



Arto Lahti

THE NEW INDUSTRIAL ORGANIZATION (IO)
ECONOMICS OF GROWTH FIRMS
IN SMALL OPEN COUNTRIES LIKE FINLAND

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I. SCHUMPETERIAN ENTREPRENEURSHIP/ MARSHALLIAN MANAGEMENT

1. The entrepreneurial function and market mechanism

The entrepreneurial function in society is probably as old as the institutions of exchange. Many economists would probably agree with the judgment that an entrepreneur is a central figure in economics. A French economist, Richard Cantillon, defined an innovative entrepreneur in the 18th century. Cantillon suggested that an entrepreneur is someone who has foresight and willingness to assume risk and takes the action to make profit or loss. Cantillon included professionals as '*entrepreneurs of their own labor*' meaning that even a penniless entrepreneur incurs potential losses to the extent that he faces opportunity costs of his time and talents.

In the beginning of the 20th century, the dominant doctrine of neoclassical economics was established. Between the 1890s and the 1920s, Alfred Marshall, the famous British economist, wrote eight editions of his book *Principles of Economics*. Marshall analyzed the relations between the firms and market(s). One of his major contributions was that he identified the internal and external economies of the firm. External economies depend on the firm's adaptation to the industry development, while internal economies are dependent on the resources, organization and management efficiency. Marshall introduced into economic analysis the concept of 'Representative Firm' that since Marshall's contribution has been as the theoretical unit of analysis, instead of a real one. This kind of simplification makes possible to focus economists' attention to *the firms' cost-minimizing adaptation, but inevitably excludes the behavior a real firm.*

In his book *The Theory of Economic Development*, Joseph Schumpeter proposed that an entrepreneur, as innovator, creates profit opportunities by devising a new product, a new production process, or a new marketing strategy. Schumpeter noticed that a group of individuals in the economy act entrepreneurially to seize opportunities, and shapes the whole course of subsequent events and their long-run outcomes. An entrepreneurial discovery occurs, when someone makes the conjecture that a set of resources is not put, also allocated, to its best use. In Schumpeter's terms, an innovation is successful only if an entrepreneur is able to achieve a temporary monopoly profit. But any firm that merely attempts to maintain and enjoy a position of monopoly would be doomed to fail under the forces of dynamic competition.

As Schumpeter declared, differentiation between individual entrepreneurs (or between firms) provides the basis for distinctive innovations and, thus, the achieving temporary monopoly profits that is the lifeblood to an innovative entrepreneur to continue investment in creative destruction. Differentiation through innovativeness is entrepreneur's (only) positive case for competition against the scale economies of big firms. But Schumpeter's thinking of innovation process could not be complete without his practical notice. *In Schumpeter's thinking, routines are essential part of entrepreneurial processes.* The routines sustain the circular flow of economic activity and, thus, provide the assurance of predictable prices and quantities which allow the

entrepreneur to calculate that the resources needed for innovation will be available at a price that will ensure a profit, given the prices and characteristics of the products which are to be displaced.

In his book *Business Cycles*, Schumpeter referred to Alfred Marshall's concept of 'Representative Firm' as the one that are used to hide the fundamental problem of economic change. It was not, perhaps, Marshall that Schumpeter primarily criticized. Marshall revised many times his book 'Principles of Economics', but could not solve the problem of complexity and was not himself satisfied to his own definition of the theoretically perfect long period¹. In Schumpeter's thinking, Leon Walras' mathematically perfect, but practically impossible, 'The General Theory' was the primary reason of distinction between entrepreneurship and economics. Walras, a Nobel Price-winner, makes simlicit assumptions. One of them was to use the upward sloped parts of the average cost function instead of the marginal cost function as the supply curve of the firm that excluded the behavior of real firms out of the frames of the neoclassical economic theory. During his career, *Schumpeter insisted on the discontinuity between Walrasian co-ordination and innovative entrepreneurship.*

In his life's work, Schumpeter not only recognized the need for a theory of economic development, but also came to understand that such a theory would have to deal with the impacts of transition from individual to collective entrepreneurship on the process of technological change². In his last book *Capitalism, Socialism and Democracy*, Schumpeter summarized his main arguments. His point was that in dealing with capitalism we are dealing with an evolutionary process. Schumpeter recognized that a transition from the 19th century competitive capitalism to 20th trustified capitalism had taken place. In Schumpeter's thinking, creative destruction creates economic discontinuities, and in doing so, an entrepreneurial environment for the introduction of innovation. Schumpeter suggests³:

- *An entrepreneurial function is the act of will of the entrepreneur for the introduction of innovation in an economy, and a source of evolution in a whole society,*
- *Entrepreneurial leadership is the source of creative energy for innovation and evolution,*
- *Entrepreneurial profit is temporary monopoly return on personal activity of the entrepreneur.*

¹ Loasby refers to David Hume's 'Impossibility Theorem' in which Hume rejected the possibility of proving the truth of any general empirical proposition, either by deduction or induction. Hume proposed an inquiry into the processes by which people come to develop particular empirical propositions and to believe that these propositions are true. In Loasby's thinking evolutionary economics is based on the growth of knowledge, not on the mathematical model to be found in the works of Walras. (Loasby, 1999, *Knowledge, institutions and evolution in economics*. London: Routledge, pp. 2-4).

² Lazonick, William (1991) *Business Organization ant the Mynth of the Market Economy*, Cambridge University Press (p. 126).

³ Lintunen, Liisa (2000) *Who Is the Winner Entrepreneur? An Epistemological Study of the Schumpeterian Entrepreneur* (dissertation), Helsinki School of Economics, series A-180, Helsinki.

Creative destruction and economic discontinuities are the typical characteristics of the so called entrepreneurial environment for the introduction of innovation and earning monopoly profits. Competition is a self-destructive mechanism; effective competition normalizes the profit level when the innovation effects have been utilized. In the light of Schumpeter, it is no doubt that much of the future technology revolution will impact on global environment, although we may not yet know the full implications. The Schumpeterian creative destruction has been going on earlier. One of the most devastating periods was in the end of 1920s and early 1930s, when the industrialized countries transferred from industrial to post-industrial society.

Michael Jensen⁴ has made an elegant contemporary interpretation of the Schumpeterian creative destruction. Comparing the growth of GNP with R&D statistics, Jensen predicted the dynamics of modern industrial revolution. Because of the chock of the oil crisis in the mid 1970s, the western countries invested in R&D. The growth of R&D expenditures has been double higher than the growth of GNPs. *The revolution of information technology (IT) has been the major source of Schumpeterian creative destruction and innovations in the industrialized countries.*

The greatest innovations are likely to occur from the cross-fertilization of different sectors and professions. Entrepreneurs, as innovators, are more likely to think laterally and holistically, while adaptive business managers involve a linear thinking pattern. Through this notion, Schumpeter was the first one who *recognized the importance of knowledge in the economy by his reference to 'new combinations of knowledge' at the heart of innovation and entrepreneurship.*

The major contribution of Schumpeter's extensive works was to redefine the risk-bearing and creative function of entrepreneur. Parallel to Schumpeter, Frank Knight, the founder of 'Chicago School', wrote his book *Risk, Uncertainty, and Profit* in the 1920s, where he emphasized entrepreneurial profit resulting from an exercise of ultimate responsibility which in its very nature cannot be insured nor capitalized or salaried. Knight's risk theory distinguishes between:

1. the objective probability that an event will happen, and,
2. the immeasurable unknown, such as the inability to predict the demand of a new product.

In Knight's thinking *'true uncertainty' is the primary function of an entrepreneur.* In Schumpeter's writings, it is an event of creative destruction (called a Schumpeter's shock) that can be utilized to generate temporary monopoly profit(s), when Knight saw uncertainty as the prevailing circumstance. Later, Kenneth Arrow, a Nobel prize-winner, pointed out, information as an economic commodity has attributes of an experience good. Individuals intending to obtain information either by purchase or production

⁴ Jensen, Michael. (1992) The Modern Industrial Revolution, Exit, and Failure of Internal Control Systems, *Journal of Finance*.

cannot know in advance the costs and benefits of certain types of information before they have acquired it. This can be referred to as '*information paradox*'⁵.

In Schumpeter's own vision of the economic system, the theory of business cycles and the theory of growth are inseparable. This Schumpeterian proposition was developed at length in his study of business cycles, although Knight's thinking of 'true uncertainty' as the prevailing contingency makes it difficult to say, if there are any more business cycles instead of chaos in the global economy. Neoclassical theorists have long been reluctant to expand their models. Therefore, the analysis on growth factor of nations has been based on residual analysis. Robert Solow, a Nobel prize-winner, developed an endogenous growth theory in which he breaks down changes in labor productivity into two parts⁶:

1. the increase in the amount of capital per unit of labor and
2. the technology progress that include improvements in the human factor.

Solow found that the *technology progress has in western countries been the most important input factor allowing long-run growth in real wages and the standard of living.* In his Nobel Prize lecture, Robert Solow referred to 'Schumpeterian' models that emphasize the rivalry (or occasional complementarity) between an innovation and its predecessors. Solow seemed to appreciate highly Schumpeter's thinking. Solow evaluated the emergent exogenous growth theory in his lecture⁷:

'The models offered the possibility of having a theory of the steady-state growth rate itself, instead of treating it as an exogenously given, if sometimes changing, fact of life. But there was an even more important attraction, I think. The nature of the theory was such that one could easily find feasible, even fairly traditional, policies that would influence the long-term growth rate.'

The new or exogenous growth theory has become popular during two last decades, when Paul Romer recognized that technology (and the knowledge on which it is based) has to be viewed as an equivalent third factor along with capital and land in leading economies⁸. Inevitably this leads to issues of the generation and exploitation of knowledge. Paul Romer⁹ formalized the neoclassical growth theory that suggests that an economy's increased openness raises domestic productivity, and hence must have a positive effect on the living standards of a nation. Romer's findings of various nations are generally consistent with the conventional model in which free trade stimulates economic growth.

⁵Arrow, Kenneth (1962), Economic Welfare and the Allocation of Resources for Invention, in Richard R. Nelson (ed.), *The Rate and Direction of Inventive Activity: Economic and Social Factors*, National Bureau of Economic Research, Conference Series, Princeton: Princeton University Press, pp. 609-625.

⁶Solow, Robert (1956) A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, pp. 65-94.

Solow, Robert (2000) *Growth Theory. An Exposition*, Oxford University Press, Etats-Unis.

⁷Robert M. Solow: Lecture to the memory of Alfred Nobel, December 8, 1987: Growth Theory and After.

⁸Romer, Paul (1990) Endogenous technical change. *Journal of Political Economy*, 98, 338-354.

⁹Romer, Paul (1989) *Increasing Returns and New Developments in the Theory of Growth*, University of Chicago, Chicago.

The New Institutional Economics attempts to incorporate a theory of institutions into economics. Institutions are formed to reduce uncertainty in human exchange. Institutions are patterns acquired from others which guide individual actions, even when these actions are quite unconnected with any other person. Institutions economize on the scarce resource of cognition, by providing us with ready-made anchors of sense or premises to decisions. They constitute a capital stock of other people's reusable knowledge, although, like all knowledge, this is fallible¹⁰.

It was Ronald Coase¹¹, a Nobel prize-winner, who made the crucial connection between institutions, transaction costs and neo-classical theory. Coase (1937) was awarded a Nobel Prize for explaining why a firm should exist. One answer is provided by the traditional economics literature. An excess level of profitability induces entry into the industry. And this is why the entry of new firms is interesting and important, because the new firms provide an equilibrating function in the market, in that the levels of price and profit are restored to the competitive levels. Coase and his followers like Oliver Williamson use to define the firm as the governance structure or nexus of contracts, a view that contrasts with the theory of the firm as a production function¹².

Institutions are not necessarily or even usually created to be socially efficient. Institutional path dependence exists because of network externalities, economies of scope, and complementarities. Douglass North¹³, a Nobel prize-winner, has focused the institutional aspects of the economic past, concluding that institutions which protected property rights and which lowered transaction costs are the decisive factors in the history of economic growth. In North's thinking, the state can never be treated as an exogenous actor in development policy, since the state have the mandate to set of property rights and enforce competitive market conditions. Neo-classical economists implicitly assume that institutions (economic as well as political) do not matter, and that the static analysis embodied in allocative-efficiency models should guide policies.

Friedrich Hayek¹⁴ is a member of the so called *Austrian School of Economics* that Schumpeter belonged primarily to. Hayek redefined the market concept. According to him, a market is a body of activity-based knowledge about the interaction of entities such as individuals, firms, and social institutions. Hayek identified 'the division of knowledge as the really central problem of economics as a social science'. Israel Kirzner¹⁵ observed the process of discovery in a market setting requires the participants to guess each other's expectations about a wide variety of things. Kirzner's entrepreneur is alert to profit opportunities that are created by the failure of others. The gap between

¹⁰ Loasby, 1999, p. 46.

¹¹ Coase, Ronald (1937) *The Nature of the Firm*, *Economica*, pp. 386-405.

Coase, Ronald (1987) *The Nature of the Firm*, in Putterman, Louis, *The Economic Nature of the Firm*, Cambridge University Press, Cambridge.

¹² Williamson, Oliver (1990) *The Firm as a Nexus of Treaties: An Introduction*, in M. Aoki, B. Gustafsson, and O. Williamson (eds.), *The Firm as a Nexus of Treaties*, Sage Publications, pp. 1-25.

¹³ North, Douglass (1993) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge.

¹⁴ Hayek, Friedrich (1948) *Individualism and Economic Order*, Chicago, University of Chicago Press.

¹⁵ Kirzner, Israel (1979) *Perception, Opportunity and Profit. Studies in the Theory of Entrepreneurship*, Chicago University Press, Chicago.

the set of mental or organisational connections and the phenomena with which individuals or organisations are trying to cope is filled with uncertainty.

Peter Drucker's¹⁶ practical Schumpeterian interpretation is worth of noticing. Drucker defines entrepreneurship 'as purposeful tasks' that can be organized - are in need of being organized - and *systematic work*. Entrepreneurship is neither science nor art. It is practice. Entrepreneurial opportunities are those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production. Although recognition of entrepreneurial opportunities is a subjective process, the opportunities themselves are objective phenomena that are not known to all parties at all times. Drucker (1985) has described three different categories of opportunities:

- *the creation of new information, as occurs within the invention of new technologies,*
- *the exploitation of market inefficiencies that result from information asymmetry, as occurs across time and geography, and*
- *the reaction to shifts in the relative costs and benefits of alternative uses for resources, as occurs with political, regulatory, or demographic changes.*

2. Marshall-Penrose-paradigm and the emergent strategic management viewpoint

Schumpeter gave economists food for thought with the concept of entrepreneurship and creative destruction. His writings were, at least temporarily, ignored by many brilliant Nobel prize-winners, economists like Alfred Marshall, John Maynard Keynes, Wassily Leontief, Milton Friedman and Paul Samuelson. Perhaps, the reason to that was that Alfred Marshall focused the interest of neoclassical economists on the concepts of representative firm instead of innovative entrepreneur. Marshall was British economist at Cambridge, where he exerted great influence on the development of economic thought of the time Marshall was concerned with theories of costs, value, and distribution and developed a concept of marginal utility. His book *Principles of Economics* from the year 1890 was for years the standard work.

Marshall became again popular in the 1950s, when Edith Penrose in her book *The Theory of the Growth of the Firm*¹⁷ reinvented Marshall's theme of the development of knowledge in economic systems. Penrose founded what has now evolved into the 'dynamic capabilities of firms' approach in the modern microeconomics. In Penrose's thinking, opportunities rest on developed internal and external routines. Penrose takes the boundedness of cognition for granted, and so, as in Schumpeter's theory, but at the level of the firm instead of the economy. Penrose's proposed that a firm's rate of growth is limited by the growth of (managerial) knowledge within it. Penrose (1959, 31) provided a new, dynamic conceptualization of the firm - as 'an administrative

¹⁶ Drucker, Peter (1985) *Innovation and Entrepreneurship, Practice and Principles*, Heinemann, London.

¹⁷ Penrose, Edith (1959) *The Theory of the Growth of the Firm*, Oxford University Press, Oxford.

organization and as a collection of resources' - designed to explain the firm level growth. Superior performance and a sustainable competitive position depend primarily on the heterogeneous resources available to the firm.

Penrose modernized the well-known writings of Alfred Marshall, and we use to talk about the Marshall-Penrose-paradigm. *Marshall-Penrose-paradigm, resource-based (or knowledge) view, distinguished the theory of growth from the equilibrium models of price theory, and linked it with Schumpeter's vision of the importance of knowledge at the heart of innovation.* Penrose distinguished the firm's tangible resources from services that these resources provide¹⁸. While the firm's tangible resources are finite, the resources from services these resources provide are mediated by the endless extensible body of managerial knowledge¹⁹. According to Penrose (1959, pp. 11-14) price theory tells nothing about the growth of the firm.

The knowledge-creating theory of Ikujiro Nonaka and Hirotaka Takeuchi²⁰ focuses on the transformation and communication of what is already known tacitly by employees.²¹ The most valuable resources for generating superior performance are those that are difficult to imitate or substitute for, and that are embedded as 'core competencies' within the firm²². Such specialized resources are developed, not acquired, and should have low mobility. *The idea of the 'learning capacity of the firm' is frequently used to embrace the resource development that leads to a carefully differentiated product strategy.*

Herbert Simon, a Nobel prize-winner²³ has been an important character of decision-making theory since the 1950s. He explained how problems are decomposed to keep connections manageable and decision premises are developed in order to simplify and co-ordinate decision-making. Simon's revolution in the concept of decision-making under uncertainty led far away from the 'rational man' often assumed in mainstream economics. Simon is the most intelligent writer in the topics 'bounded rationality' and 'maximization' by 'satisfying', i.e. setting an aspiration level which, if achieved, an individual will be happy enough with. His writings are the foundation to the development of so-called *behavioral theory of the firm* that can be interpreted as a complement of the mainstream theories.

Cyert and March²⁴, the pioneers of the behavioral theory, are concerned essentially with the day-to-day behaviour of the firm. The fact that short-period objectives can be

¹⁸Penrose, 1959, p. 25.

¹⁹Penrose, 1959, p. 78.

²⁰Nonaka, Ikujiro and Takeuchi, Hirotaka (1995) *The Knowledge-creating Company*, Oxford University Press, Oxford.

²¹ Spender, J.-C. (1996) Marking Knowledge the Basis of a Dynamic Theory of the Firm, *Journal of Strategic Management* 17, p. 47.

²²Hamel, Gary, and Prahalad, Coimbatore K. (1994) *Competing for the Future*, Harvard University Press, Cambridge.

²³ Simon, Herbert (1960) *The New Science of Management Decisions*, Harper & Row, New York.

Simon, Herbert (1979) Rational Decision Making in Business Organizations, *American Economic Review*, pp. 493-513.

²⁴Cyert, Richard & March, James (1963) *Behavioral Theory of the Firm*, Englewood Cliffs, NJ: Prentice Hall.

described whereas long-period objectives apparently need to be advocated has a significance of its own in explaining business behaviour. In Simon's thinking, *the 'rules of thumb' are the best that economic agents, like entrepreneurs and business managers, can use in the 'bounded' and uncertain real world.* Simon's critique is justified like Penrose's as a distinction from the equilibrium models of price theory, but Simon's intention was not to deny the usefulness of orthodox economic analysis.

Alfred Chandler, a famous economic historian, followed the same lines. In his book *Strategy and Structure*²⁵, he wrote of the transformation of capitalism as a system between the 19th and 20th centuries due to the combined effects of communication and transportation technology along with radical changes in managerial systems. He combined careful historical investigation of individual industrial enterprises with an in-depth analysis of theories of the firm. In Chandler's empirical data-base consisting of big multinational, organization structure tends to become increasingly technical, professional and independent of ownership. Chandler's careful analysis revealed what Schumpeter had written a decade earlier. Big multinationals did not only passively adapt to prevailing market(s). They grew to dominate sectors of the economy, and so doing, altered their structure and that of the economy as a whole.

Chandler's basic hypothesis was that business management and business organization were determining factors of the success and expansion of capitalism. Chandler advanced Penrose's thinking in the sense that an effective managerial hierarchy, called an organization structure, becomes the basic driver of the firm's (growth) strategy. According to Chandler's generally accepted axiom, *a firm's organizational structure²⁶ and competencies must be suited to implement strategy²⁷.* What, perhaps, nobody could image in the beginning of the 1960s when Chandler published his results is that his axiom became the foundation for a totally new paradigm, the strategic planning or management paradigm and to an enormous industry of strategic consulting.

Understanding sources of sustained competitive advantage for firms has become a major area of research in the field of strategic management²⁸. The resource-based and knowledge-based views are targeted attempts to deconstruct the black box of the economist's production function into some more elemental components and interactions, and until we identify these we cannot be confident about what is useful to observe over time²⁹. A competitive advantage must, by definition, be scarce, valuable and reasonably durable³⁰. However, valuable and rare organizational resources can only be sources of sustained competitive advantage if firms that do not possess these

²⁵ Chandler, Alfred (1962) *Strategy and Structure*, The M.I.T. Press, Cambridge.

²⁶ The top innovation is the multidivisional structure, M-form.

²⁷ Primarily the product/market strategy.

²⁸ See Hofer, Charles W. and Schendel, Dan (1978) *Strategy Formulation. Analytical Concepts*, West Publishing, New York.

²⁹ Schendel, Dan (1996) Editor's Introduction to the 1996 Summer Special Issue: Evolutionary Perspectives on Strategy, *Strategic Management Journal*, Vol. 17, pp. 1-4.

³⁰ Barney, J. (1991) Firm Resources and Sustained Competitive Advantage, *Journal of Management* 17(1), pp. 99-120.

resources cannot obtain them. These firm resources are imperfectly imitable for one or combination of three reasons³¹:

- a. The ability of a firm to obtain a resource is dependent on unique historical conditions,
- b. The link between the resource possessed by a firm and a firm's sustained competitive advantage is causally ambiguous,
- c. The resource generating a firm's sustained competitive advantage is socially complex.

