Imitability

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Abstract

A firm would be enticed to imitate the resources and capabilities that enable other firms to gain a competitive advantage. Nevertheless, imitation efforts might not pay off. Firms with an advantage, as a consequence, will be able to maintain it over a long period of time. This article discusses four major reasons why it might be costly to imitate another firm's resources and capabilities, namely, unique historical conditions, causal ambiguity, social complexity and patents.

Definition Imitability refers to the extent that firms can duplicate or substitute the resources and capabilities of competing firms.

When other firms appear to have a competitive advantage, a focal firm may try to imitate the resources and capabilities that enable these other firms to gain their advantages. Some economic models assume that imitation of these resources and capabilities is simple and straightforward. When this is the case, firms with an advantage will not be able to maintain it over a focal firm.

However, as early as 1973, Professor Harold Demsetz (1973) noted that imitation is not always so simple. Sometimes it may not be clear what a firm with an advantage is doing to create that advantage. At other times, even if the source of that advantage is clear, it may not be easy to imitate it.

Research in strategic management has identified a large number of reasons why it might be costly to imitate another firm's resources and capabilities. Four of the most important of these are discussed here.

Unique Historical Conditions

It may be that the low-cost acquisition or development of a resource for a particular firm depended on certain unique historical conditions. The ability of firms to acquire, develop and exploit resources often relies upon their place in time and space. Once time and history pass, firms that do not have space-and-time-dependent resources face a significant cost disadvantage in obtaining and developing these resources, because doing so would require these other firms to re-create history. Dierickx and Cool (1989) suggest that these resources have important time-compression diseconomies.

There are at least two ways that unique historical circumstances can give a firm a sustained competitive advantage. First, it may be that a particular firm is the first in an industry to

M. Augier, D. J. Teece (eds.), *The Palgrave Encyclopedia of Strategic Management*,
https://doi.org/10.1057/978-1-137-00772-8

recognize and exploit an opportunity, and being first gives a firm one or more of the first-mover advantages. Thus, although in principle other firms in an industry could have exploited an opportunity, that only one firm did so makes it more costly for other firms to imitate this original firm.

A second way that history can have an effect on a firm builds on the concept of path dependence (Arthur 1989). A process is said to be path-dependent when events early in the evolution of a process have significant effects on subsequent events. In the evolution of competitive advantage, path dependence suggests that a firm may gain a competitive advantage in the current period thanks to the acquisition and development of resources in earlier periods. In these earlier periods, it was often not clear what the full future value of particular resources would be. Because of this uncertainty, firms are able to acquire or develop these resources for less than what will turn out to be their full value. However, once the full value of these resources is revealed, others firms seeking to acquire or develop these resources will need to pay their full known value, which (in general) will be greater than the costs incurred by the firm that acquired or developed these resources in some earlier period. The cost of acquiring both duplicate and substitute resources rises once their full value becomes known.

Causal Ambiguity

A second reason why a firm's resources and capabilities may be costly to imitate is that imitating firms may not understand the relationship between the resources and capability controlled by a firm and that firm's competitive advantage. In other words, the relationship between firm resources and capabilities and competitive advantage may be causally ambiguous.

At first, it seems unlikely that ▶ causal ambiguity about the sources of competitive advantage for a firm would ever exist. Managers in a firm seem likely to understand the sources of their own competitive advantage. If managers in one firm understand the relationship between resources and competitive advantage, then it seems likely that managers in other firms will also be able to discover these relationships and thus will have a clear understanding of which resources and capabilities they should duplicate or seek substitutes for. If there are no other sources of cost disadvantage for imitating firms, imitation should lead to competitive parity (Reed and DeFillippi 1990).

However, managers in a particular firm may not always fully understand the relationship between the resources and capabilities they control and competitive advantage. This lack of understanding could occur for at least three reasons. First, it may be that the resources and capabilities that generate competitive advantage are so taken for granted, so much a part of the day-to-day experience of managers in a firm, that these managers are unaware of them. Itami (1987) calls these kinds of taken-for-granted organizational characteristics invisible assets. Organizational resources and capabilities, such as teamwork among top managers, organizational culture, relationships among other employees, and relationships with customers and suppliers, may be 'invisible' in this sense (Barney and Tyler 1992). If managers in firms that have such capabilities do not understand their relationship to competitive advantage, managers in other firms face significant challenges in understanding which resources they should imitate.

Second, managers may have multiple hypotheses about which resources and capabilities enable their firm to gain a competitive advantage, but they may be unable to evaluate which of these resources and capabilities, alone or in combination, actually create the competitive advantage. For example, if one asks successful entrepreneurs what enabled them to become successful, they are likely to reply with hypotheses such as 'hard work, willingness to take risks, and a high-quality top management team'. However, if one asks what happened to unsuccessful entrepreneurs, they too are likely to suggest that their firms were characterized by 'hard work, willingness to take risks, and a high-quality top management team'. It may be that 'hard work, willingness to take risks, and a high-quality top management team' are important resources and capabilities for entrepreneurial firm success. However, other factors may also play a role. Without rigorous

experiments, it is difficult to establish which of these resources have a causal relationship with competitive advantage and which do not.

Finally, it may be that it is not only a few resources and capabilities which enable a firm to gain a competitive advantage, but that literally thousands of these organizational attributes, bundled together, generate these advantages. Dierickx and Cool (1989) emphasize the importance of the interconnectedness of asset stocks and asset mass efficiencies as barriers to imitation. Imitation can be costly when the resources and capabilities that generate competitive advantage are complex networks of relationships among individuals, groups and technology.

Social Complexity

A third reason that a firm's resources and capabilities may be costly to imitate is that they may be socially complex phenomena, beyond the ability of firms to systematically manage and influence. When competitive advantages are based on such complex social phenomena, the ability of other firms to imitate these resources and capabilities either through direct duplication or substitution is significantly constrained. Efforts to influence these kinds of phenomena are likely to be much more costly than they would be if these phenomena developed in a natural way over time in a firm (Porras and Berg 1978).

A wide variety of firm resources and capabilities may be socially complex. Examples include the interpersonal relations among managers in a firm, a firm's culture, and a firm's reputation among suppliers and customers. Notice that in most of these cases it is possible to specify how these socially complex resources add value to a firm. Thus, there is little or no causal ambiguity surrounding the link between these firm resources and capabilities and competitive advantage. However, understanding that an organizational culture with certain attributes or quality relations among managers can improve a firm's efficiency and effectiveness does not necessarily imply that firms that lack these attributes can engage in systematic effort to create them or that low-cost substitutes for them exist. For the time being, such social engineering may be beyond the abilities of most firms. At the very least, such social engineering is likely to be much more costly than it would be if socially complex resources evolved naturally within a firm (Harris and Ogbonna 1999).

This discussion does not mean to suggest that complex resources and capabilities do not change and evolve in an organization. They clearly do. Nor does this discussion mean to suggest that managers can never radically alter an organization's socially complex resources and capabilities. Such transformational leaders do seem to exist and do have an enormous effect on the socially complex resources and capabilities in a firm. However, transformational leaders themselves are socially complex phenomena. The fact that a leader in one firm can transform the firm's socially complex resources and capabilities does not necessarily mean that other firms will be able to duplicate this feat at low cost. It may even be the case that although a particular leader may be able to transform the socially complex resources and capabilities in one firm, this same leader will be unable to transform the socially complex resources and capabilities in another firm (Tichy and Devanna 1986).

Although the ability of socially complex resources and capabilities to generate sustained competitive advantages has been emphasized so far, *non-valuable* socially complex resources and capabilities can create sustained competitive *disadvantages* for a firm. For example, large integrated steel firms, such as United States Steel, are saddled with organizational cultures, values and management traditions that prevent them from adopting new technologies in a timely and efficient manner.

It is interesting to note that firms seeking to imitate complex physical technology often do not face the cost disadvantages of imitating complex social phenomena. A great deal of physical technology (machine tools, robots and so forth) can be purchased in supply markets. Even when a firm develops its own unique physical technology, reverse engineering tends to diffuse this technology among competing firms in a low-cost manner. Indeed, the costs of imitating a successful physical technology are often lower than the costs of developing a new technology (Lieberman 1987).

Although physical technology is usually not costly to imitate, the application of this technology in a firm is likely to call for a wide variety of socially complex organizational resources and capabilities. These organizational resources may be costly to imitate, and, if they are valuable and rare, the combination of physical and socially complex resources may be a source of sustained competitive advantage.

Patents

At first glance, it might appear that a firm's patents would make it very costly for competitors to imitate a firm's products (Rumelt 1984). Patents do have this effect in some industries. For example, patents in the pharmaceutical industry effectively foreclose other firms from marketing the same drug until a firm's patents expire. Patents raised the cost of imitation in the instant photography market as well (Thurm 1998).

From another point of view, however, a firm's patents may decrease, rather than increase, the costs of imitation. This is especially true for product patents and less true for patents that attempt to protect a process from imitation. When a firm files for patent protection, it is forced to reveal a significant amount of information about its product. Governments require this information to ensure that the technology in question is patentable. In obtaining a patent, a firm may provide important information to competitors about how to imitate its technology.

Moreover, most technological developments in an industry are diffused throughout firms in that industry in a relatively brief period of time, even if the technology in question is patented; patented technology is not immune to low-cost imitation. Patents may restrict direct duplication for a time, but they may actually increase the chances of substitution by functionally equivalent technologies.

See Also

- ▶ Causal Ambiguity
- ▶ Resource-Based Theories
- ▶ Uncertain Imitability

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Imperfect Resource Mobility

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Abstract

Resources and capabilities differ in the extent to which they are specialized to a firm's needs Peteraf (Strategic Management Journal 14:179–191, 1993). Some factors may yield little to zero value outside a focal firm and thus are perfectly immobile, whereas others vary in their degree of firm-specificity, opening the door to imperfect mobility. In either case, the value created by firm-specific resources or

capabilities is bound to the focal firm. In addition, the opportunity cost associated with the use of imperfectly mobile resources is 'significantly less than their value to the present employer' Peteraf (Strategic Management Journal 14:179–191, 1993: 184). As a result, imperfect resource mobility contributes to idiosyncratic differences in firms' abilities to create and capture value.

