global cities, not only because of the attractive work environment but also their attractive social amenities. Observations such as migration of capital and attractiveness of cities for multinational corporations (MNCs) have highlighted the importance of location in knowledge management research.

Since the 1990s the role of cities in today's global business environment has become a fundamental topic of geography, management and social science research (Florida, 2002; Krugman, 1991; 1998; 1999; Leamer and Storper, 2001; Scott, 1999; 2000). In this chapter we apply the resource-based view (RBV) of the firm to a higher level of aggregation – that of cities. We illustrate that lessons from industrial districts are especially helpful in understanding the resource-based view of cities. Finally, we discuss the benefits of applying the RBV to strategic public policy in cities because government and public policy have played a major role in the regeneration of cities such as New York, Athens, Glasgow, Amsterdam and Brussels.

Our approach to the resource-based view of cities is multidisciplinary, integrating contributions from several disciplines such as geography, economics, social sciences and management. Lessons from industrial districts, which have been analysed in depth in terms of business and management theories, are especially helpful in understanding a resource-based view of cities. The RBV of the firm has been widely researched in management since the pioneering work of Barney (1991). Since then, this paradigm has also been applied in other disciplines such as international business (Peng, 2001), marketing (Srivastava *et al.*, 2001), entrepreneurship (Alvarez and Busenitz, 2001) and human resource management (Wright *et al.*, 2001). This, however, is the first time RBV is applied to cities and their prospects of success in today's global business environment.

The location of corporations has become a crucial factor in economics and business success for cities, countries and regions. Krugman (1991; 1998; 1999) has been the researcher most responsible within international economics for advocating a branch of research known as the new economic geography. This relatively new interdisciplinary area of research incorporating complexity theory, international economics and economic growth theories, and geography, has shown how historical accidents and certain underlying factors can lead to dramatic creation or equally dramatic disintegration of economic activity. This research has been complemented by the works of international business researchers such as Rugman (2000) and Rugman and D'Cruz (2000) showing the limits of globalization and the tendency for multinational enterprises to continue their focus on the traditional triad markets. Research on locations also overlaps with the continuing management research on knowledge (Grant, 1996; Spender, 1996), as increasingly knowledge assets and value are seen to have a historical, geographical and local context (Barnes, 2003).

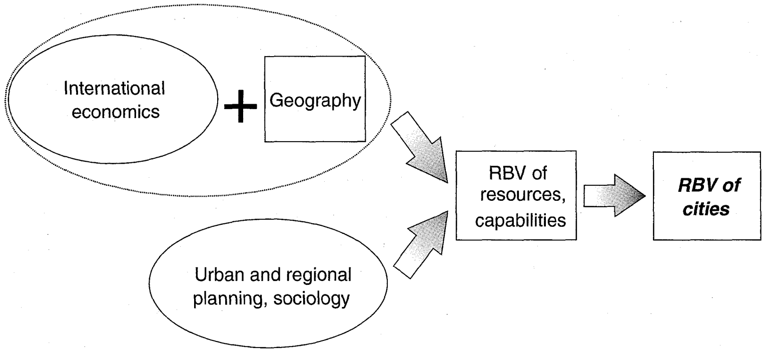
Research in international business (Rugman, 2000; Rugman and D'Cruz, 2000) and international economics (Blanchard and Katz, 1992; Gallup and Sachs, 1998; Krugman, 1991; 1998) has focused on the nature of corporations, multinational enterprises and regional economic policy. Such research has also relied on the earlier continental European works in geography and regional science of Weber (1909), Christaller (1933) and Losch (1940). As the pace of globalization increases and most activities become increasingly mobile, firms can split their production choices among locations, and are able to supply more distant markets and customers. The area of labour mobility and resource-oriented analysis of individuals, knowledge workers, or human capital, has remained relatively under-researched in both international business and international economics (Green and Turok, 2000; Herod, 2001; Martin, 2001; Waterman and Wills, 2001; Yeung, 2002). The increased labour mobility and the development of the internet and communication technologies have created a need to analyse labour and human capital in a more dynamic way (Castree, 2002; Coe, 2000; Yeung, 2002).

This gap in international economics and international business research has started to be filled recently by researchers in city and urban planning such as Florida (2002), Mendieta (2001), Hall (1998), Saxenian *et al.* (2002) and Glaeser (1999). They have emphasized the importance of the quality of a place, location or city, especially the importance of social amenities, in attracting talented workers to global cities such Paris, New York, London and Sydney (Leamer and Storper, 2001; Mathur, 1999; Robinson, 2002; Santagata, 2002; Taylor, 2000). Such talented knowledge workers include many in the professional services, knowledge industries including consulting, investment banking, law and science and technology industries (Clark, 2000; Florida, 2002; Kong, 2000; Sassen, 1991; Tams, 2002).

The meeting point or focal convergence (Schelling, 1960) of these interdisciplinary research efforts is in the concept of global cities. A RBV of cities can be positioned (Barney, 1991; 2001) relative to many other theoretical traditions including in geography, economics and urban planning. In order to provide the greatest insight for knowledge research, this chapter aligns it with research on industrial districts (Beccatinini, 1990; Marshall, 1921; Pyke *et al.* 1990; Storper, 1997).

The analysis requires a synthesis and integration of the three streams of research recently undertaken: in the social sciences, in geography and in urban planning. At both macro and micro levels, factors such as globalization, labour mobility or immobility, the nature of social interactions and the creation of social capital (Putnam, 1993) make research on global cities a key input for management theories. Elements of this analysis also touch upon management research on knowledge as an intangible asset and resource (Grant, 1996; Spender, 1996). The convergence of these research areas is depicted in Figure 3.1 below.

Figure 3.1 A resource-based view of cities



The Resource-based View of Cities

Jay Barney (1991) introduced the path-breaking concept of the RBV of the firm to strategic management research. Fundamentally, the RBV of the firm shows that the long-term competitive advantage of a firm is derived from resources and capabilities that are imperfectly imitable, rare and not substitutable (Barney, 1991; 2001). Barney's framework was originally positioned relative to the existing structure-conduct-performance (SCP) paradigm for analysing industry performance (Barney, Wright and Ketchen, 2001). The 1990s witnessed an explosive growth in research on the RBV both theoretically and empirically, mostly positioned against other major paradigms, such as neoclassical microeconomics as, well as evolutionary economics (Barney, 2001).

The influence of the RBV approach on management has also spread to sub-disciplines within management, such as human resource management (Wright, Dunford and Snell, 2001), entrepreneurship (Alvarez and Busenitz, 2001), international business (Peng, 2001) and corporate governance (Castanias and Helfat, 2001). The RBV theory of the firm, however, has had relatively less impact on other social sciences, including economics. For example, Lockett and Thompson (2001) show that there have only been relatively few citations of key RBV papers in economics journals. Based on casual empiricism, we believe this is also the case for other disciplines of social sciences, including geography and urban planning.

At the heart of the RBV of the firm is resource heterogeneity. It assumes at least that some resource bundles and capabilities underlying production are heterogeneous across firms (Barney, 1991; 2001; Barney, Wright and Ketchen, 2001). Resource-based theory suggests that heterogeneity is necessary but not sufficient for a sustainable advantage. For example, Petaraf (1993) identifies three other conditions. Ex post limits to competition are necessary to sustain rents, imperfect resource mobility ensures rents are bound to the firm, and ex ante limits to competition prevent costs from offsetting the rents.

Government and public policy have played a major role in the regeneration of cities such as New York, Athens, Glasgow, Amsterdam, and Brussels. Research on New York's regeneration has shown how cultural industries and the intangible aspects of culture can be converted into commercial economic value, serving both local and global needs for the city of New York (Kearns and Philo, 1995; Zukin, 1995). Athens' regeneration as an Olympic city in 2004 has given a boost to Europe's oldest continuously inhabited city, a rare combination of history and culture spanning 3,000 years. The 2004 Olympics are not seen as an end, but as a beginning: the beginning of a maturing and aesthetically upgraded Athens. 'We want to remind the world of the city's unique historical prestige and of the attractions of the Greek capital' (Dora Bakoyannis, Mayor of Athens, 2004).

In Europe, the designation of cities as a 'European City of Culture' has combined economic goals with solutions to local problems (Law, 1992; Mullins, 1992). Bianchinni (1991) has shown how public policy in European cities has leveraged the unique, non-imitable cultural assets of European cities, such as the arts, to attract tourists, capital investment and multinational enterprises, very much in line with the RBV of leveraging unique, non-imitable resources such as culture and competences. Since the 1990s Singapore, similarly, has been converting from a high-tech, educational metropolis to that of a cultural industries metropolis – 'Renaissance City' (Chang, 2003; Mahizhnan, 1999; Sim *et al.*, 2003). Singapore's past success in attracting multinational enterprises is well known and documented (Barlyn, 1999; Hamnett, 1995; Precourt and Faircloth, 1996; Robinson, 2002). The conversion of Singapore into a cultural industries city shows the importance of the intangible, tacit and socially complex resources and competences (Barney, 1986; Dierickx and Cool, 1989) exemplified by cultural industries and cultural capital (Bourdieu, 1977; 1984; 1990).

Barney (1991) explains the importance of positioning the RBV against the three major existing paradigms of: structure-conduct-performance (SCP), neoclassical microeconomics and evolutionary economics. In a somewhat analogous way, the RBV of cities can be positioned equally well against three existing paradigms that analyse the success of cities in the disciplines of international economics, geography and urban planning. However, the relevance for management research lies in the synthesis and integration of these three disciplines, which, when applied to industrial districts (Marshall, 1921), will allow for a standard position of the resource-based view of cities.

Cities' Paradigms: Economics, Geography, Urban Planning

Economics

Long-established research results on geography, locations and economic success have confirmed the expectation that market access and transport networks are crucial factors in the economic success and the development of major global cities. More recent research has shown that economic growth rates and economic income levels are substantially higher for countries in which a high proportion of the population lives near the coastal regions, such as in the major economic regions of the United States, the European Union and Japan. This type of development is also observable in the rapid economic development of cities in the coastal regions of China (Amin and Thrift, 1992; Gallup and Sachs, 1998; Kim, 1995). The new economic geography shows that geographical advantage is greatest for an intermediate level of trade costs. For example, there will be an initial clustering for a group of firms in order to reduce trade and transportation costs, i.e. centripetal forces are moving to reduce these costs. When this happens, firms tend to reverse the flow and scatter towards the peripheral regions, i.e. the action of centrifugal forces (Krugman, 1991; 1998; 1999). Overall, the key determinants of economic development and of successful economic cities are the ease of interaction and exchange of business and industry with major other players, such as the consumers, suppliers, information and technology. Such interactions are necessary for backward linkages when the firm purchases from others in the region and forward linkages when the firm supplies parts or trains workers (Gallup and Sachs, 1998).

Geography

Neoclassical economics generally assumes a rational maximizing behaviour among various actors in the economy. Geography's main focus has been the cumulation or agglomeration process of firms that decide to locate or conduct business in a particular location, country or region (Krugman, 1991; 1998; 1999). This means that one region or city that has a slightly greater number of successful corporations can help to create a self-reinforcing (Schelling, 1978) type of aggregation effect where larger markets are created, more suppliers are encouraged to participate and the various positive effects are further reinforced. By contrast, the models of traditional neoclassical economics assume that firms have perfect information and will rationally anticipate the future location of various other firms, thus making rational decisions that may or may not lead to such agglomerations.

Geography research has shown that certain cities and regions continue to dominate in terms of multinational enterprise locations, economic development and growth. However, both international economics and geography have assumed that the multinational enterprises supply the human capital or the talented professionals (Florida, 2002) that create value in global cities. What is missing from both strands of research is the micro-level analysis, which takes into account the importance of knowledge professionals and the social interaction among individuals and human capital, which leads to value creation within global cities.

Urban Planning

Urban planning and sociology researchers such as Castells (1996) have analysed the important role played by cities in creating global ties and networks. A key driver for this broader, social, cultural definition of the globalized cities lies in ICT, information communication technology, which includes the internet, knowledge workers and knowledge-based resources (Castells, 1996; Giddens, 1999; Glaeser *et al.*, 2001; Philo and Parr, 2000). The argument given by sociologists, political scientists and geographers (Doel and Hubbard, 2002; Featherstone, 2002; Jackson, 2002; McDowell, 2000; Nash, 2000) is that globalization has indeed occurred beyond the concentration or location of multinational enterprises in particular regions of the world (Millar *et al.*, 2005). These conclusions have overlapped with those of urban and regional planning researchers (Ashworth and Tunbridge, 2000; Graham, 2002; Graham *et al.*, 2000; Hall, 1998; Olsen, 2002; Sassen, 1991; Scott, 1999; 2000; Storper, 1997).

Table 3.1 Cities and existing theoretical frameworks

Research area	*Focal points and key academic literature*
International economics	• Focus on market forces, firms and increasing return effects. • Linkages to economic growth and development, with an assumption of mobile labour as a resource. • Key works: Amin and Thrift (1992); Blanchard and Katz (1992); Gallup and Sachs (1998); Glaeser (1999); Kim (1995); Krugman (1991; 1998); Romer (1986); Schelling (1978)
Geography, knowledge assets	• Focus on how firms determine their location, and production decisions globally, with the importance of knowledge as an asset and resource. • Location decisions of firms, oligopoly effects, globalization of industries, especially agglomeration effects and path dependency. • Key works: Casson (1993); Grant (1996); Kogut and Zander (1993); Porter (1990); Rugman (2000); Saxenian et al. (2002); Spender (1996)
Urban and regional planning, sociology	• Focus on the importance of human capital, talent, knowledge professionals and the role of cultural, creative industries in cities. • Cultural and social aspects of globalization, development of cities, role of public policy in city regeneration. • Key works: Bianchinni (1991); Bourdieu (1984); Castells (1996); Florida (2002); Giddens (1999); Hall (1998); Kong (2000); Landry (2002); Martin (2001); Sassen (1991); Scott (2000); Storper (1997); Throsby (1999); Yeung (2002); Zukin (1995)

Urban and regional planning researchers have also analysed the importance of the social interactions at the individual level in driving value creation and the concentration within cities of creative talents (Florida, 2002) or knowledge professionals. It is the presence or potential presence of such human capital, or knowledge professionals and creative talents, which attracts innovative, technology-based industries (Bassett, *et al.*, 2002; Brooks, 2000; Florida, 2002; Glaeser *et al.*, 2001). It is in turn the heritage of a city, or the meaning attached to the past and present, which forms the foundations of social, political and cultural knowledge. These then help attract such talented individuals and human capital to global cities (Cochrane and Passmore, 2001; Escobar, 2001; Graham, 2002). The focus of these three strands of literature and the key works involved are summarized in Table 3.1.

Human, Social, Cultural and Creative Capital

The literature in all the above mentioned disciplines converges towards a recognition of the increasing importance of knowledge work and knowledge professionals (Alvesson, 2001; Donaldson, 2001), thereby reflecting the increasing value of scarce knowledge resources in the economy. This parallels the work in strategy on the increasing importance of knowledge as a valuable resource in economic competition (Conner and Prahalad, 1996; Grant, 1996; Liebeskind, 1996; Spender, 1996). The definition of knowledge in management or international business research has tended to rely on Polanyi's (1957) distinctions between explicit and codifiable versus implicit or tacit characteristics (Kogut and Zander, 1993). Works by Kogut (1991) and Kogut and Zander (1993) identify the tacit nature of knowledge as a key impediment to transfer but at the same time regard it as a source of corporate/organizational advantage. Researchers such as Nonaka (1994) have identified the importance of tacit knowledge transfers in work groups operating in close proximity as being the key source of competitive advantage in many firms.

Similarly, the growing field of strategic human resource management (HRM) literature has emphasized the role of human resources in competitive advantage. Wright *et al.* (1994) have applied the RBV concepts by arguing that HRM practices cannot form the basis for sustainable competitive advantage since their imitation is readily possible by all. Rather, they proposed that the human capital pool (a highly skilled and highly motivated workforce) had greater potential to constitute a source of sustainable competitive advantage. On the other hand, Lado and Wilson (1994) apply RBV by arguing that a firm's HRM practices can provide a source of sustainable competitive advantage by enhancing a firm's competencies.

In economic geography and urban planning too researchers have examined the role of different types of human capital in the economic growth process. The suggestion that the growth of cities is related to human capital dates back as far as Ullman's (1958) work on regional development and Jacob's (1961; 1969) work on the economy of cities. Since then extensive empirical work has confirmed a link between human capital and the economic growth of cities. For example, Glaeser (1998) finds a strong relationship between human capital and city growth; Glaeser (2000) further suggests that access to scarce human capital is a key driver for firms and for the clustering of firms in a particular location.

Social and Cultural Capital

Sociological studies, based on the concepts of cultural and social capital first introduced by French sociologist Bourdieu (1977; 1984; 1990), and examining the growth of communities, have brought this area of cultural and social capital research to the fore.

Cultural capital is symbolic capital that confers status on the owner or consumer within the social structure, for example, an academic credential that provides social prestige or an upbringing that identifies one as a member of an elite group. Social capital, on the other hand, is defined as 'the aggregate of the actual or potential resources which are linked to the possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition' (Bourdieu, 1984, p. 248). In other words, the totality of actual and potential resources individuals can mobilize through membership in organizations and social networks. Later, other researchers (e.g. Burt, 1982; Coleman, 1988) have focused on the economic benefits accruing from social capital. For example, Putnam (1993) found that regions where social capital was poor also tended to be less successful economically.