Resource-based theory of the firm recognizes that knowledge or competence is a difficult concept to define, far from being one-dimensional. For example, knowledge has been differentiated in terms of explicit vs. tacit, individual vs. collective, and common vs. context-specific³². Tacit, collective, context-specific knowledge is difficult to create, transfer, or integrate via markets and, thus, provides a rationale for firms. The resource-based view similarly suggests that this type of knowledge, if valuable and unique, may provide a competitive advantage because it is less imitable. A firm's intellectual resources should support that capability today, and its ability to learn should maintain it over time³³. Loasby³⁴ concludes that the development of a specialized skill depends on a variety of experiences, but a variety that can be encompassed within a network of connections.

Coase addressed the rationale for the existence of the firm. The rationale that has been developed, specifically the various manifestations of the transaction costs of Oliver Williamson³⁵ or incomplete contracts or Oliver Hart³⁶, are out of the frame of neoclassical economics. The Resource-Based theory (RBT) of the firm, like the Coasian literature, takes as its point of departure the neoclassical microeconomics. The RBT explains why firms differ that is, what aspects of the perfect competition model most plausibly do not apply. Different firms possess different (heterogeneous) resources and are able to maintain differences in order to earn 'rents'³⁷. The concept or 'rent' has borrowed and interpreted too uncritically.³⁸

³¹Dierickx, I. and Cool, K. (1989) Asset Stock Accumulation and sustained competitive advantage, *Management Science*, vol. 35, pp. 1504-1511.

³²Spender, J-C., "Making Knowledge the Basis of a Dynamic Theory of the Firm", *Strategic Management Journal*, Vol. 17 (Winter Special Issue), 1996, pp. 45-62.

³³Lei, David, Hitt, Michael and Bettis, Richard (1996) Dynamic Core Competences through Meta-Learning and Strategic Context, *Journal of Management*, Vol. 22, No. 4, 1996, pp. 549-569.

³⁴Loasby, Brian J. (1998) How do we know? In: Boehm, Stephan, Frowen, Stephen F., Pheby, John (eds) *Economics as the Art of Thought: Essays in Memory of G. L. S. Shackle*, Rutledge, London.

³⁵Williamson, Oliver E. (1985) *The Economic Organization Firms, Markets and Policy Control*, Harvester Wheatsheaf Books, New York.

³⁶Hart, Oliver (1995) *Firms, Contracts and Financial Structure*, Oxford: Oxford University Press.

³⁷Foss, Nikolai (1997) Austrian Insights and the Theory of the Firm, *Advances in Austrian Economics*, Vol. 4, pp. 175-198.

³⁸The concept of "rents" is derived from economic foundations, namely the theory of rent as developed by David Ricardo and modified by Alfred Marshall.

As Kenneth Arrow³⁹, a Nobel prize-winner, pointed out, information as an economic commodity has attributes of an experience good. Individuals intending to obtain information either by purchase or production cannot know in advance the costs and benefits of certain types of information before they have acquired it. This can be referred to as *information paradox*. One of the conclusions of Arrow's information paradox is that geographic proximity matters in transmitting tacit knowledge developed for a particular application. The managerial knowledge is inherently 'public' of its nature. This means that knowledge is infinitely extensible. While the Internet revolution has minimized the marginal cost of transmitting information across geographic space, the marginal cost of transmitting knowledge, and especially tacit knowledge, rises with distance.

The descriptive power of the new economics has been paid for by the loss of determinism. The new microeconomics is essentially a formal language for expressing knowledge elsewhere obtained. However, it is the new economics that offers the most promise, but it is old economics in the form of industrial organization that has thus far made the greatest contribution. The economist's neoclassical model of the firm was a smoothly running machine in a world without secrets, and uncertainty, and without a temporal dimension. During the past twenty, at least five substantial problems have arisen to disturb a smoothly running machine. They are called *uncertainty, information asymmetry, bounded rationality, opportunism, and asset specificity*. Each of these phenomena, taken alone, violates crucial axioms in the neoclassical model.⁴⁰

The strategic management paradigm concentrates on the *Chandlerian strategy concept*. There is a huge number of writings of Chandler's basic axiom that organizations should configure their internal resources and capabilities to address competitive opportunities and threats⁴¹. Understanding the ways in which organizations process information to deal with various strategic options and the true Knightian uncertainty are crucial to being able to design organizational structure that is in match with the key strategy elements. Chandler (1962) found that technology clearly affects organization. For most of the 20th century, the large vertically integrated managerial corporation persisted because it was the appropriate solution for the capital-intensive industries to maintain minimum efficient scale of operations⁴².

³⁹Arrow, Kenneth (1962), Economic Welfare and the Allocation of Resources for Invention, in Richard R. Nelson (ed.), *The Rate and Direction of Inventive Activity: Economic and Social Factors*, National Bureau of Economic Research, Conference Series, Princeton: Princeton University Press, pp. 609-625.

⁴⁰Rumelt, R. P., Schendel, D. and Teece, D J. (1991), Strategic Management and Economics, *Strategic Management Journal*. Vol 12, pp. 5-29.

⁴¹ A pioneering work: Ansoff, Igor H. (1965) *Corporate Strategy*, McGraw Hill Book Company, New York.

⁴² Chandler, Alfred D. (1997, p. 64) The United States: Engines of Economic Growth in the Capital-Intensive and Knowledge-Intensive Industries, in Alfred D. Chandler, Jr., Franco Amatori, and Takashi Hikino (eds.) *Big Business and the Wealth of Nations*. New York: Cambridge University Press, pp. 63-101: "the essential large-scale investments in both tangible and intangible capital were made not by new enterprises as they had been in the past, but primarily by well-established firms whose existing learned organizational capabilities were critical in developing and commercializing the potential the new technologies on a global scale."

II. REGIONAL AND INDUSTRIAL AGGLOMERATIONS

1. The scale and scope of geographic concentration of firms

The Ricardian comparative advantage is found in accumulation of factors where the nation had the most favorable comparative costs. Gunnar Myrdal⁴³, the famous socio-economist after the World War II, has developed the *core-periphery model* that is a simple yet useful conceptualization to be used at different geographical scales (global, national, regional, etc). Myrdal proposed that the key concept of spatial development is *cumulative causation* that can be explained by *spread* and *backwash* effects. In relationships between core and periphery countries, there are spread and backwash effects. Spread effects are the positive benefits in terms of technology transfer from core countries to periphery countries. The brain drain, which refers to the tendency of highly educated citizens in periphery countries to migrate to core countries, can be considered as an example of the negative backwash effects⁴⁴.

In the beginning of the 21st century, core countries are rich and developed. The average citizen achieves a high standard of living. The USA, EU, Japan, Canada and Australia are recognized as core countries. The periphery countries are less developed having low economic growth and poorly educated, housed and fed population. Many countries in Africa, Asia and Latin America are recognized as periphery countries. The semi-periphery countries seem to improve their position in the global economy whereas many periphery countries are stagnating. Newly industrializing countries (NICs) such as the 'Four Dragons' (South Korea, Taiwan, Hong Kong and Singapore) and the 'Little Dragons' (Malaysia, Thailand, Indonesia and the Philippines), owing to impressive economic growth rates in recent years, can be classified as semi-periphery. Paul Krugman⁴⁵ has proposed increasing returns to scale (through backwash) and expansion to other nearby areas (through spread).

The core-periphery model is challenged by more rigorous conceptualization. Robert Putnam⁴⁶, a political scientist, has studied the relation of civic organizations, good local government and economic development in various regions in the "Third Italy" that is famous of high-fashion, design-intensive goods. In the Third Italy⁴⁷, a whole range of municipal government interventions have been the key to the continued success of the region. Cities have bought land and created industrial parks to encourage sector

⁴³ Myrdal, Gunnar (1957) *Economic Theory & Underdeveloped Regions*, London: Duckworth.

⁴⁴ Braudel, Fernand (1981) *The Perspective of the World*. Volume 3, New York, Harper & Row.

⁴⁵ Krugman, Paul (1995) *Development, Geography & Economic Theory*, Cambridge, MIT Press.

⁴⁶ Putnam, Robert, Leonardi, Robert and Nanetti, Raffaella (1993) *Making Democracy Work. Civic Traditions in Modern Italy*, Princeton University Press, Princeton.

⁴⁷ The "Third Italy" around the province of Emilia-Romagna with 3.9 million residents. The success of the "Third Italy" is evident since during past two decades the "Third Italy" have advanced from Italy's poorest province to the fastest growing economic powerhouse of the country.

collaboration⁴⁸. One of the important intervention mechanisms has been loan consortia created capital sources. The utilization of advance technology and virtuous networks among rival firms make it possible to cooperate around activities of mutual benefit such as training, marketing, and research⁴⁹.

The geographic concentration of firms has been a challenge of the neoclassical economics, especially that of the economic geography. In the first five decades of the 20th century, the dominating topic was the cost minimization through endowments of physical factors of production. Alfred Marshall, the most influential British economist in the era of the second industrial revolution from the 1880s to the 1930s advanced the spatial analysis in his book 'Principles'. Marshall analyzed externalities of specialized industrial locations. His prototypical industrial district was Manchester. In his insightful thinking, industrial districts enjoy the same economies of scale that only giant companies normally get. In Marshall's analysis, industrial districts can contribute to the external economies of the regionally concentrated firms through agglomeration economies that include: *spatial externalities and savings on transportation costs*

Alfred Chandler is a successor of Joseph Schumpeter as a contemporary analyst of corporate histories and their role in the economic growth. In his book, *Scale and Scope*⁵⁰, Chandler compared the history of corporate capitalism in the U.S., Britain, and Germany. Chandler noticed that Britain was the pioneer of the industrial revolution until the 1880s. After that large, vertically integrated corporations in the U.S. were the ones that could develop management institutions, agglomerate the competitive capabilities over industrial districts like Detroit, and, thereby, take collectively bold, entrepreneurial steps to win the global race before the World War I. Chandler's interpretation to that paradox was that Britain's owner-managers feared the loss of control and opposed the necessary consolidation of corporate structures. The large vertically integrated corporation emerged in the U.S. to replace what had been a fragmented structure of production and distribution⁵¹.

Britain's corporations and their institutes were seriously lagging behind the U.S. managerial revolution. Chandler is convincing that the hated U.S. trusts of the late 19 century were the ones that succeeded to increase output, lower costs, and compete vigorously. *The antitrust policy forced trustified firms to reorientate it from horizontal and forbidden agglomerates to vertical agglomerates*. In the light of Chandler's analysis, the actual dynamic competition, a vision of Schumpeter, is fundamentally at odds with

⁴⁸ Especially, in the famous Italian design industries, the marketing organizations locating in Milan and Florence have been crucial in creating competitive edges to SMEs that have not at all skills in foreign languages or cultures. Source: My own field research travels in the Third Italy in the end of 1980s and in the beginning of 1990s, when I analyzed some thirty firms and collaborated with the leading entrepreneurs in the region.

⁴⁹ Piore, Michael and Charles Sabel (1984) *The Second Industrial Divide: Possibilities for Prosperity*, Basic Books, New York.

⁵⁰ Chandler, Alfred (1990) *Scale and Scope. The Dynamics of Industrial Capitalism*, The Belknap Press of Harvard University Press, Cambridge.

⁵¹ In Chandler's words, they "provided an internal dynamic for the continuing growth of the enterprise. In particular, they stimulated its owners and managers to expand into more distant markets in their own country and then to become multinational by moving abroad. They also encouraged the firm to diversify by developing products competitive in markets other than the original one and so to become multiproduct enterprises" (Chandler 1990, pp 8-9).

the neoclassical theory of competition. In the Chandlerian firm, the visible hand of management and the internal routines of coordination provided the coordinative mechanism to hold the stages of production together. *As Chandler has claimed, the large-scale technology of the 19th century "required" vertical integration and conscious managerial attention.*

In the book *The Competitive Advantage of Nations* and in two recent articles⁵², Michael Porter proposes the diamond model as a doctrine for clustering (figure 1) that incorporates the determinants of a company's environment, which influence the company's ability to create and sustain competitive advantage in the global markets. Porter explains such agglomeration economies in terms of his 'diamond'. Its four corners are demand, factor conditions, rivalry-strategy, and industry clusters. The countries with high value-added manufactures have high per capita GDPs and are clustered in the USA and the EU. Porter identifies two critical forces as the driver of innovations: *pressure and proximity*. Pressure refers to the industrial economists' view of environmental determinism. Proximity increases the concentration of information, and thus the likelihood of its being acted upon. That will say that few companies make strategy changes voluntarily; most are forced to.

⁵²Porter, Michael E. (Feb. 2000) Location, competition, and economic development: Local clusters in a global economy. *Economic Development Quarterly*, v. 14, pp. 15 - 34.
Porter, Michael E. (1998) The Adam Smith Address: Clusters and the New Economics of Competition, *Business Economics*, Jan 1998, 33,1.

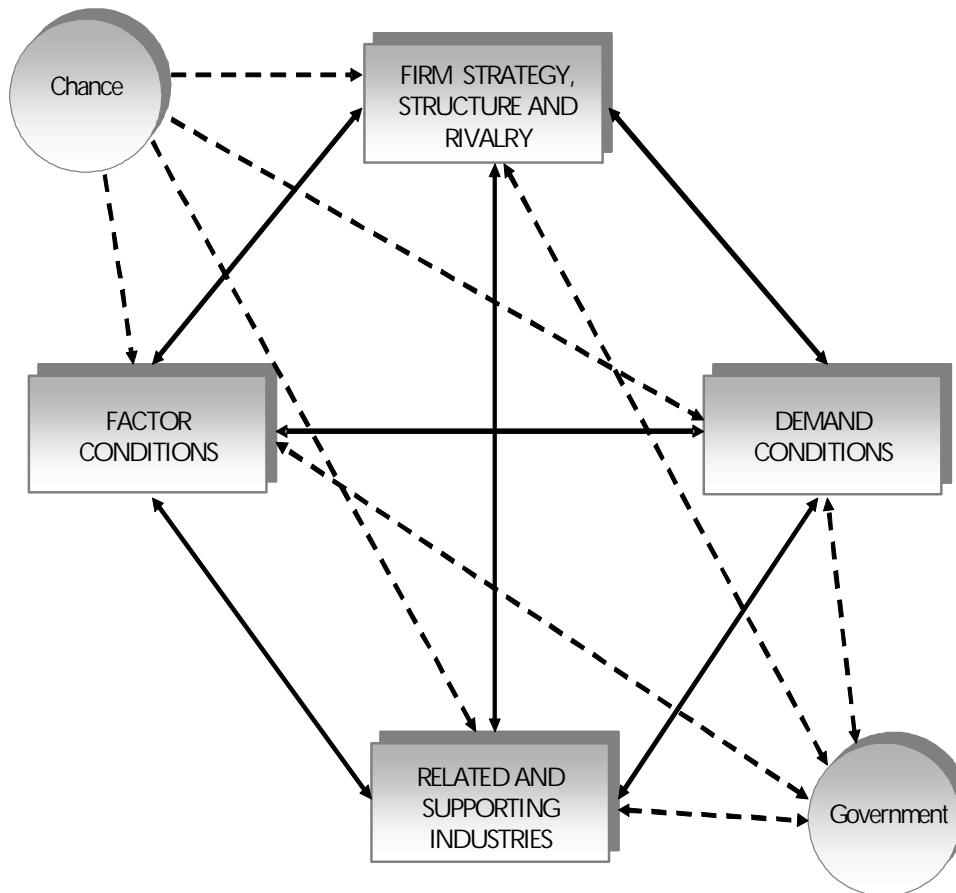


Figure 1: The diamond model

In Porter's thinking, the only meaningful measure of competitiveness at the national level is *productivity* that is the value of the output produced by a unit of labour or capital, since competitiveness is created and sustained through a highly localized process. As Porter puts it, 'Successful firms are frequently concentrated in particular cities or states with a nation'⁵³. Porter's accepts a local or national initiative but takes pains to differentiate cluster strategy. The investment climate is broadly defined and includes macroeconomic and political stability, the tax system, labour market policies affecting the incentives for workforce development, and intellectual property rules and their enforcement⁵⁴. *Porter believes that localization economies, not urbanization economies, draw on information flows. Being near competitors and mutual suppliers, a firm can enhance its knowledge of the industry operations and permits employees' specialization.*

⁵³ Porter, 1990, p. 29. Porter, Michael (1990) *Competitive Advantages of Nations*, Macmillan, Free Press, New York.

⁵⁴ Porter 2000, p. 9.

When a cluster shares a uniform approach to compete, this common cognition might create rigidities in terms of Edith Penrose that prevent adoption of improvements. Clusters also might not support truly *radical innovation*, which *tends to invalidate the existing pools of talent, information, suppliers, and infrastructure*. If we consider the critical importance that internationalization has had (and still has) to small and open countries like Finland, it is justified to criticize that Porter in his cluster theory concentrates too heavily on the nation state. Porter is, of course, affected by the size of his own country, the USA⁵⁵. The Nordic countries specialize in small missions and this narrowing of the global business scope forces firms to make the strategic choice: 'Internationalize (or globalize) or die'⁵⁶. Alternative concept could have been Erik Dahmen's development block⁵⁷ that is more entrepreneurial.

The success of the government-created Internet over the proprietary standards of firms is in many ways a classic illustration of the agglomeration economies. The Internet's existence would counteract proprietary networking strategies, notably by Microsoft, and, thereby, open the possibility for a wide range of firms to compete based on innovations around the Internet. Previous infrastructure innovations have had a double effect, permitting dispersion of routine activities but increasing the complexity of productive activity. The Internet produces forces for deagglomeration and agglomeration⁵⁸. It allows remote coordination of innovative activities. Because the Internet cannot 'feel' or 'touch', it maintain needs for deep personal contacts. The Internet's agglomeration effects seem to be stronger than deagglomeration ones; University centers' purely intellectual activities are even more clustered than material activities. This suggests that present or future improvements in communication technologies, such as the Internet, also may not eliminate the role of proximity.

The EU has carried out collaborative development programs for 20 years to capture the 'spill over' benefits of co-developments. The EU has not as strong antitrust legislation as the USA. The EU has been especially active to reach consensus on technological standards, such as GSM. The EU prefers institutional, de jure standards, when the USA prefers market selection, de facto standards. The comparative survey of 34 regional clusters (of which approximately half are traditional and half science-based) in 17 European countries reveals that that young and science-based clusters dominate the European landscape. Regional clusters in general seem to perform better than the national average in corresponding industries. Regional clusters often constitute fertile

⁵⁵ Penttinen, Risto (1994) *Summary of the Critique on Porter's Diamond Model. Porter's Diamond Model Modified to Suit the Finnish Paper and Board Machine Industry*, ETLA DP 462, Helsinki.

⁵⁶ Luostarinen, Reijo (1979) *Internationalization of the Firm. An Empirical Study of the Internationalization of the Firm with Small and Open Domestic Markets with Special Emphasis on Lateral Rigidity as a Behavioral Characteristics in Strategic Decision Making* (dissertation), Helsinki School of Economics, A-30, Helsinki or Luostarinen, Reijo (1994) *Globalization and SME. Globalization of Economic Activities and Small and Medium-sized Enterprises (SMEs) Development*, Ministry of Trade and Industry, Business Development Department, Helsinki.

⁵⁷ Dahmen, Erik (1986) Schumpeterian Dynamics. Some Methodological Notes, in Day, R and Eliasson, G., *The dynamics of market economies*, Stockholm.

⁵⁸ Storper, Michael, and Richard Walker (1989) *The Capitalist Imperative: Territory, Technology and Industrial Growth*. Oxford: Basil Blackwell.

ground for stimulating innovations and competitiveness of existing firms, encourage entrepreneurship and may attract inward investments⁵⁹.

The paradox of globalization is that the geographic concentration of firms in the same industry is 'strikingly common around the world'⁶⁰. The geographical areas that seem to catalyst global growth are only marginal parts of the whole global base⁶¹. The Internet will reinforce the importance of face-to-face contact, and make possible greater linkages between localized clusters at very long distances. Albert Hirschman⁶² expected that core cities grow through increasing returns (to knowledge), with the 'satellites' of leading technology innovators' 'spread' by knowledge exploitation nearby. Urban ghettos are a much a part of the famed 'Silicon Valley production system' as are the engineering laboratories at Stanford, or the military R&D facilities.⁶³

Substituting labor for capital and technology, along with shifting production to lower-cost locations has resulted in waves of *Corporate Downsizing* throughout Europe and North America⁶⁴. The global demand for innovative products in knowledge-based industries is high and growing rapidly; yet the number of workers who can contribute to producing and commercializing new knowledge is limited to just a few areas in the world. There are two fundamental characteristics of knowledge that differentiate from the traditional factors of production in the traditional economy⁶⁵:

1. knowledge has increased the importance of geographic proximity
2. the greater degree of uncertainty, asymmetries and transactions cost lead to an increased role of entrepreneurial activity.

The importance of geographic proximity is clearly shaped by the role played by the scientist. The scientist is more likely to be located in the same region as the firm when the relationship involves the transfer of new economic knowledge. Globalization is shifting the comparative advantage in the OECD countries away from being based on traditional inputs of production, such as land, labor and capital, towards knowledge. The knowledge intensive or network intensive regions are potential winners of the global agglomeration economies. They can be called '*Hot Spots*'. The most famous example is Silicon Valley, the region most associated with the rise of the Internet⁶⁶. *The close relationships between universities, federal research labs and industry leaders*

⁵⁹ *Regional clusters in Europe, Observatory of European SMEs 2002/ No. 3, European Commission.*

⁶⁰ Porter 1990, p. 120.

⁶¹ See Ohmae and the case Japan (Ohmae, Kenichi (1996) *The Evolving Global Economy*, A Harvard Business Review Book, Cambridge).

⁶² Hirschman, Albert (1958) *The Strategy of Economic Development*, New Haven, Yale University Press.

⁶³ Saxenian, Annalee (1994) *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge: Harvard University Press.

⁶⁴ Baily, Martin, Eric J. Bartelsman and John Haltiwanger (1996) Downsizing and Productivity Growth: Myth or Reality? *Small Business Economics*, 8(4), pp. 259-278.

⁶⁵ Henrekson, Magnus and Johansson, Dan (1999) Institutional Effects on the Evolution of the Size Distribution of Firms, *Small Business Economics*, 12(1), pp. 59-83.

⁶⁶ The Internet itself was, of course, a project directed by federal government agencies in association with regionally-based university computer departments.

have shaped the collaborative and entrepreneurial network of firms in the region. The particularity of the story of the evolution of the Internet and its interaction with the Silicon Valley region, like the unique story of all technologies and regions, helps to undermine the simplistic models of universal economic development.