Definition Imperfect resource mobility is associated with the firm-specific properties of resources (and capabilities) held by a firm, and ensures that the value generated by these resources depreciates upon transfer to another entity. Imperfect resource mobility is one of the primary conditions underlying a firm's ability to achieve and sustain an advantage relative to close competitors.

Firms differ in their bundles of resources and capabilities. The firm-specific properties of these factors affect their transferability or mobility across firms (Barney 1991; Peteraf 1993). These properties, referred to as barriers to imitation or ▶ isolating mechanisms, preserve the value created by a firm's resources and capabilities and, in turn, the value captured by the firm or its rent streams (Rumelt 1984; Barney 1991; Peteraf 1993). These rent-protecting mechanisms are imperfect – they vary in their abilities to protect the value created by a firm and, in turn, affect the degree to which resources or capabilities are mobile. Thus, an advantage associated with a firm's resources or capabilities may be temporary or long lasting. The firm-specific properties of resources and capabilities not only limit their mobility but also make them difficult to price. As a result, developing a resource-based advantage is predominantly about non-priced alternatives.

Imperfect Resource Mobility: Sources and Implications

The extant literature identifies five primary classes of barriers to imitation or isolating mechanisms that contribute to imperfect resource mobility: (1) intellectual property rights, (2) historical conditions, (3) causal ambiguity, (4) complementarity and interconnections, and (5) social connections. First, intellectual property rights are often viewed as perfectly immobile. Government-granted property rights, such as a patent, present a barrier to direct duplication of a documented invention. However, the protection promised by formal property rights is not always achieved in practice (e.g., Cohen et al. 2000) and varies across industries and countries. In response, firms often augment their protection by developing a thicket of overlapping patent rights that provide a 'patent fence', which can limit imitability or substitutability. Second, concepts such as path dependence, time compression diseconomies and asset mass efficiencies fall under unique historical conditions. For instance, characteristics of the process by which resources develop and accumulate inside a firm give rise to firm-specificity; thus, imperfect resource mobility may arise from time compression diseconomies, asset mass efficiencies, asset interconnectedness and causal ambiguity (Dierickx and Cool 1989). Recent empirical work challenges these theoretical insights. For instance, Knott et al. (2003) find that asset accumulation processes do not deter imitation, whereas other work suggests that an advantage associated with time compression diseconomies may not necessarily yield superior profits (Pacheco de Almeida and Zemsky 2007). Third, causal ambiguity limits a rival's ability to identify the source of a firm's advantage. Consequently, the cause of the firm's position is unobservable to the rival, thereby preserving immobility (Lippman and Rumelt 1982). Similarly, the firm-specific nature of a bundle of resources and capabilities is magnified when these factors are complementary (co-specialized) and/or knitted together in a distinct way. Such interconnections not only bind the resources and capabilities to the focal firm but to each other. Fifth, relationships among a firm's employees or between a firm and other actors (e.g., suppliers, buyers, intermediaries, partners, institutions) that emerge over time may be complex and also embedded in a market or social structure. As a result, these social ties rarely create the same value when transferred to another firm (Barney 1991). In sum, the firm-specific properties of resources and capabilities foster imperfections or

frictions that affect their mobility and, in turn, provide firms with opportunities to develop an advantage relative to close competitors.

See Also

- ▶ Capturing Value from Advantages
- ▶ Competitive Advantage
- ▶ Competitive Heterogeneity
- ▶ Isolating Mechanisms
- ▶ Resource-Based View

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Imprinting

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Definition Based on the concept of imprinting from biology, Stinchcombe (1965) argued that organizations adopt characteristics that are typical or appropriate in their social environments at the time of founding. Considerable historical evidence consistent with this hypothesis has demonstrated that organizations from the same historical cohorts and regions are disproportionately similar.

Organizations and Imprinting

The term imprinting entered the lexicon of organization theory when Stinchcombe (1965: 169) argued that the historically specific resources available at the time of founding shape firms and organizations. These founding structures and processes survive far into the future because forces such as tradition, vested interests and ideology make change difficult, especially after an organization has succeeded at a level sufficient to permit its survival. As Johnson (2007: 98) noted, the imprinting hypothesis encompasses two distinct sets of processes. The first links technological, economic, political and cultural contexts at the time of the founding with the internal structures and processes of the organization. The second refers to how the organization maintains over time the structures and processes imprinted at founding.

While the concept of imprinting has been much cited, it has been little studied. Ecologists have invoked imprinting implicitly in various studies of founding effects, such as density delay and the liability of newness, but have not often examined the imprinting processes directly. More recently, studies have emerged that invoke the specific content of imprinting to derive more powerful tests of the hypothesis. Kriauciunas and Kale (2006) studied firms in Lithuania after the transition from communism to a more market-oriented system. They found evidence that there was a very significant imprinting effect from prior social, institutional and market orders on the ability of firms to adapt to the changed environment after the end of communism.

Johnson (2007) used the tools of cultural sociology and entrepreneurship studies to explore the mechanisms by which organizational structures and processes are imprinted at the time of founding. Her analysis of the

founding of the Paris Opera under Louis XIV serves as the basis for theorizing organizational imprinting by arguing that it is best understood as the result of cultural entrepreneurship. Dobrev and Gotsopoulous (2010) linked the notion of imprinting with the emergence of new industries to provide evidence of strong imprinting. Specifically, entry early in the history of a new industry, when there is a lack of clarity about the form and function of a new category of firms, is associated with systematically higher levels of mortality.

Extensions to the Original Argument

Scholars have also extended imprinting beyond the initial context of individual organizations to examine how networks of relationships among organizations can also demonstrate significant imprinting. Marquis (2003) examined the 51 largest US community-based inter-corporate networks and found significant differences based on whether the networks arose before or after the advent of air travel. More specifically, he found that communities that formed their intercorporate networks before the emergence of widespread air travel have maintained a much stronger local focus in their networks.

McEvily (2012) examined the effects of co-employment ties on law firms in Nashville, Tennessee, finding that older bridging ties had significantly more substantial effects than newer ties. He interpreted this result as consistent with an imprinting effect from the possession of older ties based on the exchange of lawyers across firms. Milanov and Fernhaber (2009) linked the organization and network levels by delineating factors that would affect the ongoing capabilities of a new venture to leverage networks to create value. They argued that the network of the first partner of a new venture imprints the capabilities of an organization to work with partners as well as the pattern of ties that the new venture would exhibit going forward. Specifically, the network size and centrality of a new venture's initial alliance partner influence the subsequent size of the new venture's network.

Going forward, imprinting remains an important concept in organization theory, particularly for its value in distinguishing the behavioural account of organizational capabilities and structures from the functionalist or purely rational accounts. Of course, clarifying a succinct set of mechanisms and processes in organizations that are characteristically linked with imprinting used in this sense remains an important part of the intellectual agenda for scholars interested in imprinting. The evidence to date provides a good basis for this ongoing enterprise. Rich case studies of the founding of particular organizations provide detailed accounts of how social, technological and administrative capabilities at given moments in time become embedded in the structures and processes of organization. Ecological studies have provided evidence of organizational inertia that is consistent with imprinting, particularly those forms of inertia that can be linked with conditions at founding. Existing empirical work in the context of national transitions provides pervasive effects from older regimes on the capabilities and structures of enterprises before and after national transitions, which are also consistent with imprinting. Studies of inter-organizational networks have provided evidence of strong regional effects on the properties and capabilities of these networks. Ongoing research on imprinting should attempt to integrate these existing findings and derive a framework that simultaneously accounts for these patterns and links them with a more comprehensive framework for understanding social processes in organizations.

See Also

- ▶ Biological Analogies
- ▶ Competency Trap
- ▶ Initial Conditions
- ▶ Organizational Ecology
- ▶ Organizational Routines
- ▶ Path Dependence in Technologies and Organizations
- ▶ Sociology and Strategy

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Incentive Design

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Definition Incentive design is a careful process of crafting a system that connects performance measurement with performance rewards, with the goal of motivating employees to perform according to the expectations of the organization.

Incentive design is a means of aligning the interests of an organization's employees and owners. While the owners of the firm seek to maximize the profits, the employees focus on maximizing their private wealth (utility). Due to the utility maximizing nature of individuals, the challenge of ▶ opportunism or 'self-interest seeking with guile' (Williamson 1987: 47) arises. In particular, *ex post* opportunism – ▶ moral hazard – becomes an inevitable problem. Since the problem of opportunism increases the transaction costs of a firm, in other words, the 'costs of running the system' (Arrow 1969: 48), it is crucial to control these costs. Moral hazard can be controlled by efficient incentive design (Holmstrom 1979), a compensation plan which aims at motivating the employees to work towards the organization's goals.

Tying pay or other compensation plan elements to performance can give individuals an incentive to work efficiently. Designing an incentive plan requires careful consideration of the performance measure (for an overview of performance measure design, see Neely et al. 2005). Performance can be measured at individual level, at group level or at organizational level (Long and Shields 2005). The performance evaluation can be objective or subjective (Brickley et al. 2008). A quantifiable output variable is typically used as a basis for objective performance measurement. Such a variable could be, for example, pieces produced in a certain time, the number of products sold or the increase in the revenues. The performance measure must be selected so that the employees can actually influence the variable with their actions and so that it is not heavily influenced by exogenous factors such as economic trends. A subjective performance measure results from the evaluation of a third party. Such a measure could, for example, be a merit rating assessed by a supervisor. The evaluator must be selected carefully in order to avoid possible bias in the evaluation.

After selecting the appropriate performance measure, the next step in incentive design is to reward the employees for their performance. According to the evaluation provided by the performance measure, the employer can offer various performance rewards or ▶ incentives to the employees. These rewards might be monetary, such as bonus payments or stock options of the company, or non-monetary, such as a better office, a holiday or more responsibilities at work.