Cultural Capital and Growth

More recently, research by Throsby (1999), Simmie and Lever (2002) and Robinson (2002) has linked economic growth with cultural capital. Cultural industries generate cultural capital, and the significance of cultural capital lies not only in the role that it plays within the cultural field but also in that it can be turned into goods and services, thus linking the economic and social fields (Bourdieu, 1977). As shown by recent research in economic geography and urban planning, such conversion can have regenerative effects on cities throughout the world. And research on New York's regeneration has shown how cultural industries and the intangible aspects of culture can be converted into commercial economic value, serving both local and global needs for the city (Kearns and Philo, 1995; Zukin, 1995).

Cultural industries cover intangible industries such as film production, fashion, media, video games, architecture, modern dance, art museums; their intangible value and the importance of social networks have many similarities to the nature of knowledge-based assets and exchange (Grant, 1996; Spender, 1996). Cultural industries are making a substantial contribution and are considered crucial to the regeneration and continuing success of global cities.

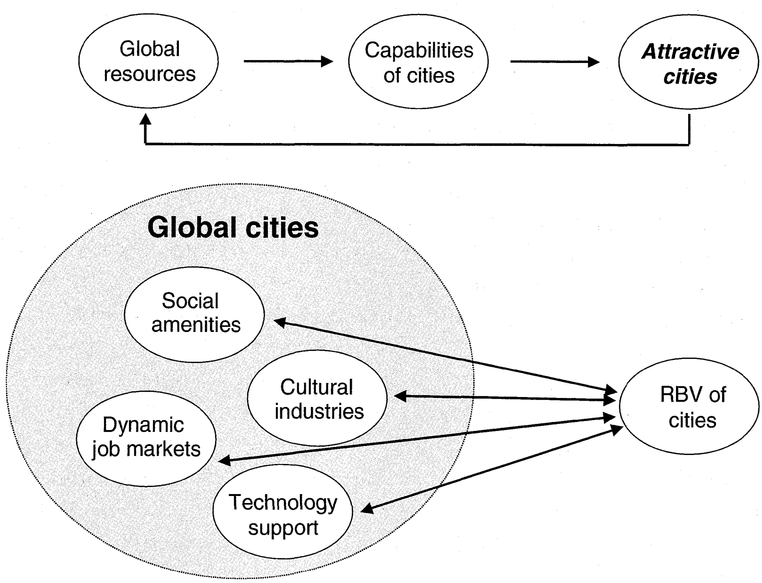
Cities, RBV and Management Research

Two global trends are currently directing the potential role of a RBV of cities in terms of future management research. First, cities worldwide discover that their global success depends on non-imitable, non-substitutable competencies and resources, something very much a core element of the RBV of cities. For example, where cities are concerned, intangible assets are often called cultural capital (Bourdieu, 1977; 1984; 1990; Throsby, 1999), which includes cultural heritage and artefacts. In turn, these can be converted into commercial products and services (Robbins, 1991). Such conversion has been shown to have regenerative effects on cities throughout the world. Recent examples include the music industry in Stockholm, Sweden; the film industry in Vancouver, Canada; and the media and architecture industry in Sheffield, United Kingdom (Power, 2002; Tams, 2002). The conversion of intangible assets

(Grant, 1996) to more commercial products can be viewed as analogous to the RBV of the firm and its strategies for products and services.

The second global trend concerns the existence of well-developed cultural capital, and thriving cultural industries, which help to attract global human capital, especially talented knowledge professionals. Research on this development has been undertaken by urban and regional planning researchers such as Florida (2002); Storper (1997); Scott (1999, 2000). Talented knowledge professionals are valuable for the success of any firm and city. Florida (2002) has created a Bohemian index to show that cities in the world that have well-developed cultural industries and large numbers of creative people in such industries can in turn attract the world's major multinational enterprises. Works such as Wright *et al.* (2001) have shown the connection between the RBV of cities and approaches based on strategic human resource management. Urban and regional planning researchers such as Storper (1997), Florida (2002;) and Scott (2000) further illustrate the problematically imitable

Figure 3.2 Global cities and their resources and capabilities



needs of talented knowledge professionals, such as the need for on-location high-quality amenities and the existence of cultural industries and cultural capital (Bourdieu, 1977; 1984; Throsby, 1999). These are all seen as crucial factors in the location decisions of global firms. Figure 3.2 depicts a successful global city's resources and competences, in the spirit of the RBV.

Chapter 4
Knowledge and Households
Value Creation through Consumption

This chapter seeks to draw a parallel between organizations and households in the areas of knowledge and value creation. We introduce comparisons between firms and households because factors such as the nature of competition, collaboration, community and sharing within households provide examples of effective knowledge and value creation and exchange carried out within an 'organization'-structured social unit. Our objective is to underpin the view that understanding of organizations can be improved by drawing out the analogy with households, where knowledge and value are created informally and holistically. Not just production can create value in the organization: value creation is also evident in the consumption decisions as they are made in households.

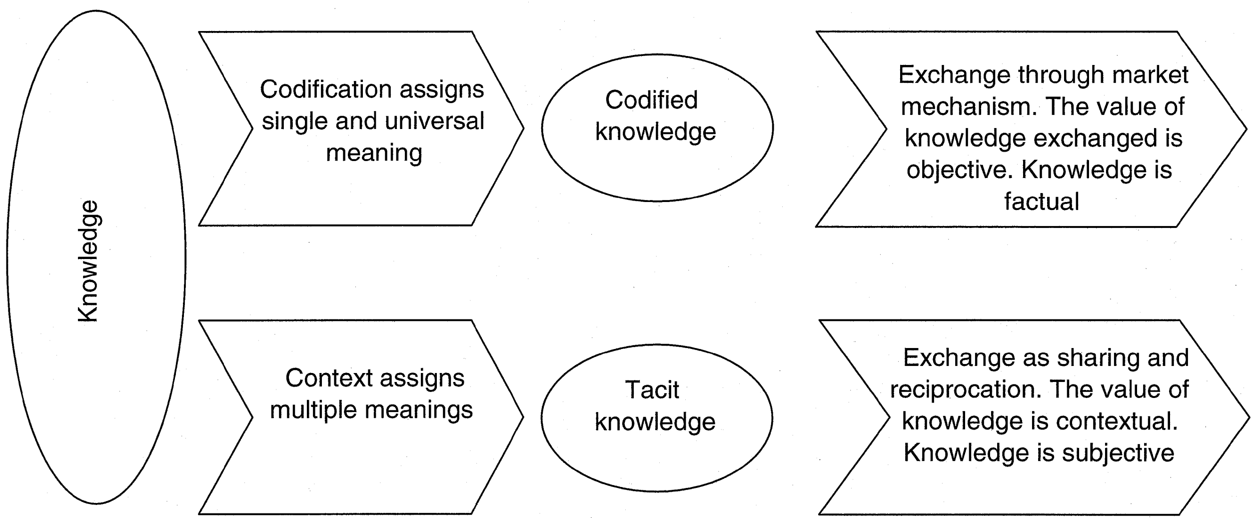
We will create a conceptual framework by linking research done in social anthropology, consumption theories and archaeology with the fields of knowledge and value creation in households (Graham, 2002; Jackson, 2002; McRobbie, 2002). We also further develop the original work of Douglas and Isherwood (1979), and more recent works such as Hassard and Kelemen (2002), Wood (2002) and Calas and Smircich (2001) on the importance of analysing simultaneously the consumption and production of knowledge.

In the 21st century, a substantial body of literature in management research (Calas and Smircich, 2001; Grant, 1996) has focused on the idea of knowledge as a crucial resource for value creation in firms, regions and countries. We believe that, especially in the context of value creation, management research has not always paid enough attention to the contributions other disciplines have made to knowledge research. Social anthropology, archaeology, media studies and human geography researchers have emphasized the importance of analysing simultaneously the consumption and production aspects of knowledge, often using the term 'entanglements' (Jackson, 2002) to show the interweaving and inseparability of products that hold value to societies (Strathern, 1999; 2001). Classic research by Douglas and Isherwood (1979) in social anthropology illustrates the importance of connecting the consumption and production aspects of knowledge to both households and society. By analysing not only organizations such as firms but also the organization of households and their respective roles with respect to knowledge, recent research on organizations and knowledge has shifted the discussion to the importance of knowledge exchange.

This chapter will cover, therefore, a number of areas. The first is to underpin the proposition that drawing out the analogies with households, where value and knowledge creation takes place informally and holistically, can improve the understanding of organizations. We will examine research in a number of disciplines, such as social anthropology, archaeology, consumer and media studies, and create a conceptual framework linking these research outputs to research on organizations. An analysis of the relationship between knowledge and value will be conducted in order to understand the relationship between informal value creation and inalienability. The comprehension of holistic value creation requires one to look at household production and consumption simultaneously, as households are a prominent example of a unit in which social behaviour facilitates effective knowledge and value creation (Kogut and Zander, 1996).

To understand the nature of knowledge as an asset for value creation, there is a need to discuss the issue of knowledge inalienability. Karl Marx developed arguments on the importance of viewing labour services as 'inalienable', of having a value that goes beyond a clear price mechanism (Loveridge, 1998). We apply the inalienability concept specifically to the measurement and valuation of knowledge. Our premise is that the inalienability of knowledge is at the root of the introduction of a more informal mechanism of knowledge exchange and exchange co-ordination. Such a mechanism can be analysed by borrowing from the social-anthropological and archaeological literature (Durkheim, 1951; Sahlins, 1972; Simmel,

Figure 4.1 Spheres of knowledge exchange



1978), which examines the nature of exchange in primitive pre-modern social systems. These social systems developed effective exchange mechanisms without formal systems of law or contracts (Bourdieu, 1977; Mauss, 1954; Sahlins, 1972). The exchange of assets such as tacit knowledge requires, in terms of analysis, analogous frameworks, whereby it is our contention that tacit knowledge, which usually can only be measured over time and repeated interactions, may be more effectively exchanged through socially embedded relations.

Figure 4.1 above illustrates the differences between tacit and explicit knowledge in exchange.

The issue of knowledge inalienability raises North's (1990) important point of exchange measurement and enforcement costs that transaction cost theory has taken as exogenous (Hirsch and Lounsbury, 1996). The importance of inalienability in understanding the nature of knowledge as an asset cannot be overemphasized. The premise in this chapter is that knowledge inalienability warrants the introduction of a more informal mechanism of knowledge exchange and exchange co-ordination. We believe that the social anthropological literature (Sahlins, 1972; Simmel, 1978), which studies the nature of exchange in primitive pre-modern social systems, can provide such a mechanism. As indicated above, these social systems developed very effective exchange mechanisms without having to resort to formal systems of law or contracts (Bourdieu, 1977; Casson, 1996; Mauss, 1954; Sahlins, 1972).

Knowledge and Value

Research in leading organization theory journals has highlighted the importance of seeing firms as only one type of organization. The study of households may provide frameworks, which are complementary to the existing research on knowledge in firms. Since existing research has tended to focus on firms, the majority of research on knowledge-based competition has tended to rely primarily on transaction cost analysis, rather than the salient features of the nature of knowledge as an intangible resource and the difficulties posed by knowledge intangibility. The fact that the market is not able to transmit knowledge easily and effectively has been analysed in numerous works such as Kogut and Zander (1992; 1996) and

Inkpen and Beamish (1997). The alternative effective mechanisms have now also been sufficiently analysed, for instance, the importance of strategic alliances and joint ventures in sharing knowledge (Inkpen and Beamish, 1997), but with insufficient detail on how knowledge is actually exchanged. The intangibility of knowledge raises the fundamental question of the effectiveness of knowledge exchange via the market mechanism and raises the question of what possible alternatives exist for market based exchange and knowledge sharing in strategic alliances and joint ventures.

The importance of social interactions in the creation and dissemination of knowledge has been identified in the literature (Choi and Lee, 1997; Grant, 1996; Kogut and Zander, 1996; Nonaka, 1991; 1994) and demonstrates the inherent linkage between knowledge, society and markets. For example, Nonaka argues that firms are efficient in creating and disseminating new knowledge when there are dynamic interactions that make specific knowledge available to others in the firm – the spiral of knowledge. Kogut and Zander (1992; 1996) conceptualize the firm as a moral community that embodies normative shared identities that increase the speed and efficiency of knowledge creation, co-ordination and communication. However, the community may be too broad a social setting to include an economic organizational aspect and institutional considerations. We suggest that when studying the firm, researchers should limit the scope of the analogy with the community taking account of the fact that firms do not manifestly incorporate the variety of institutional factors that communities do.

If we take it that effective knowledge exchange is socially facilitated (Kogut and Zander, 1996), we should then examine which types of social organization are conducive to knowledge exchange. Kogut and Zander (1996) drew a parallel between knowledge exchange in firms and moral communities. As researchers continue to develop the knowledge theory of the firm, we believe that comparisons to modern households provide a new and alternative approach that is more susceptible to concrete analysis than the idea of communities of Kogut and Zander (1996). Related research on households and knowledge artefacts has traditionally been carried out within the area of technology-based social constructionism (Loveridge, 1998), as well as in social anthropological studies of knowledge, heritage and artefacts (Strathern, 1999; 2001).

Hence, if effective knowledge exchange is indeed socially facilitated, there is a need to examine the types of social organizations that are conducive to such knowledge exchange. This chapter attempts to develop the expanding research on knowledge management into firms and households. The nature of competition, collaboration, community and sharing within households provides an example of an organization that carries out effective knowledge creation and sharing.

Firms and Households

Research on households has been carried out in a substantive manner in a number of technology-based social construction studies. This research is linked to the earlier ideas of Schumpeter (1934) who argues that the 'family, not the physical person is the true unit of class and class theory'. But research on households has not been embraced by neoclassical economists or strategic management researchers, because households have been seen as being informal and unpaid, thus making them difficult to measure and quantify in terms of economic values (Douglas and Isherwood, 1979; Kolm, 1984). Households are often seen to rely much on informal networks of knowledge and informal norms of reciprocity in exchange (Kolm, 1984; Levi-Strauss, 1969). However, exactly this type of informal exchange and informal networks of knowledge are considered as crucial for knowledge within the context of firms and strategic management (Kogut and Zander, 1996). This could justify an analysis and comparison of how knowledge is created, exchanged and disseminated within households, and how households as organizations can provide hints on the nature of knowledge within the so highly researched unit of analysis, the firm.

Often members of households are biologically related and dwell under the same roof, in which case they are closer to the notion of a family. Although traditionally a household is defined in terms of kinship or a family, nowadays a household can be more broadly defined as a social unit. As Barrett and McIntosh (1982) state, there is a strong ideology that supports family life and demotes life in other social units, such as children's homes, old people's homes and student residences. We call these social units co-operative or surrogate households. Douglas and Isherwood (1979) have shown that within households there is economic exchange and division of labour. Different members specialize in different activities and, like firms, households perform an economic function in society by pooling resources, utilizing technologies and working together following rules of social and economic exchange (Bourdieu, 1977; Douglas and Isherwood, 1979). Delphy and Leonard (1992) argued that the economic relations within a household may not be meritocratic because money and resources allocated to members are not directly proportional to the work done. They argue that, unlike employers who purchase labour by the time worked or output produced, households allocate financial resources to members based on positions rather than work input; for example, sons inherit more than daughters. Economic relations within households rarely involve formal contracts, which imply that informal methods of resources distribution and negotiation are rife. These informal methods flourish on household members being taught the norms of behaviour and the non-market criteria that regulate internal household transactions (Morgan, 1996; Morris, 1990). In other words, 'we are taught norms about our sharing obligations, that is, with whom we ought to pool income that is legally defined as owned by an individual' (Wallerstein and Smith, 1992, p. 295).

Thus, the successful operation of households involves a complex array of competitive and co-operative arrangements. Apart from economic exchanges, households are also engaged in many inalienable exchanges. For example, Parsons (1951) argues that families perform two basic roles. First, they achieve the 'socialisation of children', whereby children internalize the shared norms and values that constitute the society culture. Second, they are 'factories of human personalities' by providing members with the security, support and emotional stability they need. Other researchers have envisaged the family in terms of a nexus of interactions, where members play a strategic game by allying with each other in different combinations and playing one or more members off against each other. Moreover, members have strong reciprocal concern and pay attention to what other members do, think or feel. They internalize the family (Douglas and Isherwood, 1979).

The non-market economic and inalienable exchanges within households resemble tacit knowledge exchanges in firms, which are non-market in nature and involve the identity of the exchange parties, as discussed in previous chapters. Social anthropologists and archaeologists have shown the close connection between the study of households and the study of primitive societies (Sahlins, 1972; Simmel, 1978; Strathern, 2001). Firms are seen to be efficient knowledge handlers because they are moral communities (Kogut and Zander, 1996). Earlier, we have already proposed the analogy of the household as a community. The evolution of the firm and community analogy is observable further through the different economic eras and shows the necessary shift towards households. It may also raise the question of whether we need a new analogy for the future.

Firms, Organization Structure and Households

Through the years, economic organization has evolved to match the socio-economic evolution from the pre-industrial era to the machine era, just after the industrial revolution, and on to the information era, and lately the knowledge era. The concept of networks has become a crucial area of management research in recent years, as potentially a distinct form of firm organization appropriate for the 21st century. The evolution of organizational forms in modern society is shown in Table 4.1.

Table 4.1 The evolution of the organization: an application to households (adapted from Miles *et al.*, 1997)

Historical era	*Machine era*	*Information era*	*Knowledge era*
Focus	Standardization	Customization	Innovation
Organization form	Hierarchy	Network	Cells and *households*
Key asset	Capital goods	Information	Knowledge
Influence driver	Chief operating officer	Chief information officer	Chief knowledge officer
Key capability	Specialization and segmentation	Flexibility and responsiveness	Design creativity, holistic creativity: firms versus *households*

Miles *et al.* (1997) refer to the machine era as the era of standardization, the information era as the era of customization and the knowledge era as the era of continuous innovation creation. Through the eras, knowledge has been a production factor of increasing importance. In the machine and information era, it was principally codified knowledge that was utilized and exchanged – although codification is a form of knowledge creation and involves tacit exchanges as well. Both codified and tacit knowledge were present in all eras, but the emphasis was very different for each of them. For instance, in many periods of the machine era, a significant amount of non-codified knowledge was passed on through craft apprenticeship, whilst a substantial amount of tacit marketing knowledge was embodied in conventions about who were the 'appropriate' customers. During the process of industrialization, the focus of attention was on codifying knowledge.