Financial service industries are highly clustered in 'Hot Spots' in big cities, and especially in the triad of New York, London and Tokyo⁶⁷. *These informational, intellectual, and innovation-based clusters have succeeded well.* The Internet economy has produced high densities of dot.com firms in San Francisco, New York, Los Angeles and Seattle, and is following precisely the same geographical pattern as financial service industries and others. For immaterial intellectual production, there is great value in being at the center of business, where the division of labor can be pursued intensively through seminars, conferences, and spontaneous face-to-face contacts. The exchange of experiences requires trust, understanding and long-term relationships, either directly or through third party enforcement.⁶⁸

The study of the interaction of information technology and Silicon Valley highlights the highly mediated nature of regions, by the technology that shapes new industries, by the federal investments that fuel the growth of new population sectors and new innovations. While the reasons for this clustering around universities are not clear, the availability of government-funded technology has been a catalyst of agglomeration economies in modern science-based industries. For instance, Cambridge biosciences cluster has spawned a *constructed advantage* state-wide and nationwide for the USA by its magnetizing effects upon firms, policies and talents. Today, universities and their related research laboratories spread throughout most regions. *Geographical proximity can be expected to serve the incubation of new technologies. As firms expand their competitive edges, their activities may move out of the region generating 'spread' of technological innovations globally.*

That there exists regional life cycles in parallel with technological or demand based seems evident. The oldest technology parks in the U.S. at Research Triangle in North Carolina, at Stanford Industrial Park and the University of Utah Research Park have kept going. Examples from the successful European cluster are: British auctioneers are all within a few blocks in London and Basel is the home base for all three Swiss pharmaceutical giants. Many of the new technology parks have failed to attract a critical mass of growth firms⁶⁹. Route 128 in Boston, Massachusetts (minicomputers), the Minneapolis, and Minnesota (mainframes) have experienced great declines in growth, accompanied by economic devastation because of inability to proact the changes in the markets. The emphasis in cluster theory is on *dynamic improvement*⁷⁰. Clustered firms are successful in the origination stage when there are lots of opportunities for growth. The innovativeness of clustered firms gives them a favorable

⁶⁷Sassen, Saskia (1991) *Global Cities: New York, London, Tokyo*. Princeton: Princeton University Press.

⁶⁸Williamson, Oliver E. (1985) *The Economic Organization Firms, Markets and Policy Control*, Harvester Wheatsheaf Books, New York.

⁶⁹Harrison, Bennett. 1994) *Lean And Mean: The Changing Landscape of Corporate Power in the Age of Flexibility* Basic Books: US.

⁷⁰Porter 2000, p. 28.

time to market. But although we know that there is a kind of 'economies of timing', it is difficult to identify the emergence of a cluster before it occurs. However, there seems to be an element that can be used to anticipate the origin and initial location of geographical clusters of firms. It is a *single fast growing and successful new start-up firm*⁷¹. If several new firms spin off from a common parent, or a set of parents, then a cluster of like firms could begin spontaneously. Referring to the writings of the scale and scope of agglomeration economies, it is possible to assume that the Schumpeterian entrepreneurship is functioning in regional clusters like Silicon Valley somewhere between local networks and global clusters (figure 2).

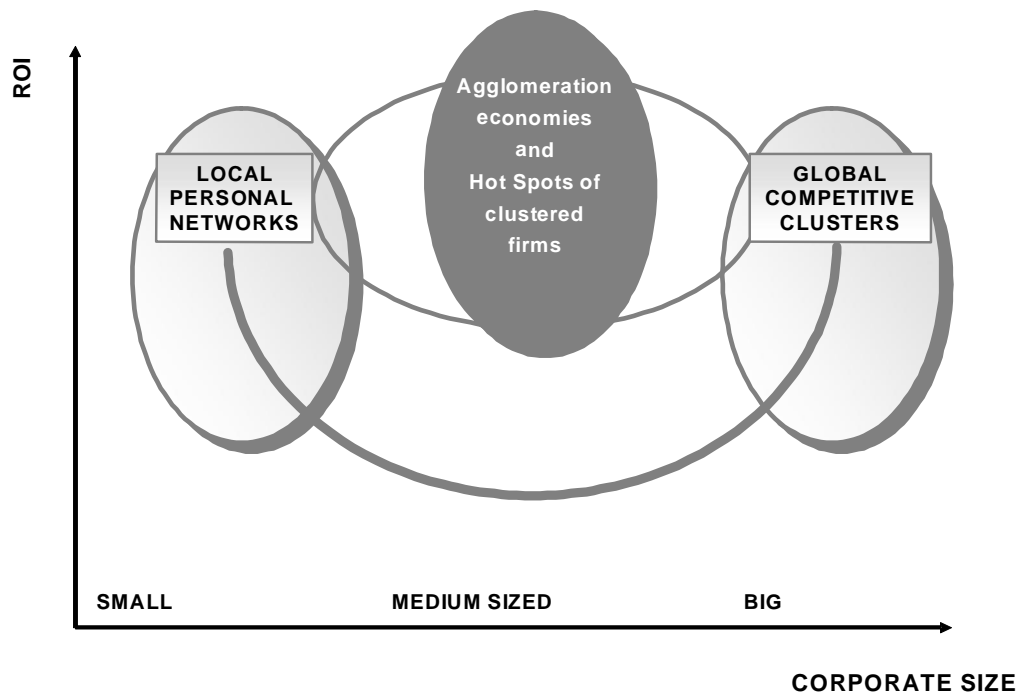


Figure 2: The Schumpeterian dynamics and the agglomeration effects

According to Putnam or Saxenian, collaborative contracting relationships, social capital is the "trigger" of economic progress of regions. *Social capital is a major source of comparative advantage of a modern knowledge society or post-industrial society in terms of David Ricardo*. In that sense, it is the key measure of the Schumpeterian dynamics. Social capital includes many various institutions of a modern knowledge society. For instance, Intellectual Property Rights (IPRs) are vital for ensuring that creativeness is rewarding and the availability of the public domain technology is the catalyst of technology transfer from universities and research laboratories to various business companies. Obtaining funds for any creative business plans is a universal challenge. Private and institutional venture capitalist markets are the critical institution in that sense.

⁷¹ Saxenian, Annalee (1994) *Culture and Competition in Silicon Valley and Route 128*, Harvard University Press, Cambridge.

2. The Industrial Organization Economics, IO, Harvard and Chicago approaches

In the industrial organization theory (IO) the key characteristics of the oligopolistic industry structure are materialized in the idea of entry (or exit) barriers⁷², and market power is supposed to stem from the presence of structural or behavioral barriers to the entry of new competitors⁷³. *The IO theory is an extension of the neoclassical economic theory. Instead of analyzing abstract oligopolistic game, the IO tries to verify empirically the presence of structural or behavioral barriers.* Inside the IO, the Structure-Conduct-Performance (SCP) paradigm concentrates on the analyses of how the presence of structural or behavioral barriers varies between various industries. Relying closely to the neoclassical economic theory's assumptions about the firm's homogeneity, Harvard's SCP approach attributes most variations of the firm's performance differences across industries⁷⁴.

The Harvard approach seeks to explain how market processes direct the activities of firms in meeting market demand, how market processes break down and how these processes adjust to improve economic performance. In the 1960s, the Chicago School of industrial organization⁷⁵ challenged the Harvard view of entry barriers in the industrial organization. The Chicago approach was more liberal to the monopolistic behavior of big multinationals and did not view strategies such as collusion to create entry barriers as necessarily anti-competitive. The Chicago approach accepts the principal managerial objective of profit maximization through development of specialized, high-quality resources and capabilities.

The SCP perspective as the combination of the Harvard and the Chicago approaches of the industrial organization is still valid especially in industries in which big multinational, publicly listed firms dominate. *The Chicago approach investigates the SCP model (structure, conduct and performance) with a deep concern for structure and includes references to the institutions which guide the production and contractual operations of particular market*⁷⁶. The relevant framework for the analyses of structural or behavioral barriers is the one specified by Frederick Scherer⁷⁷ who is often mentioned as the absolute authority of IO paradigm until the 1970s. Scherer divides the economic environment into two elements:

1. *Basic conditions*
2. *Market structure*

The SCP paradigm assumes that the performance of a single industry is determined of how various kinds of firms in that industry can conduct their activities in terms of

⁷² Bain, Joe (1956) *Barriers to Competition*, Harvard University Press, Cambridge.

⁷³ The model of extended competition by Porter (1980) is one of the most well-known visualization.

⁷⁴ Bain, Joe S. (1956) *Barriers to New Competition*. Cambridge MA: Harvard University Press.

⁷⁵ For instance: Stigler, George J. (1968) *The Organization of Industry*. Chicago: University of Chicago Press.

⁷⁶ Modified from Cool & Schendel, 1987, p. 1103.

⁷⁷ Scherer, Frederic (1980) *Industrial Market Structure and Economic Performance*, Rand McNally and Company, Chicago.

economic environment structural characteristic (basic conditions, and market structure). Scherer's model is an important contribution, since it includes most of the relevant variables that the research studies of the SCP paradigm have identified between the 1950s and 1970s. Scherer's original model includes a broad list of variables. Conduct-variables are a mix of the Harvard and the Chicago approaches, since Scherer includes also aspects of the law and economics approach that is one of Chicago's core areas. Performance variables contain Harvardian microeconomics and macroeconomics. Latest modification with David Ross includes also *public policy* variables (figure 3⁷⁸).

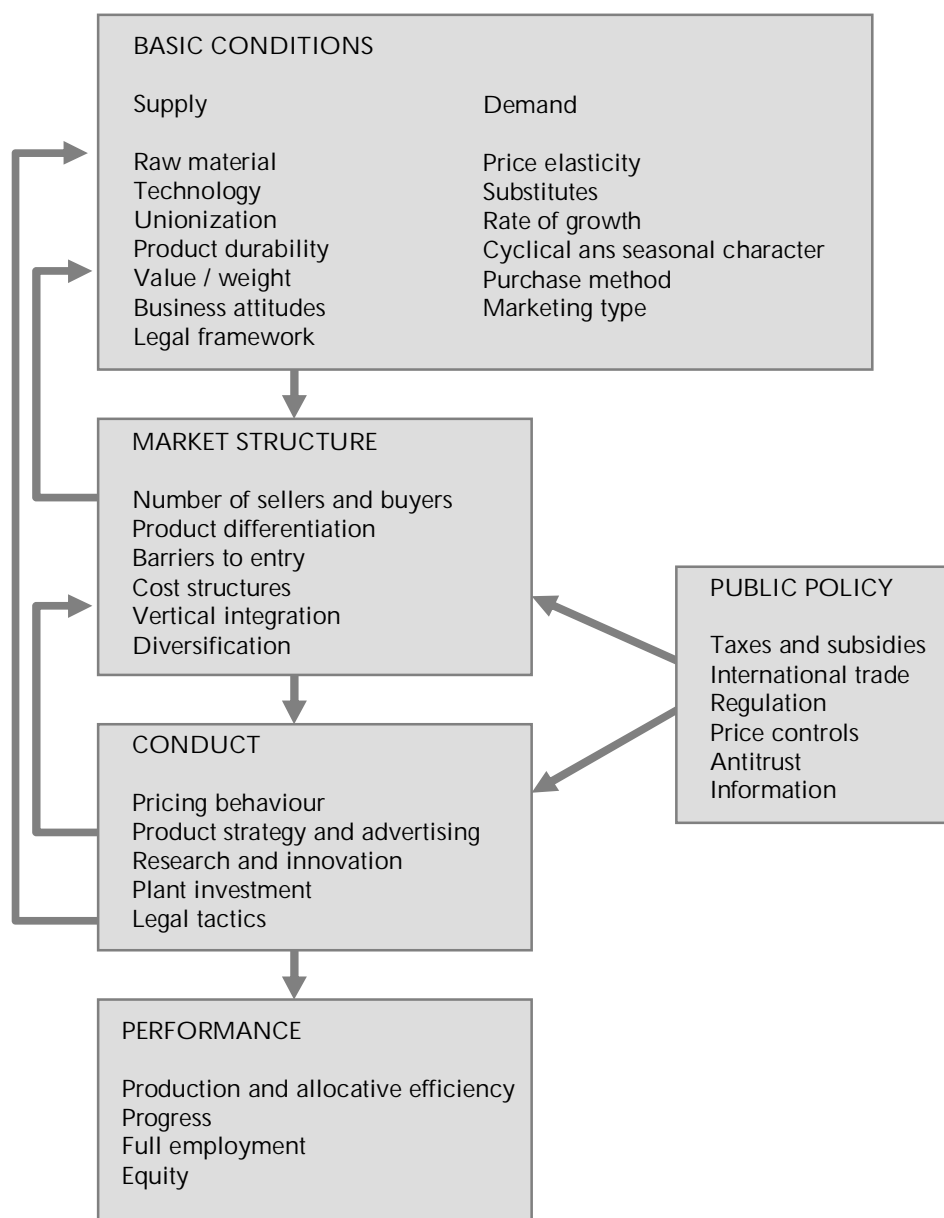


Figure 3: Scherer & Ross model

⁷⁸ Scherer, Frederic and Ross, David (1990) *Industrial Market Structure and Economic Performance*. Houghton Mifflin Company, Boston, p. 5.

The SCP paradigm has its theoretical underspinning in the orthodox, economic theory, also called the material-based, economic theory. In that sense the SCP paradigm can be seen as an extension of the neoclassical material-based economic theory that is a production theory in its basic nature. The huge technological revolution since the oil crisis in the early 1970s has actually shaped the basic conditions of supply and demand. Perhaps, one of most crucial difference is that the technological revolution, parallel with the globalization of industrialized countries, has materialized the Schumpeterian notion of dynamic completion. The difficulty with the Harvardian approach is that its models exclude some vital elements of economic growth like the whole contractual function of the firm. The assumption underlying mainstream theory is that differences between firms contesting a market are insignificant. But this mainstream research has been remarkably unsuccessful in discovering relationships between market performance and market structure (Rumelt 1991).

Harvard view of entry barriers in the IO that was challenged by the Chicago approach was in focus during the 1970s. Basic conditions in the global and intellectualized economy are in many ways different than in most of traditional industries. Market structure elements are history-culture-specific, path-dependent⁷⁹, and so are public policy elements. The IO paradigm discusses about barriers or structures between or inside industries. New Institutional Economics (NIE) (or the Chicago approach) discusses about elements like specific investments⁸⁰ or asset ownership⁸¹ as explanations of the existence and the scope of the firm in industrial organization economics⁸². In NIE both resource-based and transactions cost or agency theory logic are applied⁸³. *The NIE is a valuable contribution to the development of the theory of the industrial agglomerates, since the public-private-interface is a crucial problem in the global and intellectualized economy*⁸⁴.

The Harvard Department of Economics under the lead of Richard Caves began to modify the traditional SCP model of structure and performance to include differing positions or strategic groups of firms within industries. The original concept of 'strategic group'⁸⁵ was invented by Hunt⁸⁶ in his doctoral dissertation. He proposed this term in order to describe the asymmetry and explain the performance he observed in the strategies of members of the U. S. 'white goods' industry in the 1960s. This asymmetry

⁷⁹ North, Douglass (1993) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge.

⁸⁰ Coase, 1937; Williamson, 1975, 1985.

⁸¹ Grossman, Stanford and Hart, Oliver (1986) The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration, *Journal of Political Economy* 94, pp. 691-719.

⁸² Modern financial theories (like Jensen, Michael and Meckling, William (1976) Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, pp. 305-360) have been proposed agency costs as a primary determinant of the existence and scope of the firm.

⁸³ Central to this theory is the notion Ronald Coase, a Nobel price winner, that firms emerge as a mechanism to organize resources as a way to generate and appropriate rents (Coase, 1937).

⁸⁴ An excellent analysis is found in Lintunen (2000).

⁸⁵ Strategic behavior of the firms is the key criteria by which the groupings are observed.

⁸⁶ Hunt, M.S. (1972). *Competition in the Major Home Appliance Industry, 1960–1970*, Unpublished Ph.D. dissertation, Harvard University.

resulted in four different strategic groups. Newman⁸⁷ postulated that the complexity of the structure of the strategic groups populating an industry exerts a significant influence on their performance. He tested this hypothesis on a sample of 34 4-digit U.S. producer goods industries and he concluded that complexity can help to explain why profitability differences exist across groups. Porter⁸⁸, comparing the performance of the 'leader' and 'follower' strategic groups, in 38 3-digit consumer goods industries, stated that 'leader' groups outperform 'followers', although the difference found was not statistically significant.

Richard Caves's doctoral program targeted to redefine Joe Bain's (1956) original concept of 'entry barriers' to the notion of 'mobility barriers' which protect members of a competitive group of firms from attack by members of other industries and competitive, strategic groups. Thus, this generalization of entry barriers into mobility barriers *'allows a richer and more realistic portrayal of the process of entry and the motives for diversification (cross-entry)*⁸⁹. The early doctoral studies by Hunt, Newman and Porter in the strategic group doctrine attempted to explain the diversity of demand and cost curves of firms within the same industry first discussed by Edward Chamberlain (1933). For that purpose they utilized the theoretical construct of strategic groups to shed more light on strategic behavior, rivalry and performance differences between firms. Firms form a strategic group within a competitive setting if they follow similar strategies with respect to product market combinations and/or to the resource bundles they employ. *A new radical contribution of Richard Caves doctoral program was the axiom that there exist persistent structural features not only on a firm level but also on a group level that give rise to structural or strategic, asymmetric mobility barriers protecting a given group from the entry of potential rivals and, thereby, permitting persistent performance differences between groups and, hence, between firms.*

Essentially, the main tenet of this theory is that between-group variations in performance are greater than within-group variations because of the existence of mobility barriers. The proposition that entry barriers generalize to mobility barriers may help us to understand why some groups of firms within an industry persistently earn higher profits than others, and why some groups of organizations adopt different strategies although not all strategies are equally successful. Without mobility barriers firms within a group with successful strategies could be quickly imitated by other firms from different groups or industries, and firm groups' high profit rates would tend towards 'normal' profit, except for relatively differences in the firm's abilities to execute the best strategy through operational activities. The existence of these mobility barriers means that some groups of firms can enjoy systematic advantages over others groups, which can be overcome only by strategic acts that can lead to schumpeterian 'creative destruction', structural change in the industry structure.

⁸⁷ Newman, H. H. (1973). *Strategic Groups and the Structure-Performance Relationships: A Study with Respect to the Chemical Process Industries*, Unpublished Ph.D. dissertation, Harvard University.

⁸⁸ Porter, M. E. (1973) *Consumer Behavior, Retail Power, and Manufacturing Strategy in Consumer Goods Industries*, Unpublished Ph.D. dissertation, Harvard University.

⁸⁹McGee and Thomas, 1986, p. 155.

Unlike the orthodox theories of differentiated oligopoly, the new Harvard approach attempts to explain the differences, rather than simply explaining the consequences of those differences for market behaviour or outcomes. This early strategic group concept was introduced to explain the presence of long-run heterogeneity among firms within the same industry and to remedy theoretical shortcomings of the structure-conduct-performance (SCP) paradigm. The concept was in fact primarily useful to explain heterogeneity between firms within an industry as the "homogeneity assumption" of the traditional SCP paradigm proved to be false⁹⁰. Management as the strategic actor is the champion of the new SCP analysis, when the traditional SCP analysis was based on the assumption that the internal logic of structural characteristics determines the management actions⁹¹. The new SCP analysis has its theoretical underspinning in so called *Resource-based (RB) approaches* that are built on work on the theory of the firm begun by Penrose (1959). *Resource-based theory emphasizes how heterogeneity in firms' internal characteristics and the resources and capabilities they control generate heterogeneity in their performance.*

During the 1980s, the pace of change of the new Harvard doctrine accelerated. The most influential contribution of the early 1980s was undoubtedly Michael Porter's *Competitive Strategy* (1980). In a remarkably short time, Porter's applications of mobility barriers or generic strategies became broadly used in teaching, consultation, and research projects. The rationality in that in his trivial textbook, Porter moved economic thinking closer to the strategic management cognition. Porter (1980) has confirmed himself as the author of influence in the topic as the huge number of citation reveals. *In spite of the citations, the original Structure-Conduct-Performance paradigm (SCP) has not been supplanted⁹². Most of the researchers referring directly to Porter's simplistic textbook have totally misunderstood the original SCP paradigm or its intellectual modifications lead by Richard Caves.*

There is another scientifically ambiguous tradition, associated with the Purdue University where Dan Schendel, together Arnold Cooper, began the so-called "brewing" studies which explored the empirical links between organizational resource choices, interpreted as "strategy," and firm's performance⁹³. The Purdue paradigm has developed a special tool for tackling the relation between a firm and its industry competitors. These analyses are based on the idea to look at the specific internal heterogeneity of the industry structure that is the basic assumption of the resource-based view. The analytical idea is to group the heterogeneous industry structure into homogenous sub-groupings. The groups of companies are called *strategic groups* according to the original concept of Hunt.

⁹⁰McGee, J. 1985. Strategic groups: a bridge between industry structure and strategic management in Thomas, Howard & Gardner, D. (Eds.) *Strategic marketing and management*, Chichester, John Wiley & Sons, p. 298.

⁹¹That is the meaning of conduct.

⁹²Ramos-Rodriguez, Antonio-Rafael and Ruiz-Navarro, Jose (2004) Changes in the Intellectual Structure of Strategic Management Research: A Bibliometric Study of the Strategic Management Journal, 1980-2000, *Strategic Management Journal*, Vol. 25, 981-1004, p. 1001.

⁹³Rumelt, R. P., Schendel, D. and Teece, D. J. (1991), Strategic Management and Economics, *Strategic Management Journal*. Vol 12, pp. 5-29.