When designing an incentive plan one should consider that employees will only agree to an incentive contract when their expected utility for signing the contract is higher than choosing an alternative employer (*participation constraint*) (Milgrom and Roberts 1992). This means that employees have to value the compensation offered at least as much as a best alternative

offer. In addition, in order to offer a motivating incentive scheme for the employees, the utility which the employees receive for performing well (for example, through a bonus payment) has to be greater than (or at least as much as) they would obtain with low levels of performance (*incentive compatibility constraint*) (Milgrom and Roberts 1992) – that is, the employee prefers to act towards the goals of the organization.

An efficient incentive design motivates employees to work towards the organizational goals. Nevertheless, employees have different preferences when it comes to performance rewards as well as performance measures. Especially when a company employs an international workforce, special attention should be placed on the incentive plan design. An incentive plan that motivates employees in one country might even have adverse effects in another (Gunkel 2006). As individuals have different interest in incentives it might be beneficial to offer employees incentive plans that allow them to choose the rewards they receive. These so-called cafeteria plans offer employees the option of picking those rewards that increase their utility the most within a given budget (Lazear 1998). Such plans help organizations to avoid rewards that waste financial resources and therefore help the company to offer efficient forms of incentives.

See Also

- ▶ Incentives
- ▶ Moral Hazard
- ▶ Opportunism

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I

Incentives

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Abstract

In strategic management, incentives are usually considered as the factors that induce desired behaviours and/or performance of individuals, groups and organizations. It is believed that incentive conflicts between individuals and managers, managers and firm owners, and those between transaction partners are harmful to the long-term performance of organizations. Strategic management scholars have suggested many incentive designs that help to mitigate incentive conflicts, such as different compensation and governance structures. Research issues on incentives at the individual, group and organizational levels are discussed respectively.

Definition An incentive is any factor that motivates or encourages individuals, groups or organizations to take a particular course of action, or counts as a reason for preferring one choice to the

alternatives. It can be economic, normative and affective bonding. By aligning the incentives of employees, managers, firm owners and those between transaction partners, an organization's performance can be enhanced.

> One day Deng Xiaoping decided to take his grandson to visit Mao. 'Call me granduncle,' Mao offered warmly. 'Oh, I certainly couldn't do that, Chairman Mao,' the awe-struck child replied. 'Why don't you give him an apple?' suggested Deng. No sooner had Mao done so than the boy happily chirped, 'Oh thank you, Granduncle.' 'You see,' said Deng, 'what *incentives* can achieve.' (Lyer 1984: 62)

Incentive is generally defined either as 'a thing that motivates or encourages someone to do something' or as 'a payment or concession to stimulate greater output or investment' (*Oxford English Dictionary*). Along with some other factors (e.g., organizational capabilities, managerial cognition), incentives have been found to have strong effects on the behaviours and performance of individuals, groups and organizations (Devers et al. 2007; Kaplan 2008). In strategic management, incentives are usually considered as the factors that induce desired behaviours and/or performance of individuals, groups and organizations.

Individuals and organizations with different goals, and attitudes towards risk tend to have different incentives. When more than one organization or individuals within a group or an organization have to cooperate with each other to achieve organizational goals, incentive conflicts lead to governance problems such as agency, free-riding and hold-up problems (Eisenhardt 1989; Williamson 1991). These problems increase agency and transaction costs, which tend to harm the interests of at least one party in the relationship (usually the principal in an agency relationship or the party with more relationship specific assets) (Jensen and Meckling 1976; Williamson 1991). Strategic management scholars investigate the different incentives of individuals and organizations, and explore the governance mechanisms that may mitigate the governance problems resulting from these incentive conflicts. Below, we will discuss the incentives of different entities across three levels: individual, group and organization, based on a brief review of articles published in four leading management journals from 1991 to 2010 (*Academy of Management Journal*, *Academy of Management Review*, *Organization Science* and *Strategic Management Journal*: see Table 1).

The Incentives of Individuals

Individual incentives are presumed to affect behaviours and performance to the extent that

Incentives, Table 1 Distribution of studies in different levels of incentives: a survey of four leading management journals, 1991–2010 (Academy of Management Journal, Academy of Management Review, Organization Science and Strategic Management Journal)[a]

Level of incentives		1991–2000 Number of articles	%	2001–10 Number of articles	%
Individual level					
	Employees	10	25%	15	23%
	Managers	13	33%	8	13%
	CEOs	3	8%	14	22%
Group level					
	Employees	2	5%	4	6%
	Top management teams	0	0%	3	5%
	Boards	2	5%	7	11%
Organization level					
		10	25%	13	20%
Total		40	100%	64	100%

[a]Includes only articles with the word 'incentive' in the abstract

they affect the intentions of an individual. They can affect behaviour when the individual changes intentions (conscious goals) as a result of being offered or receiving an incentive (Locke 1968; Tolchinsky and King 1980).

Management scholars' attention to the incentives to employees can be dated back to Taylor's scientific management (Taylor 1903, 1911) and the Hawthorne research (Shepard 1971). The former started research on economic incentives while the latter raised the importance of social rewards (e.g., appropriate supervision and resulting interpersonal satisfactions) in inciting employees' productivity, and attached social value to monetary incentives. In more recent years, rational, normative and affective bonding incentives have been discussed (Kidwell and Bennett 1993). Various incentives were recognized as antecedents of employees' better performance (Erez and Somech 1996) and other desired organizational behaviours (Schweitzer et al. 2004; Wang and Barney 2006).

As discovered by Taylor (1903, 1911), a basic incentive conflict between employees and organizations stems from the fact that employees aim to maximize their compensation and minimize their effort expenditures, while the owners of organizations want to increase the value and performance of the organizations (Jensen and Meckling 1976; Bloom and Milkovich 1998). To manage this conflict, behaviour-based, outcome-based and socialization-based control mechanisms have been suggested (Anderson and Oliver 1987; Banker et al. 1996).

Scholars pay special attention to the design of compensation strategy that helps to align the incentives of employees and organizations, and directs the efforts of various individuals and subunits towards the achievement of an organization's strategic objectives (Gomez-Mejia et al. 2010). In particular, the linking of a substantial portion of an employee's income to the ups and downs of pre-established performance criteria is called 'incentive compensation' (Gomez-Mejia et al. 2010).

A firm's CEO and top managers can be highly influential in determining the firm's strategies and performance (Finkelstein et al. 2009). The separation of ownership and control of large corporations makes the incentive conflicts between managers and owners/shareholders a very salient issue (Berle and Means 1932; Zajac and Westphal 1994). ▶ Agency theory is the dominant theory in discussing this topic. It assumes that, while the owners/shareholders are risk-neutral and care about the value of their firms, the self-serving managers have incentives to maximize their monetary income, to shirk, to build their empire and reputation, to avoid risk and so on, sometimes at the expense of the interests of the owners/shareholders (Harrison and Harrell 1993; Decker and Mellewigt 2007). The incentive conflicts between managers and owners/shareholders lead to value-reducing strategies (Baysinger et al. 1991; Buchholtz and Ribbens 1994; Zhang et al. 2008).

There are external and internal mechanisms that help to manage the incentive conflicts between managers and owners/shareholders (Oviatt 1988; Rediker and Seth 1995). The external mechanisms include the market for corporate control, competition in product markets, and the managerial labour markets (Fama 1980; Grossman and Hart 1980). The internal mechanisms are monitoring and compensation systems. The managers can be monitored by large outside shareholders and boards of directors or mutually monitored by each other (Fama and Jensen 1983; Demsetz and Lehn 1985). Compensation systems help to align the incentives of managers with share ownership, pay contingency, long-term incentive plans and compensation protection devices (Gerhart and Milkovich 1990; Bodolica and Spraggon 2009).

In addition to agency theory, transaction cost theory, managerial discretion perspective, prospect theory, social influence mechanisms, resource-based perspective, behavioural view of the firm and social control perspective have been used to discuss the incentives of managers and the mechanisms that help to mitigate the incentive conflicts between managers and owners/shareholders (Oviatt 1988; Rajagopalan 1996; O'Donnell 2000; Henderson and Fredrickson 2001; Fiss 2006; Zhang et al. 2008).

The Incentives of Groups

While the individual incentives are very important, they have significant drawbacks (Weiss 1987). Employees are not motivated to cooperate with one another, and serious morale problems can result from inequalities in pay across jobs. Group incentive programmes can help to solve these issues (Gomez-Mejia et al. 2010). There are three streams of research focusing on group incentives.

The first stream works on various aggregate pay-for-performance systems. Aggregate pay-for-performance is a compensation scheme in which remuneration is systematically tied to group output. Different levels of aggregation may be used to determine how performance is to be measured (Gomez-Mejia et al. 2010).

The second stream works on pay dispersion within a team, a group or an organization. Rooted in social comparison (Festinger 1954) and equity (Adams 1965) theories, pay dispersion theory focuses on 'the extent to which the amount of pay received differs substantially among peers at the same organizational level' (Gomez-Mejia et al. 2010: 139). It is usually believed that greater pay dispersion is seen as a sign of inequity, leading to 'perceptions of unfairness, hard feelings, and lower satisfaction' (Gomez-Mejia et al. 2010: 139), negatively affecting cooperation and performance (Siegel and Hambrick 2005). Since executives at a given level tend to share similar skills, knowledge and human capital, pay dispersion can have a negative impact, particularly at the ▶ top management teams level (Finkelstein et al. 2009).

The third research stream focuses on the incentives of boards of directors. Boards of directors serve an important function for organizations: monitoring management on behalf of shareholders (Hillman and Dalziel 2003). However, directors and boards tend to vary in their incentives to monitor management to protect shareholder interests; as a result, the incentives of boards are an important precursor to effective monitoring. Agency theory suggested that when the boards' incentives are aligned with shareholders' interests, boards will be more effective monitors of management, enhancing firm performance (Fama 1980; Jensen and Meckling 1976). Board independence and director compensation are the two prominent proxies for board incentives in agency theory research (Hillman and Dalziel 2003).