It is in the knowledge era, with its requirement for continuous innovation, that knowledge, principally in the form of tacit knowledge, has become the most precious organizational resource and value creator (Kogut and Zander, 1992). In the standardization era the firm was a hierarchy and can be seen as parallel to a kinship household – where members work under the central authority and co-ordination of the head of the household. The firm differs from the kinship household in that firm members enter the firm by contract and are contractually bound together, whereas kinship members are born into the kinship (Douglas and Isherwood, 1979; Sahlins, 1972). But firms and households are similar in that, whether members join firms voluntarily or are born into them, they find themselves engaged in exchange with others over whom they have no say. This is shows in Table 4.2

Table 4.2 Households as organizational forms for value and knowledge creation

		Contracts between members of organizations	
		Yes	*No*
New member has direct choice of particular partners	*Yes*	Co-operative household	Multiple virtual households
	No	Surrogate household	Kinship household

As analysed in Miles *et al.* (1997), the era of customization brought about downsizing, re-engineering and concentration of resources on core activities. Initially, companies began to outsource to upstream and downstream partners who completed the value-chain and this is a parallel to a surrogate household (Table 4.2). In surrogate households, members are brought in and accepted in a household, for example, in the case of an adopted child, and that entry is sanctioned by an overriding authority, like the adoption service. The ultimate organizational form of the customization era was the network organization. In this era, companies began to realize that success

> *demanded a higher level of know-how and resource utilisation than existing internal management processes allowed [and they]...turned to network structures in which empowered teams managed not only their internal work processes, but also external relationships with...partners. In many networks...it became difficult to determine where one organisation ended and another began.*
>
> Miles *et al.*, 1997, p. 10

The network organization is a parallel to a co-operative household (Table 4.2), where members choose their exchange partners before entering the household – for example, the case of individuals sharing a house together and where there is personal intention and agreement to join it. In co-operative households, members are bound together by direct (though often not written) contracts and new members have a direct choice of whether to join the other partners or not. In surrogate households, members are bound together by indirect contracts – for example, in the case of the adopted child, where there is an indirect contract between parents and child through the adoption agency and new members do not have a direct choice of whether to join a particular household.

The 21st century will be the knowledge era characterized by continuous innovation, complexification, unpredictability and inalienability of inputs and outputs (Miles *et al.*, 1997). We posit that households will become important and that the organizational form of the knowledge era will be the virtual household (Table 4.2); an era in which firms will be made up of multiple virtual household units. Virtual households self-organize, when members come together voluntarily without formal contractual obligations towards other members. Virtual households have some similarities to communes but communes are a very restrictive analogy to the virtual household. Communes are defined as experimental household groups, which practise an ideology of sharing (McCulloch, 1992). The difference between communes and virtual households is that the former are bound together by ideology whereas the latter are bound together by consensus and a drive for mutual benefit through innovation. Another difference is that virtual households typically have a shorter life cycle than communes, because they dissolve as soon as their creative potential and momentum runs out.

The formation of self-organizing and emergent virtual households is facilitated by the advent of the internet. Currently, virtual households are limited in their capacity to function like proper households because the internet nodes are fixed in space. They are also limited in their ability to measure the knower because there is no face-to-face interaction between members and hence there is no adequate tacit knowledge communication and exchange. However, with the advent of mobile internet technology and high bandwidth, this barrier will be broken as people increasingly will be in a position to meet in virtual households such as coffee shops or internet cafes. In such environments, they will be able to exchange tacit knowledge via face-to-face interaction, and at the same time have access to a huge amount of explicit knowledge via the internet. Recent research (Guo, 2003) on internet usage in 12 Chinese cities observed that internet cafés in small Chinese cities such as Nanhai, Yima, Guangshui, Yimo and Fengnan became 'public schools', where many residents had their first contact with a computer, or learnt to type and surf the internet. This development could have important socio-economic implications for the future. Guo notes that the arrival of the internet allows Chinese people to access information, communicate and conduct economic transactions in a new way and while the internet is still relatively new to China, it is already changing Chinese cultural, social and political institutions.

We believe that the experiences of households in the way they manage informal and holistic value creation will become important in understanding the way organizations and firms evolve.

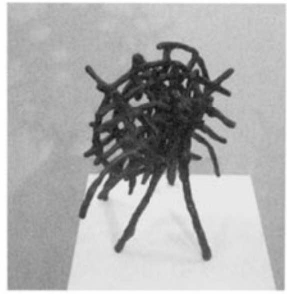
The focus of this chapter was to gain an insight from a micro perspective into the nature of knowledge as an asset for value creation. The firm is only one type of organization in society where knowledge plays a crucial role in creating value. This chapter analysed the household as an alternative example of an organization where knowledge plays an equally vital role. Households are a prominent example of a unit in which social behaviour facilitates effective knowledge and value creation (Kogut and Zander, 1996) and where knowledge production, transfer and consumption take place.

Chapter 5 will consider knowledge exchange and its ethical implications.

Chapter 5

Knowledge and Exchange

An Ethical Consideration



Our interest in devoting a chapter to knowledge exchange and the ethical issues that come to the fore stems from the fact that a growing body of literature in business ethics considers the concept of exchange as central in understanding business ethics.

In order to develop a framework for analysing exchange in knowledge-based service industries, we need to first draw attention to the differences between the nature of markets and market-based exchange and the nature of non-market-based exchange. The key distinction is that tangible, physical assets such as equipment or capital have a 'valuation' and price determined in the market (Houston, 1986). This valuation serves as a universal, transparent mechanism to facilitate the exchange of such physical assets. In the extreme, under market exchange of commodities, assets being exchanged in the market are defined, quantified and valued at a particular price. In contrast, however, it is difficult to determine a valuation for tacit, informal assets in knowledge-based services such as consulting, investment banking and legal services as the value can be context or situation specific, or specific to particular organizations or actors (Choi and Lee, 1997; Spender, 1996).

Moreover, in the abstract system of anonymous exchange and competition used in many economics models there is no need to identify the other actor or actors within market-based exchange. The assumption is that the content or value of the product is tangible, thus there is no uncertainty. Transaction costs can be ignored or taken as standard and hence the value and tangible quality of the product being exchanged will determine the nature of the relationship. In this sense, there is no social aspect to the relationship. Services with tangible outcomes are already one step away from purely anonymous exchange, as they are often person or organization bound and the issue of measurement and standardization of outcome plays a role (Millar, 2004).

The expanding research on networks and other social capital-driven organizations (Burt, 1992a) has tried to analyse broader aspects of exchange (Kohli and Jaworski, 1990). A shortcoming of the analysis in these earlier works is that they have tended to distinguish between market exchange and social exchange as two extremes only (Burt, 1992a; Slater and Narver, 1994; Webster, 1992). We believe that there is a need for a richer, more formal and inclusive typology of exchange mechanisms to illustrate the range between market and social exchange, which exists in most societies (Polanyi, 1957). We will provide such typology in Table 5.1 at the end of this chapter.

Meanwhile, a substantial body of literature in knowledge management argues that exchange of tacit knowledge (Polanyi, 1957) is conceptually and practically different from exchange of explicit information. As noted by Spender (1996), an organization's competitive advantage may increasingly be based on variables that are hard to identify and most difficult to measure, such as knowledge. And specifically, it will be based on the ability to view the results of a proposed transfer (of knowledge) as it affects the other firm or actor in the exchange, rather than the product or service that 'contains' the knowledge. Assessment of this nature has impact on the value of the firm.

For business ethics and general management research, a number of issues have become increasingly prominent in the 21st century. They include issues of shareholders and stakeholders and the strength of particular types of capitalism (Klein, 2003), including global capitalism. This focus is partly due to the various corporate scandals involving corporations such as Enron, Worldcom and Parmalat, as well as professional service firms such as Andersen. Such firms are seen as part of the more profit-oriented and 'winner-take-all' shareholder business system. In such a winner-take-all situation, individuals or actors in an industry such as professional services, fashion, or sports, or cultural industries such as film and music, dominate their industry and receive disproportionate benefits relative to other actors (Choi and Baden-Fuller, 1995; Frank and Cook, 1995). Globalization has helped to accelerate this process to many other industries and we will discuss this further in Chapter 7.

These observations all imply that the nature of knowledge exchange varies among different exchange systems and consequently raises different ethical issues. The purpose of this chapter is to demonstrate how the concept of exchange can help illuminate many of the ethical issues in knowledge exchange – the nature of which has hitherto received little research attention.

Knowledge exchange has become an increasingly important factor in the competitive success of businesses. For example, Itami and Roehl (1987) have noted that 'invisible' assets, such as accumulated consumer information, brand name, reputation, management skills or corporate culture can be just as important to the success of the firm as visible, tangible assets. These invisible assets are key to a firm's success because they are frequently difficult to obtain and in some sense, difficult for competitors to imitate. The invisibility of such assets, in turn, raises the problem of exchange of with potential collaborators (Choi and Lee, 1997).

With the increased use of electronic networks such as the internet that facilitate information exchange, knowledge exchange has become an increasingly important item on the agenda for businesses. This has raised a number of ethical issues related to the use of information, such as the right to privacy and rights over intellectual property exchanged over the internet. A recent and much publicized example is the legal dispute over Napster, the website that allows users to exchange music files over the internet (Langenderfer and Cook, 2001; Radcliffe, 2001).

Further expansion of IT and the internet is one of the reasons it is likely that ethical issues surrounding knowledge exchange will increase over the coming years. Despite the widespread concerns over these issues, unlike other types of assets in the firm such as plant and machinery, there has been less research on knowledge assets and there has been less theoretical development concerning the ethical issues that are raised in knowledge exchange. In this chapter we will address that gap and propose a preliminary framework of thought for understanding the ethical issues in such knowledge exchange situations.

Exchange as a Basis for Conceptualizing Business Ethics

Our framework for conceptualising business ethics is rooted in the concept of exchange (Bourdieu, 1977; Durkheim, 1951; Levi-Strauss, 1969; Mauss, 1954; Sahlins, 1972; Simmel, 1978). As a concept, exchange is both broader in scope and of a higher level of abstraction than the firm. Economists typically consider exchange in the context of transfer of money for a product or service or self-gain. Psychologists and a number of sociologists consider exchange in the context of the relationship between two actors, while anthropologists and sociologists have considered the different functions of exchange within a specific group or organization. While the use of such a broad concept risks the inability to draw specific conclusions, considering such issues from the perspective of exchange enables a more abstract theorizing and identification of issues, which may not otherwise be obvious. In this decision we are supported by Iyer (2001), who states that the concept of exchange provides a sound basis for analysing many of the issues that arise in international business ethics.

It has long been recognized by researchers in a number of disciplines that different systems for exchange exist internationally. In the field of comparative marketing (Boddewyn and Grosse, 1995; Farmer and Richman, 1964; Luck, 1969), researchers have identified different forms of exchange in markets worldwide. In the studies of international trade, scholars have long recognized that the market is only one form of trade structuring (Polanyi, 1944; 1957). As has been demonstrated by numerous studies, these differences in exchange systems often result in particular ethical issues when firms attempt to trade internationally (Asgary and Mitschow, 2002; Singhapakdi, 1999). Even simple transactions, such as the export of a firm's goods, may involve multiple smaller exchanges of money, information and goods and numerous social actors such as distributors, freight companies, etc. Given the multiple exchanges and parties involved, some conflict is inevitable. For example, in many parts of East Asia, such as China and Japan, an informal system of personal network ties and private norms of exchange operates in parallel with the formal market system (Carr and Landa, 1983; Lovett *et al.*, 1999). As has been demonstrated in many studies (e.g. McNeil and Pedigo, 2001), conflicts may arise when firms used to the Western market system of exchange fail to take account of such informal networks in trading with East Asian firms.

Knowledge-based Exchange

We suggest that similar clashes of exchange systems may arise in undertaking knowledge-based exchange. When viewed from the perspective of exchange, much of the above research on comparative exchange systems has close parallels with research in the knowledge management literature. In contrast with more traditional economic models of perfect competition, research by behavioural scholars such as Polanyi (1957), White (1970), Burt (1992), Coleman (1990) and Granovetter (1985) has shown that once analysis moves away from the abstract economic models of perfect information and frictionless exchange, it is more realistic to incorporate the complexities of imperfect competition and exchange based on social structures, personal contacts and relationships. Such social capital, structure and relational effects are especially true in knowledge-based industries (Spender, 1996; Walker *et al.*, 1997). In addition, the nature of knowledge assets imparts certain characteristics to knowledge-based exchange that needs consideration in any analysis of business ethics.

In order to develop our frameworks for analysing the exchange of knowledge as an asset, we need to briefly discuss the nature of markets and market-based exchange. In line with Durkheim (1974), we begin by distinguishing two different concepts of value – 'economic value' in which social interaction is negligible and 'ideal value', which is created by strong social interaction (Sorenson, 2002). The former applies most strongly in the trading of commodities. Under market exchange of commodities, assets being exchanged are focalized, quantified and valued at a particular price (Gell, 1982). This price, being determined in the market, serves as a universal, transparent mechanism to facilitate the exchange of such physical assets. In contrast, it is difficult to determine a valuation for tacit, informal assets such as knowledge, and therefore the value can be context or situation specific, or specific to particular organizations or actors (Choi and Lee, 1997; Spender, 1996). Such a context requires a consideration of the 'ideal value'. This has a number of implications for the types of exchange that can occur with knowledge assets.

Inalienability

The first implication is that although knowledge assets can be published and traded independently from the originator, other types of knowledge are difficult to abstract from the source. For example, some works of art may be difficult to appreciate without some knowledge of the artist. Similarly, the implications of an industrial innovation may be difficult to understand without some knowledge of the innovating firm. We suggest that some of the implications can be drawn by examining the social anthropological literature which has studied the nature of exchange in primitive, pre-modern, social systems (Casson, 1996). These systems develop effective exchange mechanisms without formal systems of law or contracts. However, the difference between the exchange of commodities, and the exchange of 'inalienable' assets (Gregory, 1982) has also been studied in depth. Alienability refers to tangible assets and products, which are fundamental to market-based exchange. Such commodities can be easily valued and valuated in certain monetary prices, and their values can be quantified. In contrast, inalienability refers to assets whose value may be more difficult to measure without reference to the owner, giver or seller. For example, in the case of gifts, the value can be traced to the identity of the actor giving the gift (Bourdieu, 1977; 1990; Gregory, 1982). Exchanges based on gifts are seen to create status, and have symbolic, relative rankings for the exchange partners (Mauss, 1955; Sahlins, 1972; Simmel, 1978). The value of such gifts is thus more difficult to measure in terms of market price and may be more dependent on qualitative rather than quantitative measures (Douglas and Isherwood, 1979; Polanyi, 1944; 1957; Sahlins, 1972; Simmel, 1978).

Trust

Another implication concerns a greater need for trust. The significance of this proposition rests on the fact that it may not be easy to ascertain the quality and value of knowledge as a resource or asset at the time of exchange, and possibly even after the exchange. As analysed by North (1990) and by Hirsch and Lounsbury (1996), knowledge exchange in the market generally entails high measurement costs. Moreover, owing to the tacit nature of much knowledge (Polanyi, 1957), even where knowledge transfer has taken place, there may be uncertainty that it has been correctly absorbed or internalized in what Lippman and Rumelt (1982) term 'uncertain imitability'. Thus, the ability to identify the other firm or 'actor' in the exchange becomes more crucial than the identification of the knowledge asset. Consequently, there is a great need to rely on trusted external intermediaries, on signals in the market and on social institutions (Elster and Moene, 1989; Williamson, 1975).

Reciprocity and Non-monetary Exchange

A third obvious but nevertheless important point is that exchanges by definition require both the acts of giving and taking. Whereas the act of giving involves the disposal of some asset without necessarily receiving and the act of receiving involves the acquisition of some asset without necessarily giving, an exchange relationship requires both acts. The exchange may not necessarily involve money. As shown in primitive and pre-modern societies that do not utilize money, other forms of exchange such as barter can be used (Bourdieu, 1977; 1990; Gregory, 1982; Levi-Strauss, 1969; Malinowski, 1961; Mauss, 1955; Sahlins, 1972). Such non-monetary exchanges are also commonly seen in modern societies and have been analysed in various works such as Choi (1994), Schlicht (1993) and Kranton (1996).

Research in social anthropology has shown that even in societies where monetary exchange exists, there is a tendency to distinguish different 'spheres' of exchange. For instance, certain tangible items, such as foodstuffs and raw materials, are exchanged for money, but more intangible items, such as special types of cloth would only be given as gifts without the exchange of money (Gregory, 1982; Neale, 1976). We believe this is crucial in understanding the exchange of knowledge. As discussed earlier, it is difficult for knowledge assets to have a market valuation, or monetary value. Therefore, non-monetary exchanges must also be considered. Since there is often little formal agreement or agreed standard for such exchanges, ethical issues are likely to arise.

Ethical Issues in Knowledge Exchange

In this chapter we focused on examining the general perspective of knowledge exchange to enable us to better understand the underlying sources of the many ethical issues that arise in knowledge exchange. We will now demonstrate this by examining three different types of knowledge exchange.