Whereas the new Harvard approach captures strategic groups from a top-down perspective, the strategic choice approach utilized by Purdue-studies⁹⁴ assumes that systematic similarities and differences exist between firms as a result of strategic resource choices (i.e. decisions to invest in assets which are often difficult and costly to imitate)⁹⁵. The strategic choice view conceptualizes strategic groups *bottom-up* (firms with heterogeneous resource deployments are grouped into homogeneous groups). Firms are grouped, not because they are the same kind, but *because they are follow the same strategy yet differently*⁹⁶. The Purdue studies sought to focus on individual firms and their patterns of competition within a single industry. A very important trait of this new theoretical stream was the utilization of numerous variables linked to strategy to identify competitive groups selected within the context of the particular industry under study. All the research mentioned above was the beginning of a large body of diverse empirical studies in which strategic groups would be defined in terms of multiple key scope and tangible and intangible resources commitments of each firm⁹⁷. The rationality used is a system model of the following⁹⁸:

1. Performance = f (controllable; non-controllable variables)
2. Firm performance = f (operations; strategy; industry structure)

A strategic group is defined as *'a set of firms competing within an industry on the basis of similar combinations of scope and resource commitments'*⁹⁹. Parallel to that the new Harvard tradition hypothesizes that the presence of groups within an industry moderates the amount of rivalry at industry level and concludes that the concept of strategic groups allows us to systematically integrate the differences in the skills and resources of an industry's member firms and their consequent strategic choices into a theory of profit determination¹⁰⁰. In their intelligent analysis, McGee and Thomas (1986) concluded that *oligopolistic interdependence and homogeneity of firms become recognizable, not at the industry level, but at the strategic group level*¹⁰¹. A common assumption is that rivalry between groups is more intense than rivalry within groups because of opportunities offered for (tacit or otherwise) cooperation and/or

⁹⁴Hatten, K. J. (1974): *Strategic Models in the Brewing Industry*, Unpublished doctoral dissertation, Purdue University.

Patton, G. R. (1976): *A Simultaneous Equation Model of Corporate Strategy: The Case of the U.S. Brewing Industry*, Unpublished doctoral dissertation, Purdue University.

⁹⁵McGee, John & Thomas, Howard (1989) Strategic groups: a further comment, *Strategic Management Journal*, 10, pp. 105-107.

⁹⁶Hatten & Hatten, 1987, *Strategic Management Journal*, Vol. 8, p. 333.

⁹⁷Cool, K. & Schendel, Dan (1987) Strategic Group Formation and Performance: The Case of the U.S. Pharmaceutical industry 1963-1982, *Management Science*, p. 1104.

⁹⁸Scherer, Frederic and Ross, David (1990) *Industrial Market Structure and Economic Performance*. Houghton Mifflin Company, Boston, p. 5.

⁹⁹Cool and Schendel, 1987, 33, p. 1106

¹⁰⁰Porter, 1979, p. 220.

¹⁰¹McGee & Thomas, 1986, p. 160.

coordination between group members¹⁰². Parth-dependent, strategic investments in information and technology acquired to develop factor market imperfections and isolating mechanisms are at the heart of strategic group formation. Firms making similar commitments develop similar competitive resources, pursue similar customers and environmental opportunities in similar ways, and form strategic groups. The concept *mobility barriers* between strategic groups rest, however, on the same structural features as barriers to entry into any group from outside the industry¹⁰³.

III. BUSINESS STRATEGY AS A FRAMEWORK FOR GROWTH-COMPANIES

1. The BCG and PIMS as the challengers of the administrative management doctrine

Hofer & Schendel¹⁰⁴ summarized the early studies of strategic management tradition. What is still relevant is the distinction of strategic management studies into two areas: *process* studies and *content* studies. Although the majority of the strategic management studies discusses about process issues, the truth is still that there are no convincing scientific result of the performance contribution of process excellence. There are a lot of content studies of the varying performance ratios of different strategic groups or firm clusters. The content tradition of strategic management has much to do with the modern IO. In the IO, the challenge is to contribute to the discussion of strategic groups; parallel with business policy research¹⁰⁵.

One of the inspiring business level content models is still the Boston Consulting Group's (BCG) *experience curve* from the 1960s¹⁰⁶. As Rumelt, Schendel, and Teece (1991, 11) claim, 'the Boston Consulting Group was a powerful force within strategic management'. Although the idea that some cost elements seems to follow a learning-

¹⁰²The extent of this moderating effect depends on three factors

(1) the number and share distribution of groups in an industry: the greater the number of groups and the more equal their shares, the greater the rivalry among them;

(2) the 'strategic distance' between strategic groups: the greater the 'strategic distance' (i.e. the different groups differ along key dimensions), the greater the rivalry at industry level;

(3) the level of 'market interdependence': the greater the 'market interdependence' (the degree to which groups target the same customers) the greater the rivalry at industry level.

Porter, Michael (1979) The structure within industries and companies' performance, *Review of Economics and Statistics*, May, pp. 214 – 227.

¹⁰³ McGee, John and Thomas, Howard (1986) "Strategic Groups: Theory Research and Taxonomy", *Strategic Management Journal*, Vol. 7, p. 14.

¹⁰⁴Hofer, Charles W. and Schendel, Dan (1978) *Strategy Formulation. Analytical Concepts*, West Publishing.

¹⁰⁵ Salimäki Markku (2003) *Suomalaisen design-teollisuuden kansainvälinen kilpailukyky ja kansainvälistyminen (International competitiveness and competitive advantage of the Finnish design-industry)*, (dissertation), Helsinki School of Economics, A-220, Helsinki.

¹⁰⁶ Boston Consulting Group (1970) *Perspectives on Experience Curve*, Boston Consulting Group, Inc., Boston.

by-doing pattern had been well-known since Frederick Taylor¹⁰⁷, it was largely ignored by economists because of a theoretical nuisance; it seems to destroy the ability of standard models to reach equilibrium. BCG argued that experience-based cost reduction was not restricted to the early stages of production, but continued indefinitely; BCG provided convincing data showing experience effects in a broad variety of industries.

BCG suggests that there is no naturally stable relationship with competitors on any product until some one of the competitors has a commanding market share of the normal market for that product and until the product's growth saturates. Furthermore, under stable market conditions, the profitability of each competitor should be a function of his accumulated experience with that product. The logic of the experience curve challenged the stationary microeconomic theory because *for the first time there was a simple, parsimonious account of what competitive advantage is like, and how it is gained in the long run*. The logic of experience-based competition was not actually imported from economics, but was instead developed within strategic management literature and, then, exported to economics¹⁰⁸. As Lintunen (2000) has written the key elements of strategic management doctrine have been borrowed from Joseph Schumpeter, and, perhaps, through Alfred Chandler's writings.

BCG gave a useful guidance to manage high-value business strategies. BCG advised its clients to "invest" in market share in growing industries and "harvest" market share in declining industries. BCG considers the experience effect to be a demonstration of the way in which a firm conducts its whole business. BCG's claim for the *experience curve was that for each cumulative doubling of experience, total costs would decline roughly 20% to 30% because of economies of scale, organisational learning and technological innovation*. In the BCG matrix, the experience curve effect requires that market share investments are increased by the firms in the business to be able to drive down costs in the long run and that the firm with a dominant market share will inevitably have a cost advantage over competitors.

A high market share means high experience and lower costs, implying high margins and profitability. It implies improved cash flows whereas a low market share implies the loss of cash and profits. Market growth is often used as an indicator of the stage in the product life where positive growth indicates a growing market and a negative growth indicates a declining market. The stages of the life cycle play a role in decision-making and the matrix is a quick method of showing where the business/ products stand in their life cycle. Growth, therefore, indicates attractiveness. BCG is still challenging. BCG's experience curve was most applicable to material-intensive industries, in hi-tech-industries there could a combination of experience curve and economies of speed¹⁰⁹, as demonstrated in figure 4.

¹⁰⁷ Taylor, Frederick (1911) *The Principles of Scientific Management*, New York: Harper Bros.

¹⁰⁸ Rumelt, Schendel, and Teece, 1991, p. 12.

¹⁰⁹The notion of economies of speed is from Chandler, Alfred (1990) *Scale and Scope. The Dynamics of Industrial Capitalism*, The Belknap Press of Harvard University Press, Cambridge.

Unit costs of production

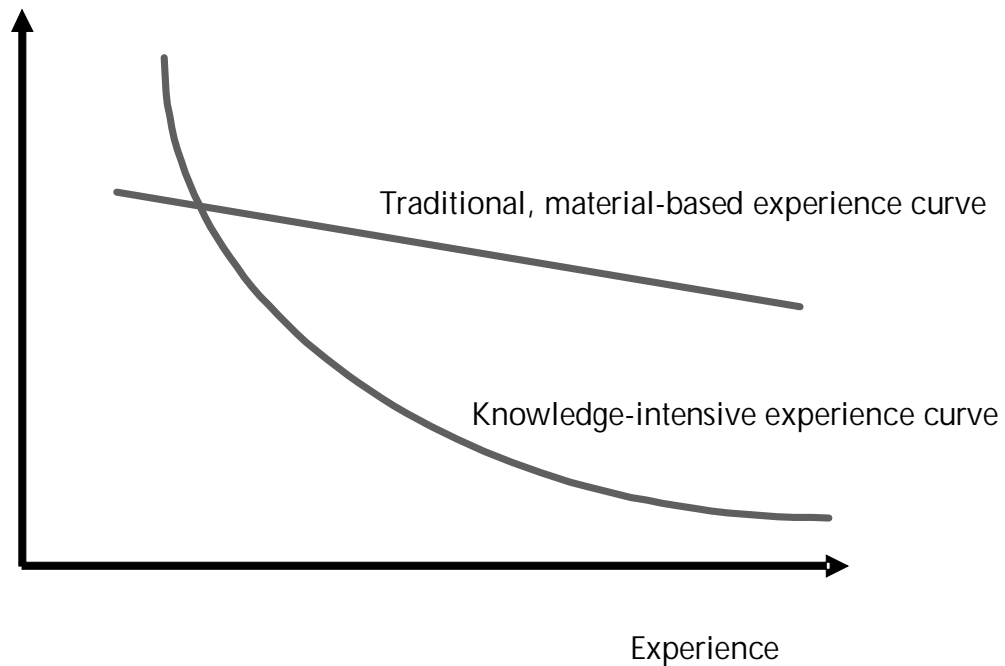


Figure 4: Traditional, material-based and knowledge-intensive experience curve

The relation between material-intensive and knowledge-intensive experience curves has not been verified by scientific research. The studies of knowledge-creating companies demonstrated (e.g. Nonaka and Takeuchi, 1995), knowledge has a different logic than material in economizing. The original innovation of the information economies has been presented by Kenneth Arrow. The endogenous growth theory (e.g. Robert Lucas and Paul Romer) implies to the same direction. The extensive literature of regional agglomeration economies and industrial organization economies has also a strong tension that a stock and flow of knowledge minimize the transaction costs of various kinds of institutes mediating between firms and public organizations.

BCG has stimulated academic scientific research. In the 1970s, various business schools began to look systematically at corporate performance data¹¹⁰. The most crucial stimulus to go further from the BCG model was the Profit Impact of Market Strategy (PIMS) studies¹¹¹. PIMS is an example of the practical Stanford doctrine and

¹¹⁰At Helsinki School of Economics, Veikko Leivo referring to PIMS and Rumelt's (1974) study of diversification strategy motivated his students to study the performance linkages of business strategy. The story of the market-share effect provides a good illustration of this dynamic.

¹¹¹ A good summary: Buzzell, Robert D. and Gale, Bradley T. (1987) *The PIMS Principles*, The Free Press, New York.

initiated by General Electric. The PIMS model includes some of the most relevant SCP-variables like market differentiation, market growth rate, entry conditions, unionization, capital intensity and purchase amount. PIMS model includes also a set of relative environmental variables like relative perceived quality, relative market share, relative capital intensity and relative costs. PIMS told managers they could increase share, and thus profit, by redefining their market scope (i.e., redefine their competitors and presumably their market share position). PIMS is an example of a program that has its background in the academic institutions from the 1970s. PIMS contribution is to provide insight, principles derived from an analysis of statistical data. The PIMS Competitive Strategy Paradigm is described in figure 5¹¹².

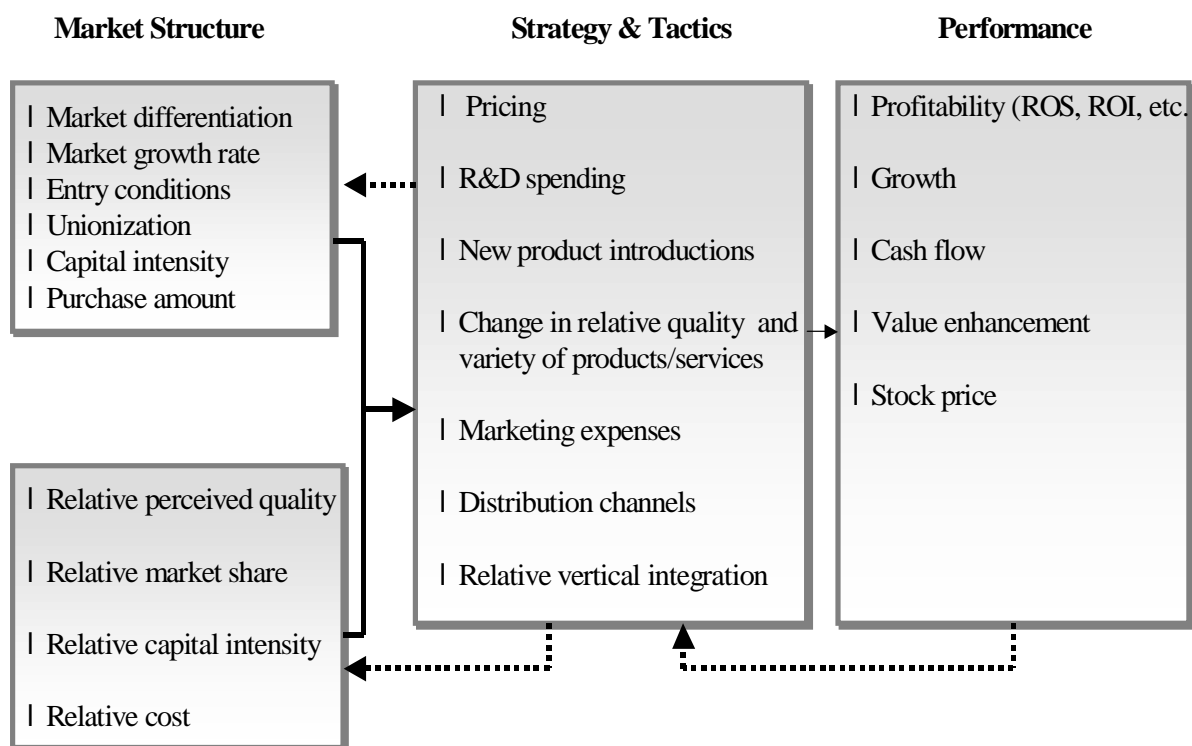


Figure 5: The PIMS Competitive Strategy Paradigm

The leading role of both BCG and PIMS characterized the strategic management doctrine in the late 1970s¹¹³. The PIMS database¹¹⁴ has been used by managers and planning specialists of the participating companies in many ways. Applications of PIMS-based analysis include developing business plans, evaluating forecasts submitted

¹¹² Buzzell, Robert D. and Gale, Bradley T. (1987) *The PIMS Principles*, The Free Press, New York.

¹¹³ Rumelt, Schendel, and Teece, 1991, pp. 9-12.

¹¹⁴ PIMS database about 3.000 business unit included in the database are big or medium-sized.

by division managers, and apprising possible acquisitions and divestitures, among others. In over 100 published studies, researchers have drawn on PIMS to explore various dimensions of performance, economies of vertical integration or conditions favouring investments in mechanizing and automating. One of the most challenging results is the strong contribution of relative market share to profitability (figure 6).

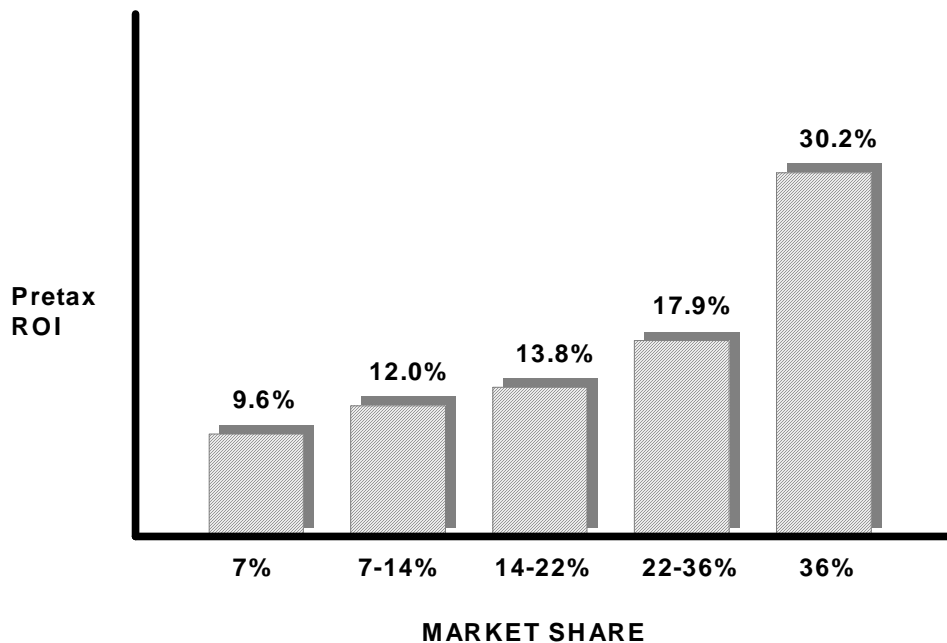


Figure 6: The main result of PIMS

2. Some of the extensions of the business strategy doctrine

The empirical association between market share and profitability was first discerned in IO economics research where the relationship was interpreted as evidence of "market power." PIMS studies using a parallel model of the structure-conduct-performance paradigm envisaged that market share represents a crucial structural element as the major source of supernormal returns. There were challenging efforts to develop a PIMS method¹¹⁵. In the early 1980s, when Levitt¹¹⁶ declared the time of globalization to be

¹¹⁵ Since the 1970s, PIMS has been an important benchmarking method in Finland. Many of the Finnish international enterprises have used the PIMS database to learn the "principles" of profit contribution. Professor Veikko Leivo was one of the pioneers in the PIMS approach. He motivated his students to analyze PIMS "principles". I worked as an economist in the central association of technology industries in the late 1970s. In that time, companies like Nokia started to apply PIMS. I act as a "PIMS specialist" in the industry associations.

¹¹⁶ Levitt, Theodore (1983) "The Globalization of Markets", *Harvard Business Review*, May-June.

begun, the intelligent doctrine a' la BCG and PIMS was rejected. Many of the leading institutes and consultant companies adopted Porter's¹¹⁷ model. Porter's model of generic strategies can be interpreted as a simplification of the main stream of Industrial Organization (IO) Economics¹¹⁸.

The IO researchers are well aware of Porter's model that is far too trivial compared to the latest studies in the strategic group research. Porter divided a company's market scope in two: *industry wide* and *particular segment only*. Anyone who really has read Porter's dissertation¹¹⁹ could recognize that this is the same division into big (industry wide) and small (particular segment only) companies. This is not very much more than what any policy-maker or business manager already knows. The real problem of a company's market scope selection is not the scale of production in terms of orthodox economic theory. The basic choice is how to define a company's business boundaries or arena like Derek Abell¹²⁰ demonstrates. In that sense, there are two basic alternatives:

- (1) *Market strategy formulation* - it means many various forms of oligopoly theory extensions like markets leadership doctrine, competitive strategy game and strategic group positioning.
- (2) *Customer strategy formulation* - it is the only relevant alternative, if markets are really incomplete like Chamberlin or Robinson describe. In that situation, it is not reasonable to invest in oligopoly game. The best possible alternative is strategic marketing that Abell (1980) gave foundations to.

Differentiation as well cost leadership should be interpreted according to the two various modes of strategy formulation:

(1) *Market strategy formulation*

- differentiation is a passive company specific strategy, which can only be implemented by mass marketing, 1/3 of the whole and,
- cost leadership is the classical problem of optimal investments and location, 2/3 of the whole.

¹¹⁷ Porter, Michael (1980) *Competitive Strategy*, Macmillan, Free Press, New York.

¹¹⁸ In Finland, Porter's model was commonly used in the banking industry and small and medium sized industries with destructive outcomes in the early 1990s. The leading business schools in Europe have renewed their IO models to counterpart the reality of global markets. Howard Thomas (the dean of Warwick) is the leading gestalt of the European doctrine. Still, the Finnish tradition is 'Porterian' in the leading business schools.

¹¹⁹ Porter, Michael (1973) *Consumer Behavior, Retail Power, and Manufacturing Strategy in Consumer Goods Industries*, dissertation (unpublished), Harvard University.

¹²⁰ Abell, Derek E. (1980) *Defining the Business: The Starting Point of Strategic Planning*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

(2) Customer strategy formulation

- differentiation is a product specific strategy like Chamberlain theorized in his intelligent book on the monopolistic competition, 2/3 of the whole
- cost leadership is the classical problem of technology diffusion, 1/3 of the whole.

A revaluation of Porter's generic strategies is shown in figure 7.

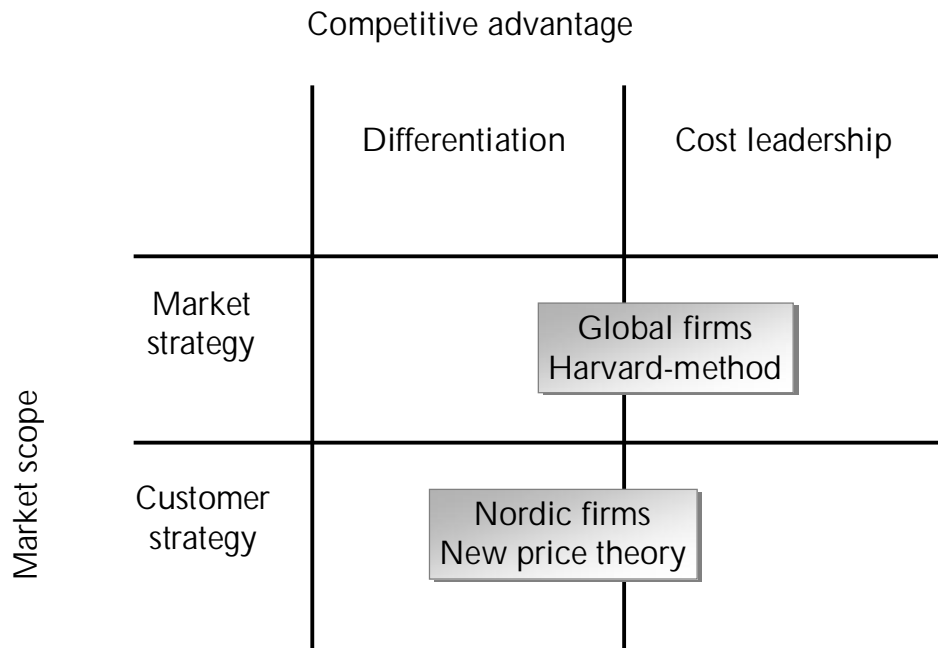


Figure 7: An interpretation of Porter's generic strategies

What is important to notice is that the market (or competitive) strategy is the arena of global firms that have huge marketing budgets, which allow them to differentiate their offerings and utilize location and ownership advantages over continents¹²¹. *What Porter do not tell and what we know from experience is, that a market-wide competitive game is risky for small and open countries.* The Nordic firms are skillful in the customer-specific differentiation. It is a strong capability, since global giants cannot combine a large-scaled marketing and logistics with customer-specific strategies. In figure 8 an application model of the Nordic niche-strategies modified for the design retailing is shown. The truth of market strategies is different from the cases described in the standard textbooks.