The Incentives of Organizations

The research on incentives at an organizational level has been mainly based on ▶ transaction cost economics and organizational economics (Williamson 1975, 1985). Different institutions that organize transactions, such as firms (i.e., hierarchy), market and various hybrid forms (e.g., franchising, alliance, joint venture) tend to have different incentive implications (Sorenson and Sørensen 2001; Foss 2003; Makadok and Coff 2009). The market is believed to provide strong incentives to parties in transactions. Firms, however, are subject to incentive limits that constrain the ability of internal governance to replicate and/or transmit the strong incentives found in the market, limiting the advantages of integration and organizational size and scope (Williamson 1975, 1985).

Building on the above theoretical argument, scholars look into the incentive conflicts between firms or different units within firms, especially between transaction counterparties and alliances partners (D'Aveni and Ravenscraft 1994; Gulati et al. 2005; Polidoro et al. 2011). Reducing the benefits of transactions or collaborations, incentive conflicts between opportunistic transaction partners are especially high in the presence of safeguarding, performance evaluation and adaptation problems. A safeguarding problem arises when a firm deploys specific assets and fears that its partner may opportunistically exploit these investments. A performance evaluation problem arises when a firm whose decision-makers are limited by bounded rationality has difficulty assessing the contractual compliance of its exchange partners. An adaptation problem is created when a firm whose decision-makers are limited by bounded rationality has difficulty modifying contractual agreements to changes in the external environment due to a high switching cost. It is suggested that integration or other hybrid governance mechanisms that provide a higher level of control than the market help to

align the interests between transaction partners (Williamson 1975, 1985; Gulati et al. 2005).

Conclusion

'Incentives' has long been a core concept in many of the main paradigms widely used in strategic management, such as agency theory, transaction cost theory, institutional perspective, behavioural theory of the firm and upper echelon perspective. Strategic management scholars are interested in investigating the antecedents of incentives that motivate individuals, groups and organizations, as well as the behaviour and performance implications of different incentives. It is generally believed that incentive conflicts between individuals and managers, managers and firm owners, and those between transaction partners are harmful to the long-term performance of organizations. In order to align the incentives of these different entities, different compensation and governance structures were suggested and their behavioural and performance implications were examined. However, the empirical findings are still mixed (Henderson and Fredrickson 2001; Dalton et al. 2003; Goranova et al. 2007; Zhang et al. 2008). Future research can help reconcile the mixed empirical findings and provide new insights.

See Also

- ▶ Agency Problems
- ▶ Agency Theory
- ▶ Ceo Compensation
- ▶ Top Management Teams
- ▶ Transaction Cost Economics
- ▶ Upper Echelons Theory

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Incomplete Contracts

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Abstract

This entry reviews contractual incompleteness and its implications for firm strategy and organization. An incomplete contract is an agreement that does not specify actions and payments for all possible contingencies. All but the simplest contracts are incomplete, containing 'gaps' that must be filled by negotiation, convention, or formal dispute resolution procedures such as courts and arbitration. Because contracts are incomplete, contracting parties cannot always rely on written agreements to protect relationship-specific investments, so they will establish firms, develop customs and provide other safeguards to govern their relationships. Hence incomplete contracting is central to modern economic theories of the firm.

Definition Incomplete contracts are contracts that do not specify actions and payments for all possible contingencies. All but the simplest contracts are unavoidably incomplete, containing 'gaps' that must be filled by negotiation, convention, or formal dispute resolution procedures such as courts and arbitration. For this reason, firms cannot always rely on written agreements to protect relationship-specific investments.

A firm may be described as a 'nexus of contracts' (Alchian and Demsetz 1972; Jensen and Meckling 1976) and the analysis of contracts has become central to strategy research. Contracts bind the firm to its owners, suppliers, workers and customers, and how a firm designs, negotiates, implements and enforces contracts is fundamental to its competitiveness. Building on contributions from law, economics and organization theory, strategy research characterizes contracts by reference to key attributes such as duration, complexity and completeness. This entry explains the difference between complete and incomplete contracts and draws out implications of contractual incompleteness for strategy and organization.

Main Idea

A complete contract specifies a course of action, a decision or terms of trade contingent on every possible future state of affairs. The 'contracts' of textbook microeconomic models – agreements to buy and sell goods, contracts between principals and agents to perform labour services, loans from banks to firms – are complete in this sense. Either there are no important contingencies to worry about, or forward-looking actors write complicated contracts with 'contingent claims' (Arrow and Debreu 1954) that link actions to potential outcomes. In these stylized models, the future is not known with certainty, but the probability distributions of all possible future events are known. In an important sense, the model is timeless: all relevant future contingencies are considered in the *ex ante* contracting stage, so there are no decisions to be made – no actions to be taken at all – as the future plays itself out.

An incomplete contract is one with gaps: there are possible future states of affairs that were not previously considered, and hence not treated explicitly in the contract. In the real world, there are genuine surprises, and complete, contingent contracts are impossible to achieve. For simple transactions – for instance, procuring an off-the-shelf component – uncertainty may be relatively unimportant and spot-market contracting works well. For more complex transactions, such as the purchase and installation of specialized equipment, a more sophisticated contract is needed. However, such a contract will typically be incomplete – it will provide remedies for only some possible future contingencies. One example is a relational contract, an agreement that describes shared goals and a set of general principles that govern the relationship (Goldberg 1980). Another is an implicit contract – an agreement that, while unstated, is assumed to be understood by all sides. Whether a contract is formal, written and explicit or informal, tacit and implicit, it is

considered incomplete as long as parties lack a shared understanding of how at least some unforeseen contingencies are to be remedied.

Real-world contracts for all but the simplest transactions are, of course, incomplete. Procurement contracts are subject to various shocks – technical specifications have errors or need adjustment, delivery arrangements don't work out as planned, customer requirements vary unpredictably. Winning bidders in a procurement auction may be overoptimistic, promising more than they can deliver – especially when the client is a public entity (Williamson 1976; Brousseau and Saussier 2009). The patent system provides a messy and difficult-to-define set of rights to patent holders and restrictions on their rivals and partners (Tirole 1999). In short, production and exchange are suffused with incompleteness, and often noticed as rarely as a fish notices water.

Implications of Incompleteness

Despite their ubiquity, incomplete contracts are key to understanding important and familiar business relationships such as ▶ vertical integration, relational contracting, sunk commitments and regulation. Contractual incompleteness exposes the contracting parties to certain risks. If unforeseen contingencies emerge, perhaps because of unexpected changes in circumstances or the revelation of some new information, the previous terms of trade may no longer be effective. Parties making specialized investments in the relationship may find themselves in a vulnerable position, no longer protected by the original governing agreement. To avoid this vulnerability, contracting parties will devise various safeguards to protect their investments.

In this sense, the implications of incompleteness for organizational form are central to ▶ transaction cost economics (Williamson 1985, 1996), the property-rights approach of the firm (Grossman and Hart 1986; Hart and Moore 1990; Hart 1995), theories of relational contracting (Baker et al. 2002), and entrepreneurial theories of the firm (Foss and Klein 2012). (Agency theory, by contrast, typically assumes that contracts are complete.) Williamson's work on the limits to contracting is particularly influential on strategy research. The need to adapt to unforeseen contingencies constitutes an additional cost of contracting; failure to adapt imposes what Williamson calls 'maladaptation costs', the best known of which is the 'hold-up' problem associated with relationship-specific investments. Investment in such assets exposes agents to a potential hazard: if circumstances change, their trading partners may try to expropriate the rents accruing to the specific assets. Suppose an upstream supplier tailors its equipment for a particular customer. After the equipment is in place, the customer may demand a lower price, knowing that the salvage value of the specialized equipment is lower than the net payment it offers. This creates an underinvestment problem: anticipating the customer's behaviour, the supplier will be unwilling to install the custom machinery without protection for such a contingency, even if the specialized technology would make the relationship more profitable for both sides.

If complete and contingent contracting were feasible, this problem could be solved with an arm's-length relationship, specifying prices and other conditions of trade as a function of potential future outcomes. Incomplete contracts will not be adequate for protecting relationship-specific investments, and firms may choose vertical integration or a 'hybrid' arrangement such as a joint venture instead of a formal contractual relationship.

More generally, the very existence of the firm, the hierarchical entity that substitutes managerial discretion for the coordination of the market (Coase 1937), is predicated on some notion of contractual incompleteness. As Loasby (1976: 134) puts it: 'The firm exists because it is impossible to specify all actions, even contingent actions, in advance; it embodies a very different policy to emergent events. Incomplete specification is its essential basis: for complete specification can be handled by the market.' This is particularly true for longer-term relationships, as Coase notes in his famous entry on the firm: 'the longer the period of the contract is for the supply of the commodity or service, the less possible, and

indeed, the less desirable it is for the person purchasing to specify what the other contracting party is expected to do. . . . Therefore, the service which is being provided is expressed in general terms, the exact details being left until a later date' (Coase 1937: 391–392).

Of course, the same factors that make contracts – and hence residual income rights – incomplete may also hinder formal and informal enforcement of ownership, or residual control rights (Demsetz 1998; Foss and Foss 2001). For this reason, we cannot simply assume that the hazards of incomplete contracting disappear when assets are under combined ownership. In this sense, incomplete contracting theories depend on specific conceptions of property rights (Foss and Foss 2005; Kim and Mahoney 2005).

Unpacking Incompleteness

Williamson, following Herbert Simon, attributes incompleteness to bounded rationality: contracting parties are simply unable to anticipate and specify all possible contingencies. Other scholars emphasize the costs of writing detailed contracts: parties may choose, rationally, to ignore certain highly improbable contingencies because the costs of specifying them exceed the benefits of a more complete contract (Saussier 2000). Parties may assume that courts will fill in the gaps using well-understood 'default rules' (Ayres and Gertner 1989). In other words, incompleteness may arise from information costs or the limitations of natural language, even among 'fully rational' agents. Moreover, even if the contracting parties are sufficiently clever and farsighted to write a complete contract, certain contingencies may be unverifiable to third parties, making parts of the contract unenforceable (Hart 1990).