Knowledge Exchange in R&D Joint Ventures

Although knowledge exchange occurs in many joint ventures, the most obvious example of knowledge exchange occurs in R&D joint ventures. As collaborating firms are often also competitors, firms in such joint ventures face the common 'Prisoner's Dilemma' of deciding whether to collaborate or compete for knowledge in such alliances (Larsson *et al.*, 1998). On the one hand, as demonstrated by Larsson *et al.*, purely competitive learning behaviour can be detrimental to both parties. On the other hand, as Hamel argued in his study of international strategic alliances (Hamel, 1991), some US firms who are trying to behave as 'good' partners by being transparent in their sharing of knowledge risk being exploited by Japanese firms who are less transparent in their knowledge sharing. As has been discussed thoroughly in ethics literature, ethical issues arise in such situations when the gains from opportunism outweigh the gains from acting for the common good.

Underlying many of these ethical dilemmas are differing views about 'procedural justice' (Greenberg, 1987; Kim and Mauborgne, 1991). The view of what is deemed fair in such relationships and the perception by one or other party that the exchange is unfair are some of the most common reasons for the failure of such alliances. For example, as reported by Doz (1996), a key factor in the breakdown of the alliance between pharmaceutical companies Alza and Ciba Geigy was the perception by Alza that the latter was unwilling to fully share information as per the joint venture agreement.

Although opportunistic behaviour by one or other party in such joint venture failures cannot be ruled out, we suggest that another possible cause could be a clash of different systems for social exchange. For example, in US–Japanese joint ventures a clear difference exists in the systems of exchange between the US and Japan. As in many other Asian societies, many of the social exchanges in Japanese societies are non-economic in nature, employment relationships tend to last longer and many business activities rely on a set of unwritten social rules. Therefore, knowledge tends to be less 'alienable' from the group. In contrast, the dominance of US economic exchanges is one where employment relationships are shorter and most business activities are extensively documented.

Bases for Intellectual Property Rights

The second example of ethical issues arising from a clash of exchange systems concerns differing approaches to intellectual property rights in East Asia, continental Europe and the Anglo-Saxon countries (i.e. the UK and other Commonwealth countries and the US). In the Anglo-Saxon legal system intellectual property rights are primarily economic rights granted by the sovereign to facilitate commerce and trade. In exchange for granting rights to copy or otherwise exploit intellectual property, authors receive monetary compensation in the form of royalties. The guiding force behind copyright laws is the prevention of unfair competition rather than safeguarding authors' rights, and unless an author retains moral rights through a legal contract 'asserting moral rights', the assignment or licensing of the work terminates his or her involvement with it (Machlup and Penrose, 1950).

In contrast, a different set of ethical codes guides the intellectual property rights system in the rest of Europe. Although other European countries at one time had similar systems for intellectual property protection to the English one, this has changed following the Republican revolution in France in the late 18th century. Fuelled by the Rights of Man movement, which swept through Europe, these countries rejected the assertion of royal prerogative and asserted instead the rights of citizens to enjoy the fruits of their creative labour. The 'droits d'auteur' and 'brevets d'invention' grounded in 'natural rights' replaced what is called copyright and patent in English-speaking countries. Under this European system, authors and artists have two types of rights: economic rights and moral rights. Economic rights allow the creator to assign or license to others the right to use the work. These are the principal means by which an author reaps profit from the work, as is the case in the Anglo-Saxon system. However, these operate in parallel with moral rights, which grant the author continuing control over the work despite the assignment of economic rights. Thus, in continental Europe intellectual products are seen as being inalienable from their creator despite any economic exchange.

As might be expected, a number of ethical dilemmas can result when the Anglo-Saxon system of exchange based on alienable products clashes with the system of exchange in continental Europe in which intellectual products are inalienable. One notable example is the dispute over the rights to the film *The Asphalt Jungle* by the late John Huston. Legal representatives of Huston's estate were able to prevent the distribution of a colour version in France on the grounds of moral rights but were unable to do the same in the US where the legal system favoured the distributors. In another celebrated case, Shostakovich and other Russian composers were able to bring an injunction in the French courts against the distribution of a film, which made use of their music and was critical of the Soviet Union, but were unable to do likewise in the US courts.

A further contrast can be drawn with the intellectual rights systems prevalent in Asia and the Middle East. Despite recent attempts to enforce a Western legal approach to intellectual property in these countries, copying of other authors' work is still widely accepted (Wingrove, 1995), unlike in Europe and the US. Some commentators have attributed this to Confucian and Islamic culture, which places an emphasis on learning and quoting classical texts (Husted, 2002). Although such an explanation seems attractive, the links are rather tenuous and do not permit detailed analysis of the systems that link culture and widespread piracy in these countries. At a micro level, the system of social exchange in these countries enables us to provide a more nuanced explanation for such behaviour and also provides a more general theory for differences in other countries, such as the US and European countries. For example, this perspective places Asian countries on one end of the spectrum where social ties and social exchanges are seen as more important. In the Anglo-Saxon countries, where economic exchange dominates, they are placed at the other end of the spectrum with continental European countries somewhere between these two extremes. This placement allows us to understand the relative importance of various ethical issues that are likely to arise when individuals and firms from different countries attempt to exchange knowledge.

Plagiarism in Academic Research

The final example of ethical issues regarding knowledge exchange within a community concerns the publication of academic research. Given the 'publish or perish' culture in many universities, the temptation to plagiarize the work of others in order to raise one's publications count could be high. It is not surprising that one of the most common ethical violations cited by academic researchers is plagiarism (Kock, 1999; Von Glinow and Novelli, 1982). Examples include outright copying of work that has been done by someone else to taking ideas from a paper one has been asked to review. While it is easy to condemn such practices, in some instances the offence may also mask differing systems of exchange. It is useful to consider why plagiarism is regarded with outcry by most academics when the presumed role of academic publishing is to disseminate knowledge. In the system of exchange subscribed to by most academic researchers, academic publications do not count so much for their monetary value (with some exceptions such as where schools reward authors directly for each publication) but rather for the 'social capital' (Bourdieu, 1977) that they bring. Good publications enhance the standing and reputation of the researcher among his or her peers, and count towards their School's reputation and, given the effort required by authors to publish in a top journal, it is understandable why plagiarism is so widely condemned. On the other hand, although there are undoubtedly cases of wanton theft of ideas, other cases of plagiarism reflect differing views about the nature of knowledge exchange within the community. In one case known to one of the authors, an unnamed offender incorporated ideas from another researcher in his own paper without attributing the source. He justified his actions on the grounds that the idea had been made freely available in public discussions and he had added significant value to the initial idea. The offender's actions thus did not stem so much from a lack of morals or a conscious decision to steal ideas, but from differences in the valuation of the initial idea and in the alienability of the idea from the source.

Despite this justification, some in academic circles might still not find these actions acceptable. However, it should be noted that this form of practice is common in commercial circles, where firms often copy ideas from competitors that have not been patented or otherwise protected legally. To the extent that the idea can be abstracted from the original source, an idea is also regarded as being 'alienable' and so is a 'tradable' commodity. In the commercial sphere, the currency in the system of exchange is not 'social capital' but 'financial capital'. Therefore, unless there is proof of a monetary loss there is no offence.

Although the illustrated examples concern quite different types of knowledge situations and are examined from the perspective of exchange, they all reveal certain common ethical issues such as alienability, trust and justice. This observation allows us to have a clearer understanding of the underlying causes of ethical problems.

This chapter has considered knowledge exchange and its ethical implications. In today's globalized world, an organization's ability to properly exchange or share knowledge within a network of social and technological relationships is often crucial to success.

The theory of exchange expounded on a 'dual sphere' approach that combines market and institutional factors in the exchange and valuation of knowledge. This dual sphere approach takes into account the tangible and intangible elements of knowledge as a resource. Three different types of knowledge situation have been examined from the perspective of exchange and they all reveal common ethical issues such as alienability, trust and justice.

We summarize the chapter's discussion in Table 5.1 below.

Table 5.1 Knowledge, exchange and ethics

	Market	*Reciprocity*	*Gift*
Transparency	Between parties only (subject to legal disclosure obligations)	Between parties only, but spontaneous disclosure required by 'good faith'	(Potential) visibility to a wider group is needed if gift is to have full significance
Integrity	Main rationale is to build reputation – pragmatic motives	Stronger pragmatic motives in order to sustain relationship and validate intangibles exchanged	Lack of integrity devalues the gift (i.e. undermines the intended social effect)
Contractual legality	Legal obligations are almost co-extensive with ethical ones	Legal obligations provide a framework upon which ethics can build	Legal obligations undermine the significance of the gift

Chapter 6
Knowledge and Measurement
Reciprocity and Commensuration

An organization's ability to create and exchange knowledge within a network of social and technological relationships has become crucial in today's international business world. The ability to measure and value such knowledge assets has become important because of the role they have as fundamental drivers of global success. This is especially true in the service industries, which are increasingly knowledge-based (Coe, 2003b; Herbert *et al.*, 2003).

While Greenfield (2002; 2003) has noted the interdependence of goods and services, researchers have not yet paid much attention to the interdependence of knowledge and services. This chapter analyses this interdependence of services and knowledge in the services industries – with an application to cultural industries. It does so using a framework rooted in the concept of reciprocity which was developed to analyse and understand the sociology of knowledge (Bourdieu, 1977; Mauss, 1955; Simmel, 1978).

A reciprocity-based (Bourdieu, 1990; Mauss, 1955; Sahlins, 1972) framework helps to lay the foundations for an approach to measurement in service industries where knowledge assets have become increasingly important. Furthermore, in the light of global capitalism, we will examine the link between classical value measurement and commensuration (Espeland and Stevens, 1998), which is defined as comparing different entities using a common metric or measurement. Our application again is to cultural industries where winner-take-all effects are especially prevalent. We believe that global corporate capitalism should be evaluated using explicit criteria of commensuration, including taking account of capitalism's capacity for reciprocity and redistribution of a system's wealth. In this context we need to re-examine the characteristics of exchange in modern and primitive societies as they provide an insight into knowledge creation and/or measurement.

Most of the vast body of past research on knowledge-based competition and knowledge management has tended to focus primarily on transactions, thereby neglecting the salient features of knowledge as a resource and the difficulties of measuring or valuing it. As discussed in earlier chapters, the intangible nature of knowledge calls for a shift in focus away from tangible products and the specific nature of their market exchange to a framework which overcomes the problems of value and measurement for intangible resources.

Research by behaviourally oriented scholars such as Polanyi (1957) and Burt (1992) has shown that once analysis moves away from the abstract economic models of perfect information and frictionless exchange, it is dominated by the complexities of imperfect competition and exchange based on social structures, personal contacts and relationships. Such social capital, structure and relational effects are especially important in knowledge-based service industries (Spender, 1996). The significance is that it is very difficult to ascertain the quality and value of knowledge-based services such as consulting, investment banking and legal services (Berry *et al.*, 1985; Darby and Karni, 1973) at the point where they are the subject of exchange transactions. While recent research has improved understanding of knowledge creation, it has done so without providing frameworks for understanding the nature of exchange in such intangible assets as knowledge (Deshpande *et al.*, 1993; Itami and Roehl, 1987) – an issue we have addressed briefly in the previous chapter.

Recent works in international business have analysed the similarities and differences among various business systems and types of capitalism and the implications of these for business ethics in the new global environment. They include studies which focus on capitalism in general, the nature of plural societies, globalization and the need for corporations to behave ethically (Gonzalez, 2003; Klein, 2003; Sethi, 2003; Stevenson, 2002; Stormer, 2003). Also, research on marketing and company strategy in a more stakeholder-driven business environment is increasing (Dawkins and Lewis, 2003; Maio, 2003; Zwetsloot, 2003). What is lacking in these works, however, is an analysis of the role of consumption, which we have addressed in Chapter 4 in a different context, and that of escalating consumerism, all in the context of global corporate capitalism. A further relevant strand of research is that of stakeholder values and systems (Freeman, 1984).

Past research on the nature of stakeholder-led business environments and corporate social responsibility includes a review by Jones (1995), who analysed the three models which have dominated research in this field. These are the model of corporate social performance (Schaniel and Neale, 2000; Wood, 1991) focusing on the internal aspects of the firm; second, the model of social control of business (Jones, 1995; Ramstad, 2001), focusing on the external environment of the firm and, finally, the pure business stakeholder model (Donaldson and Preston, 1995; Freeman, 1984; Polonsky, 1995) focusing on the various actors that constrain and influence a firm's behaviour and performance. These models endeavour to address the ongoing academic debate between the neoclassical assertion that any attention to social performance 'is a breach of [investors'] trust that inevitably reduces the welfare of shareholders' (Preston, 1994, p. 2) and the more behaviourally based view of firm performance that is founded on notions like co-operation and trust between business and society. This claims that business legitimacy is derived from favourable social impact, and that social and financial performances tend to be positively correlated in the long term (Freeman, 1984).

Within social sciences and management research there is indeed growing appreciation for the role of stakeholder relations (Polonsky, 1995; Ramstad, 2001; Stormer, 2003; Wood, 1991), but the diversity of stakeholder interests erects significant obstacles in measurement and assessment of performance. Thus, the ability to measure or 'commensurate', or to compare different entities (Espeland and Stevens, 1998) simply in monetary terms has been seen as a key strength of the shareholder value system. For stakeholder systems, however, there is a lacuna in the social science and management literature regarding the interconnected issues of measurement, stakeholder values and consumerism – something which we are now addressing.

The above discussion then draws out the significance of this chapter's contribution. First, the intangibility of knowledge-based services, such as cultural services, consulting, investment banking and legal services, raises North's (1990) important point on measurement and enforcement costs, which Williamson (1975) had taken as exogenously given (Hirsch and Lounsbury, 1996). It is imperative, therefore, to understand the nature of knowledge as an asset and in this respect to revisit the importance of intangibility and inalienability. Knowledge-based service assets tend to be inalienable, whereas commodity-type non-service assets, which can be freely exchanged in the market, are alienable. Such alienability allows for the transparent measurement of value in the commodity-type resource or asset.

Second, although research views the accumulation of knowledge as positive and generating an asset, the process of exchange whereby knowledge is acquired is not sufficiently analysed. If knowledge is partly tacit and informal, how can it have a transparent market valuation? The intangibility and inalienability of knowledge add aspects which are not captured in the contemporary theory of market exchange (Jaworski and Kohli, 1993; Kohli and Jaworski 1990; Kotler, 1972). There is, therefore, a need for categories from a system of exchange and co-ordination that can cope with such problems – without the extensive and often ineffective legal formalization that besets attempts to deal with them in the shareholder system. We suggest that one can learn from the social anthropological literature (Sahlins, 1972; Simmel, 1978), in which the nature of reciprocity in primitive, pre-modern social systems has been studied. These systems develop effective reciprocal exchange mechanisms without formal systems of law or contracts (Bourdieu, 1990; Mauss, 1955; Sahlins, 1972). Anthropologists also studied in depth the differences between exchange of commodities and the exchange of inalienable assets. These studies provide a more holistic picture of exchange and point to multiple paths that can be employed (Houston, 1986; Kaldor, 1971). The exchange and measurement of tacit, informal assets such as knowledge (Polanyi, 1957) requires an analogous framework of analysis.

This is particularly relevant as we examine the debate within globalization and global corporate capitalism about shareholder- versus stakeholder-driven business systems, and wish to integrate the issues of escalating consumerism and winner-take-all effects (Frank and Cook, 1995) in Chapter 7. We believe that this needs to recognize the concepts of measurement by commensuration, and a key question is whether tangible market measurement should be the dominant criterion for assessing the success of business systems under globalization. Hence, we will also study more intangible criteria, such as reciprocity (Polanyi, 1957) and redistribution (Bowles *et al.*, 2001; Kolm, 1994) and devise conceptual typologies comparing exchange, reciprocity and redistribution. In turn, these typologies will contribute to the understanding of knowledge and to further research on global corporate capitalism, global consumerism, ethics and measurement.

Knowledge-based Services and Market Exchange

If knowledge is now so much more important as an asset and is difficult to exchange through markets (Cronin and Taylor, 1992; John *et al.*, 1998; Polanyi, 1957; Spender, 1996), is the model of pure functioning markets the ideal representation of knowledge transactions in the knowledge-based service industries?

What facilitates market-based exchange? Money, and the price or valuation by the market, seems crucial and the impression can be created that these are stable and unambiguous parameters. However, money itself has different functions in different societies as past research in sociology and anthropology has demonstrated. The existence of multipurpose money plays an important role in helping to determine and create markets because it allows a valuation of assets, goods and services in the market place. But, as mentioned earlier, intangible assets such as in knowledge-based services resist consistent valuation (Darby and Karni, 1973; Deshpande *et al.*, 1993). This is, in large measure, because their value may be specific to organizations and/or actors, or even be situation or context specific.

Value cannot therefore be directly linked to money. And this is also the case for assets that may have a symbolic economic value (Bourdieu, 1977; 1990; Douglas and Isherwood, 1979). In fact, research in social anthropology has shown that in various societies where money exists there has been a tendency to categorize different 'spheres' of exchange. Certain tangible items, such as foodstuffs and raw materials, are exchanged for money but more intangible items, such as a special cloth, would only be given as gifts without the exchange of money (Sahlins, 1972; Simmel, 1978). Although such differing spheres of exchange can be seen as merely reflecting a random difference or arbitrary choice between market exchange and social embeddedness, we propose that it is characteristic of certain intangible assets (or goods with strong intangible value) for their exchange to be reliant on spheres other than the sphere of exchange for tangible assets, such as plant, equipment and capital. Such different spheres of exchange also exist in exchanges within families or households (Bourdieu, 1990; Douglas and Isherwood, 1979). We believe this is crucial in understanding the exchange of knowledge-based services.