¹²¹ Dunning, John (1993) *The Globalization of Business*, London

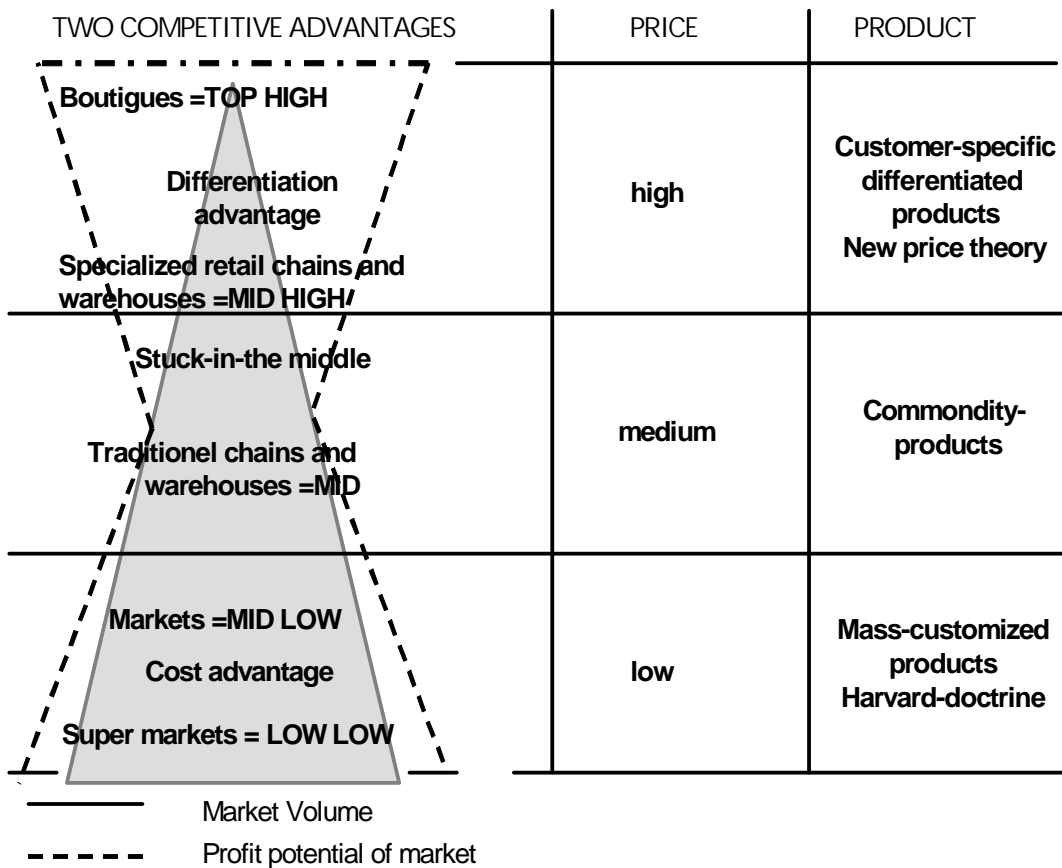


Figure 8: The Nordic niche-strategies modified for the design retailing.

Big global companies like IKEA dominate the mass-customized products. IKEA is superior to mobilize global sourcing and can develop a design-collection for many consumer segments with a reasonable price (MID LOW). But IKEA and other transnational companies can only imitate some elements of the original design. Their success is primarily dependent on the economies of scale or scope. Differentiation is only a minor element of the strategy formulation. Most of the Nordic industrial and retailing companies are positioned in the MID and they all have serious difficulties to compete against IKEA. The only strategy, which is still profitable to small players, is high customer-orientation with fashionable design-collection and high pricing (MID HIGH)¹²². Global firms are obliged to follow mass-customization strategies like Alvin Toffler¹²³ described.

¹²² Fortunately, there are positive examples of that in the Nordic countries like Stocke in Norway with Balanse and Tripp Trapp collections

¹²³ Toffler, Alvin (1980) *Third Wave*, Bantam, New York

3. Strategic group as a business strategy tool?

The Purdue doctoral program was an ambiguous attempt to integrate the new strategic group paradigm of the IO and the strategy content approach. The Purdue tradition rooted in strategic management, the Marshall-Penrose resource-based view, and is further focused on firm-specific factors which are controllable decision variables. Schendel's and Cooper's brewing industry studies produced two dissertations (Hatten, 1974; Patton, 1977) and number of publications¹²⁴. Purdue studies utilized advanced methodology in the studies of the U.S. brewing industry. The Purdue stream sought to focus on individual firms and their patterns of strategy within a single industry¹²⁵. A very important trait of this new theoretical stream was the utilization of numerous variables linked to strategy to identify competitive groups selected within the context of the particular industry under study. *Purdue-studies was an evidence of the facts like: The changes in share and changes in profitability were positively related in the strategic group of big brewing companies but negatively sloped in the small one.*

The new Harvard IO tradition shifted attention from entry barriers to competition among industries to mobility barriers among strategic groups within an industry. The Purdue tradition developed a content strategy model that describes strategies or various strategic groups in detail. When the new Harvard IO tradition relied on cross-sectional data in their analyses, the Purdue tradition has a rich data-base of poled cross-sectional and time-series data. Although the Purdue was more developed in that sense, and they could analyze dynamic changes in industry sub-groupings, they could not analyze differences in performance within strategic groups. Strategic groups can serve here as reference groups or benchmarks, as the the Purdue brewing studies convinced¹²⁶. The cross-sectional and longitudinal studies pursue to draw valid inferences about the relationship between strategic group membership and persistent performance differences. Lahti's dissertation¹²⁷ is one of the first dynamic studies where the strategic group-performance linkage is explored in a whole industry composed of firms

¹²⁴Cool, K. O., and Schendel, D. (1987): "Strategic group formation and performance: The case of the U.S. pharmaceutical industry, 1963-1982", *Management Science*, 33: 9, pp. 1102-1124.

Cool, K. O., and Schendel, D. (1988): "Performance differences among strategic group members", *Strategic Management Journal*, 9: 3, pp. 207-223.

Hatten, K. J., and Schendel, D. E. (1977): "Heterogeneity within an industry: Firm conduct in the U.S. brewing industry, 1952-71", *Journal of Industrial Economics*, 26: 2, pp. 97-113

Hatten, K. J., Schendel, D. E., and Cooper, A. C. (1978): "A strategic model of the U.S. brewing industry: 1952-1971", *Academy of Management Journal*, 21: 4, pp. 592-610.

Schendel, D., and Patton, G. R. (1978): "A simultaneous equation model of corporate strategy", *Management Science*, 24: 15, pp. 1611-1621. Scherer, F. M. (1980): *Industrial Market Structure and Economic Performance*, Rand-McNally, Chicago, IL.

¹²⁵Based on these two key components, a much more precise definition of the strategic group concept was given. According to Cool and Schendel (1987, 1106) a strategic group can be defined as "a set of firms competing within an industry on the basis of similar combinations of scope and resource commitments". This definition contrasts with the less specific strategic group notion given from the traditional IO.

¹²⁶See Hatten & Hatten, 1987.

¹²⁷Lahti, Arto (1983) *Strategy and Performance of a Firm. An Empirical Investigation in the Knitwear Industry in Finland 1969-1981* (dissertation), Helsinki School of Economics, A-41, Helsinki.

with very different sizes. Later, Kumar¹²⁸, Fiegenbaum and Thomas¹²⁹, Vikkula's¹³⁰, Salimäki and Killström have studied how a firm's strategic choice affected its performance with the evolution of time.

The most important tenet of this approach is that some firms may consistently perform better than others within the same strategic group. More precisely, while mobility barriers can explain some of the sustainable performance differences among competitive strategic groups and, therefore, among firms of different groups, performance differences often exist among firms holding identical strategic positions within an industry¹³¹. New IO economics argue that true group-level effects result from group-level processes, i.e. market power, efficiency effects and differentiation effects¹³². Hence, intragroup rivalry is the essence of strategic group membership. The performance variations within a group can be expected as firms have idiosyncratic resources and, hence, performance differences within a group can overcome performance differences between groups¹³³. Thomas & Venkatraman (1988) made a survey of early studies and found only a weak linkage between group membership and performance. *Despite of the fact that group membership proved to be a poor predictor of firm performance, the interest for strategic group research has never faded away, on the contrary*^{134, 135}.

The New IO paradigm applied by strategic management scholars has focused on the costs to create resources and capabilities, including learning, as an important explanation of the existence and scope of the firm¹³⁶. Mobility barriers protect 'superior' strategic groups from the expected entry of firms from 'inferior' strategic groups¹³⁷. A mobility barrier, like an entry barrier at the industry level (Bain, 1956) and isolating mechanisms at the firm level (Rumelt, 1984), is a limitation on imitation,

¹²⁸Kumar, N. (1990): "Mobility barriers and profitability of multinational and local enterprises in Indian manufacturing", *Journal of Industrial Economics*, 38: 4, pp. 449-463.

¹²⁹ Fiegenbaum, A., Sudharshan, D., and Thomas, H. (1990): "Strategic time periods and strategic groups research: Concepts and an empirical example", *Journal of Management Studies*, 27: 2, pp. 133-148.

¹³⁰Vikkula, K. (1993): *Strategic Choice and Performance in the Securities Intermediation Industry: An Empirical Analysis of Strategic Groups in Scandinavia*, The Helsinki School of Economics and Business Administration, Helsinki.

¹³¹Carroll, C., Pandian, J. R. M., and Thomas, H. (1994): "Assessing the height of mobility barriers: A methodology and an empirical test in the U.K. retail grocery industry", *British Journal of Management*, 5: 1, pp. 1-18.

¹³²Dranove, D.; Peteraf, M. & Shanley, M. (1998) Do strategic groups exist? An economic framework for analysis, *Strategic Management Journal*, 19, pp. 1029-1044.

¹³³Lawless, M.; Bergh, D. & Wilsted, W. (1989) Performance variations among strategic group members: an examination of individual firm capability, *Journal of Management*, 15, pp. 649-661.

¹³⁴Thomas, Howard & Venkatraman, N. (1988) Research on strategic groups: progress and prognosis, *Journal of Management Studies*, November, pp. 537 - 555.

¹³⁵Reger, R.K. & Huff, Anne (1993) Strategic groups: a cognitive perspective. *Strategic Management Journal*, 14, pp. 103-124.

¹³⁶ Finnish studies (Lahti (1983) Salimäki (2000), Killström (2005) (Killström, P, *Strategic Groups and Performance of the Firm*, Helsinki School of Economics A-248, dissertation, 2005) has this orientation.

¹³⁷Fiegenbaum, A.; Sudharsan, D. & Thomas, H. 1990 Strategic time periods and strategic groups research: concepts and an empirical example, *Journal of Management Studies*, 27, pp. 133-148.

or a set of factors that deter the movement of a firm from one strategic group to another¹³⁸. When using certain variables to form groups, the presence of performance differences between the groups cannot be used as a proof that the variables used to delineate groups are mobility barriers¹³⁹. Hatten and Hatten (1987) have raised concerns about the theoretical validity of the strategic group concept. The legitimacy of strategic group existence cannot be resolved with a cluster analysis. Cluster analysis detects groups by a predetermined variable selection. While an inductive method can be defensible during exploratory phases of a research, the researcher has little arguments to say that the structure found is 'the' substructure of the industry¹⁴⁰.

Reger and Huff¹⁴¹ suggest some means in which current conceptualizations of strategic group structures could be enriched:

(1) Every firm does not have to have a strategic position

For instance, the ambiguous result of studies attempting to link strategic group membership to profitability are stuck in that dilemma. Theoretically, the existence of mobility barriers is linked to oligopoly as the dominant competitive model. Without mobility barriers there are no strategic positioning advantages.

(2) Group membership is a matter of degree

Ambiguously defined strategic groups can be verified in many ways and using different dimensions or methods depending on researcher's own premises.

(3) Some groups may be tightly associated while others are more diverse.

The pattern of strategic group formation is sequential, since some firms are rapidly linked by clustering algorithms while other lie at greater distance and are incorporated into a strategic group much later in the clustering procedure.

(4) Overlapping group membership may characterize some industries.

Strategic groups being overlapping can signal (a) an evolution of strategic group structure - a potentially viable location for new group formation or (b) a 'stuck in the middle' -problem.

¹³⁸Segev, E.; Raveh, A. & Farjoun, M. (1999) Conceptual maps of the leading MBA programs in the United States: core courses, concentration areas, and the ranking of the school. *Strategic Management Journal*, 20, pp. 549-565.

¹³⁹"Strategic groups are one of the most valuable analytic concepts in the armory of the strategist, practitioner or researcher. Groups and asymmetry go hand in hand, and together may hold the key to a greater understanding of market entry and exit and the processes underlying industry structure" (Hatten & Hatten, 1987, pp. 340-341).

¹⁴⁰Barney, J. & Hoskisson, R. (1990) Strategic Groups: Untested Assertions and Research Proposals, *Managerial and Decision Economics*, 11, pp. 187-198.

¹⁴¹ Reger, Rhonda and Huff, Anne (1993) Strategic Groups: A Cognitive Perspective, *Strategic Management Journal*, Vol. 14, pp. 115-117.

(5) For periods of time, strategic group structure may not exist or may not be apparent.

Performance differences between groups are often explained by the presence of mobility barriers while the mobility barriers are said to be rooted in the variables used to delineate the groups¹⁴².

A strategic group is a 'real' group and not just an "artefact" constructed by the researcher. A strategic group is a well functioning oligopolistic group of mutually interdependent firms, whose position is protected from entry from outside or mobility from inside the industry. Mobility barriers are a necessary prerequisite for sustained performance differentials between groups. Group members may well react in parallel to environmental changes due to their common resources, strategies, histories and managerial mindsets¹⁴³, and as such create mobility barriers undeliberately or unintendedly. Pitt and Thomas¹⁴⁴ have innovated *Enhanced Structure-Conduct-Performance model* (ESCP) that is shown in figure 9.

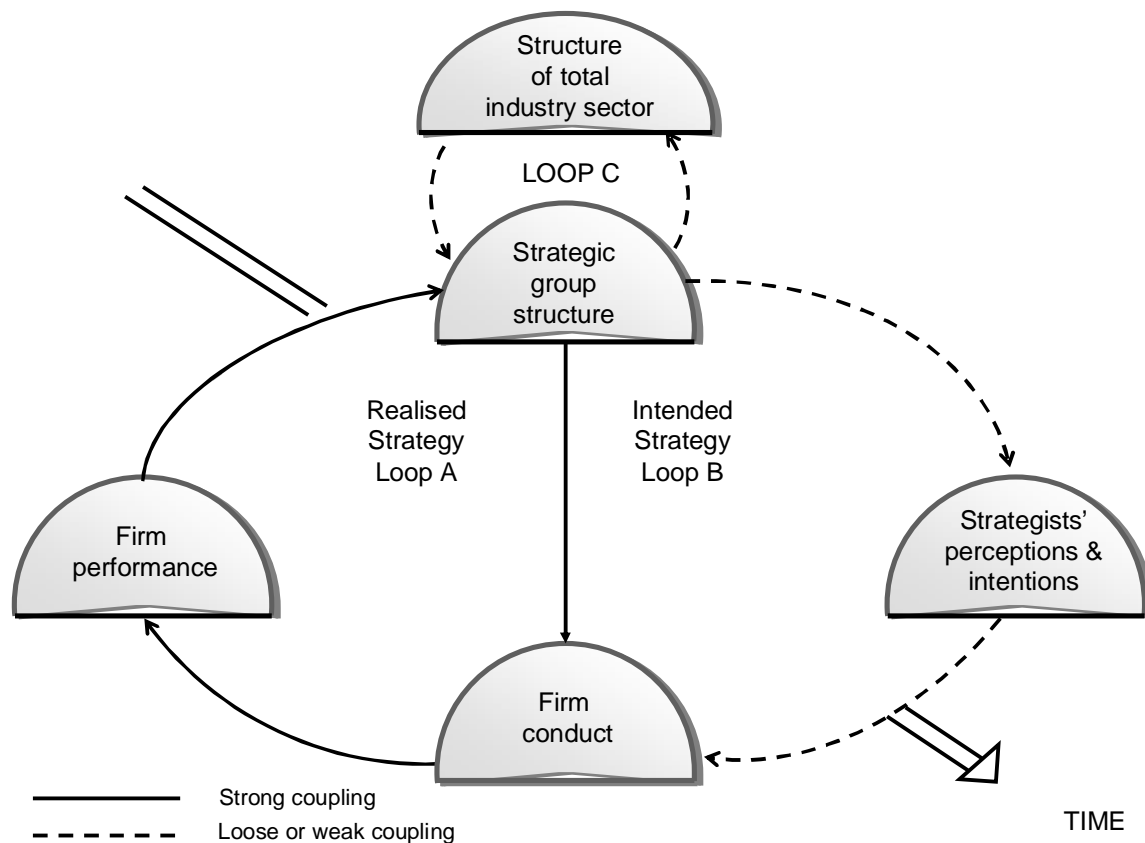


Figure 9: Enhanced Structure-Conduct-Performance (ESCP) model

¹⁴²See Thomas & Venkatraman, 1998.

¹⁴³Peteraf, M. & Shanley, M. (1997) Getting to know you: a theory of strategic group identity, *Strategic Management Journal*, 18 (Summer Special Issue), pp. 165-186.

¹⁴⁴ Pitt, M. and Thomas H. (1994) Industry Groups and Strategic Management: A Reappraisal of Strategic Group Concepts and Research Methodologies in Daems, Herman and Thomas, Howard (eds.) *Strategic Groups, Strategic Moves and Performance*, Pergamon, p. 85.

The ESCP simplifies a complex, empirical reality. It takes the posited group-within-sector (Loop C in Figure 9) as the basic unit of analysis. *Assuming that a strategic group is a population of firms, the group, not the firm, must be regarded as the prime unit of analysis.* Because the orientation of early strategic group studies has been strategy content more than strategy process, the conduct-performance link (Loop A) is essentially realized strategy in terms of Mintzberg¹⁴⁵, with the rider that the firm's performance outcomes directly affect group structures subsequently; this is, variances in productive and allocative efficiencies produce differential long-run growth rates, potentially changing firm's postures and, ultimately, group composition¹⁴⁶. The firm's conduct is moderated by an intervening set of perceptual and motivational variables (Loop B), intended strategy in terms of Mintzberg. Lacking systematic empirical evidence, Pitt and Thomas see these links as weak and loosely coupled. Group structures are one major source of sector structure. Loop C links are relative weak in practice¹⁴⁷.

In Lahti (1983, p. 31) the theoretical and empirical analysis (Figure 9) of links between the group structures and the industry sector structure is firm conduct. The major innovation is to divide the firm conduct-concept into two subelements:

1. Strategic industry competition of the performance potentiality

There is assumed to be an interaction between the firm's business definition (Abell, 1980), the strategic dependence of firms within a common strategic group and the strategic industry competition at the industry sector level.

2. Operational Industry Competition focusing on the performance realization

There is assumed to be an interaction between the firm's functional strategies, the functional dependence of firms within a common strategic group and the operational industry competition at the industry sector level.

The third element is called 'Performance achieved'. There is assumed to be an interaction between the firm's economic performance, the economic performance contribution that a common strategic group adds to to the firm's economic performance and the operational industry competition at the economic performance of the industry sector. The model (figure 10) is a more comprehensive view for the seeking explanation to the firms's performance.

¹⁴⁵Mintzberg, Henry (1980) *The Nature of Managerial Work*, Englewood Cliffs, J., Prentice Hall, New York..

¹⁴⁶ Pitt, Thomas, 1994, p. 85.

¹⁴⁷ Pitt, Thomas, 1994, p. 86.