Some contract theorists have complained, however, that restrictions on terms and clauses are assumed, rather than explained. Tirole (1999: 743) worries that '[f]or all its importance, there is unfortunately no clear definition of "incomplete contracting" in the literature. While one recognizes one when one sees it, incomplete contracts are not members of a well-circumscribed family; at this stage an incomplete contract is rather defined as an ad hoc restriction on the set of feasible contracts in a given model.' Indeed, Maskin and Tirole (1999) suggest that the kinds of cognitive limits (i.e., transaction costs) thought to underlie incomplete contracting do not matter much – as long as parties can describe their possible rewards under various contingencies, they need not specify the actions they will take.

Responding to this criticism, Hart and Moore (2008) and Halonen-Akatwijuka and Hart (2013) suggest that parties deliberately leave gaps in contracts because including specific, detailed provisions makes it harder to renegotiate after the fact – loosely specified provisions are useful 'reference points' for future bargaining. Taking a different approach, Foss and Klein (2012) note that contracts might be incomplete because contracting parties have different, subjective expectations about the likelihood of various contingencies affecting the value of their co-specialized investments.

For the purposes of applied work on strategy and organizational form, the precise source of incompleteness may not matter: if all feasible contracts for complex transactions contain gaps, then firms will explore other options for protecting relationship-specific investments, whatever the ultimate reason for the incompleteness. Strategy scholars have thus tended to remain agnostic on the exact source of incompleteness, and have not generally followed Williamson in emphasizing bounded rationality.

Extensions

While all complex contracts are unavoidably incomplete, parties can choose how carefully to specify contingencies; in other words, the degree of incompleteness is chosen endogenously by the contracting parties. For procurement agreements, this can be operationalized as the probability that a contingency not covered by prior contractual agreement arises, or the extent to which renegotiation procedures are specified (Crocker and Reynolds 1993). For employment contracts, it is reflected in the degree to which employees'

actions are constrained by managers, similar to Simon's (1947) notion of authority; that is, a less complete employment relation is one that gives the employee more discretion (Foss and Klein 2012). An important implication is that more complete employment relations may stymie entrepreneurial behaviour among employees.

Incomplete contracts also underlie some 'stakeholder' approaches to the corporation, which combine team production theory (Alchian and Demsetz 1972) and the idea that residual claims are contested and imperfectly enforceable (Rajan and Zingales 1998; Blair and Stout 1999). In these approaches, the firm is modelled as a nexus of incomplete and implicit contracts, with the Board serving as a mediating hierarchy (Kim and Mahoney 2010; Klein et al. 2012). Evolutionary capabilities and knowledge-based approaches to the firm also often make use of incomplete-contracting reasoning, albeit implicitly.

See Also

- ▶ Property Rights and Strategic Management
- ▶ Transaction Cost Economics
- ▶ Vertical Integration
- ▶ Williamson, Oliver E. (Born 1932)

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Industrial Espionage

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Abstract

Industrial espionage is an important, if somewhat neglected, topic in strategic management. Seen by some as a modern phenomenon and by others as little more than a theme for Hollywood blockbusters, industrial espionage is actually real and widespread. Often discussed in practice-facing publications and the mass media, few management scholars have delved into such murky waters. As a result, this entry draws on discussion of industrial espionage drawn from scholars interested in the spread of innovation, business crime, external learning and business history. The most important aspects of industrial espionage are set out below as a brief introduction and explanation for strategic management scholars.

Definition Viewed as a form of strategic organizational learning, industrial espionage can be seen as larcenous learning, an illegal yet effective way of obtaining valuable knowledge, and information. The targets for industrial espionage are varied, but include trade secrets, R&D activities, internal operating processes, customer and supplier information and marketing plans.

Nasheri (2005) usefully distinguishes between 'economic espionage', as involving a government's efforts to collect information and appropriate trade secrets, and 'industrial espionage', as an organizational phenomenon with the same objectives as economic espionage yet without direct governmental involvement. Viewed as a form of strategic ▶ organizational learning, industrial espionage can be seen as larcenous learning (Ferdinand and Simm 2007), an illegal yet effective way of obtaining valuable knowledge and information. The targets for industrial espionage are quite varied, but include trade secrets, R&D activities, internal operating processes, customer and supplier information, and marketing plans. Industrial espionage can thus provide access to complementary assets; allow organizations to bypass the substantial cost of research and development; and gain access to valuable information from industry knowledge and competitors.

Far from being a recent phenomenon, industrial espionage has occurred throughout business history. The porcelain industry is a prime illustration of this (see, e.g., Savage 1952, 1961, 1969), because for over 100 years competing manufacturers engaged so frequently in deliberate acts of industrial espionage that the phenomenon has been described as fundamental to any understanding of the growth of the industry (Young 1999). In fact, the process of making 'true' porcelain was, according to Bergier (1975), stolen from the Chinese and introduced into Europe by Père Francois Xavier d'Entrecolles. This Jesuit missionary travelled to China in 1698 and subsequently detailed the processes in letters dated 1712 and 1722. The early textile industry is another example of the widespread practice of industrial espionage, with the US in particular massively benefiting from it (Fialka 1997). Evidence of this can be seen in the naming of Lowell, Massachusetts, after Francis Cabot Lowell, who in 1811 visited Scotland and England, specifically to surreptitiously acquire knowledge of water-powered mills and cotton-making technology, especially the Cartwright loom. Lowell, almost single-handedly, successfully transferred the knowledge and expertise underpinning Britain's textile manufacturing industry to America (Mendell 2003), despite the fact that British mill owners were often obsessed

with secrecy. At the time, publication of technological innovation was suppressed; businesses moved goods and machinery in and out of their factories at night and via the back door; and 'many a mill resembled a medieval fortification with perimeter walls and gatehouse' (Jeremy 1996: 215).

However, it is important to recognize that such knowledge theft in itself is insufficient to gain maximum utility. In order to realize the value of knowledge and information, such knowledge has to be effectively put to work, and so industrial espionage frequently involves the hiring of key personnel and has sometimes even involved kidnapping people (see, e.g., De Camp 1974: 297; Cipolla 1993: 158). When considering the hiring of key personnel, and, more generally, the involvement of people in industrial espionage, motivation is an important concern and an understandable preoccupation of the practitioner literature. Nasheri (2005) argues that espionage is motivated by either a disgruntled employee misappropriating company secrets for his/her own financial benefit, or else a competitor of the company or a foreign nation misappropriating trade secrets to advance its own financial interests. However, Ferdinand and Simm (2007) extend this understanding by arguing that organizational culture, the strategic position of the firm, internal structure and competitive environments also contribute in combination to industrial espionage. Likewise, factors such as loyalty, ideology and high-pressure contexts significantly influence industrial espionage (Ferdinand and Simm 2007).

Industrial espionage is real and an important aspect of contemporary strategic management. With increasing levels of competition resulting from globalization and harsh economic conditions, the temptation to engage in industrial espionage is growing. Through recognizing and understanding industrial espionage as a strategic option for organizations, despite its illegality, strategic management scholars can identify the contexts and motivations for individuals and organizations. Through such knowledge, more effective forms of protection, and other tactical and strategic decisions, can be made.

See Also

- ▶ Agency Theory
- ▶ Organizational Learning
- ▶ Transaction Cost Economics

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Industrial Organization

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Abstract

Industrial organization evolved gradually as a distinct field of economics in response to the growing prominence of large manufacturing corporations from the late nineteenth century (Chandler, A.D. *The visible hand: The managerial revolution in American business*.

Cambridge, MA: Harvard University Press, 1977). Initial scholarship took the form of an ongoing tradition of industry case studies, reflected, for example, in new editions of Walter Adams' edited collection (Adams, W. *The structure of American industry: Some case studies*. London: Macmillan, 1950; Brock, J. *The structure of American industry*, 12th ed. New York: Prentice Hall, 2008). Indeed, the US Federal Trade Commission was formed in part to conduct just such in-depth analysis of individual industries. However, by the middle of the twentieth century, most scholars had shifted their focus to the search for regularities and theories that could be applied across industries and market structures. One branch of research, which I tackle last, has focused on the theory of the firm – the recognition that business enterprises are more than just production functions.

Definition Industrial organization (or industrial economics) is the field of economics that studies the nature of the business enterprise in a modern industrial economy; the determination of price in imperfectly competitive markets; and the effectiveness of antitrust or competition policy in correcting market failures resulting from such real-world frictions as entry barriers, transaction costs and limited information.

Industrial organization evolved gradually as a distinct field of economics in response to the growing prominence of large manufacturing corporations from the late nineteenth century (Chandler 1977). Initial scholarship took the form of an ongoing tradition of industry case studies, reflected, for example, in new editions of Walter Adams' edited collection (1950; Brock 2008). Indeed, the US Federal Trade Commission was formed in part to conduct just such in-depth analysis of individual industries. However, by the middle of the twentieth century, most scholars had shifted their focus to the search for regularities and theories that could be applied across industries and market structures. One branch of research, which I tackle last, has focused on the theory of the firm – the recognition that business enterprises are more than just production functions.

Far more attention has been devoted to understanding the determinants of price when markets fail to conform to the conditions of perfect competition or monopoly. The comparative statics (or pricing trajectories) of microeconomics fail to hold in the absence of a deterministic industry supply curve. Two overlapping approaches have been proposed for generating testable hypotheses: the structure-conduct-performance paradigm and what has been termed the new empirical industrial organization. The field of industrial organization is inextricably linked with the institutions and agencies charged with implementing competition (antitrust) policy.

I

Structure-Conduct-Performance

Since at least Bain's influential textbook published in 1959 (Bain 1968), it has been useful to trace the constraints market structure places on firm conduct, which in turn determines the degree to which market performance deviates from the competitive ideal. The early emphasis on defining causal linkages from structure to performance has been replaced by the recognition that firms conduct (investment) can alter market structure (subject to the constraints of intrinsic conditions such as price elasticity of demand, availability of raw materials and the state of technological know-how); that even the most cooperatively optimistic duopolists can find themselves engaged in ruinous price wars; and that government policies have crucial (often unanticipated) impacts on all three.