Trust and Reciprocity

Recent research in management and social sciences has shown the increasing importance of trust in all systems, including the value of trust and social institutions in market-driven societies. Throughout the systems, trust becomes essential when the assets being exchanged are intangible or the nature of exchange presents difficulties in arriving at a market valuation or price. Related to this, Polanyi (1957) and other social scientists such as Kolm (1984) have suggested the importance of reciprocity in society, defined as, 'the giving and receiving according to need' (Polanyi, 1957, p. 210). As these earlier works by Polanyi (1957) and Kolm (1984) do not further describe the types of institution that could potentially work in such a reciprocity-based system we will analyse this for knowledge-based services.

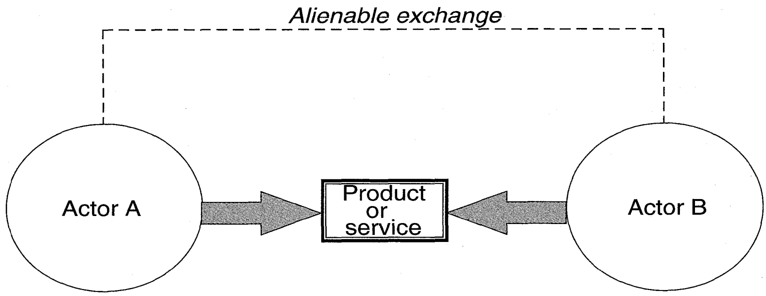
One of the characteristics of pre-modern societies is that exchange is informal and social. Pre-modern societies, notwithstanding their lack of formal legal frameworks, create institutions for undertaking trust-based exchange (Loken and John, 1993; Morgan and Hunt, 1994) of intangible assets. As the literature agrees that intangibility is a key component of knowledge as an asset (Spender, 1996), the characteristic nature of exchanging knowledge-based service assets may well reflect the characteristic nature of exchanging intangible assets in these pre-modern societies (Bourdieu, 1977; Mauss, 1955).

Invisible Assets and Invisible Value

The expanding literature on knowledge-based service industries (Caruana *et al.*, 2003; Kelliher and Riley, 2003) has raised the importance of invisible assets in the success of organizations. As analysed by Jacobson (1992), dynamic frameworks of competition, such as those advocated by the Austrian school of inter-firm competition, place a greater emphasis on intangible, invisible assets and the role of unobservable factors. This has implications for measurement. Itami and Roehl (1987) note that traditional research tends to define assets too narrowly, focusing on the tangible assets, such as plant and equipment. They argue, on the other hand, that invisible assets such as accumulated consumer information, brand name, reputation, management skills and corporate culture are just as important to the success of the firm. The intangibility of such assets in turn raises the problem of exchange with potential collaborators (Choi and Lee, 1997). This has similarities to the concept of causal ambiguity in a firm's strategy, something which makes it difficult for competitors to overcome or imitate because of the ambiguous nature of the competitive advantage (Cronin and Taylor, 1992; Deshpande *et al.*, 1993). Knowledge-based services have many characteristics similar to those of such intangible assets.

In the abstract anonymous market-based exchange and competition system used in many economics models, there is no need to identify the other actor or actors. The assumption is that the content or value of the product or service is tangible, thus there is no uncertainty. Transaction costs can be ignored or taken as standard and hence the value and tangible quality of the product or service being exchanged will determine the parameters of the transaction and hence of the relationship. In this sense, there is no social aspect to the relationship. However, the expanding research on networks and other social capital-driven organizations (Burt, 1992) has tried to analyse broader aspects of exchange (Kohli and Jaworski, 1990). As noted earlier, a shortcoming of the analysis in these earlier works, however, is that they have tended to distinguish only between market exchange and social exchange as two extremes (Burt, 1992; Slater and Narver, 1994; Webster, 1992). We felt that there is a need for a richer, more formal and inclusive typology of exchange mechanisms to illustrate the range between market and social exchange, which exists in most societies (Polanyi, 1957). Figure 6.1 below shows a classical case of market exchange of commodities, or non-service industries.

Figure 6.1 Exchange of 'alienable' assets: no measurement costs

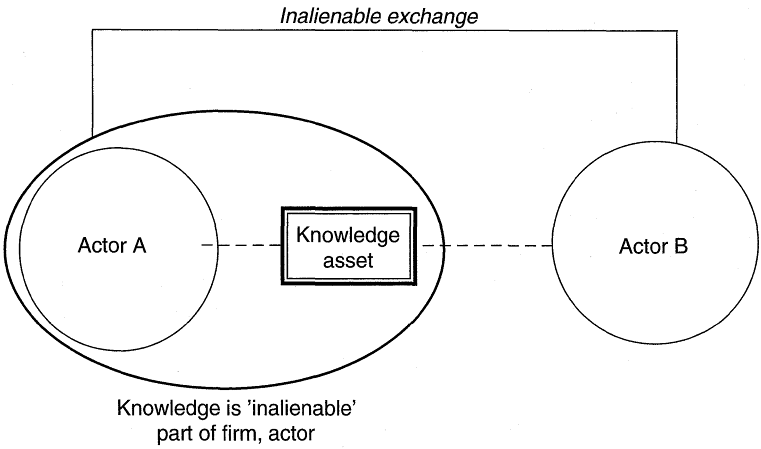


As analysed by North (1990) and Hirsch and Lounsbury (1996), information costs, such as measurement costs, add to the fundamental problems of interaction and exchange in the market. Such measurement costs are especially high for knowledge-based industries, where content and value are highly intangible. It is also noted that the identity of the firms and of the consumers engaged in exchange becomes relatively more important as the value of what is being exchanged becomes more uncertain.

The limitation of such pioneering works by North (1990) and others is their inability to make the link with inalienability. Moran and Ghoshal (1996) discuss the three conditions which must be satisfied for exchange to take place in terms of a combination of: the opportunity, value expectancy and motivation. However, they do not analyse the different structures of exchange. Nor do they distinguish between alienable assets such as commodities and inalienable assets such as knowledge.

In exchanging inalienable assets, a consumer can be driven by the identity of the source – in addition to the quality and value of the product or service being provided. Thus, the crucial aspect of a firm's competitive assets and advantage may shift away from the product or service itself to the importance of its overall firm identity or reputation in the market. In the extreme case, the product or service can actually become identified with the firm and with the firm's quality or status leading to an increased role for trust and long-term relationships within the market. In the case of inalienable assets such as gifts, the identity of the actor giving the gift can similarly determine its value (Bourdieu, 1977). This is shown in Figure 6.2 below where firms and consumers are categorized as actors.

Figure 6.2 Exchange of inalienable assets: high measurement costs



We argue that such identification in the market is relative and leads to a form of status (Bourdieu, 1977) and status ranking within the industry. This is similar in thought to the concept of 'gifts' in social anthropology. Exchanges based on gifts are seen to create status and symbolic, relative rankings for the exchange partners (Mauss, 1954; Sahlins, 1972; Simmel, 1978). Such a mechanism is also seen to be effective in exchanging products and services with intangible value.

Measurement and Exchange

In a sense, transactions involving inalienable assets such as knowledge can be seen as similar to barter-based exchange, which almost always encompasses a social or psychological component (Bourdieu, 1977). Unlike commodity-based exchange, which involves money and is done through the anonymous market, barter type exchange involves known exchange partners who may well diverge from market valuation and price. Traditionally, barter-type exchange has been thought to exist only in primitive or pre-modern societies or later in trade and exchange with partners with non-convertible currencies. However, research on topics such as counter-trade (Choi and Lee, 1997; Marin and Schnitzer, 1995) and linked trade have shown that there are a number of different types of non-standard exchange, which can exist even in modern economies such as Western Europe or North America. This means that non-standard types of exchange, like barter trade, provide additional facilities to the participants, and ones which may not be available when measurement is purely in terms of market valuation and market price. We postulate that this may be due to their ability to facilitate the accommodation of inalienable assets in the exchange.

By including barter-type transactions as an alternative or third category, we can now distinguish three categories of exchange: reciprocity, as in barter; redistribution, as in gifts; and market exchange, as in commodities. This is shown in Table 6.1 below.

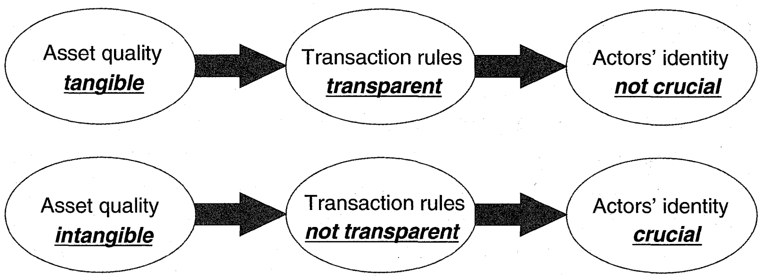
Table 6.1 Reciprocity, redistribution, market exchange

Types of exchange	*Major characteristics*
Reciprocity	Under barter-type reciprocal exchange, the identity of the exchange partners is known, with the market valuation or price less important than the social, psychological aspects
Redistribution	Under gift exchange, inalienable assets are exchanged, often between actors of different status, leading to a certain redistribution of assets
Market exchange	Under commodity exchange, exchange is through money of alienable objects, products, services between free actors, agents, who may enact further exchange anonymously

Under alienable exchange the identity of the actors is not important. This is because the asset being exchanged is tangible, and the quality and market value are transparent. In addition, the rules and procedures of exchange, such as search costs, time of exchange or frequency are already determined or can be determined again, making the identity of the actors irrelevant to the transaction. Quality and visibility are important here. In contrast, when the asset being exchanged is inalienable, the asset does not have a clear, transparent market value, because the quality itself is intangible even though one might be dealing with a physically embodied object. Valuation and identity become the salient factors.

The net result is to place a high importance on the identity of the actors. This distinction between alienable and inalienable or knowledge-based services exchange is shown in Figure 6.3 below.

Figure 6.3 Alienable versus inalienable exchange: measurement and valuation



Globalization and Global Corporate Capitalism

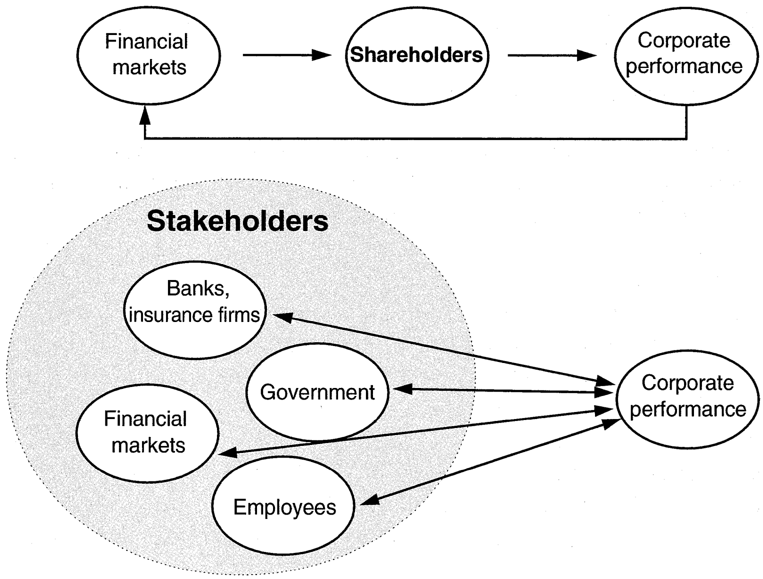
One of the key results of global corporate capitalism is the acceleration of the globalization of standards, weights and measures. In turn, the emphasis on measurement is seen as a key feature of a successful capitalist system (Espeland and Stevens, 1998). However, the recent ethical issues surrounding scandals in major companies such as Enron, Worldcom, Tyco, Parmalat, as well as professional services firms such as Andersen, have shown that globalization may not necessarily be followed immediately by an appropriate code of business ethics. This is the background against which, in recent years, the debate on proper corporate governance and the differences between the Anglo-Saxon shareholder and stock market-driven system versus the more communitarian (Etzioni, 1996) and social market-driven system of continental Europe has resurfaced. The latter, communitarian system is closer to the stakeholder system of capitalism. The following section will expand on relevant differences between these types of capitalism.

Capitalism: Shareholders and Stakeholders

According to Preston and Post (1975), there is a primary area of organizational involvement with society – transactional behaviour, which arises directly from (the firm's) specialized functional role. There also is a secondary area of organizational involvement with society, which includes impacts and effects that are not intrinsic to the character of the organization but generated by its primary involvement activities (Preston and Post, 1975, pp. 10–11). Firms are responsible for outcomes arising from both the primary and secondary category of involvement with society – the notion of public and social responsibility. Firms need to meet this set of criteria with an emphasis on reciprocity and redistribution.

As suggested by Wood (1991), complications arise when the field of involvement is expanded further into society, where 'the reciprocal influences of business and society are so wide-ranging that companies may indeed be able to justify social involvements that seem far afield from their primary and secondary involvements' (p. 698). It is evident that action in the primary and secondary fields of involvement with society can have ripple effects on multiple fields of involvement. In the primary field of involvement there is a direct connection between cause and effect. However, in the area of secondary involvement cause and effect relationships are less salient and much more difficult to discern. Similarly, as one moves further into multiple, ripple-effect fields of a firm's involvement with society, causality links between action and consequences become blurred, complex and entangled with a variety of social factors. Consequently, they become resistant to analysis. Secondary and multiple effects are not under the control of the firm because the processes of their occurrence involve streams of disparate outsiders, not necessarily directly related to the firm's primary activities. A variety of interests comes into play and these can be affected by indirect, complex and frequently unexpected consequences of a firm's action. This leads us to conclude that in the primary but predominantly in the secondary and multiple fields of a firm's involvement with society actions inadvertently link a broad and relatively disparate group of stakeholders due to indirect and complex interactions.

Figure 6.4 Shareholder versus stakeholder business systems



This broad area of a firm's involvement with society and the multiplicity of its stakeholders are depicted in grey in Figure 6.4, which compares the general shareholder versus stakeholder models:

This ties in with two important notions. First, we distinguish the concept of corporate social responsibility (Frederick and Weber, 1987; Gonzalez, 2003; Klein, 2003), which articulates a view that society expects and rewards proper business behaviour. It also ties in with the functional theory and the principle of legitimacy (Preston and Post, 1975), namely that firms play an institutional role in society and that they are rewarded with legitimacy when their conduct is in harmony with the rest of society's institutions. Society's institutions in turn have both economic and social roles in the system. Furthermore, we notice the complexity of the phenomenon of the interaction between stakeholder and firm and its effect on business viability in the global business environment (Dawkins and Lewis, 2003; Maio, 2003; Zwetsloot, 2003). The double-headed arrows in Figure 6.4 depict the complex social ties and interactions which link firms with corporate social responsibility, but at the same time reward legitimacy and can positively affect corporate performance (Sethi, 2003; Stormer, 2003).

Measurement and Stakeholders

There has been significant interest in the notion of stakeholders, primarily since Freeman's (1984) seminal book *Strategic Management: A Stakeholder Approach*. This includes recent publications by Stormer (2003), Sethi (2003), Klein (2003) and Jones (1995), which either elaborate on different aspects of stakeholder theory or combine it with corporate governance, ethics or agency theory. The diversity of stakeholder-firm interests and interactions has resulted in a large amount of literature elaborating more pragmatic definitions of what a stakeholder is and the development of tools for managing stakeholder relationships for the benefit of firm performance (Dawkins and Lewis, 2003; Maio, 2003; Polonsky, 1995; Zwetsloot, 2003). In parallel, other writers have explored the nature of the relationship between social and corporate performance (Gonzalez, 2003; Klein, 2003).

Although the literature generally agrees and takes for granted that stakeholders are capable of measuring a firm's performance and accordingly are able to adjust their attitudes and actions, in reality it is not at all clear how stakeholders discern and value tangible, but more importantly, intangible and invisible assets. In other words, much of the existing research too has refrained from analysing the issue of performance measurement, confident that this is transparent to stakeholders and has a transparent market price. Thus, what is fundamental in our analysis is the introduction of a role for measurement costs (North, 1990), which inadvertently arise from measurement problems, which in turn stem from the diversity of stakeholder interests and the intangibility of firm's value to them. This requires us to abandon measurement in absolute terms, such as monetary value, in favour of commensuration, a term of which Espeland and Stevens give the following definition: 'Commensuration is the comparison of different entities or qualities according to a common metric...into the form of rankings, ratios, prices' (Espeland and Stevens, 1998).

Since the key strength of the shareholder value system is in the area of measurement, the important question remains whether reliance on such commensuration is a fundamental weakness of the stakeholder system. Globalization, on the other hand, by often standardizing measures (Sethi, 2003) has accelerated traditional direct measurement and standards throughout the world.

In stakeholder systems, the greatest measurement difficulties arise in knowledge-based industries due to the inherent intangibility of product and service quality, as well as the greater uncertainties caused by technological change and globalization in those industries (Giddens, 1999; Millar *et al.*, 2005; Sethi, 2003; Spender, 1997). This leads to the breakdown of traditional industry boundaries and an acceleration of the rate of change and innovation, resulting in an unpredictable, volatile and complex environment. On the consumption side, such intangibility can increase the level of social contagion and global consumerism towards particular actors and brands.

Commensuration and Reciprocity

Commensuration provides standards and proxies for transforming qualities into quantities (Espeland and Stevens, 1998). We posit that, despite the proclaimed allegiance of many firms to market economy standards and traditional focus on value in terms purely of multipurpose money, globalization and global corporate capitalism will, in fact, accelerate modern society's use of commensuration, which has already, in the past, helped in decision-making (Stokey and Zeckhauser, 1978), as well as in overcoming people's cognitive confusion (Thaler, 1983; Tversky and Kahneman, 1974; 1981). The linking of commensuration to rationality and the reduction of risk has been analysed for thousands of years, going as far back as discussions by Plato (Nussbaum, 1984).