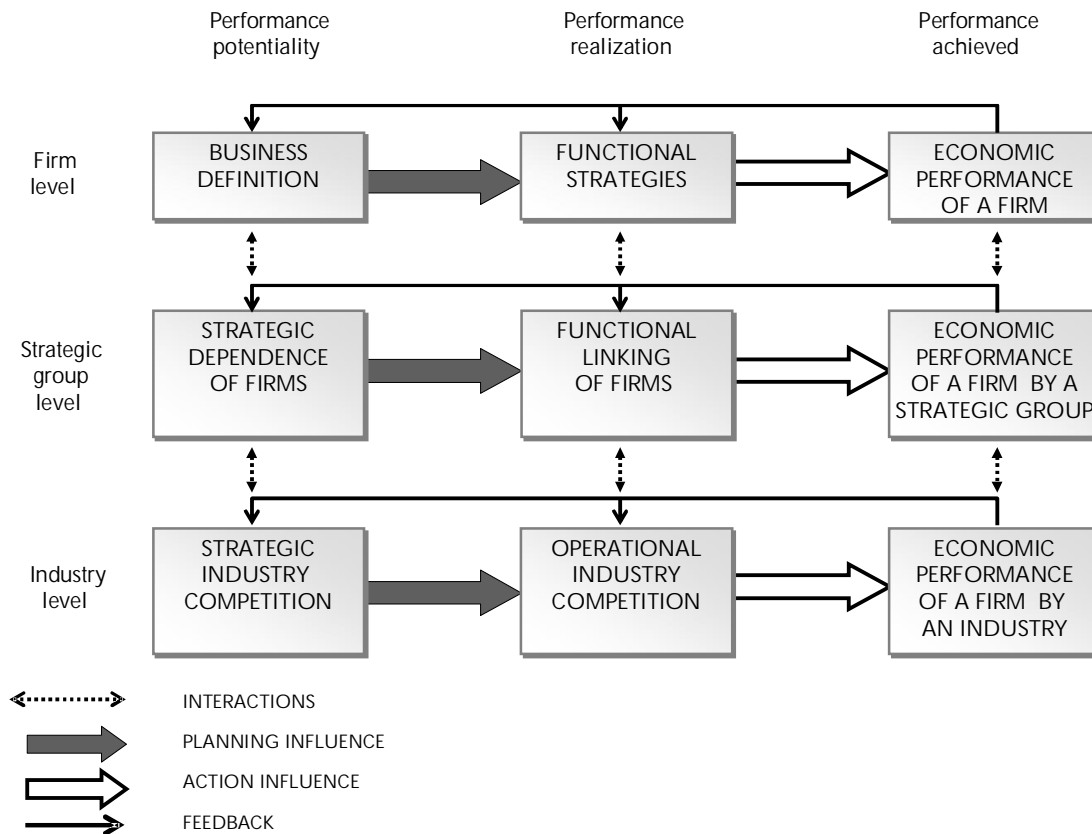


Figure 10: The three hierarchical processes of Lahti's model

The empirical study of the Finnish knitwear industry contained:

1. The *history analysis of the industry evolution from the early 1960s to the early 1980s* that illustrated the multi-faced phenomenon of the historical reality in terms of Alfred Chandler
2. The *quantitative data* used in objective indicators consisting of financial, marketing, and production records available of a typical knitwear firm. The data-base collected included a 13 year span (1969-1981) and covered 15 firms.
3. *Five firm cases* that described in details how these firms responded to the business environment's changes in three levels of performance.

The 14 knitwear firms that could provide complete data were divided into three strategic groups (big, medium-sized and small) according to their size that seemed to be the most crucial element of strategy behavior. The methodology selected was in much the same as used in the Purdue studies. The new innovation was that Lahti's empirical study was conducted in the way that the systematic differences in the two conduct elements and 'performance achieved' were analysed within each of strategic groups

(big, medium-sized and small). Based on the comprehensive, sequential analyses, Lahti (1983, p.169) concluded:

It is basically the actions of the leading sub-groups within strategic groups (big, medium-sized and small) that through their strategic and operation actions and performance achieved create the image of industry attractiveness.

The revised model of industry evolution through strategic group formation is shown in figure 11. The complete model contains also a revised model for the firm's and industry's level.

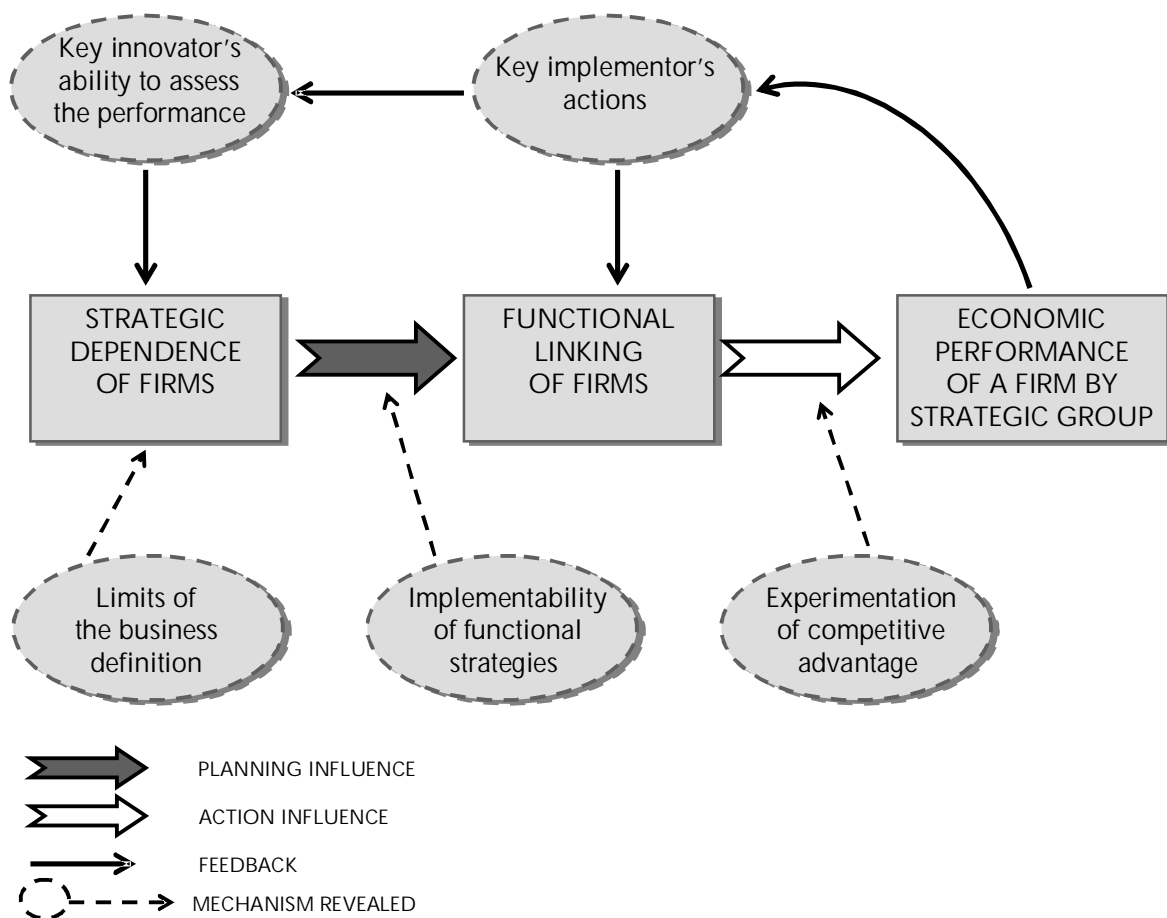


Figure 11: The revised model of industry evolution through strategic group formation

Research shows that established mental maps lead managers to ignore contradictory data of the current state of a firm¹⁴⁸. In the same way, a strategic group structure maintains collective mental maps of managers. *One or more strategic group member firms can act as evolutionary agents to force the existing strategic group structure to the transition process.* Lahti¹⁴⁹ included a detailed analysis of how successful strategic group member firms acted as evolutionary agents in the knitwear industry in Finland in the 1970s. In that time, the trigger of industry evolution was Finland's integration to the EEC¹⁵⁰ together with some evolutionary changes in the production technology, buyer demographics and distribution channels. The Finnish knitwear industry was in the trap of declining profitability of overpopulated strategic positions in the EFTA¹⁵¹ markets. Some firms (Nanso and Virke) could act as evolutionary agents to break the established mental maps of the managers in the knitwear industry. The leading firm in the industry (Suomen Trikoo) was challenged to reorientate, which never totally succeeded. The leading firms in the Finnish knitwear industry are nowadays the change-agents (Nanso and Virke) and the former leader (Suomen Trikoo) has been merged with a change-agent (Nanso).

Lahti (1983) is one of the pioneering studies of the substantive performance tradition within the strategic group paradigm (table 1).

	Prior classification was via:			
	"Substantive" measures of		"Perceptual" measures of	
	Structure / conduct	Performance	Group structures	Patterns of conduct
Within sector studies	Hunt (1972)	Lahti (1983) Johnson and Thomas (1987)	Dess and Davis (1984)	Dess and Davis (1984)
Across-sector studies	Harrigan (1980) Tushman and Anderson (1986)	Porter (1979) Newman (1973) Rumelt (1973) Tushman and Anderson (1986)	Snow and Hrebiniak (1980)	Snow and Hrebiniak (1980)

Table 1: Studies Testing the Robustness of Groupings¹⁵²

¹⁴⁸ Prahalad, Coimbatore K. and Bettis, R. P. (1991) The Dominant Logic: A New Linkage between Diversity and Performance, *Strategic Management Journal*, Vol. 7, pp. 485-501.

¹⁴⁹ Lahti, Arto (1983) *Strategy and Performance of a Firm. An Empirical Investigation in the Knitwear Industry in Finland 1969-1981* (dissertation), Helsinki School of Economics, A-41, Helsinki..

¹⁵⁰ European Economic Community

¹⁵¹ European Free Trade Association

¹⁵² Pitt, M. and Thomas H. (1994) Industry Groups and Strategic Management: A Reappraisal of Strategic Group Concepts and Research Methodologies in Daems, Herman and Thomas, Howard (eds.) *Strategic Groups, Strategic Moves and Performance*, Pergamon, p. 93.

4. An integrated, resource-based view to business strategy for growth firms

One major problem of strategy group perspective is that there is not yet any research where the impact of strategic group membership on performance measures has been empirically and explicitly tested from both theoretical and empirical perspectives. The most crucial element of the resource-based view of the firm is the role of management in converting these resources into positions of sustainable competitive advantage leading to superior performance in the marketplace. The resource-model is another element of business strategy management in a growth firm. Another is, of course, market strategy. Based on Lahti's writings (1983, 1989, 1993, 1998) of market-based, entrepreneurial strategy making, there are five critical elements of business strategy. Lahti's model combines conceptually the elements of resources, market strategy and competitive advantage/ synergy in figure 12.

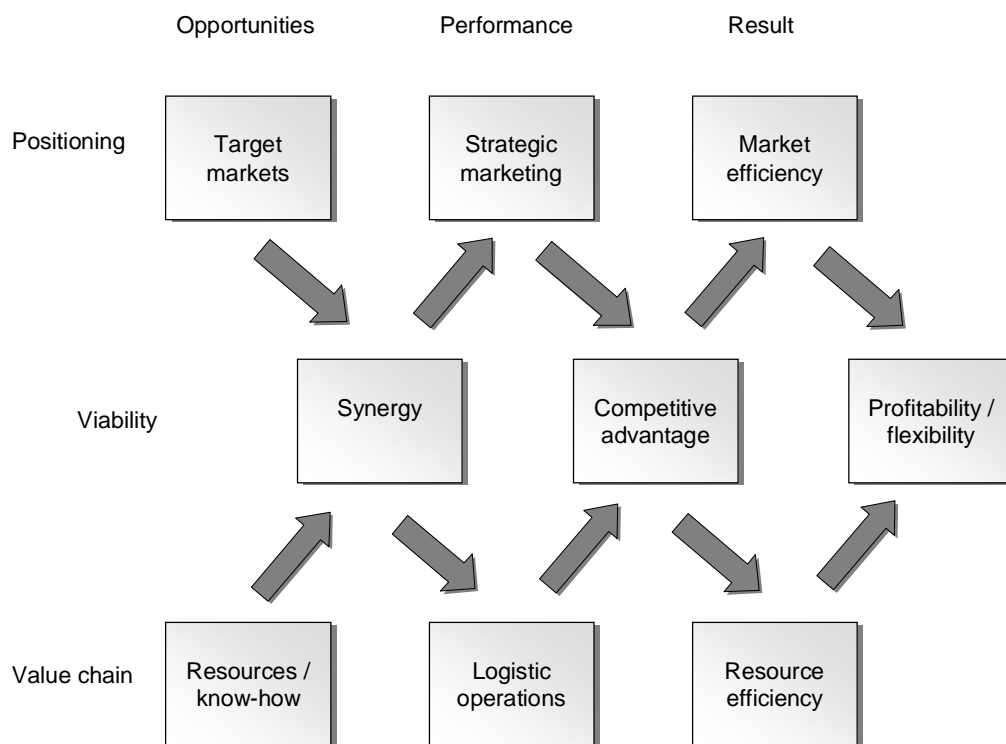


Figure 12: Lahti's model

A crucial element of the lacking market theory of keenly competitive industries can be found from modern financial theories. One of the factors in the 1970s is, that drove strategy researchers to search for theoretical explanations for persistent performance differences was the enormous success and legitimacy of the capital asset pricing model (CAPM). Developed by financial economists, the CAPM not only had practical usefulness, it gave great strength to the idea that markets were *efficient*. Consequently,

an intellectual climate developed in the academy which tended to presume efficiency in all markets, even product-markets, and aggressively challenged assertions to the contrary. The experience curve doctrine provided a partial response to this challenge, but it clearly was not the whole story. High value is an estimation of EVA (Economic Value Added)¹⁵³ that is one of the innovations of the modern financial theories¹⁵⁴. Nobel price winners like Merton Miller, Franco Modigliani and William Sharpe have developed financial theories. The most relevant approach in valuation of shares in non-listed companies is the so called CAP model (Capital Asset Pricing) of Sharpe¹⁵⁵.

Salimäki¹⁵⁶ has applied this benchmarking processing in the design companies utilizing the Winner Model that combines the strategic (broad, holistic operationalisation of strategy) choices of a firm (potential) and the operative processes (realization) with the business performance (result). 'Design-Winner-program' is unique in the sense that the researcher could continue his research and identify some of the internationalization dynamics of two companies. Having in his licentiate theses the benchmarking of 16 top design companies based on cross-sectional data, the researcher could collect time-series and history analysis data of the two case companies. This kind of triangulation makes possible to validate some of the key finding of the 'Design-Winner-program' in his dissertation. The model also includes the 13 themes that were used in the company interviews. The analyzed companies were chosen so that most of the leading firms of each industry could be analyzed. Altogether 16 firms were analyzed. In the final results 13 firms are included. The empirical study had 6 stages:

- (1) choice of the companies
- (2) qualitative theme-analysis guided by the "strategy-performance" - model
- (3) evaluation and grouping the companies by a group of experts (possible strategic groups)
- (4) constructing the international success model of a Finnish design company
- (5) comparing the results to earlier studies
- (6) analysis of the suggested strategic groups and mobility barriers

The analyzed companies (13) were positioned by the expert group on a 3 x 3 matrix (figure 13). The matrix is also a valid and empirically grounded model of the mainstream pattern of design industry's internationalization. The dimensions found in the data described each of the 13 themes of the gathered data. Further for each

¹⁵³ Copeland, T., Koller, T. & Murrin J. (1996) *Valuation: Measuring and Managing the Value of Companies*, New York, John Wiley & John, s. 247 or Zimmerman, J. (1997) EVA and Divisional Performance Measurement: Capturing Synergies and Other Issues, *Journal of Applied Corporate Finance*, Vol. 10.

¹⁵⁴ Hampton, J., *Modern Financial Theory*, Prentice-Hall, 1982.

¹⁵⁵ Sharpe, William (1964) Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk, *Journal of Finance*, Vol 19, 425-442.

¹⁵⁶ Salimäki Markku (2003) *Suomalaisen design-teollisuuden kansainvälinen kilpailukyky ja kansainvälistyminen (International competitiveness and competitive advantage of the Finnish design-industry)*, (dissertation), Helsinki School of Economics, A-220, Helsinki

dimension was given the values that existed and the dimensions and values were defined (operationalised). Altogether about one hundred qualitative or qualitative values were identified in the data. The analyzed companies (13) were positioned by the expert group on a 3 x 3 matrix (figure 18). The matrix is also a valid and empirically grounded model of the mainstream pattern of design industry's internationalization.

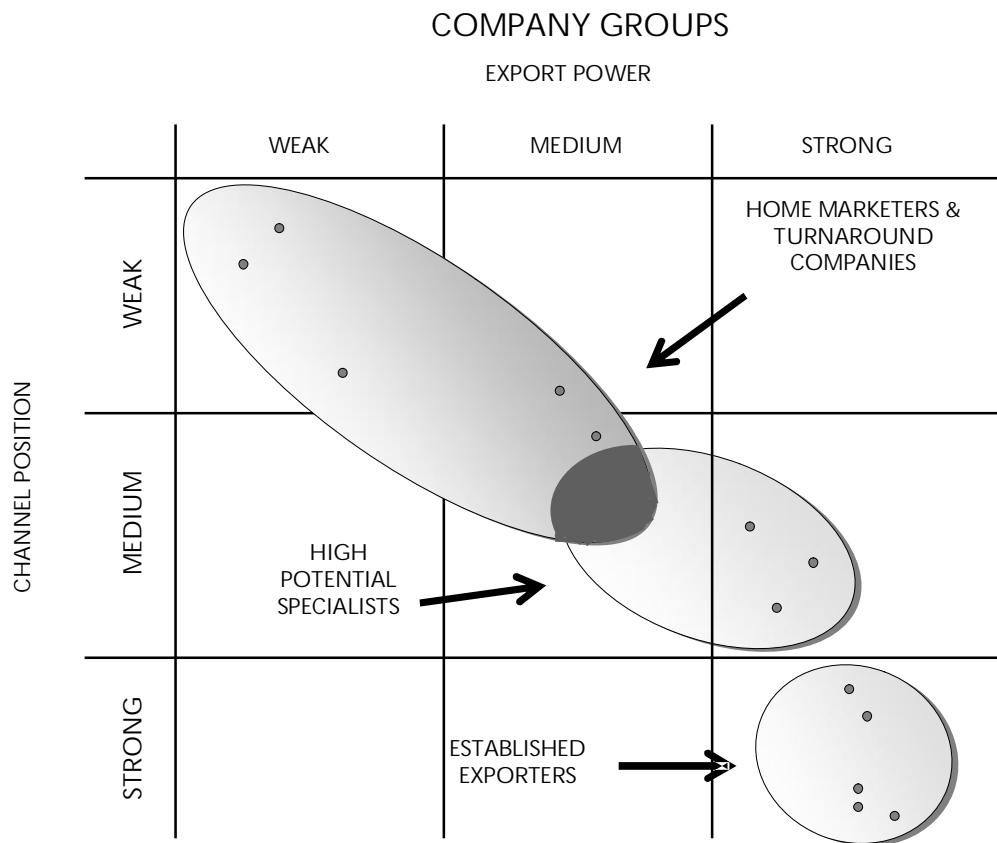


Figure 13: Empirically grounded model of the mainstream pattern of design industry's internationalization

The following groups were identified and described:

1. Home marketers and turnaround companies (5 companies)

- Companies acting mainly on the home market or companies in the beginning of their internationalization process

2. High potential specialists (3 companies)

- The business is based on a locally competitive innovation (normally material technology and production process)

3. Established exporters

- Companies with stable market position and medium/large volume in Central Europe

From the perspective of medium-sized companies three contingencies of 'Design-Winner-program' (highly successful established exporters, high potential specialist and turnaround companies) are interesting. As we all know small and medium sized firms are masters of technical innovations, since like PIMS studies report, they seem to produce about four times as many innovations per R & D dollar compared to middle-sized firms and 24 times as many as the big companies. If we consider Schumpeterian creative destruction, medium sized companies are potential winners of the innovation competition or strategic competition¹⁵⁷. Fragmentation in the global markets means that there are a lot of market niches that medium sized companies can conquer. There is also empirical evidence of the success of medium-sized companies. The PIMS studies show that *return on investment in market segments of less than 100 million dollar averages 27 percent, while the return in large (billion dollar and over), less differentiated markets averages 11 percent.*

There are not very many research studies of the growth companies in the Nordic countries. The Nordic Small Business Research¹⁵⁸ was an ambitious effort to identify the patterns of international growth strategies in three Nordic countries (Denmark, Finland and Sweden), especially from the Schumpeterian entrepreneur's point of view. The extensive empirical study was done for the ISBC88 in Finland. The study includes an in-depth empirical analysis of 60 companies in three Nordic countries (Finland, Sweden and Denmark) in four industries (clothing, furniture, metal/ engineering and ICT). The collected extensive database contained firm level data on the ownership or entrepreneurial background, chandlerian growth strategy, organization structure, operational functional strategies in production and marketing and performance. The theme of Penrosian managerial learning was tackled by comparative analysis which the case-firms were selected so that they represent five contingencies¹⁵⁹ of decision making (figure 14).

¹⁵⁷ PIMS studies have not data of small companies since about 3.000 business unit included in the database are big or medium-sized.

¹⁵⁸ Lahti, Arto and Pirnes, Hannu (1988) *Nordic Small Business Research*, ISBC 88, Helsinki.

¹⁵⁹ See Smith, N. (1967) *The Entrepreneur and his Firm*, Michigan State University.