Barriers to entry and exit are the *primus inter pares* of structural characteristics. Free entry would drive profits to zero and minimize rents earned by the owners of scarce high quality resources. Bain (1956) identified four entry barriers causing imperfect competition: economies of scale, cost advantages of established firms, product differentiation advantages of established firms, and absolute capital costs. Bain's argument that an entrant might be deterred by a need to invest absolutely large sums of money has been widely criticized; but the ability of an incumbent

to exploit information asymmetries to deter entry or induce exit (Tirole 1988; Bagwell and Wolinksy 2002) has been added to the list.

In an influential paper, Stigler argued that firm conduct in oligopoly should best be viewed as an application of the theory of cartels. Whether through explicit or tacit collusion, cartel members must reach agreement in choosing levels for the most critical strategic variables and must implement mechanisms for deterring defections from the desired outcome. A variety of factors play a facilitating or limiting role (Scherer and Ross 1990). While not everyone would agree with Bagwell and Wolinsky, who wrote in 2002 that 'Non-cooperative game theory has become the standard language and the main methodological framework of industrial organization', many useful insights have emerged from formal models of the challenges facing firms navigating the shoals of oligopolistic rivalry (see also Schmalensee (1988) and Tirole (1988)).

Such models solve for behaviours that correspond to a Nash equilibrium, a situation in which each firm's strategy (a list of the moves it will make in all possible situations) is a best response to the strategies of its rivals, such that no firm has an incentive to change its behaviour. This rich theoretical literature has uncovered a number of general principles, such as the importance of credibility and the consequent value of commitment through investment, that have proven useful in a wide variety of contexts. But the dictum that virtually anything can happen in imperfectly competitive markets remains true; game-theoretic solutions are highly sensitive to the details of the models; and the prediction of such models are often difficult to test.

The New Empirical Industrial Organization

In reaction to the perhaps overzealous attempt to find evidence of structure-performance linkages in inter-industry cross-sections, since the mid-1980s researchers have turned to industry-specific studies that start with the first-order conditions for profit-maximization, which equate marginal cost to marginal revenue (Bresnahan 1989; Einav and Levin 2010). For an oligopolist selling a differentiated product, the latter depends on its own price elasticity of demand and cross-elasticities with the prices of important substitutes. Price and marginal cost are simultaneously determined, so that a primary challenge of this literature is finding variables outside the firms' control that can permit identification of the structural (in the econometric sense) relationships. (An alternative approach, common in merger simulations, is to use price and cost-related data in one geographic market as instruments for those in another.) The resulting framework allows researchers to test the consistency of observed data with the predictions of benchmark models such as joint profit-maximization or Bertrand pricing.

Some criticisms (e.g., Angrist and Pischke 2010) of this approach focus on the sensitivity of results to the identification strategy; others (e.g., Schmalensee 1988) on the difficulty of generalizing from industry-specific studies. Little attention has been given to the validity of the profit maximization assumption when markets are imperfect. The perfectly competitive firm must maximize profits or face bankruptcy. No such constraint exists in the presence of entry barriers and an imperfect market for corporate control; it is not obvious just what mix of objectives determines the strategies of business enterprises.

Competition Policy

More than most microeconomic fields, the agenda for industrial organization research has been driven by the needs of policy makers – notably those charged with evaluating mergers, uncovering collusive behaviour, and tempering the excesses of dominant firms. Antitrust agency merger guidelines all reflect the insight that rivalry is more likely to be suppressed in highly concentrated markets, but that seller concentration is only one of many drivers of economic performance. Econometric simulations have become a standard element of merger investigations. Withering criticism by economists of the presumption in law of

negative effects from price discrimination has caused a marked decrease in enforcement activity in this area. Similarly, industrial organization research played a crucial role in the US Supreme Court's elimination of the per se illegality of manufacturers' vertical restraints on wholesalers and retailers.

Economists and competition policy practitioners sometimes talk past one another out of a failure to clarify objectives and tolerance of unanticipated consequences. Is the goal to maximize the total surplus generated by market outcomes or to protect consumers? What weight should be given to the political implications of rising aggregate concentration? How much market power (elevation of price above marginal cost) in the short run can be tolerated as a by-product of the profits that stimulate entrepreneurial innovation?

Contractual Nature of the Firm

Industrial organization is concerned not only with the way senior management copes with rivals but with the challenges of organizing the internal operations of the firm. The analysis begins by considering efforts to align the interests of stockholders and senior management (Jensen and Meckling 1976). But similar principal-agent problems apply at every managerial layer. From this perspective, the firm consists of a set of contracts (some defined by law or custom) among input suppliers. These contracts are incomplete in the sense that they do not fully specify the consequences for all parties of all possible actions in all possible states of nature. They must reflect the challenges of asymmetric information (e.g., about managerial effort) or environmental characteristics (such as the riskiness of investments) that are too complex to be objectively verified by third parties.

This contractual view of the process of organizing tasks related to production has been expanded (by Williamson (1985) and others with a nod to Coase (1937)) into an analysis of the boundaries of the firm as driven by transaction costs. Under this paradigm, institutional arrangements emerge so as to minimize the impact of the selfish, boundedly rational behaviour of individuals on the overall goals of the enterprise. When a particular transaction requires tangible or intangible assets that would be of substantially less value if redeployed to alternative transactions (asset specificity), efficiency dictates that the transaction be subsumed into the general managerial structure of the firm, rather than concluded at arm's-length in the market place. Researchers have come to see the reduction of transaction costs as at least as important as engineering considerations in explaining the extent of vertical integration in a modern industrial economy.

In 1968, George Stigler questioned the value of trying to define an industrial organization field distinct from the rest of microeconomics. The concerns of business enterprises remain the same in all market structures; and certainly nothing as elegant as competitive price theory has emerged from a century of research. Yet industrial organization economists have developed an impressive toolkit for the thoughtful analysis of individual industries and continue to fine-tune the questions guiding future research – questions that would never have arisen under the assumptions of the competitive model.

See Also

- ▶ Cooperative and Non-cooperative Game Theory
- ▶ Perfect Competition
- ▶ Risk and Uncertainty
- ▶ Structure–Conduct–Performance

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Industrial Policy

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Abstract

Scholars have long treated industrial policies as temporary expedients that help developing economies to catch up with rivals. A growing body of research suggests that public policy interventions targeting particular industries play important but very different roles across developed economies. Industrial policies can substitute for market coordination, can supplement capitalization by private investors and can be used to jump-start infant industries. Understanding the variety of industrial policies, and their roles in modern economies with different systems of government coordination, private initiative, research and development, labour cooperation and training will be increasingly important for strategic management scholars.

Definition An industrial policy is a government-sponsored economic growth programme that encourages development of, or investment in, a particular industry. Industrial policies may target local, regional or national development of an industry by any number of means.

An industrial policy is a government-sponsored economic growth programme that encourages development of, or investment in, a particular industry. Industrial policies may target local, regional or national development of an industry by any number of means. Industrial policy instruments are often directed at 'infant' industries, but may also bolster mature industries or help them to implement new technologies. The most visible industrial policies include public investment in industry, public procurement policies and tax relief for private investors. Less visible policy instruments include tax incentives, foreign direct investment incentives, intellectual property rights programmes, fiscal policies, trade policies, labour market policies, and science and technology policies (Cimoli et al. 2009: 1–2).

Early Studies: Industrial Policy as a Temporary Intervention for Economic Development

In the heyday of laissez-faire theorizing, industrial policy was thought to be a strategy for developing economies to catch up with developed economies. In academic research, the role of industrial policy was recognized in the 1950s by development economists, who suggested that the experience of second-wave industrializing countries in Europe would be repeated in underdeveloped countries in Asia, Africa and Latin America. Economists saw that the promotion of key sectors through state intervention was important for

overcoming economic backwardness. Alexander Gerschenkron (1962) argued that late-developers like Germany and Russia did not go through the same stages of development that Britain went through, but leapt ahead by using the state to provide the missing prerequisites of economic growth. Gerschenkron suggested that each stage of economic development may require a particular set of policies. Albert Hirschman (1958) argued that economic development can be achieved not by mobilizing an entire economy at once but, rather, by mobilizing key strategic sectors that can pull the rest of the economy along with them. Hirschman referred to this 'pushing' and 'pulling' process as the creation of 'forward-and-backward linkages' in industrial development. Industrial policies favouring key industries were integral to initiating the process.

The strategic role of the state in economic development was advocated by post-war proponents of import substitution industrialization (ISI) in Latin America (O'Donnell 1973). ISI was designed to reduce the foreign dependency of late-developing countries through local manufacturing. Industry nationalization, subsidization of vital industries and protectionist trade policies were the core policy instruments. ISI does not eliminate imports, but rather, alters the type of imports by replacing some goods with domestically produced substitutes. The objective is to lift the economy to a higher stage by developing manufacturing capacity and moving from export of raw materials to production, and eventually export, of manufactured goods. ISI policies were seen as a temporary measure to jump-start developing economies.

The role of the states in promoting economic development in the US was recognized by economic historians by the 1950s. They chronicled state and local promotion of banking, canal construction and railway building in the first half of the nineteenth century (Handlin and Handlin 1947; Goodrich 1949, 1960). Even after many of the American states passed constitutional amendments prohibiting direct government aid to industry in the latter half of the nineteenth century, state and local governments continued to promote industrial development through incentives for private industry to invest in specific areas and industries (Graham 1992). These economic historians did for the United States what Gerschenkron (1962) would do for Europe, showing that states had taken charge of ensuring funding of early industries.

Recent Studies: Persistence of Industrial Policy

Whereas development economists and economic historians saw industrial policies as a temporary expedient countries needed to catch up, studies of advanced economies have confirmed that they continue to use industrial policy instruments of various sorts. The early literature on industrial policy sought to identify the ideal role of the state in economic development, but recent studies suggest that a number of different approaches have been effective. There is no single industrial policy or course of action that can deliver economic development most effectively across countries, industries or firms.