Earlier we cited the example which social anthropological researchers described as the concept of gifts and used it in contrast with commodities. Gifts are inalienable and thus exchanged socially, commodities are alienable and thus exchanged in the market (Bourdieu, 1977; 1990; Douglas and Isherwood, 1979). However, as far back as Polanyi (1957), analyses have pointed out that most societies have elements of both alienability and inalienability. We infer

Table 6.2 Market exchange versus barter/reciprocity

Market exchange	*Barter/reciprocity*
Exchange value	Use value
Quantitative measurement	Qualitative measurement
Commensurate, standards	Incommensurate, intangible

that measurement and commensuration may well be counterproductive in assessing symbolic value and the importance of inalienability.

In Table 6.2 above we show the contrast between the quantitative and tangible aspects of market exchange and the more qualitative with intangible aspects of barter and reciprocity.

Money is often seen as the primary institution that commensurates qualities into quantities. Simmel (1907 [1978]) points out that the defining characteristic of modern times is that of 'weighing and calculating' (pp. 443–4), which transforms many types of value into single, homogeneous money values. More recently, in response to the acceleration of commensuration in today's global business environment, Zelizer has applied such ideas to the many multipurpose and social uses of money, and to the importance of having categories of priceless goods or services (Zelizer, 1985 [1994]). This further confirms the importance of symbolic value in business and society addressed earlier by Bourdieu (1977; 1990) and Douglas and Isherwood (1979).

A barter or reciprocity type of social exchange may be much more in keeping with the concept of commensuration, whereas market exchange is closer to traditional issues of direct measurement, standardization and weightings. The systems such as barter and social exchange, which are often seen as elements of pre-modern business systems, may actually have hidden strengths of reciprocity (Bowles *et al.*, 2001) that are needed particularly in today's globalizing business environment.

Global Corporate Capitalism and Cultural Industries

Traditionally, sports and the arts were seen as diametrically opposed in terms of consumption patterns and quality judgements. Athletes and the sports industry, for example, were seen as industries where individual contributions can be clearly observed and the quality of a performance measured, thereby helping to match the quality with a price in the market (Rosen and Sanderson, 2001; Rottenberg, 1956; Szymanski, 2000). In contrast, artists and the quality of art are often seen as difficult to measure in terms of value and price, without the role of expert opinions (Bonus and Ronte, 1997; Frey and Pommerehne, 1989; Millar and Choi, 2003; Schneider and Pommerehne, 1983). It would seem that the industries of sports and the arts are diametrically opposed in terms of measurement, value and quality of product (Seaman, 2003; Urrutiaguer, 2002).

Global corporate capitalism and global consumerism have shaped these and many other industries into a mould which manifests strong 'winner-take-all' effects (Choi and Baden-Fuller, 1995; Frank and Cook, 1995). There has always been a parallel between sports and the arts through the labour market – that is the market for talent ('superstars') has similarities in sports and the arts. Researchers in labour economics have illustrated the importance of the superstar effect whereby a minority within an industry can receive disproportionately high incomes, whereas the majority earns substantially less (Adler, 1985; Rosen, 1981). However, many distinctions too can be defined between art and sports. In terms of a broad definition of culture, art is seen as the highbrow or high end of culture and sports as the mass consumption or low end of culture (Abbing, 2002; Bonus and Ronte, 1997; Seaman, 2003). Many aspects of the arts industry have traditionally been seen as close to non-profit institutions (Albert, 1998; De Vany and Walls, 1999; Heilbrun and Gray, 2001; Throsby, 1994), along with the difficulties faced by artists in sustaining a minimum level of income in their profession. The sports industry, on the other hand, with national and global associations such as the National Basketball Association or the International Football Federation FIFA, has been seen as more professional and more profit-oriented (Caves, 2000; Frey, 2000; Goff and Tollison, 1990; Klamer, 1996).

As indicated above, researchers in diverse disciplines increasingly point to the convergence of culture in what is being called 'late capitalism' of the 21st century (Fry, 1998; Negus, 2002; Nelson *et al.*, 2001; Soar, 2002). In this chapter, we show that the convergence of culture across global markets in general helps to clarify the similarities between the industries of sports and the arts. In turn, the key driver of this convergence is global advertising and global consumerism, and the supportive effects of the rapid development of the worldwide web. There are ethical issues which result, centred on the fact that this convergence will further accelerate and increase the superstar effect in industries (Adler, 1985; Rosen, 1981), and the winner-take-all market behaviour (Chossat and Gergaud, 2003; Frank and Cook, 1995) in this global business environment.

According to Kretschmer *et al.* (1999), there are four structural characteristics which together provide a working definition for what comprises cultural industries. An industry is cultural if: there is an oversupply of potential candidates for (suppliers of) goods in the industry, the quality of goods in the industry is highly uncertain, consumers of goods in the industry form social consumption networks of a particular kind, and demand for goods in the industry follows a characteristically cyclical curve.

In the following, we argue that *formal* characteristics (each of which may be shared by other industries) indeed explain curious dynamics in certain core industries that traditional analysis frequently fails to explain.

Even if particular individuals experience winner-take-all effects (Frank and Cook, 1995) in such cultural industries, success is elusive for the majority of the actors. Only a fraction of the candidates for cultural goods are actually turned into products. It has been estimated that during the 1990s about 10 million people in the US were trying to earn a living by writing, while the actual number of full-time self-employed writers around that time was about 300 (Tebbel, 1996). Such a continuous oversupply of creative ambitions, typical for all media, visual and performing arts, is probably attributable to two reasons. On the one hand, expressive activity generates a peculiar psychological satisfaction; on the other hand, and this may be even more important, ideas are cheap and proliferate with usage. Thus, ideas seem to be exempt from the economic condition of *scarcity*, which many writers have held responsible for the shape of the Western economic and institutional regime (North, 1981).

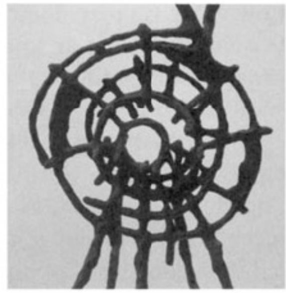
The cultural industries have always operated under conditions of causal ambiguity, not because of a particularly turbulent institutional environment but because of the nature of the goods these cultural industries produce and sell. Here the economic approach to quality uncertainty may be helpful. Nelson (1970) first distinguished between search and experience goods. The quality of search goods, such as commodities, can be ascertained before purchase; for experience goods, such as restaurants, quality can only be learnt after use. Darby and Karni (1973) introduced a third category, that of credence goods, for which quality is rarely ascertained. Examples of such goods include the worth of a transfer title on a property or the quality of care received on hospitalization for a non-specific illness. Millar and Choi (2003) distinguished a fourth category, that of social goods, the quality of which individual purchasers can never finally know, as it is society, and the community, that collectively experiences, and hence determines, the quality. Cultural goods fall under the third category. In effect, determining the quality of experience and credence goods becomes dependent on what other people think, before consumption and in many cases even after consumption – for example, if you read a good review after you have seen a movie which you disliked. Such social effects again will accelerate under globalization and global consumerism.

In terms of production in global corporate capitalism, Frank and Cook write (1995, p. 19): 'Publishers have learned that the surest way to achieve large early sales is to promote books by authors who have already written several best-sellers. Studios have learned that the surest route to a big opening weekend is to produce a sequel to a recent hit movie'. On the consumption side, herding behaviour, information cascades or bandwagons, whereby people prefer to do what other people do – particularly where the quality of goods is uncertain (Abrahamson and Rosenkopf 1993; 1997) – may explain this. On the other hand, there is a more subtle explanation from the side of the benefits derived from being able to share social experiences. We do not want to read books nobody else reads; we do not want to see movies nobody else sees. We want to define ourselves by the things we like. Here, much can be learnt from sociological literature on fashion, such as written by Simmel (1957) or Hirsch (1972). Again, such socio-psychological network effects are self-enforcing, favouring products which have already become known in some way. But unlike for technological externalities, these feedback loops typically do not escalate into monopolistic competition where markets become locked in.

This chapter focused on knowledge measurement and the issue of knowledge appropriation. An organization's ability to measure and value knowledge as an asset has become important as it is one of the fundamental drivers of global success. The challenge is especially clear in service industries, which are increasingly knowledge-based in today's business environment (Coe, 2003b; Herbert *et al.*, 2003) and in those industries that deal with trade in products that are perceived as intangibles, such as software. We focused specifically on cultural industries.

In international business research it is often assumed that resources or assets can be easily measured in terms of a market value or market price. This creates a complex problem in relation to knowledge resources, as they have intangible aspects and characteristics. This and inalienability led to the highlighting in this chapter of social context in assessing the role of knowledge resources.

Chapter 7
Knowledge and Competition
Complexity, Value and Disproportionate Competition



This chapter combines looking at complexity with a consideration of value creation in knowledge-based industries. Our main conjecture is that indices (Jervis, 1985), or external truthful signals, can be used by the market to certify and rank the value of an actor's product or services. Such path-dependent effects can lead to winner-take-all (Frank and Cook, 1995) results, where ranked actors gain a disproportionately large part of the market or value relative to unranked actors. This framework helps to illustrate the complexities of competition when our analysis integrates both markets and institutions.

The emergent behaviour of complex systems is so rich and varied that any attempt to deal with it by reductionist means, any mechanistic, linear thinking, is difficult. By contrast, complexity theory suggests that in a complex environment one should seek to identify patterns and principles, the iteration of which generates the richness of outcomes. In the same vein, Drazin and Sandelands (1992) suggest that rules which govern individual action and interaction 'constitute a deep structure that generates relationships among actors and produces macro-order' (p. 235). Therefore, in applying the principles of complexity theory to complex environments, one should develop reasoning for isolating the rules or principles which drive their dynamics.

In this conceptual chapter, we combine a discussion of traditional aspects of market competition with that of the role of social structure (Das and Teng, 2002; Granovetter, 1985; McWilliams and Siegel, 2001; Rangan, 2000) to analyse a macro order and to evaluate how value is created and measured in knowledge-based industries. We will show that an analysis of knowledge and of knowledge based industries (Spender 1996; Spender and Grant 1996) will add substantial complications to currently available complexity research.

In this chapter we seek to identify those rules, patterns and principles that drive the dynamics in the complex environment of knowledge-based industries. More precisely, we seek to discuss the fact that in knowledge-based industries the intangibility of knowledge makes the issue of the identity of exchange partners crucial (Jeffries and Reed, 2000; Meeus, *et al.* 2001; Scott and Lane, 2000; Spender and Grant, 1996). Next to intangibility, the difficulty of ascertaining the creation process and knowing its value in exchange plays a vital role.

The chapter builds on concepts such as social capital (Bourdieu and Wacquant, 1992; Carney and Gedajlovic, 2002; Granovetter, 1985), signalling and identity (Camerer, 1988; Choi and Lee, 1997; Rangan, 2000; Schelling, 1969; Spence, 1973) to support a model for analysing exchange and value creation in knowledge-based industries. The use of indices (Jervis, 1985) to identify, certify and rank products or services by the market will be a main input in this respect.

Ultimately, success in the market is directly linked to this ranking and valuation process. The dynamics of the proposed framework lead to the emergence of disproportionate value (Choi and Baden-Fuller, 1995), where ranked actors have close ties with the various indices within the social structure (Granovetter, 1985) which help to certify their value and quality, whereas unranked actors do not possess such ties and are thus disadvantaged. Eventually, such dynamics can lead to a winner-take-all (Frank and Cook, 1995) type of result, where ranked actors gain a disproportionately large part of the market relative to unranked actors. The analysis of the whole complex system in combination with market-based competition and the firm's structural relationships helps to explain the phenomenon of disproportionate success in certain industries.

This chapter is divided into the following thematic sections. First, we present the connection between complexity and organizational theories. Second, we identify the principles of firm interaction in the complex environment of knowledge-based industries. Third, we develop a complexity-based framework for analysing the emergent nature of knowledge-based industries. And, finally, we introduce the notion of disproportionate value as an application of organization science to complexity theory.

Organizations as Complex Entities

As seen from the summary of the complexity literature in Table 7.1, complex adaptive systems theory was originally developed in natural sciences and progressively expanded to social sciences. The basic notion of complexity theory is that complex adaptive systems in far-from-equilibrium conditions are poised at the edge of chaos. Under these circumstances, they are capable of very complex information storage and manipulation (Heylighen, 1996; Langton, 1989; Peterson and Meckler, 2001; Tsoukas and Hatch, 2001). The edge of chaos is a state between order and disorder, between a condition of constrained or fixed interconnections and completely loose or random ones. In that condition, complex adaptive systems are capable of tackling by self-organization the complex optimization problems generated by the endless evolution of their environments. Self-organization is not a property of the constituent elements of the system as such, but stems from 'their interrelation and organisation...the operation of building blocks acting in concert, in parallel, combining to form new blocks at a higher level' (Baker, 1995, p. 107). Complex adaptive systems possess properties such as adaptivity, flexibility, resilience, intelligence, self-renewing and learning capabilities which are attributed to their self-organizing potential (Koput, 1992; Stacey, 1996a; Thietart and Forgues, 1995; Tsoukas and Hatch, 2001).

Complexity as applied to organization studies borrows the elements of non-linearity and far-from-equilibrium conditions from the Prigogine (1980) school. Organizations must be open to information and resources from the environment. Controlled environmental and internal noise, such as new reflections and outside perspectives challenge the existing equilibrium and push towards new, emergent states. This is done by self-organization, and organizations must be able to contain it within some boundaries otherwise they run the risk of disintegration (Carney and Gedajlovic, 2002; Nonaka, 1988; Ofori-Dankwa and Julian, 2001;Peterson and Meckler, 2001).

Table 7. 1 Literature on complexity

Concept	Comments	Applications and references
	The development of chaos theory	
Discovery of chaotic dynamics	• Simple deterministic models, such as celestial mechanics, can generate highly irregular behaviour.	Poincare, cited in Gleick (1987)
Chaos theory – the qualitative study of unstable aperiodic behaviour in deterministic non-linear dynamical systems	• Interaction at constituent level governed by rules (e.g. cellular automata [Von Neumann, 1951]). • Sensitive dependence on initial conditions and long-term prediction impossible. • Bounded long-term evolution (Lorenz attractor and strange attractors). • Strange attractors are fractal objects (Mandelbrot, 1982). • Self-organized criticality (Bak and Chen, 1991).	*Natural sciences* Gleick (1987), Hall (1991), Kellert (1993), Ruelle (1991) *Economics and organization studies* Arthur (1988), Baumol and Benhabib (1989), Cheng and Van de Ven (1996), Gregersen and Sailer (1993), Priesmeyer and Baik (1989), Richards (1990), Thietart and Forgues (1995)

Table 7. 1 Literature on complexity *contd.*

Concept	Comments	Applications and references
	Open systems and dissipative structures	
Open non-equilibrium systems develop dissipative structures (self-organization), i.e. non-uniform states of structural organization varying in time or space (or both)	• Dissipative systems are non-linear non-equilibrium ordered systems sustained by dissipation of matter and energy from their surroundings. • Systems must be contained and have permeable boundaries. • Bifurcations, self-organization, path-dependency and order from fluctuations. Examples: Belusov-Zhabotinsky reaction, Benard systems, Chemical clocks.	*Thermodynamics and chemistry* Nicolis (1989), Nicolis and Prigogine (1977; 1989), Prigogine (1980), Prigogine and Stengers (1984) *Medicine* Winfree (1987) *Social Science* Smith (1986)
Autopoiesis (self-production)	• Living organisms use their contact with the environment to produce their own constituent components (self-organize).	Maturana and Varela (1980) *Social Science* Zeleny (1980)

Table 7. 1 Literature on complexity ***contd.***

Concept	Comments	Applications and references
	The science of complexity *(primarily developed at Santa Fe Institute)*	
Complex adaptive systems and the science of complexity	• The science of complexity merged evolution, chaos theory and self-organization (emergence). • Complex systems are non-linear, built on positive feedback, and are sensitive to small change. • They self-organize, learn, adapt and innovate as they co-evolve.	*Mostly natural sciences, showing potential for social science* Begun (1994), Gell-Mann (1994), Lewin (1993), Waldrop (1992)
Self-organization (spontaneous organization by itself) and selection in Boolean networks which adapt over conflict-laden co-evolving fitness landscapes	• Self-organization in Boolean networks. • Self-organization requires redundancy. • Systems at the edge of chaos (see also Langton, 1989). • Systems learn and adapt with gradual accumulation of change, and their evolution is trapped in attractors.	*Mostly natural sciences, some application to organization theory* Kauffman (1993; 1995)

Table 7. 1 Literature on complexity *contd.*

Concept	Comments	Applications and references
Simulations of complex adaptive systems – genetic algorithms	• Complex adaptive systems rely on three basic mechanisms: parallelism, competition and recombination. • Fitness landscapes at the edge of chaos which use mutation, recombination and selection to solve complex optimization problems. • Extensive computer simulations.	*Mostly natural sciences, showing potential for social science* Holland (1992a; b;1995)
Artificial life	• Computer simulations of complex adaptive systems with living properties.	Langton (1989), Langton *et al.* (1992)
	The science of complexity applied to organisation theory	
Autogenesis: self-organization in complex social organizations	• Self-organization emanating from 'deep structure' and 'elemental structure', yielding 'observed structure'.	Drazin and Sandelands (1992)
Self-organization in human organisations	• Self-organization arises from the dynamic interaction between identity, information and relationships.	Wheatley and Kellner-Rogers (1996a, b)