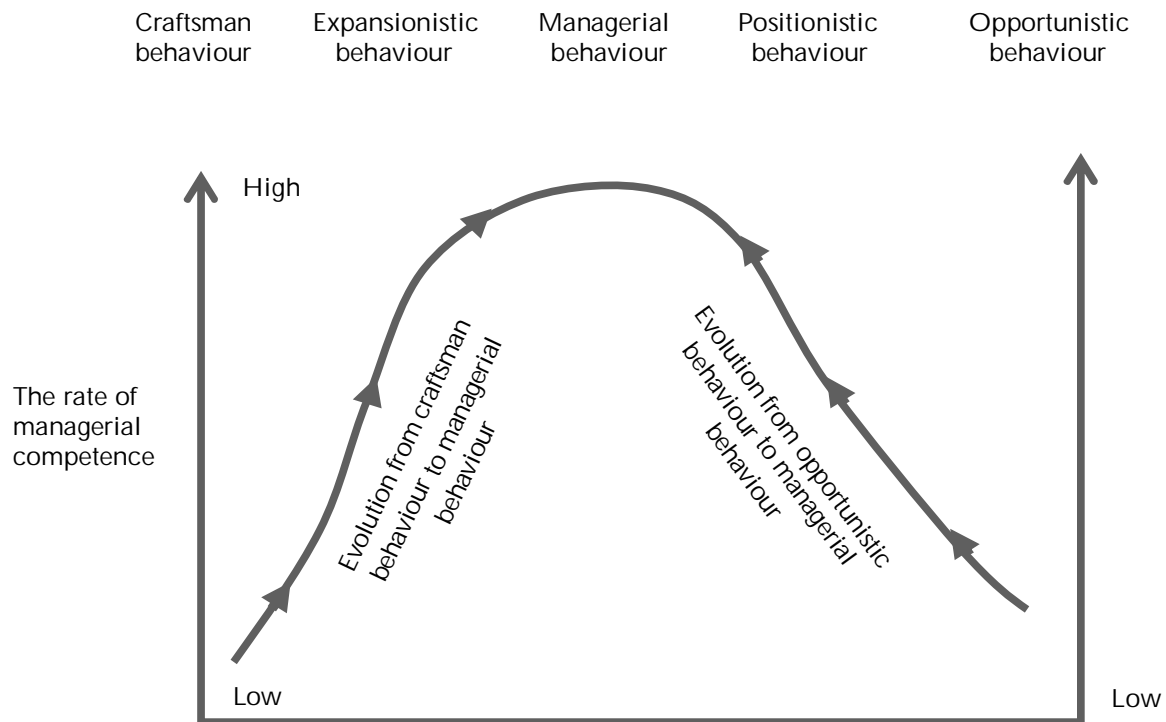


Figure 14: The five contingencies of decision making

The logic of contingency model applied is that a firm can grow into a managerially mature firm in terms of Marshall-Penrose-paradigm (contingency 3, 'Managerial behavior' in figure 3) from two various directions:

- (1) *The 'normal' growth part from local craftsmanship to international management* that in an industrial activity means utilization of existing technologies, processes, skills and knowledge. This is very much what Penrose have emphasized. (contingency 1, 'Craftsman behavior' and contingency 2 'Expansionistic behavior' in figure 3)
- (2) *The growth from opportunistic behavior to international management* that is based on the entrepreneurial function, the act of will and the introduction of innovations. (contingency 4, 'Positionistic behavior' and contingency 5, 'Opportunistic behavior' in figure 15)

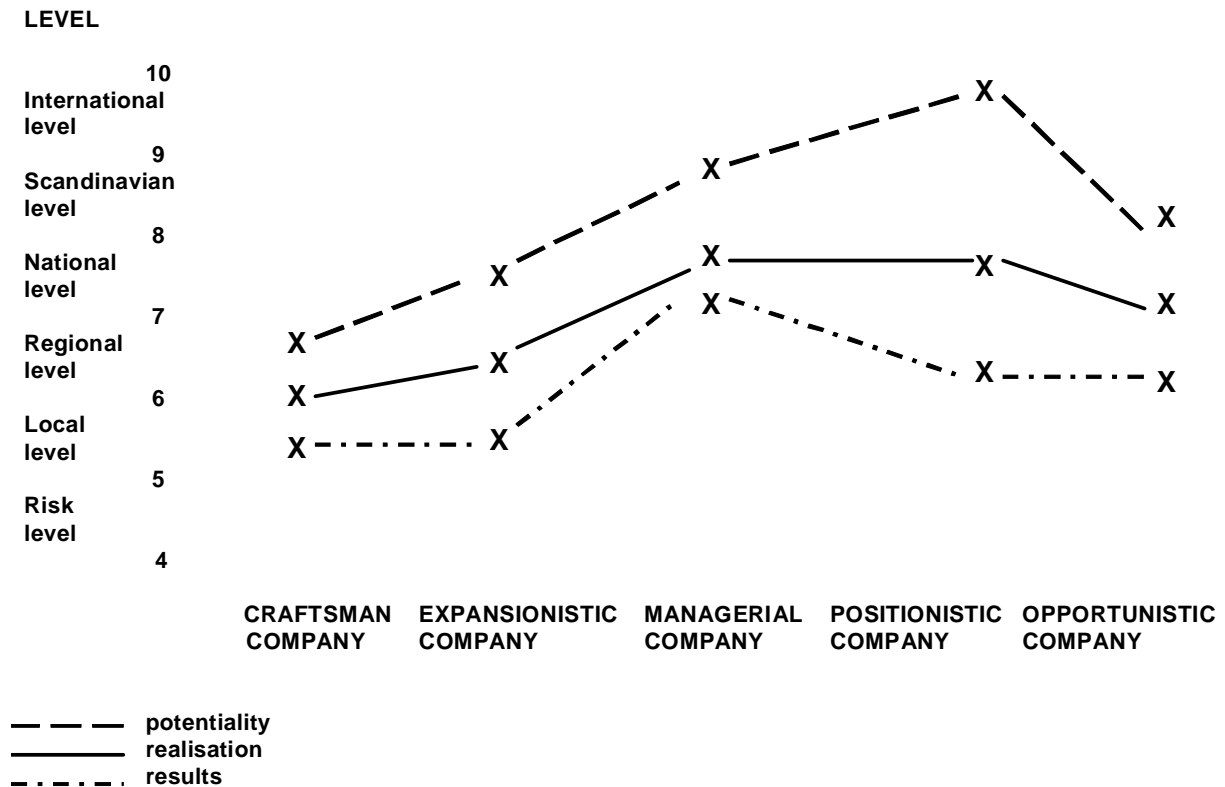


Figure 15: The performance of various company types

Managerial competence was measured with about one hundred indicators and in-depth case-descriptions per a firm. All the information available is scaled into a scale from 4 to 10¹⁶⁰. A firm's behavior is analyzed by collecting all the information into three components:

3. *Potentiality* - this component includes topics around chandlerian growth strategy like product, market and technology strategies.
4. *Realization* - this component includes topics around penrosian organization strategy and function strategies.
5. *Result* - this component includes many various measures of performance like profitability, growth and cash flow.

All results were carefully analysed and reported for each of the 60 companies in order to get feedback for the calibration of results. After that they were aggregated to three aggregates:

¹⁶⁰ In the scaling 4 means the lowest level, 'Risk level' and 10 highest level, 'International level'. Scales in between represent steps of internationalization.

1. *Country-specific results.* Each of the three countries had their own comparative advantages of resource deployments in terms of Ricardo's concept. Denmark was absolutely the best to realize opportunities that firms had. Sweden was skillful to organize. Finland was strongest according to Chandlerian strategic thinking.
2. *Branch-specific results.* Each of the four branches had its own comparative advantages of resource deployment. The forth-coming crises of labor-intensive industries in the early 1990s, especially the one of clothing and furniture could be seen in the database from the year 1987.
3. *Contingency-specific results.* Each of the five contingencies had their own comparative advantages of resource deployment. These results will be analysed in details later.

Based on the research of the Nordic countries, *a positionistic company with 80 % opportunism in behavior and 20 % craftsmanship is identified as the potential winner.* Like the 'potentiality' line in figure 4 demonstrates these companies were supposed to beat their competitors in the 1990s, which actually happened¹⁶¹. Strategic marketing orientation (that is the crucial content of opportunism) seems to be the winning characteristic of the entrepreneurial strategy making in the three Nordic countries. As well, a high level of managerial competence seems to be a valid estimation of a future high level of economic performance. Since the end of 1980s, the outstanding performance of 'positionistic company' has been challenging, although in the global markets, Nokia has solved a part of the mystery in the ICT-industry context. In the traditional industries, there are only some consistent research findings. Especially, Denmark has fully utilized the momentum. Denmark has a big number of medium-sized companies in the traditional industries. The weakness of Finland benchmarked towards other Nordic countries is the low number of high-performing medium-sized companies that partly depends on the deep depression in the early 1990s that killed many highly potential industrial companies.

IV. IMMATERIAL PROPERTY RIGHTS AND STRATEGIC GROUPING OF FIRMS

1. Mobility barriers and isolation mechanisms as new innovations

The new SCP (Structure-Conduct-Performance) paradigm perspective is especially valid when medium sized firms are concerned. Most of them operate with a dominant product line, sell to a geographically limited market area and grow by expansion. They may be stock firms but as well family or management team owned. Some of them are real growth firms that operate in many continents in a well selected niche-market. These firms are obliged to follow strategic group specific strategies and they have the

¹⁶¹ The only major exception was Finland in which the deep depression in the early 1990s killed many high potential industrial companies and some of our population.

best options to utilize the new conception to will their global, dynamic competition game. Mobility barriers are relevant since a transfer from one strategic group to another is not possible without transaction-specific switching costs. These costs are relative to the highness of the mobility barriers and aggressiveness of competitors' reactions. One crucial element of barriers making is Immaterial Property Rights (IPRs). Global strategic competition is contracting intensive especially in intellectualized industries. McGee and Thomas divide the sources of mobility barriers into three broad categories (Table 2):

- (1) *Market-related strategies*
- (2) *Industry supply characteristics*
- (3) *Characteristics of the firms*

Market-related strategies	Industry supply characteristics	Characteristics of firms
Product line	Economics of scale: production marketing administration	Ownership
User technologies		Organization structure
Market segmentation	Manufacturing processes	Control systems
Distribution channels	R & D capability	Management skills
Brand names	Marketing and distribution systems	Boundaries of firms - diversification - vertical integration
Geographic coverage		Firm size
Selling systems		Relationship with influence groups

Table 2: Sources of mobility barriers

Market-related strategies include many mobility barrier elements (like the product line, user technology or market segmentation) that the group member firms can utilize to widen their market scope. *Industry supply characteristics* consist of infra-type mobility barriers elements (like industry specific economies of scale, manufacturing process, R&D investment and vertical marketing and distribution systems). *Characteristics of the firms* are, perhaps, most difficult to specify. Ownership or organization structure varies,

for instance, between material intensive traditional industries and intellectualized industries. The firm size is a major, substantial scaling factor. In any industry, a big multinational firm has different structural characteristics than a small, local one. Which mobility barrier elements are relevant to a certain industry depend basically on the choices that member firms have made. There is, of course, a more general internal logic of how these mobility barrier elements can be combined. Basic conditions like the global or local growth rate have an impact on investment prospects and, thereby, strategy and structure selection of an industry.

The new SCP paradigm concentrates on the analyses of how firms select their (competitive or business) strategies to beat their competitors in the minefield of structural or behavioral barriers. The SCP paradigm adopts the Scherer's structural characteristic (basic conditions, and market structure) with microeconomic emphasis. The difference is that *when the traditional SCP paradigm assumes that firms are passive and adaptive in their relation to general economic environment. The new SCP paradigm assumes that firms are actively looking for new strategies.* In parallel, strategic management researchers have described this clustering strategy in terms of strategic typologies¹⁶². More recent research in strategic management has shifted toward understanding the strategic mechanisms that can create competitive advantage and to explain the firm-level mechanisms for achieving *sustainable competitive advantage* (Barney, 1991) based mainly on the framework of *core competitive capabilities* (Hamel and Prahalad, 1994).

In the integration of the new IO (Industrial Organization) and the strategic management doctrine, the efforts have focused on explaining the nature of the conduct (strategy) component in the SCP paradigm. Peteraf¹⁶³ develops a *dynamic theory of strategic group identity*. According to the theory, managers cognitively partition their industry environment to reduce uncertainty and to cope with bounded rationality. The organizational theories of social identification and social learning are used to describe how cognitive groups converge into strategic, competitive groups and how group level identity emerges. Fiegenbaum and Thomas¹⁶⁴ develop a new approach by arguing that *strategic groups are used as reference groups*¹⁶⁵ *when firms formulate their future competitive strategy*. Their major argument is that an industrial group's structure describes the competitors' strategies and capabilities and enables competitors to define and direct their future moves towards a better position within the industry.

¹⁶²For instance: Miles, R. E. and Snow, C. C. (1978) *Organizational Strategy, Structure, and Process*. McGraw-Hill, NY.

¹⁶³Peteraf, M. A. (1993): "The cornerstones of competitive advantage: A resource-based view", *Strategic Management Journal*, 14: 3, pp. 179-191.

¹⁶⁴Fiegenbaum, A. and Thomas, H. (1995). Strategic groups as reference groups: Theory, modeling and an empirical examination of industry and competitive strategy. *Strategic Management Journal*, 16: 461-476.

¹⁶⁵This comparativeness is, of course, well known in economics since David Ricardo. Management tradition has focused its attention to manager's perception when he or she looks from the firm's windows towards markets. Rumelt, Schendel and Teece (1991, p. 16) explain the difference between the management literature and that of economics as that between the application, the pragmatic use of available tools of analysis to solve actual business problems, and the theory, the development of sets of tools that can be used by practitioners. This view is now too simplistic. Management research has a life of its own, but a life that is parallel to that of economic theory, specifically to economic theory beyond the mainstream.

An interesting approach of solving the problem of the existence and scope of the firm is isolating mechanism according to Richard Rumelt's¹⁶⁶ conceptual innovation. Rumelt focuses knowledge, especially tacit knowledge, in generating economic rents¹⁶⁷. In economic terms, profit seeking economic actors, firms and entrepreneurs, will continue to invest in until the cost of investing in this opportunity rises to equal the economic value it generates¹⁶⁸. The rate at which knowledge about a market opportunity diffuses among strategic groups of firms is relevant in the context of how do strategic groups emerge, perform or reconstruct. If the rent-generating or profit potential of a market opportunity becomes widely known, competition will increase, and it is unlikely that member firms of a strategic group are able to earn abnormal profits. Therefore, the *isolating mechanism innovated by Rumelt is relevant element of strategic grouping and clustering of firms.*

Elements of strategic position	
Sources of potential rents (unexpected events)	Isolating mechanisms
Changes in technology	Causal ambiguity
Changes in relative prices	Sunk costs and limited markets
Changes in consumer taxes	Switching and search costs
Changes in law, tax and regulation	Consumer and producer learning
Discoveries and invention	Idiosyncratic investment
	Team embodied skills
	Unique resources
	Special information
	Patents and trademarks
	Reputation and image

Table 3: Isolating mechanism as a parallel concept to mobility barriers

¹⁶⁶ Rumelt, Richard (1984) "Towards a Strategic Theory of the Firm", in Lamb, R., (ed.) *Competitive Strategic Management*, Englewood Cliffs, Prentice-Hall, New York.

¹⁶⁷ Schumpeter's notion of temporary monopoly profits is the common challenge

¹⁶⁸ Barney, 1986

Isolating mechanisms are asymmetries, derived from costs of contracting that protect entrepreneurial rents (temporary monopoly profits in terms of Schumpeter) from imitation. To manage uncertainty, firms must develop their contractual, legal-economic function, intellectual resources and capabilities to manage IPRs. Basically, *intellectual property (IP) is about the 'control of a market' for things that are needed to commercialize an invention, and this has nothing to do with the natural property right argument*. Isolating mechanisms are used to protect a firm's core competence from environmental uncertainty. Barney¹⁶⁹ cites the effects of a unique history, causal ambiguity, and social complexity as also contributing to non-imitability. Another parallel challenge is to utilize externalities, networking and alliances to share and integrate knowledge rather than information¹⁷⁰.

2. IPRs as a new source of barriers or isolation mechanism

The name 'intellectual property right' has some kind of respectable connotation 'property', instead of the more unpleasant thing 'monopoly privilege'. Fritz Machlup and Edith Penrose¹⁷¹ argued that the term 'intellectual property right' instead of 'intellectual monopoly privilege' was a very deliberate choice on the part of politicians working for the adoption of a patent law in the 19th century. This period was for liberty and equality and against privileges and monopolies of any sort. Patent law on inventions based upon a 'monopoly privilege' would be rejected, but as a 'natural property right', the patent law would be justified. The Paris Convention for the protection of industrial property established in 1883, and the Berne Convention for the protection of literary and artistic works established in 1886 provided the internationally agreed frameworks for IPRs. The World Intellectual Property Organisation (WIPO) was established in the 1970s to govern these Conventions and to serve as a forum for international discussions on IP. WIPO treaties facilitate international harmonisation, but do not guarantee minimum levels of protection for IP. The growth of IP 'piracy' in the 1980s was the major concern, why the industrialised countries turned to the Uruguay Round of GATT negotiations. Since then IRPs are included in the GATT framework, thereby shifting the emphasis on procedural uniformity, as promoted by WIPO¹⁷², to *minimum standards of substantive protection*. The outcome, after much negotiation¹⁷³, was the TRIPS¹⁷⁴ Agreement.

¹⁶⁹Barney, Jay, Firm Resources and Sustained Competitive Advantage, *Journal of Management*, Vol. 17, 1991, pp. 99-120.

¹⁷⁰Quinn, J. B., P. Anderson, S. Finkelstein, Leveraging Intellect, *Academy of Management Executive*, Vol. 10, No. 3, 1996, pp. 7-27.

¹⁷¹Machlup, Fritz and Penrose, Edith (1950) The Patent Controversy in the Nineteenth Century, *Journal of Economic History*, X (1), May, 1-29.

¹⁷²WIPOs failure in an attempt to revise the Paris Convention was its UN-like structure and membership, and its reliance on voluntary accession of countries to its conventions, made it an unsuitable vehicle for achieving and policing minimum standards.

¹⁷³The Uruguay Round negotiations resulted in an Agreement on Trade- Related Aspects of Intellectual Property Rights (TRIPs Agreement) which came into effect with the WTO on 1 January 1995.

¹⁷⁴Trade Related Aspects of Intellectual Property Rights

The TRIPS Agreement established such standards of protection as well as rules on enforcement, and most significantly, it brought the IPR regimes of WTO member countries under the jurisdiction of the new dispute settlement system of the WTO. But the TRIPS Agreement could not eliminate conflicting pressures between protectionism and globalization¹⁷⁵. The increasingly central role of knowledge as a commercial commodity in the global knowledge economy and the international competition for all knowledge assets like highly talented researchers is the profound characteristics of the global challenge. The emergence of mega-science themes¹⁷⁶ which can only be addressed on a global scale are the real challenge for international cooperation. *Efforts to promote and/or regulate global economic activity through international treaties and organisations e.g. WTO, WIPO, etc. is a major moral challenge for advances in science and technology.*

The primary driver of the enormous expansion in the number and value of global products over the past two decades has been the pursuit of economies of scale. The high fixed costs of R&D and product development¹⁷⁷, and the pressure to reduce new product development time because of the shortening life cycle of products, has placed a premium on generating larger revenue flows by selling the same product in many countries. The emphasis was on building an efficient network of production, sales and service capable of penetrating markets around the world. The leading global firms have strong technological and managerial competences, and access to global capital and markets. Their emphasis is on the continuous building of new core competences. *With the enhanced value and cost of knowledge in the global knowledge economy, the major driver for extraction of temporary monopoly profits is the intellectual property protection.*

Universities are strongly encouraged to act as a source of start-ups, following Stanford University's role model as a nursery for a number of young companies in Silicon Valley. Since the 1960s, the University of Cambridge has played a similar role of developing what is called the 'Cambridge Phenomenon'. This resulted in the creation of some 600 technology firms in 2003, employing 20.000 persons, that rely on 'robust', patented technologies, such as biotechnology, medical devices, scientific instruments, sensors or new approaches serving the life-sciences. The close-knit array of diversified, agile, technology companies provides the Cambridge region with resilience to economic downturns, apparently higher than the more 'boom and bust' Silicon Valley ecosystem. The University of Cambridge is also generous with the patent rights; the

¹⁷⁵ Reich, Robert (1992) *The Work of Nations – Preparing Ourselves for 21st Century Capitalism*, Vintage Books, New York .

Rifkin, Jerome (1995) *The End of Work, the Decline of the Global Labour Force and the Dawn of the Post-Market Era*, G.P. Putman's Sons, New York.

Korten, David (1995) *When Corporations Rule the World*, London.

Paul Krugman (1998), *The Accidental Theorist*, New York.

Putnam, Robert (2000) *Bowling alone*, New York

¹⁷⁶ For instance: global warming, astronomical research and the human genome project.

¹⁷⁷ A new version of Microsoft's Windows computer operating system may take about five years and billions of dollars to develop. The lifetime of the product may be little more than two years.

university wishes to generate additional revenues by controlling IPRs of top research.
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A broad category of industries called ICT (Information, Communication and Technology) cluster has traditionally been geographically concentrated in certain regions. The most famous regional concentration is Silicon Valley in the USA in California. The major macroeconomic stimulus was US Federal government's change in antitrust policy. Responding to the challenge from Japan, USA shifted its policy considerably in the early 1980s, in order to remove the obstacle represented by Federal antitrust laws to collaborating research projects between firms in the same industry. In the year 1987 14 US firms from the semiconductor industry, including HP, IBM, Intel, Lucent and Motorola, decided to launch a common research program to develop processing and material improvements for the manufacturing of advanced semiconductor products. Federal Defense funded 80 million dollars per year during the year 1987-1996. At the same time, the Advanced Technology Programmes (ATP) provided Federal seed funding (about 120 million dollars in 2002) to consortia comprising companies and universities or governmental laboratories. To date, more than 500 projects have been supported, representing over 3 billion dollars of cumulative effort.¹⁷⁹

Through the mega-science the international system of IPRs will be reconstructed. The Bay-Dole Act, enacted in the USA in 1981, was a major trigger of mega-science revolution in the USA. Universities have filed more than 2.000 patents in 1998. University of California was the top earner of royalty income in 2000, with 261 million dollars. These revenues are invested in new research facilities and filing new patents. One of the most important innovations is intelligent licensing policy. Universities has the first-right to commercialize patents, if no so, the Federal Government retains the ownership of patents and then can grant non-exclusive licenses to interested third parties. This policy has meant the creation of an estimated 260.000 new jobs in the year 2000.¹⁸⁰ As a matter of fact the U.S. Federal Government has reformulated the rule of institutional exchange, when it started a federal IPR-agency. *It is policies that shape economic performance because they define and enforce the economic rules of the game.* The heart of development policy must be the creation of polities that will create and enforce efficient property rights. Another powerful institution is the loyalty of firms to the global economy.

A firm's intellectual resources cannot be utilized as the basis for a sustainable competitive advantage without reliable commercial and legal protection (figure 16). The exploitation of knowledge embodied in product and process innovations or related to intangible assets and symbolic material, is in most mature economies protected through the use of intellectual property rights (IPRs). IPRs came about as a natural evolution from property rights on land, capital and labour. Intellectual property rights are important because they represent the legal isolation mechanism for protecting the firms' assets. IPRs designed to protect the inventor from exploitation of their knowledge

¹⁷⁸ Haour, 2004, 83-84.

¹⁷⁹ Haour, 2004, 75.

¹⁸⁰ Haour, 2004, 85.

embodied in, predominantly industrial, product and process innovations mainly take form of patents. Ideas embodied in symbolic material and creative expression are protected mainly by copyrights and trademarks. Although information and communication technology have increased the scope for trademarks and copyrights, the patent system is still of primary importance, and increasing in relevance. Increasingly, the companies, especially SMEs, are confronted with the fact that poorly managed intellectual assets are costly and create risk. In intellectualized industries (like biotechnology or software or design industries) the list of mobility barriers or isolation mechanisms should be extended or modified including IPRs and other firm-specific and industry / region specific contracts like standards.