At the country level, in economic sociology and comparative political science an emergent camp contends that capitalism may take a variety of different forms rather than conforming to a single ideal type, and that state industrial policy contributes to this variety. Sociologists working in the 'national business systems' tradition argue that nations have broadly different approaches to dividing the work of entrepreneurship, capital allocation, bank regulation, labour market regulation, workforce training, industrial relations and public procurement, and that public policies in each of these domains can be used to promote particular industries (Whitley 1992). Political scientists working with the 'varieties of capitalism' framework argue that countries develop different systems for managing firms and labour markets (Hall and Soskice 2001). Liberal market economies, epitomized by the United States, coordinate economic activity through markets and corporate hierarchies. Coordinated market economies, epitomized by Germany, coordinate economic activity more through non-market mechanisms, such as collective bargaining between unions and

employers. Varieties-of-capitalism scholars challenge the mainstream neoclassical approach to government–market relations, suggesting that countries have different sets of institutions to manage problems of accessing capital, motivating employees, ensuring appropriate skill levels and bargaining over wages. Across different types of 'national business systems' or different 'varieties of capitalism' the state plays different roles in the economy, and sometimes roles that belie national beliefs about state–industry relations. In the United States, for instance, despite long-standing opposition to public funding of industry, generous military procurement policies have been used deliberately to promote industries such as aircraft and electronics (Hooks 1991; Graham 1992). Others argue that national economic systems depend on different sorts of government leadership. Zysman (1983) argues that the role of the state in coordinating financial systems shapes industrial development in persistent ways. Dobbin (1994) shows that distinct national patterns of industrial policy reflect broader national political cultures. Institutional logics of political order were transferred to the project of achieving economic order in Britain, France and the United States.

Distinct patterns of industrial policy and corporate organization persist over time and shape the international competitiveness of firms. Guillén (2001) shows that firms in Argentina, South Korea and Spain diverged in their patterns of behaviour, organizational form and growth, and that differences persisted as they became more integrated into the global economy. He suggests that social and economic organization is informed by historically developed logics, which are changed only with difficulty. Broad institutional blueprints at the national level define which actors are legitimate participants in the economy, how they relate to one another and how they relate to the state. These blueprints offer comparative advantages in international markets to different sorts of firms and industries.

At the industry level, political scientists from the varieties-of-capitalism camp argue that countries and firms play different roles in the global economy. They document that national firms compete in world markets following different templates, building on their countries' institutional strengths, and depend on very different government roles. Thus German, French, Japanese and American firms lead in different arenas in the global economy, but rarely in the same industries and market segments. German firms excel at high-quality, engineering-intensive industries such as specialty chemicals, advanced machine tools and luxury cars (Streeck 1991); French firms specialize in large-scale high-technology systems engineering and construction projects such as high-speed trains, aircraft and space hardware, and nuclear power (Storper and Salais 1997); Japanese firms excel at assembled products, from consumer electronics to household appliances to cars (Gerlach 1992); American firms are innovative in the fields of software engineering and biotechnology (Storper and Salais 1997). These national differences are shaped in large measure by different approaches of the respective nation-states to encouraging entrepreneurship, capitalizing industry and promoting technological development.

At the firm level, comparative organizational sociologists have shown that firms pursue different modes of economic action and adopt different organizational forms depending on their home countries' dominant industrial policies. Hamilton and Biggart (1988), for example, found variation in corporate forms in South Korea and Taiwan. Rapid and successful economic growth in Korea has been dominated by *chaebol*, enormous family-owned conglomerates. In contrast, Taiwanese economic growth has been achieved by small to medium-sized family firms. Hamilton and Biggart suggest that political and cultural embeddedness explains the differences between Taiwanese and Korean firms. Korean industrial policy was implemented by a strong, centralized state that strategically supported the formation of large conglomerates as its partners in economic development. By contrast, the Taiwanese state did not develop strong relationships with corporations, but built large state-owned enterprises that dominated capital-intensive, upstream industries and encouraged the growth of competitive, small and medium-sized enterprises in other sectors (Wade 1990).

Implications for Strategic Management

In the past, industrial policy was regarded as a temporary measure that nation-states use to promote certain industries or to catch up with more advanced economies. It is now regarded in some quarters as more than a temporary expedient. The role of the state in industrialization in some of the East Asian economies has bolstered the idea that a developmental state can play a positive role at every stage of development.

Contrary to widespread expectations, globalization has not induced convergence towards a single approach to promoting industry, but has stimulated a variety of institutional responses. Even within advanced industrialized countries, significant differences exist in the nature of industrial policy and its role in the economy. In economic sociology and comparative political studies, scholars now contend that baseline institutional differences across nation-states contribute to this variety. Given that national industrial policy differences appear to be here to stay, strategic management scholars will need to build industrial policy differences into their models of strategic corporate behaviour. Strategic action in an economy like Korea's, with state-designated national champions in key industrial sectors, may look very different from strategic action in an economy like Argentina's, with less government coordination but significant private-sector coordination of industry. As a first step, strategic management scholars might establish the scope conditions for their theories, perhaps using the typologies offered by the varieties-of-capitalism literature (Hall and Soskice 2001) and the national business systems literature (Whitley 1992).

See Also

- ▶ Foreign Direct Investment (FDI) and Economic Development
- ▶ Institutional Environment
- ▶ Public Policy: Strategy in the Public Interest
- ▶ Sociology and Strategy

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I

Industry Architecture

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Abstract

The concept of industry architecture (IA) describes how labour is typically organized and structured within an industry ('who does what') and which firms capture value and profit as a result ('who takes what'). It encompasses features such as the degree of vertical integration, the division of labour between firms and the 'rules and roles' that determine how firms interact and the business models, available to them. While IA reflects the conditions under which firms operate, it is influenced, in the medium term, by firms' attempts to reshape those conditions to their own advantage. IA has close links with the concepts of ecosystems, platforms and global value chains, and with the field of evolutionary economics. It can also illuminate historical events such as the deregulation of financial services and subsequent financial crisis.

Definition An industry architecture (IA) is the set of organizational and inter-organizational roles, rules, customs, structures, business models and relationships that describe the division of labour within a particular industry and determine how and by whom value is typically created, and who captures value as a result.

What Is Industry Architecture?

The concept of industry architecture (IA) describes how labour is typically organized and structured within an industry (or, synonymously, 'sector'). As originally coined by Jacobides et al. (2006), the term was intended to refine the characterization of industries by moving beyond their implicit definition as monolithic, clearly delineated entities: in reality, industries are permeable, shifting sets of firms within which roles and relationships are set at any one point in time, yet also evolve over time. The way such sets are structured has important consequences in terms of business activities, conduct, performance and profit.

IA describes not only the degree of vertical integration within an industry, but also how labour is divided among firms. For instance, a vertically disintegrated industry might operate either as a set of independent vertical segments (as with computers during the 1990s), or as a set of closed and hierarchical supply networks centred on key manufacturers (as in automobile manufacturing today). The nature of the architecture will significantly affect the resulting patterns of value distribution and migration (Jacobides and McDuffie 2013), determining the fortunes of the industry as a whole and of individual segments and firms within it.

IA also encompasses the terms of engagement between firms in an industry, considering firms as interrelated economic agents (Jacobides et al. 2006: 1203). Drawing on institutional economics and economic sociology, IA suggests that firms have a limited 'menu' of rules and roles that they can choose from. Legal frameworks and regulation often dictate what is ruled in or out, while customs and norms influence what is regarded as appropriate. For example, consider how wine production and trade is organized in different regions, and who has the privileged position of certifying quality and owning the brand: in port it is shippers, in Bordeaux it is growers/bottlers and in Côtes du Rhône it is *commerçants* (traders) (Duguid 2005). IA research considers how such division of labour affects the division of profit, as in Dedrick et al. (2009) analysis of Notebook and iPod production.

IA considers several structural issues, such as the extent to which business relationships are hierarchical, or whether the links within transactional networks flow in one direction or both. Luo et al. (2012), for instance, document the hierarchical differences between electronics and automotive procurement, and link these industry-level phenomena to choices firms make about their own vertical boundaries. They also show how different industry architectures affect vertical

architecture – that is, the way individual firms configure their own boundaries to become more capable or responsive (Jacobides and Billinger 2006).

How Firms Shape Industry Architectures

IAs do not always represent unchangeable conditions that firms must passively accept; they are also actively influenced or manipulated by particular firms (or groups of firms), either for their own benefit or that of the entire industry. Because IAs shape rules and roles, they influence which business models are possible or viable in an industry. Thus, business-model innovation is often an effort to push the frontiers of how business is done in an industry, permanently altering the established IA in the process and sometimes changing regulatory provisions too. Santos and Eisenhardt (2009) show, for instance, how entrepreneurs try to build their success by shaping the IA around their venture through a process of claiming, demarcating and controlling. Conversely, if it is not possible to establish a set of rules that pertain to the division of labour in an emerging field, new products or services may fail to 'take root', as Ozcan and Santos (2014) show for the case of mobile payments. This is particularly relevant for innovative offerings that lie at the intersection of different industries, where powerful established players have to collaborate to establish a new IA.

IA thus reflects the strategic struggle to define the terms of engagement and shape the IA itself. Ferraro and Gurses (2009) show how Lew Wasserman, Chairman of the Music Corporation of America (MCA), used new technology to change the institution of the entertainment industry and benefit his own firm. IA shows how firms try to become 'bottlenecks' by taking up positions within the industry that give them control over scarce resources or outputs, power over peers and, as a result, better opportunities for value capture, as Fixson and Park (2008) show for the case of the bicycle industry and the role of Shimano.

Sometimes, leading firms push for their entire *segment* (themselves, plus a few of their competitors) to become a bottleneck, as Jacobides and Tae (2015) show for the case of the computer industry. Apple, for example, has made itself a bottleneck in the mobile/tablet space by bringing in multiple collaborators in those areas where it has chosen to be less active (such as iOS app development) while retaining control over key resources (such as iOS itself) to maintain its privileged position (see Pisano and Teece 2007; Pon and Kenney 2011). As Samsung and Google battle over whether device makers or operating-system providers will dominate in the telco market, each is trying to change the IA to its own advantage. Similar shifts are happening in industries such as pharmaceuticals and healthcare.