Table 7. 1 Literature on complexity ***contd.***

Concept	Comments	Applications and references
Emergent strategy in complex environments	• Emergent strategy: a firm 'populates its world' by positing who lives there and interpreting what they do, as well as 'fostering generative relationships' which produce new and emergent sources of value.	Lane and Maxfield (1996)
Organizations as complex adaptive systems	• Self-organization driven by the dynamic interaction between the stabilizing 'legitimate system' and the destabilizing 'shadow system' in far-from-equilibrium conditions.	Stacey (1992; 1995; 1996a; b)
Social systems can self-organize in far-from-equilibrium conditions	• Open social systems with firm but permeable boundaries, far-from-equilibrium, challenge existing equilibrium and self-organize in the form of emergent co-operative structures. • Self-fulfilling prophecies propagate redundancy.	Goldstein (1994; 1995)

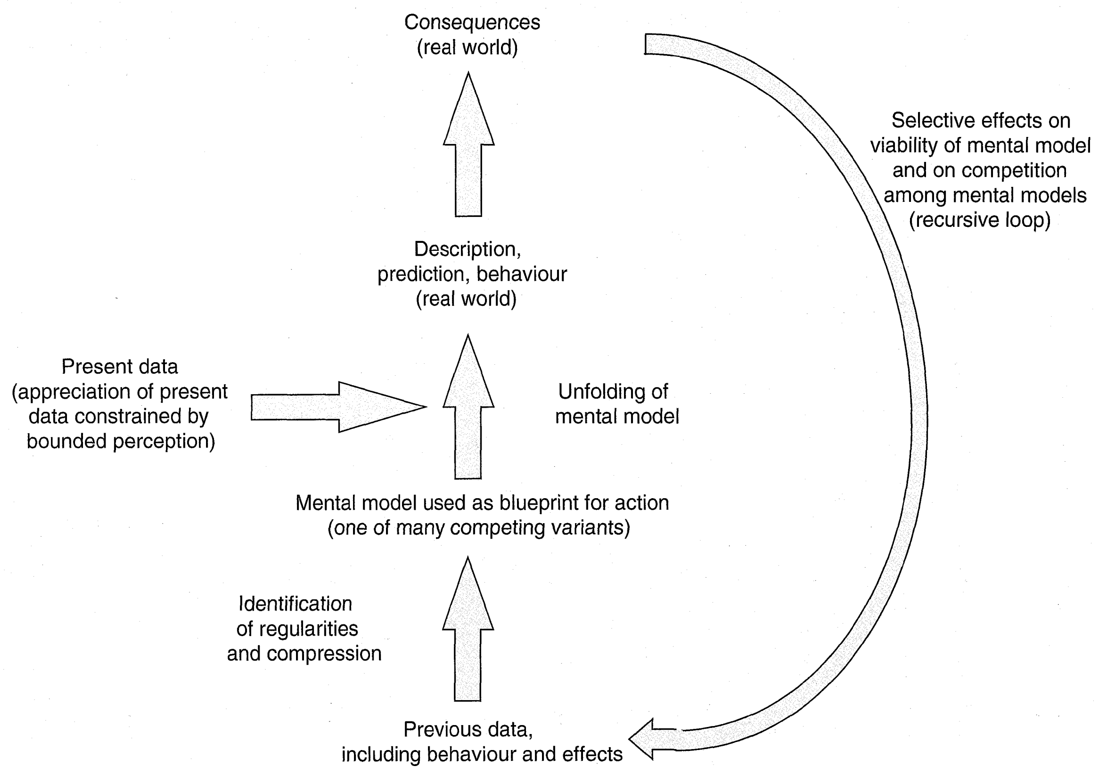
Table 7. 1 Literature on complexity ***contd.***

Concept	Comments	Applications and references
The intelligence advantage	• Complex organizations possess collective intelligence. • Intelligence arises from rules to convert data into information and knowledge, and it is a function of internal and external communication and connections as well as reliability and redundancy.	McMaster (1996)

It is a non-linear complex adaptive process which gives rise to complicated and evolving market formations where economic, social and psychological factors, as well as random events, intertwine and transfer information via multiple links (Fombrun, 1995; Weick, 1979). Complex systems exhibit non-linear, aperiodic, emergent behaviour where direct causal links disappear and long-term predictions become impossible (Johnson and Burton, 1994; Stacey, 1995). Studies have mathematically demonstrated the non-linearity of these interactions (Guastello, 1994). As a result, there can be no direct link between intention, decision and outcome. Rather, one can talk about a multiplicity of causes and co-evolving outcomes (Mintzberg and Waters, 1990; Pettigrew, 1990). Figure 7.1 suggests an open organization, which constantly fosters relationships with its environment and receives information, which continuously pushes the organization towards new equilibrium states. Present data combine with the mental model of the organization to lead to actions, the outcome of which is fed back as noise or disturbance to shake the organization from its equilibrium. Noise is distributed inside the organization and the formation of self-referential expectations (Arthur, 1988) ensures that organizational agents develop different mental models (Goldstein, 1994; 1995; Stacey, 1996c) and interpret varied things differently. Individuals formulate their behaviour according to their cognition of what their neighbours do and what the collective purpose dictates (Wheatley and Kellner-Rogers, 1996a). In other words, actions and their consequences recursively alter individual behaviours, which in turn alter the patterns of links and relationships inside and outside the organization, allowing for a new macro order to emerge.

Our framework, being an application of complexity, seeks precisely to provide a framework for facilitating the process of choice for attractors, in the context of organizational exchange partners and adding an element of predictability to the analysis of how value is created and measured in complex systems. Devlin and Rosenberg in their book Language at Work (1996) see the understanding of a phenomenon as adding up to constructing a suitable metaphor (Tsoukas and Cummings, 1997) or schema – and subsequently using that to generate a detailed but sufficiently abstract description of the phenomenon to enable it to override the limitations posed by the schema. In the same vein we have constructed a schema, which

Figure 7.1 The recursive nature of mental model formation (adapted from Gell–Mann, 1994, p. 25)



is capable of generating descriptions and meanings in the complex environment of knowledge-based industries.

Before outlining it, we will have to identify the principles of knowledge-based industries that constitute the foundations of the schema.

Value Creation in Knowledge-based Industries

In knowledge-based industries value creation is accelerated by phenomena such as increasing returns, short innovation cycles and reduced barriers to entry (Arthur, 1988; Chakravarthy, 1997; Kogut and Zander, 1992; Wade-Benzoni *et al.* 2002). We propose a framework based on complexity principles, which suggests how firms may be analysing, combining and utilizing information and knowledge from their socio-economic interactions. As in analysing any other complex system, our framework emphasizes several features which we consider paramount to the question of exchange and value creation in knowledge-based industries.

Signals, Indices and Exchange Value

As discussed earlier, contrary to anonymous exchange theories, North (1990) and Hirsch and Lounsbury (1996) suggest that measurement costs are one of the fundamental problems of exchange and that they are especially high for knowledge-based industries, which have high intangibility of content and value. Exchanges and co-operative relationships in such industries are driven more by the identities of the participating actors. Actors can also rely on external, third party intermediaries (Millar and Choi, 2003), who also may hold a similar status or position in the social structure (Jeffries and Reed, 2000; McWilliams and Siegel, 2001; Rangan, 2000) in their own industry. As the value of an actor's product or service becomes difficult to measure, the market will shift away from reliance on internal cues and an actor's signals towards 'external cues' and information provided by other actors. In other words, restricted or identified exchange with other trusted actors in the same social structure can occur in knowledge-based industries because of uncertainty, and the difficulties of measuring the value and content of the product or service being exchanged.

As defined by Coleman (1990) and Granovetter (1973; 1985) actors in the market and within social structures are subject to a synthesis of a network of constraint-generating relationships and a network of real and imagined embedding relationships. We believe that this dual nature – which helps determine an actor's identity – is also linked to the idea of market signals (Schelling, 1969; Spence, 1973; Wade-Benzoni *et al.*, 2002) and market value, which helps communication and identification under uncertainty. Milgrom and Roberts (1992) provide a more general definition of signals: 'signals demonstrate to others the actor's intentions or abilities or some other characteristic about which the actor has private, unverifiable information' (p. 212).

There are at least two potential problems with signals as a basis for determining actors' values in the market. In the first place, in the search for a co-operative exchange partner a particular actor's network may be screened according to certain path-dependent, homogeneous beliefs and cognitive maps of reality, which may not be an accurate measure of value or reality (Das and Teng, 2002; Glynn *et al.*, 2000; Granovetter, 1985; Rangan, 2000). In developing objective views the importance of certain weak ties, or relatively less homogeneous relationships, has been raised by Granovetter (1973; 1985), Feld (1981), Oliver and Marwell (1987), Oliver *et al.* (1985) and Marwell *et al.* (1988).

Second, signals can be confusing or be manipulated by actors for strategic ends. A distinction needs to be made between signals and indices. Indices, as defined by Jervis (1985), are: 'statements or actions that carry some inherent evidence that the image projected is correct because they are believed to be inextricably linked to the actor's capabilities or intentions' (p. 26).

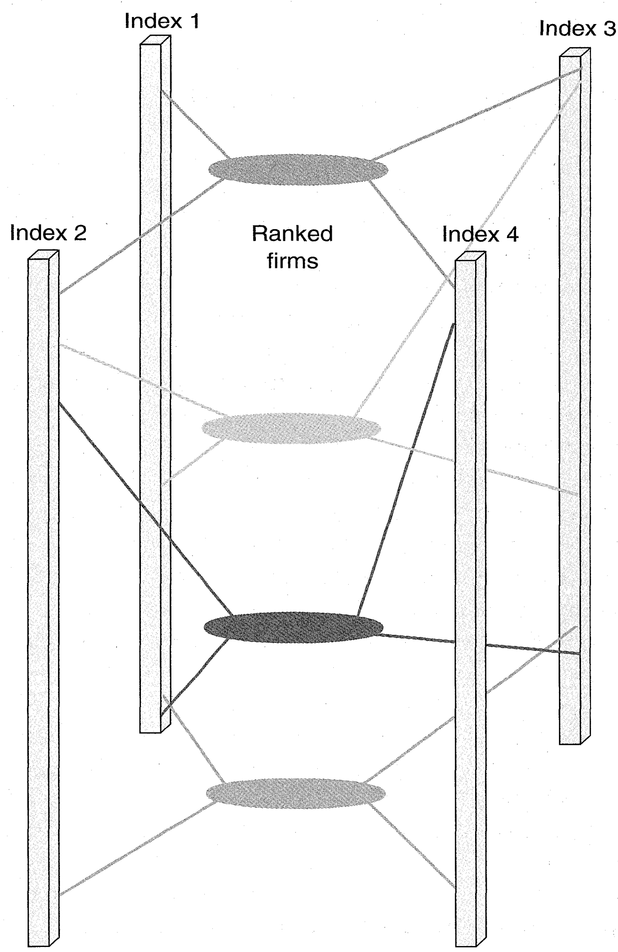
Indices, unlike signals, cannot be easily manipulated. Examples include private messages the perceiver overhears or intercepts. In some senses, an index is an external truthful type of signal, one which cannot be manipulated, thus creating a more general measurement of the actor's value. The ability to use indices depends on an actor's particular capability, or rare experience, such as past success, which other competitors cannot imitate. Thus, only certain types of actors would have an incentive to use indices. Summarizing, indices may be more widely used by older and more successful actors, because indices are more trustworthy than signals, and actors would like to convey information on their past successes and value with as much credibility as possible

Creation of Value

In knowledge-based industries, external intermediaries can also play a potential role in certifying the content and value of an actor's product or service (Millar, 2004; Millar and Choi, 2003). We believe that a firm's or actor's identity in the market place for knowledge-based industries is determined by a number of value drivers which help to certify the quality, value and content of the actor's product or service. Similar lines of thought can be found in works such as Podolny (1993), Camic (1992), Haunschild (1993; 1994), which have further developed the earlier writings of White (1970), Sorensen (1983), Burt (1992), Bonacich (1987), Dutton and Jackson (1987) and Simmel (1950). The emphasis is that an actor's position in the social structure affects rewards and also reduces his ability to interact with actors of different social status (Jeffries and Reed, 2000). We believe that this basic idea of interdependence can be taken further. With assets such as knowledge, where the value and content of product or service being exchanged are uncertain, external cues like assurances from intermediaries help to identity and certify an actor and the value and quality of its products or in the market place (Millar and Choi, 2003). This is shown in Figure 7.2.

There are four major indices, value drivers or creators of value for actors in knowledge-based industries. First, an actor's client base is a driver of value. The position or status (Frank, 1988; Podolny, 1993) of the particular clients can in turn help to elevate and provide an index, rather than a signal, of the actor's ranking and identity. Second, the ability to innovate and reputation for being innovative, such as developing new products or a dynamic corporate culture, helps define another type of index or creator of value in the market place for knowledge-based industries (Haunschild, 1994; Scott and Lane, 2000). Third, an actor's networks (Jeffries and Reed, 2000), whether with collaborators or competitors, can also be an index or creator of value in the market place. An example of this would be top-ranked business schools being competitors but holding executive programmes or other conferences together in a network (D'Aveni,

Figure 7.2 Four indices of value creation



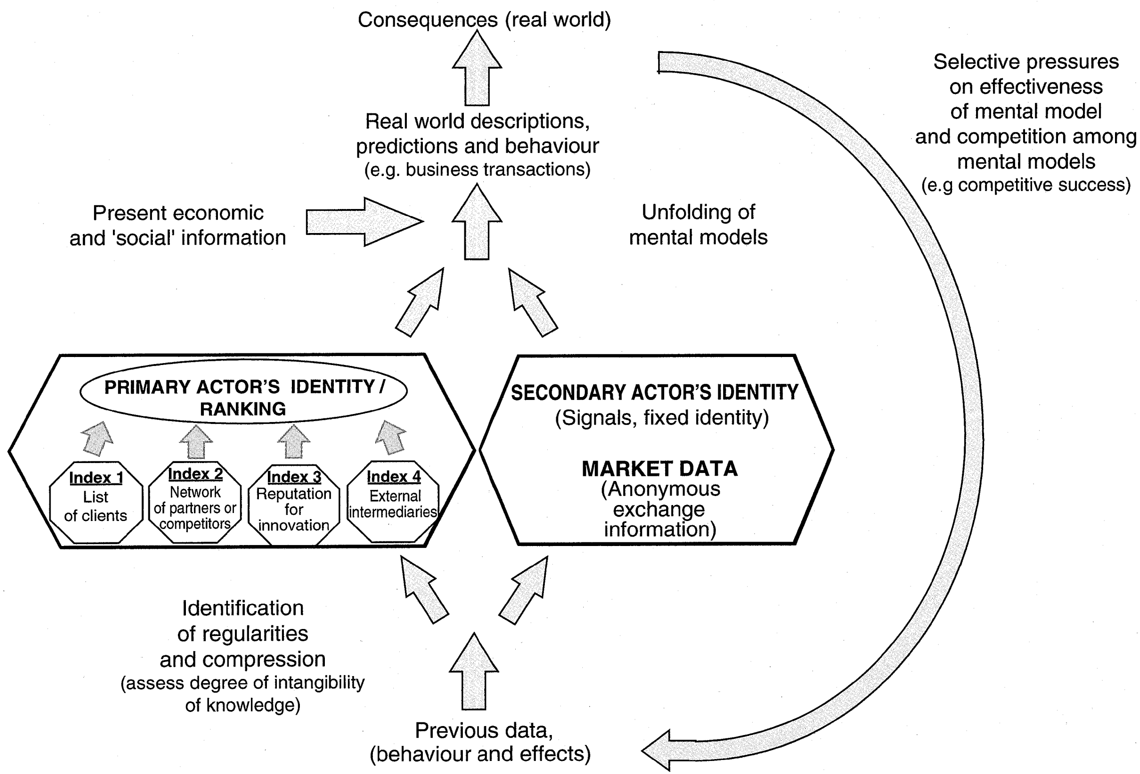
1996; Fiol *et al.*, 2001). Fourth, outside external sources of information, such as Standard and Poor indices in financial markets, consumer reports written by private organizations, or business magazines and commentaries, all help to serve as an index of quality and creator of value. Summarizing, in knowledge-based exchange an actor's value and relative position in the market place is affected by the following four indices: client list, reputation for successful innovation, network of partners or competitors and evaluation by external intermediaries.

Schema for Value Creation in Knowledge-based Industries

We posit that organizations use a generic schema, which seeks to identify and quantify trustworthy, reliable and hence useable socio-economic information and knowledge. In Devlin and Rosenberg's terminology, it is a schema which can help determine identity and act as a blueprint for describing specific situations or phenomena and for measuring value. It facilitates the process of exchange and knowledge creation within networks of socio-economic relationships (Granovetter, 1985). It incorporates the elements of both anonymous and relationship-based exchange (Das and Teng, 2002; Jeffries and Reed, 2000; Ofori-Dankwa and Julian, 2001). In traditional non-knowledge-based industries, the schema emphasizes anonymous exchange. In this case, there is no need to proceed with identity issues because the situation is transparent. In knowledge-based industries, however, the schema seeks to cut through the mist of inherent uncertainty and intangibility and works by 'ranking' an actor as either having a primary or secondary value in the market and society.

The proposed model serves to increase the flow of knowledge to market actors, thus enhancing exploration, experimentation and the seeking out of opportunities resulting in new links and connections. Considering that a firm's knowledge base is embedded in (Granovetter, 1985) and reflected by its capabilities, the model assists in the extraction and absorption of knowledge from the environment. In the process the market, being a co-evolving system, changes and so do the views of all constituent organizations. This new information, when decomposed, analysed and combined with the sense-making capacity of organizations, will result in new interpretations and fresh opportunities for interactions. The market will then evolve to new, emergent states with much more diversity. It is a schema which emphasizes partner selection to generate and accrue social capital (Bourdieu and Wacquant, 1992; Coleman, 1990; Glynn, *et al.*, 2000; Granovetter, 1985; Tsoukas and Hatch, 2001). The schema utilizes a tagging mechanism to break down the appar-

Figure 7.3 Ranked (primary) versus unranked (secondary): disproportionate value



ent symmetry and complexity of intangible knowledge. It also facilitates partner selection and the formation of aggregates (Holland, 1995). Holland also adds that 'tags...allow agents to select among agents or objects that would otherwise be indistinguishable...[and] provide a sound basis for filtering, specialisation, and cooperation' (p. 15). Further, that 'tags almost always define a network by delimiting the critical interactions, the major connections' (p. 23).