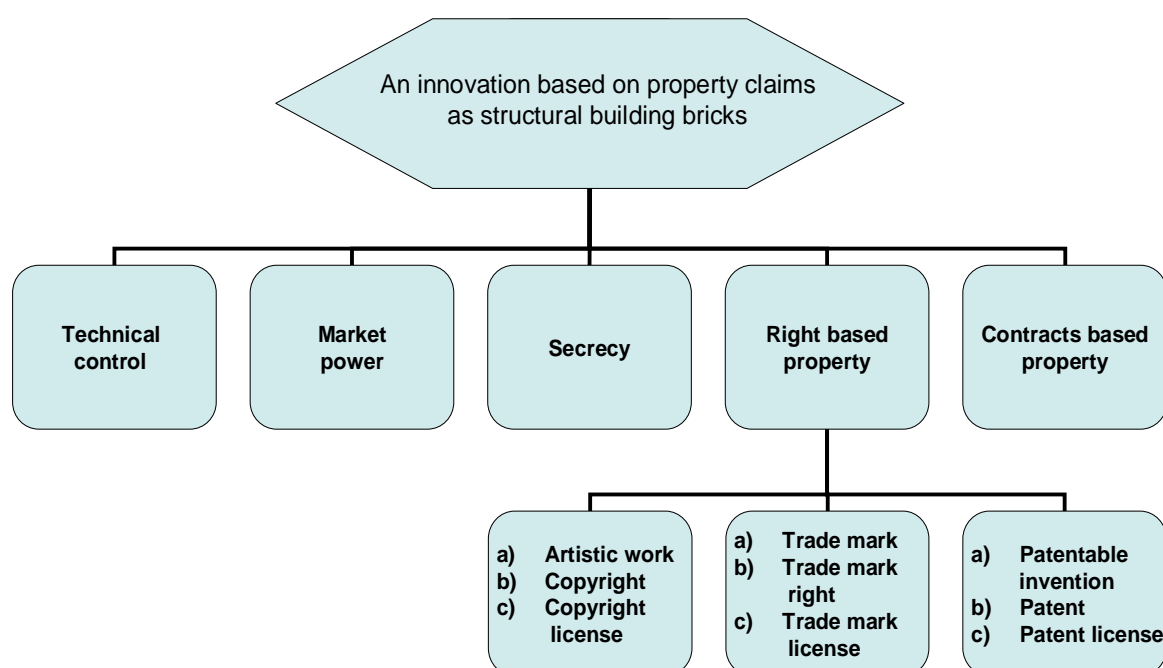


Figure 16: Mapping innovations as phenomena based on structural control¹⁸¹

Petrusson (2004) visualizes the different tools for structural control. There are many parallel tools. Technical control mechanisms are crucial when modern internet is used. In the light of Chandler's axiom and Schumpeter's writings, market position is the most relevant structural control mechanism, since Chandler found out that firms with strong market position (multinationals) can dominate branches and sectors of the economy, and so doing, altered their structure. In terms of SCP paradigm, the "forgotten" mobility

¹⁸¹Petrusson, Ulf (2004): *Intellectual Property & Entrepreneurship*, CIP Working Paper Series, Göteborg, Sweden (p. 136).

barriers (or isolation mechanisms) are technical standards that are believed to be crucial in the growth of network-intensive industries like the computer and software industry. In these industries standards are crucial in designing and producing programs that are compatible and interoperable across platforms. Economists call standards “impure public goods”, which have traits of both private and public goods. In this context, the production and creation of standard share a similar element with law making, in that they have significant social meanings¹⁸². Standards are of two different types:

1. *Private* (set by organizations or by dominant firms like Microsoft)
2. *Public* (set by a public standard setting organization, SSO) or government(s))

Sets of technical standards developed by organizations with either private or public initiatives, are often referred to as *de jure* standards, and the standards that market adopts or accepts of various reasons, are often referred as *de facto* standards¹⁸³. Standards perform several important functions. Open standards are, of course in opposition to proprietary standards, crucial drivers of growth and innovation. They insure the compatibility of complementary products and economize vertical marketing and production systems. They provide the information to producers and consumers to enable them to judge the quality of products. In intellectualized industries a well-functioning standard setting mechanism is a major catalyst of an industry's growth prospects because it may help ensure the smooth functioning of a complex value chain with millions of interrelated business transactions.

However, standard setting can also pose barriers causing concerns in a strategic group level. If the process of setting or enforcing a standard is manipulated by certain firms at the expense of others, mobility barriers effects may occur. Even if the process does not appear designed to harm competition, the rules set by a standard setting organization (SSO) can themselves foster the exclusion of SSO members. The standard setting process can also be abused by a single member firm. If a firm's proprietary technology, e.g. essential patents, is chosen by the SSO as a vital component of an industry standard, that firm can potentially derive substantial market power. If the standard becomes successful and other firms have built their products around the standard, the firm that owns the vital technology can “hold-up” the other industry members. The GSM case provides an interesting example of how (essential) IPRs ownership and alliance networks influence each other, and how both of them affect market structure and market shares. In June 1998, the ETSI¹⁸⁴ published a list of essential patents in GSM that contains 380 entries, the large majority of which are individual patents¹⁸⁵.

¹⁸²Lee, Nari (2004) Proprietary Standards and Patent Law – Is Standardization a Concern for Patent Law? IPR-instituutin seminaari, 25.-26.10.2004 Hanasaari, p. 2

¹⁸³ Lee, 2004, p. 3.

¹⁸⁴The European Telecommunications Standards Institute

¹⁸⁵ By focusing on the three most important patent systems in the world generally, and for GSM in particular, the list of 140 patents we have is a fair representation of essential IPRs in GSM. Of the 140 patents in our database, 107 are identified by an EP number (European patents), 20 are US patents, and 13 are under PCT. The 140 patents are held by 23 firms. In terms of sheer numbers, Motorola is the largest, with 27 patents. Nokia (19), Alcatel (14), Philips (13) and Telia (10) are the next largest holders of essential IPRs in GSM.

The GSM case provides an example of how essential IPRs ownership affects market structure and market shares. The GSM market has become dominated by five major firms in the late 1990s: Ericsson, Nokia, Siemens, Motorola and Alcatel. Together, these five firms control more than 85% of the European GSM market, the largest in the world. The owners of essential IPRs can utilize monopoly power which makes it possible to demand a high fee for such licenses. Alternatively, the IPR holder can demand cross-licenses or other compensations, such as the common development or marketing. *In the supply market(s), there are major mobility barriers, since the owners of essential IPRs can block the actual competition.* The standards laid down at ETSI, including GSM, are formally voluntary. Nevertheless, European network operators have virtually no choice but to use GSM for mobile telephony networks.

During the last two decades the patent intensity (patents obtained per R&D investments) has risen dramatically even as the expected value of individual patents has decreased¹⁸⁶. The majority of patents has no value, and the values of those that have value are nearly impossible to determine *ex ante*. The average expected value of a patent is extremely small and likely negative when acquisition costs are considered¹⁸⁷. The patent portfolio theory explains *ex post* this phenomenon that is known as ‘the patent paradox’. Patent portfolios simultaneously increase both the scale and the diversity of available marketplace protections for innovations. Therefore, firms will typically seek to obtain a large quantity of related patents rather than evaluating their actual worth. *These implications of the patent portfolio theory are important and explain such observable patterns in the modern patenting environment as firm-size differences in patent intensity and litigation rates or the value of patents.*¹⁸⁸

The patent portfolio theory extends well beyond the notion of the patent paradox by positing alternative views of patent value; individual patents have little or no value and, therefore, information about individual patents is relatively valueless commodity. The holder of a patent portfolio can implement an efficient competitive strategy (offensive, defensive, strategic or tactical) by combining the *effective scale of patent portfolio*¹⁸⁹ and the *isolation mechanism of differentiated patents*. The simonian notion of bounded rationality is not valid, since the multinational with sophisticated decision-making like IBM, Intel and Hewlett-Packard are among the top patent recipients; perhaps, it is more question of contractual inefficiency¹⁹⁰. Firms will obtain patents whenever the

Bekkers, Rudi, Duysters, Geert and Verspagen, Bart (2002) “Intellectual Property rights, strategic technology agreements and market structure: The Case of GSM”, *Research Policy*, September 2002, vol. 31, p. 1146/ table 1. Collected from <http://www.sciencedirect.com>

¹⁸⁶OECD (2004), “Patents and innovation: Trends and Policy Challenges”. Collected from <http://www.oecd.org/dataoecd/48/12/24508541.pdf>, p.6.

¹⁸⁷Empirical studies find the average value of patents to be in the range of about \$7,500 to \$25,000, which is generally less than average acquisition costs. See, e.g., Mark Schankerman, *How Valuable is Patent Protection? Estimates by Technology Field*, 29 RAND J. OF ECON. 93 (1998).

¹⁸⁸Parchomovsky, Gideon and Wagner, Polk (2004) *Patent Portfolios*. University of Pennsylvania Law School, Scholarship at Penn Law, Year 2004 Paper 51.

¹⁸⁹the total scope of protection in the marketplace

¹⁹⁰The proper policy response to this conclusion is greater use of mandatory contract terms and judicial modification of the unconscionability doctrine to better respond to the primary cause of contractual inefficiency. Korobkin, Russell B. (2003) Bounded Rationality, Standard Form Contracts, and Unconscionability, *University of Chicago Law Review*, Vol. 70, p. 1203, 2003 <http://ssrn.com/abstract=367172>.

marginal increase in value of the portfolio is greater than the acquisition costs. The explanatory power of the patent portfolio theory allows for a number of important predictions about the future course of the patent system. Among others, the patent intensity will continue to rise as well as patent 'thickets'¹⁹¹. A practical scenario is that patent litigations will become more complex and costly, patents are no more 'gold mines'¹⁹² and decision-making in more real option based¹⁹³.

3. Some examples of IPR-based mobility barriers

The fundamental argument here is that the real value of patents lies not in their individual significance, but instead in their aggregation into a patent portfolio. Thus, a patent portfolio is best understood as a collection of individual patents that share critical technological features. A portfolio might be focused on a specific problem in a particular industry, such as techniques for using 90-nanometer and smaller conductors in semiconductor manufacturing. It might be more process-based; for example, a bio-pharmaceutical patent portfolio might be targeted at the treatment of a specific disease in a specific way, such as the use of statins to address human cholesterol levels. A portfolio might be more simply targeted at a specific individual product, such as a genetically-modified agricultural product, or a consumer electronics product. Whether process-based, problem-based, or product based, the unifying concept of patent portfolios is their aggregation of related patentable inventions in a way that is coherently designed and directed.¹⁹⁴

The scale-economies of patent portfolios are based on the observation that a well-conceived patent portfolio is in many ways a form of 'super patent'. In some ways, a collection of closely-related patents defining a patent portfolio can operate much like what might be called a 'super patent': in much the same way that the holding of a U.S. patent grants the right to exclude others from within the scope of its claims, the holding of a patent portfolio will allow the holder to exclude others from the *collective* scope of its claims. Where such patents are both (patentably) distinct yet cover coterminous subject matter, the breadth of the right to exclude conferred by a patent portfolio is essentially the sum of the individual patent rights. But the scale advantages of patent portfolios are more than merely additive. The broader protection conferred by patent

¹⁹¹Shapiro, Carl (2001): *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting, in Innovation Policy and the Economy*, Volume 1, pp. 1-31 eds. Jaffe, Adam, Lerner Joshua & Stern, Scott <http://faculty.haas.berkeley.edu/shapiro/thicket.pdf>.

¹⁹² In the USA the mean patent value at \$4,313 for pharmaceutical patents, \$4,969 for chemical patents, \$15,120 for mechanical patents and \$19,837 for electronics patents, but the distribution of patent values is highly skewed on the account of highly valuable patents. Parchomovsky and Wagner, 2004, pp. 13-14/ references.

¹⁹³ Indeed, the rise of patent portfolios in the business community has become so significant that at least one investment analyst has posited a new credo of firm value in the modern innovation environment:

1. Time to flush those P/E ratios down the toilet.
2. Forget all those R&D numbers.
3. Investors hoping to measure a company's potential had better start paying attention to patent portfolios.

Parchomovsky and Wagner, 2004, p. 6/ references.

¹⁹⁴ Parchomovsky and Wagner, 2004, pp. 27-28/ references.

portfolios offers a range of benefits to the holder different in kind as well as size from a simple collection of unrelated individual patents, such as the following¹⁹⁵:

a. Eases subsequent in-house innovation.

Holding a patent portfolio allows a firm to more confidently proceed along an innovation path. The broader scope of protection, 'freedom of movement', ensures that a wider range of technological possibilities will be covered.

b. Attracts related external innovations

A patent portfolio can provide a firm with a strong market position (either real or perceived) in a particular field, thus encouraging upstart innovators to combine their inventions with that of a portfolio holder, rather than seeking to develop their own market niche.

c. Avoids costly litigation.

By deploying a patent portfolio with a broad sweep of exclusivity in a particular field, the holder is likely to dramatically reduce its involvement in patent litigation.

d. Improves bargaining position.

Holding a significant patent portfolio can improve the holder's bargaining position and the chances for success of any follow-on products.

e. Improves defensive positions.

Patents can play a defensive rather than offensive role: big players within an industry sign cross-licensing agreements that let them use one another's technology without paying fees.

f. Increases voice in the politics of the patent system.

Having a 'seat at the table' during any negotiations concerning patent law changes is important to the modern firm. Holding a significant patent portfolio can ensure that firms are viewed by regulators and legislators as 'players' in the patent debates.

g. Enhances efforts to attract capital.

The size-effects of patent portfolios will improve holders' ability to attract and retain capital investment.

The benefits of patent portfolios, however, go well beyond their status as de facto super-patents. For patent portfolios are not simply singular items, but rather a constructed array of related-but-distinct individual patents, with each component patent representing a fraction of the total. This diversity- the fact that no single patent determines the value- is a major benefit of patent portfolios. By distributing the importance of the total portfolio across the constituent individual patents, a patent portfolio allows holders to significantly hedge against aspects of risk and uncertainty

¹⁹⁵ The following list of patent portfolio advantages is the summary of Parchomovsky and Wagner, 2004, p. 30-35/ references.

that are endemic to innovation in the modern economy. Specifically, note the following benefits of the diversity of patent portfolios¹⁹⁶:

a. Addresses ex ante uncertainty related to technology.

Innovation is a notoriously uncertain business, with no guarantees of success and often little visibility concerning future conditions. Patent portfolios can help dismiss some of this uncertainty, by allowing holders to secure protections along broader options of the technological-development paths than would be possible with individual patents alone.

b. Expands the freedom of research inquiry.

The diverse nature of a patent portfolio means that researchers can freely move into distinct-but-related fields of inquiry with the assurance that patent protection is available; given the diversity of protection provided by a portfolio, such associated research can be conducted with less fear of infringement and a greater expectation of exclusivity.

c. Addresses uncertainty related to future market conditions.

A portfolio-driven strategy would encourage firms to broaden their research focus to encompass distinct-but-related technology opportunities, or seek to acquire such research (or patents) from external sources.

d. Addresses uncertainty related to future competitors.

Holding a patent portfolio can also hedge against future moves by one's competitors in the marketplace. The diversity-features of patent portfolios mean that a holding firm's future innovation paths will be broader than competitors' patent-related and market-related moves.

e. Addresses uncertainty in the patent law.

The diversity-features of patent portfolios offer a hedge against uncertainty related to the patent law itself. That is, because no single individual patent conclusively determines the value of a portfolio, any uncertainty in the law that could alter the value of individual patents will have less impact.

There is a specific logic of how the three mobility barrier elements and standards are related. Market-related strategies are easier to implement if open standards exit. But a widely used standard can basically be used both as a facilitator of technology transfer and as building-blocks of mobility barriers. Potential mobility barriers are: *monopolizing effect of essential patents included into standard* and *monopsony barriers of technology sourcing*. But this is only true when analyzing the transparent market strategies selected within an industry. Below this transparent level, there are many kinds of group specific barriers. Industry supply characteristics are more directly related to the dynamics of standard setting. In the telecommunications industry in the beginning of the 1990s, Motorola's antitrust behaviour strongly influenced the supply market structure and created mobility barriers to the markets. In the light of Motorola case, *the scope of patent claims of essential patents* and *the rules of the game of cross-lisencing*

¹⁹⁶ The following list of patent portfolio advantages is the summary of Parchomovsky and Wagner, 2004, p. 35-38/ references.

can function as barriers making elements. The behaviour of Motorola had strong implications to the strategy-making processes of competitive firms, like Nokia and Ericsson. In the broadest level, *the R&D and IPR strategy content* was redefined. In a narrow sense, patent policies were changed. In the implementation level, *the litigation policy of industry member firms* is a crucial element of mobility barriers. Motorola's aggressive litigation policy created the hold-up problem, because Motorola had the best possible IPR lawyers and financial resources to go to court. Although the acute crisis was only temporary, litigation policy of the industry is history-dependent. Small companies without proprietary technology, e.g. essential patents, must withdraw or make special arrangements with big firms claiming infringement.

The second element analyzed is patent portfolio that has also a specific logic of how the three mobility barriers elements are related. The portfolio theory of Harry Markowitz, a Nobel price-winner, is widely used in strategic management literature and praxis. Although most of these applications simply reflect misunderstanding of the true content of Markowitz's theory, portfolio approaches have increased management's risk awareness. Market-related strategies are in many ways different when a portfolio approach is applied. In the light of literature¹⁹⁷, most relevant candidates of mobility barriers are: *the scale-economies of patent portfolios* and *the diversity of patent portfolios*. These two alternative strategies are both extremely demanding applied in a full scale. Therefore, market strategies can explain a major part of strategic group formation. In global markets, there is a strategic group, multinationals, that have in average massive financial resources to invest in both of the full scale patent portfolio strategies. Focusing the scale-economies, multinationals can comprise a form of 'super patent' of their patent portfolios. The total scope of claims will allow multinationals to exclude their small, local competitors, and, especially, the ones with the single patent strategy. Focusing the diversity of patent portfolios, multinationals can significantly hedge against various aspects of risk and uncertainty of technological innovations. The existence of full scale patent portfolio has a major impact on the industry supply characteristics. The patent-intensive industries, like the semiconductor and software industry, have certain specified industry supply characteristics. The most crucial new structural element is the contractual function as the supplement of the neoclassical production function. The most relevant candidate for mobility barriers is *economizing of contractual function*¹⁹⁸. When investing in 'nexus of IPR-specific contracts', the patent-intensive industries are supposed to dismiss in their investments in the neoclassical production function. The solution that seems to be in balance with the contractual function is, of course, *the utilization of productive externalities*. In management literature, the parallel concepts are alliances and networks. In the level of firm characteristics the major isolating mechanism creating barriers is the *in-depthness of institutional knowledge* and *matching of business and legal processes*.

The third element analyzed is related to the regional agglomeration of the *scope* economies, when the two other elements, standardization and patent portfolio, are related to the regional agglomeration of the *scale* economies. The Internet will produce certain forces for deagglomeration, remote coordination of innovative activities and

¹⁹⁷ Parchomovsky and Wagner, 2004.

¹⁹⁸ Coase (1937) and followers like Williamsson (1985).

agglomeration, clustered intellectual processes that have a major impact on the logic of how the three mobility barriers are established. In the light of literature¹⁹⁹, most relevant candidates of mobility barriers are related to *the "Internet paradox"* which says that human, intellectual processes are both deeply personalized and non-personalized. When market-related strategies are both deeply personalized and non-personalized, the potential mobility barriers between competitive firms are: *the inherent ambiguity*²⁰⁰ and *economies of speed of market strategies*²⁰¹.

In the intellectualized industries, the ambiguity of managerial processes is a critical issue. The present research, which relies on stereotypical experiences gleaned from management. Rather than denying such inconsistencies and confusion through more or less simplified stereotypical interpretations, an ambiguity approach is used as a conceptual lens to bring these inconsistencies to the surface and examine them as potential key characteristics for understanding of the human side of intellectual business processes. The rational managerialism as the sole explanation of high performance is unfair, as it disempowers the informal networks of actors. Instead of just imposing one set of values as the dominating one, value differences can be used as a resource. Putnam (1993) posits that organizations are not monolithic entities. They are rather coalitions of participants with different priorities where individuals negotiate their goals, actions, and meanings to achieve a common direction. Ambiguity seems to be a concept that can capture the multiple realities in business.

The Internet's agglomeration effects seem to be stronger than deagglomeration ones. Therefore, the industry supply characteristics in the intellectualized industries are restructured to provide firms in the same industry geographical proximity in the incubations of new technologies. The potential mobility barriers dividing firms into strategic groups are: *geographical proximity of technology-related firms* and *complexity of technology evolution in the key industrial incubators*. In the level of firm characteristics the major elements of creating mobility barriers are grounded to the human capacity of communicating. The potential mobility barriers dividing firms into strategic groups are: *the social capacity of personal communication* and *the elasticity of organization culture*. The refinement of technology change management in terms of organization process and technology innovation is a complex phenomenon in terms of adaptive, flexible, self-organizing systems. Older 'freezing' and 'refreezing' models and metaphors from organization development theory are still relevant²⁰². Skill sets in the networks force to allow for flexibility, speed, and experimentation an organization that supports information sharing and knowledge creation amongst its members and is committed to including and reconciling multiple viewpoints is likely to establish effective and efficient processes as well as improve organizational culture (Table 4).

¹⁹⁹ For instance, Saxenian (1994)

²⁰⁰ For instance, Saxenian (1994)

²⁰¹ For instance, Chandler (1990)

²⁰² Schein, Edgar (1987) *The clinical perspective in fieldwork*, Newbury Park, Calif., Sage Publications.

Market-related strategies	Industry supply characteristics	Characteristics of firms
Monopoly effect of patents included into standard	The scope of patent claims of essential patents	R&D and IPR strategy content of firms
Monopsony barriers of technology sourcing	The rules of the game of cross-lisencing	The litigation policy of industry member firms
The scale-economies of patent portfolios	The economizing of contractual function	In-depthness of institutional knowledge
The diversity of patent portfolios.	The utilization of productive externalities	Maching of business and legal processes
The inherent ambiguity of market strategies	Geographical proximity of technology-related firms	The social capacity of communication
Economies of speed of market strategies	Complexity of technology evolution in incubations	The elasticity of organization culture

Table 4: A tentative list of IPR-specific sources of mobility barriers