Similarly, the framework seeks characteristics in prospective partners in terms of the four indices, or creators of value discussed above. It will be harder to evaluate or measure the value of actors lacking these characteristics, thus minimizing the possibilities for potential exchange. Borrowing Lane and Maxfield's (1996) terminology, one could say that our proposed model is an attempt to 'generate insight into the agent-artifact space that the agent inhabits and into the way in which control is distributed through that space' (p. 226). Therefore, actors who create value can identify themselves and others in terms of the four indices. They also possess the advantage of having a clear picture of their world and their position in it. At the same time, they understand too that they have to concentrate effort and resources on entering or moving within these indices. Lane and Maxfield (1996) suggest that generative relationships, which are an essential strategic competence in complex environments, can alter an actor's positional information and schemata. Rankings in terms of the four indices promote generative relationships by creating additional value for the ranked because a measure of heterogeneity is introduced between actors by separating them through the indices.

An organization's identity as a potential exchange partner can be seen as a meme (Dawkins, 1976), a cultural transmission. Coveney and Highfield (1995) make a distinction between scientific and non-scientific memes. Scientific memes, such as a mathematical model, proliferate when their predictive or descriptive capacity is being continuously verified by scientific data. Religious and political ideas, on the other hand, fall into the category of non-scientific memes, obviously characterized by the intangibility of knowledge and reduction of objectivity. In this case, 'no objective yardstick or fitness measure exists for carrying out such a ranking, and so, which ideas win out depends on a collection of more arbitrary and subjective criteria' (Coveney and Highfield, 1995, p. 335). For example, the potential for non-scientific manifestation of a meme to proliferate depends on the frame of reference, such as background beliefs within the society.

A firm's value creation in the market and society is a metaphor for a firm's quality and potential for exchange and it is possibly mediated as a meme. Following this through, one could draw a parallel to the proliferation of a firm's identity as a meme in knowledge-based and non-knowledge-based markets, with the proliferation of scientific and non-scientific memes. In non-knowledge-based markets, value creation and measurement are transparent; tangible products or services and financial data guarantee the quality of a potential exchange partner. There are objective criteria to facilitate selection and we are in the realm of scientific memes. In the case of knowledge-based markets though, given the uncertainty and difficulties in measuring the value and content of the products or services offered, proceeding with an exchange opportunity seems more like following a religious creed than an objective scientific choice. A firm needs a yardstick to judge other firms and to transform its own and others' memes into 'scientific' ones. Identity is a meme, a cultural transmission, because it relates directly to the socio-economic environment within which it evolved. Moreover, it is a scientific meme because it offers the option for comparison with identity memes of different firms, which have similar capabilities of value creation in the market and society.

Ranked Versus Unranked: Disproportionate Value

The above analysis constitutes a new reflection on competition in knowledge-based industries. It introduces competition in terms of ranked or primary, and unranked or secondary actors. The ranked actors have developed various close linkages and relationships with the key indices or value creators within the market, and they in turn have incentives to support the success of the ranked actor in the market. A ranked actor's success benefits all ranked actors by promoting, in terms of the indices, the whole network of ranked actors. The proposed schema promotes actors who satisfy the tagging mechanism and demotes those who fail to satisfy the tags. Therefore, identified actors move on an upward spiral of value creation, which unidentified actors do not enjoy.

Frank and Cook (1995) have coined the term winner-take-all markets to demonstrate that such superstar effects were becoming increasingly prevalent in all industries. Such winner-take-all effects are in turn complemented by escalating consumerism, and a global demand which leads to particular actors being compensated disproportionately relative to other actors in an industry. Frank and Cook (1995) note that in global sports such as tennis, athletes who are ranked globally in the top ten receive disproportionate incomes, whereas others who are ranked just below these actors would actually be under-compensated relative to their talent and efforts. This phenomenon is driven by the fact that the global consumer prefers to watch only the true global stars and athletes on television (Frank and Cook, 1995). Globalization and the development of ICT (information and communication technologies) have thus increased the debate among corporations and policy-makers about the nature of optimal business systems, global consumption and the impact of winner-take-all effects in today's global business environment.

Choi and Baden-Fuller (1995) argue that the nature of competition and the allocation or distribution of value in markets and society can be 'disproportionate' or particularly difficult for the unranked actor. The ranked, identified actors have the advantage of their social embeddedness (Granovetter, 1973; 1985; Jeffries and Reed, 2000), which in turn allows them to be externally certified – a key competitive advantage in knowledge-based industries where value and content can often be intangible. In today's global complex world signals are no longer sufficient. They must be accompanied by indices. Furthermore, resources needed to satisfy the indices are not necessarily contradictory or trade-offs and they are not in conflict with those needed to compete in the market. We define disproportionate value creation as the following: disproportionate value creation occurs where the interaction of markets, indices and relationships in the social structure leads to a separation of ranked or primary, from unranked or secondary actors; the ranked actors acquire a disproportionately large value in markets and society.

The unranked, unidentified actor faces two aspects of competition and co-operation in knowledge-based industries. First, the actor needs to compete in the conventional sense, in head-to-head market competition with the ranked, high value-creating actor. Second, the actor needs to either develop relationships or indirectly compete with the four sets of actors that help create the value indices in the market place. This is why we have termed this phenomenon 'disproportionate value creation'. Consequently, drivers of identity or index-makers assume a power position in the market and in society due to their ability to exercise control over the processes of constructing and communicating meaning in an organizational setting (Ashforth and Humphrey, 1997, p. 55). In this sense, our conceptual framework helps to bring together the existing economics-based research on competition with the more behavioural and social structure (Granovetter, 1985) aspects of research on co-operation and competition.

This last chapter combined an application of knowledge complexity with that of disproportionate value creation in knowledge-based industries. It drew its arguments from complexity theory and presented the connection between complexity and organisational theories. It also illustrated that the principles of firm interaction are paramount in analysing how firms create and measure the value of knowledge in knowledge-based industries. This is in line with institutional analysis whereby institutions are seen as socially constructed templates for action, generated and maintained through ongoing interactions (Meyer and Rowan, 1977; Zucker, 1977). The focus is on how the operating environment affects a given organisation or set of organisations (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1987; Zucker, 1977; 1987).

Our main conjecture was that indices (Jervis, 1985), or external truthful signals, can be used by markets to certify and rank the value of an actor's product or services. Such path-dependent effects can, as we showed in Chapter 6, lead to a winner-take-all result (Frank and Cook, 1995), where highly ranked actors gain a disproportionately large part of the market, or value, relative to other actors. In this chapter we focused on competition and our framework helps to illustrate the complexities of competition when both markets and institutions are integrated in the analysis.

Conclusions

Knowledge itself is Power.

Francis Bacon, *Meditationes Sacrae,* 1597, 'Of Heresies'

The concept of knowledge as an asset and resource has been examined in this book from a much broader perspective than is traditional in knowledge management. This gives overdue recognition to the intrinsic nature of knowledge, which in itself is complex, and to the different and extensive contexts in which knowledge is entrenched or present. For example, the tacit nature of knowledge, its intangibility and inalienability require a different framework of analysis in terms of knowledge exchange and measurement. This framework, which has been extensively discussed in Chapter 5, builds on the works of North (1990) and raises the important point of measurement and enforcement costs.

The distinct contexts we examined surfaced as a result of the close linkages among the various actors, players and disciplines under discussion. Different aspects of knowledge, such as knowledge and the state, knowledge and cities, knowledge and households, knowledge and exchange, knowledge and measurement, and knowledge and competition, intertwine with these distinct contexts to bring about knowledge 'entanglement'.

The actors and players include individuals, entrepreneurs, firms and industries, as well as the state and countries.

The complexity of knowledge is further reinforced as a result of new expanding theories in other disciplines which seek to explain the role of knowledge as an asset and resource in the knowledge-based or service industries. Some of the theories discussed in the chapters above included market-based exchange, the resource-based view of cities, global capitalism, winner-take-all model, the shareholder versus stakeholder business system, the reciprocal exchange mechanism, and value creation and the disproportionate value phenomenon.

The 'entanglement' of knowledge results in a conceptual complexity which requires transparency and insights from other disciplines and their problem issues. In our references to some of these we set out to gain greater clarity about, and understanding of, the complexities involved in knowledge as an asset and resource. Part of the complexity is also the result of the inseparability of the material and the intangible aspects of products that hold value to societies (Strathern; 1999; 2001). So much so that the term 'entanglements' was used earlier by Jackson (2002) and Mansfield (2003) to illustrate the inseparability of the consumption and production aspects of knowledge.

This chapter summarizes major points covered in the book and draws conclusions integrating them. It pays attention to the necessity of analysing knowledge in an interdisciplinary manner, within its context and entanglements. Knowledge and the dynamics of knowledge are also seen as the major drivers that catapult people, groups of people or even states into breaking away from their bottom of pyramid position.

Chapter 1 drew our attention to the linkages of applied economics, international business and their institutional social context in understanding the role of knowledge and its utilization as a resource and asset. Actors and institutions interact in a social and institutional context to redefine how knowledge has been perceived traditionally. The role of the institutions, formal and informal rules and the social context of business and society impact on how knowledge is to be utilized in society. The formation of sub-networks and their connectivities result in a total network system (Burt, 1992; Choi *et al.*, 1999). These sub-networks of social bonds encourage knowledge sharing and in appropriate circumstances the burgeoning of a community of entrepreneurs (see Figure 1.1). The development of Taiwan's Hsinchu valley is seen as a classic example based on such sub-network effects. This has been further discussed and analysed in Chapter 2.

Chapter 2 identified the state as a crucial element in the success of Asian capitalism. It highlighted the close relationships among industrial districts, corporations and public policies. It weaved together the theories of entrepreneurship and their linkages to international business research and, through the success of the Hsinchu Science-based Industrial Park (HSIP), illustrated how public policy over time could sustain an entrepreneurial spirit within the technology districts (Chen, 1997; Yu, 1997). The state of Taiwan played a fundamental role in creating a collective identity based on a global export strategy. The equally vital role played by the entrepreneur in connecting the various aspects of the business system (Choi *et al.*, 1999) was also highlighted. The Hsinchu Science-based Industrial Park experiences show the entrepreneur taking on the role of a knowledge co-ordinator between economic public-policy makers in government and the business and financial community. The entrepreneur, in setting up a new company or technology, is often caught in a web of uncertainties relating to decision-making, measurement of value and technology (Casson, 1990; 1996). The contention of the chapter is that knowledge-based industrial districts can help companies overcome such barriers as uncertainty, financing and infrastructure.

Chapter 3 deployed a range of disciplines in economics, geography and urban planning to help us understand the concept of global cities. We analysed how knowledge as a scarce resource is closely linked to cultural capital and human capital. Florida (2002), Storper (1997) and Scott (1999; 2000) demonstrated how developed cultural capital and thriving cultural industries could help attract global human capital – especially talented knowledge professionals. Their research further indicated that talented knowledge professionals had requirements for good location, high-quality amenities and the existence of cultural industries and cultural capital (Bourdieu, 1977; 1984; Throsby, 1999) and stimulated the provision thereof in dedicated concentrated areas such as cities.

Chapter 4 drew a parallel between organizations and households in the areas of knowledge and value creation. The authors introduced comparisons between firms and households because factors such as the nature of competition, collaboration, community and sharing within households provide an example of an organization that carries out effective knowledge and value creation and exchange.

Research has shown that households often rely on informal networks of knowledge and on informal norms of reciprocity in exchange. Such types of informal exchange and networks of knowledge are seen as crucial for knowledge within the context of firms and strategic management. This therefore justified an analysis and comparison of how knowledge is created, exchanged and disseminated within households and how households as organizations can provide hints on the nature of knowledge within the firm.

The amorphous nature of knowledge leads to high measurement costs besetting knowledge exchange. As is the case for many an inalienable asset, it is difficult to put a value on knowledge as an asset or resource without due reference to the owner, giver or seller. The way in which knowledge is valued raises many ethical issues in knowledge exchange. In Chapter 5, the nature of market-based exchange was examined critically alongside the nature of exchange found in primitive pre-modern social systems. The focus on the social systems of exchange helped to shed light on issues of ethical concern, such as the quality and value of knowledge as an inalienable asset or resource; the dependence on trusted external intermediaries; signals in the market and from social institutions; and the form adopted by non-monetary exchanges, since there was often little formal agreement or agreed standard for such exchanges.

These endemic issues were prominent in the valuation of three particular types of knowledge exchange: R&D and joint ventures, intellectual property rights and plagiarism in academic research. Examples were drawn from the individual, firm and industry level to illustrate the ethical concerns such as alienability, trust and justice. In the process, the authors hope to have provided a greater insight and clarity into the causes of ethical problems in knowledge exchange.

Chapter 6 addressed the fundamental issues occurring in orderly measurement and exchange in knowledge-based service industries, in particular the cultural industries. The nature of knowledge exchange (as expounded in Chapter 5) is such that the foundations for measurement are in conflict with those commonly used in modern market exchange. The reciprocity-based framework, often associated with pre-modern societies was adopted to help lay the foundations to measure knowledge assets in the service industries. An understanding of reciprocity enabled us to define a form of measurement identity essential for intangible and inalienable assets such as knowledge-based services. Hence measurement or the ability to measure or 'commensurate' was seen to be fundamental to modern-based business systems.

New waves of technology have created alternative organizations such as the internet and mobile internet, which pose new challenges to both firms and households in terms of knowledge and value creation, internationally.

The final chapter of the book examined the complexity principles involved in knowledge exchange and competition in the knowledge-based industries. The industry environment was seen as a complex, co-evolving entanglement of actors and artefacts. This chapter endeavoured to advance our understanding of the various aspects of knowledge interactions by formulating an overarching theoretical framework of knowledge exchange that would enable industry to understand and capitalize on the complex interdependence between competition and co-operation.

It therefore highlighted the use of external cues or indices as creators of value, to determine an actor's relative position or status in the knowledge-based market place. The four indices identified are the basis of a schema, which is capable of generating descriptions and meanings in the complex environment of knowledge. The competition for status among the various actors could then result in a 'disproportionate value creation' phenomenon whereby the industry is characterized by relationships between ranked, primary actors enjoying the advantages of their social embeddedness, surrounded by sparse networks of unranked secondary actors.

The analysis carried out in the various chapters has helped to clarify knowledge as an asset and a resource and enabled us to draw a number of conclusions. Furthermore, the chapters provided material for suggestions and hints for future areas of research, which we will develop below.

The catalysing complexity, fluidity and dynamism of knowledge are the great drivers that will cause and enable knowledge workers to rise from the 'bottom of the pyramid' – whether the application is in the area of knowledge research or in relation to the actors and players themselves, including countries. We believe that understanding of knowledge and the access to knowledge will enable the different actors and players to position or reposition themselves in the globalized economy. This in particular will have implications for China, the rising dragon of Asia, where many actors and players, including the state, keenly seek access to knowledge.

We also conclude that latecomers to industrialization can learn many lessons from Taiwan's experiences as a successful entrepreneurial state. The linkages between an entrepreneurial state and industrial districts hold promise for many catch-up economies and such an area of study will continue to gain importance in international business research.

The resource-based view of cities will continue to be a useful framework in examining the optimal mix of both cultural and non-cultural capital industries, which are essential for successful cities such as London, New York, Paris, Sydney and Tokyo. Further analysis can be done in the application of the RBV to public policy with regards to the transformation of a city and its unique, non-imitable resources and competences.

In the area of knowledge exchange, the adoption of comparative case studies can help clarify those ethical issues that border on the grey or not so obvious areas. This is where a clear distinction has to be made between the exchange of alienable commodities and inalienable knowledge-type assets. We argue that it would be useful to consider earlier works of social anthropologists such as Simmel (1978), Mauss (1954) and Sahlins (1972).

The very nature of knowledge-based assets does not allow for the transparent measurement of value in a style appropriate for commodity-type resources or assets and this continues to pose problems for knowledge measurement. There are approaches that can be gleaned from the barter and reciprocity systems of primitive pre-modern societies.

The comparative study of firms and households provides a new and alternative approach to looking at knowledge consumption and value creation. Since households are often seen to rely on informal networks of knowledge and informal norms of reciprocity in exchange, there would be value in further empirical research and analysis.

We find it important that a framework is formulated that incorporates the potential role of the internet and the mobile internet for knowledge exchange. Recent studies by Guo in China (Guo, 2003) indicate that the internet has become a tool for the exchange of substantive ideas in knowledge, politics and society. Cities like Nanhai, which carry the predicate 'smaller' as compared to Shanghai or Beijing, appear to have the highest proportion of internet users (35.6 per cent compared to 33 per cent for metropolises). Guo reckons that the rapid expansion of internet usage has the ability to expand the flow of information and spur economic growth. This development has great implications for how household consumption will impact on knowledge consumption and value creation.

The complexities involved in knowledge competition and co-operation imply that the effects of 'disproportionate value creation' will become endemic in knowledge-based industries. Such a phenomenon warrants further empirical research in the fields of economics and behavioural and social studies, bringing together aspects of competition and co-operation.

The entanglement of knowledge, its complexity, inalienability, context and dynamism are its strength. A reductionistic approach, seeking to reach an analysis in terms of discrete single strands would have overlooked or understated this strength. This book has endeavoured to make a number of knowledge strands more transparent whilst considering them within the complexity of entanglement.

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