IAs as Organic Systems, Cognitive Frames and Relationship to Platforms

Some industries have a single dominant IA; in others, there are varied ways to organize and compete. The growing popularity of the term 'ecosystem' (e.g., Iansiti and Levien 2004; Adner 2012) is testament to the 'organic', multidimensional complexity of modern IAs, which provides the backdrop against which firms shape their boundaries and business models (Kapoor 2013).

IA also has a cognitive component, in that industry participants often try to impose their own vision of how the architecture should work through rhetoric and framing contests. This effort is aimed at legitimizing their own version of an IA and co-opting key industry players, regulators and the broader public, as Gurses and Ozcan (2014) have shown for pay-TV services. However, leading actors in a sector sometimes promulgate IA, which may not benefit them in the long run, as a result of bounded rationality and diverging incentives and biases within firms. This happened in the mortgage banking sector (Jacobides 2005) and nearly happened in automobiles, where car manufacturers were able to reverse their operationally and strategically risky decision to excessively modularize their sector (Jacobides et al. 2015b). Issues of agency to change as well as structure

which allows some firms to be effective in shaping their sector are central to IA research.

IA has close links with research into platforms (e.g., Gawer and Cusumano 2002; Baldwin and Woodard 2009). A platform can be seen as a particular type of IA that is usually accompanied by network externalities and a particular set of relationships around a platform sponsor. Firms' quests to become more 'nodal' and capture value *within* a platform, or to ensure one platform prevails over another, are part of the broader effort to shape IAs (see Tee and Gawer 2009; Jacobides et al. 2015a).

Links with Research Streams and Policy Implications

IA has parallels with the global value chain tradition (see Gereffi et al. 2005), which takes a global perspective on the struggle for competitive supremacy through the terms of engagement in an industry. It also relates to organizational field research (DiMaggio and Powell 1991; Fligstein 2007; Wooten and Hoffman 2008) by emphasizing relational networks, norms and aspects of behaviour that are taken for granted, but departs from it by examining how these structures change, focusing on agency more than social norms of preservation, and looking at industry-level dynamics. It thus moves beyond the analysis of structure in markets (Fligstein 2001), and considers how different participants broker a shifting industry-level 'truce' that defines the stable and evolving patterns of production and exchange.

IA is more directly allied with evolutionary economics (Nelson and Winter 1982), and extends analyses of industry evolution by focusing on how scope and organizational arrangements evolve (Langlois and Robertson 1995). IA contributes to this literature by suggesting that IA influences feedback mechanisms, which in turn drive individual action and the development of collective competencies, ultimately shaping the selection context (Jacobides and Winter 2012). The analysis of how vertical segments and their inter-relationships co-evolve can also help us revisit the nature of product lifecycles and the emergence of entrepreneurial opportunities over time (e.g., Fink 2014).

The analysis of IA has significant policy implications. For example, Jacobides et al. (2014) show how, especially from the late 1990s onwards, the IA of financial services was transformed from a vertically integrated, stable structure to a mass of individual players mediated by capital markets and rating agencies, ultimately leading to the financial crisis. At the time, this change was neither understood nor monitored by financial regulators, and the authors suggest that since regulators *still* do not consider rules, roles and relationships in the financial services industry, the risk of a fresh systemic collapse is still very real. Similarly far-reaching changes in industries such as telecommunications, media, entertainment, healthcare and education make the concept of IA both relevant and valuable for researchers and managers alike.

See Also

- ▶ Business Ecosystem
- ▶ Co-opetition
- ▶ Firm Size and Boundaries, Strategy

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Industry Transformation

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Abstract

During an industry's evolution, events endogenous or exogenous to the industry may disrupt its development and trigger a period of transformation. A transformation period generally evolves through stages: an era of ferment followed by convergence towards a new, relatively stable structure. Industries, however, vary in the pace and severity of the

transformation process. Because the way firms compete is altered after transformation begins, incumbents and entrants encounter strategic challenges that differ from those that incumbents faced pre-transformation. Thus, understanding how different sources and patterns of transformation influence competitive heterogeneity is an important line of inquiry in strategy.

Definition Industry transformation involves a process of change that is triggered by an endogenous or exogenous event. Such events, whether technological or institutional, alter the rules governing competition in an industry, disrupting its path of evolution and, in turn, initiating a course of redevelopment.

An industry is a complex set of relationships among firms, customers, suppliers and providers of substitute and complementary products and/or services. An industry's evolution typically follows a distinctive pattern of birth, growth, shakeout and maturity as new firms enter and failing firms exit (Klepper and Graddy 1990). The rate of evolution varies across industries but typically occurs at a relatively slow pace. However, at any time, events endogenous or exogenous to an industry may trigger a period of transformation and disrupt the industry's path of development. The degree of divergence from the previous evolutionary path may be incremental or revolutionary. In either case, the rules governing an industry differ before and after a transformation event. Such trigger events may lower the barriers to entry and create a shift in customer preferences and loyalties. Because the way firms compete is altered after transformation begins, both incumbents and entrants encounter challenges that differ from those that incumbents faced pre-transformation. In order to adapt and survive under the new industry conditions, incumbents must replace or modify their traditional capabilities developed in the previous era while entrants must build capabilities de novo (Madsen and Walker 2007). As conditions shift, maintaining or developing a superior profit position 'depends on meeting the challenges of competing over time' (Walker 2008: 90; Nelson and Winter 1982).

Patterns of Industry Transformation

Periods of transformation traditionally evolve through predictable stages: trigger event, era of ferment, convergence toward a new, stable industry structure and, in turn, an equilibrium state. However, the literature identifies alternative patterns (for instance, see Dosi 2005). The first is characterized by a semi-stable industry structure with persistent heterogeneity, rather than convergence, among firms. The logic is that heterogeneity in capabilities and resources is sustained across competitors and, in turn, differences in the performance of firms persist. While this pattern does not suggest persistent states of industry disequilibrium, it does predict sustained meaningful differences among firms even as the transformation period concludes. A second pattern leverages the concept of differences in cohorts operating in an industry during transformation. Variation in the cohorts' histories interact with the industry's history to yield different patterns of cohort evolution. These differences give rise to variance in the cohorts' adaptation and learning rates and, in turn, a dynamic cycle of divergence and convergence in the industry. The system fluctuates but the overall structure is relatively balanced (e.g., a dynamic equilibrium). In general, industries vary in the pace and severity of the transformation process. The following describes the core stages of the traditional process, and the subsequent section identifies various triggers that initiate the transformation process.

Era of Ferment: Experimentation

Transformation initiates with a period of experimentation in how firms serve an industry, and sets the industry on a course of redevelopment. After a transformation event, the rules governing competition are often unclear and an industry's market and technology trajectories are difficult to predict. For instance, uncertainty exists regarding customer preferences, the types of resource and capability investments that will yield an advantage, and which rivals, entrants (de novo or *de alio*) or incumbents will pose the most significant threat. Consequently, this stage is characterized by wide variation in firms' resources and capabilities, as

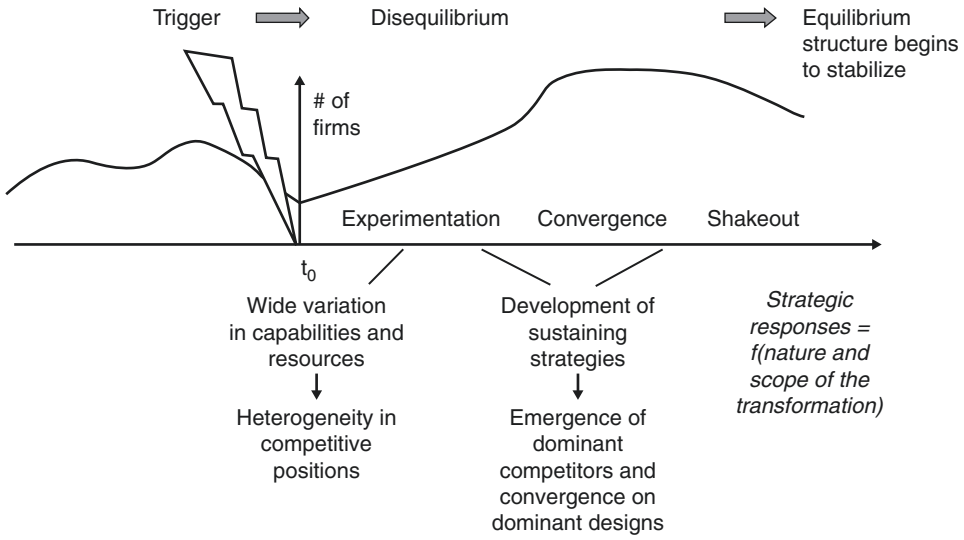
entrants and incumbents experiment with various approaches to serve the industry and to gain legitimacy. In general, the future direction of the industry is contested. Only some experiments in this stage will meet the emerging requirements for survival; a subset of these may imprint the industry's new structure (Stinchcombe 1965). The length of the variation period is substantially influenced by how significantly the disruption affects the established firm's bundles of resources and capabilities. As uncertainty regarding customer preferences and methods for serving those preferences declines, a set of ▶ dominant design emerges for product or service offerings (Utterback and Abernathy 1975), and the era of ferment concludes.

Convergence and Shakeout

Next, competitors converge on common practices underlying the dominant designs, and competition shakes out firms with ineffective capabilities and fragile strategic positions (e.g., Anderson and Tushman 1990). This process typically includes incremental technological progress and elaboration of the dominant design(s). Shakeout begins when one or more firms achieve a level of productivity that cannot be matched by weaker rivals or potential entrants (Klepper and Graddy 1990). The exit rate begins to exceed the rate of entry and the number of firms operating in the industry declines. As the industry converges toward a new structure, a new network of relationships among industry participants and institutional actors stabilizes (see Fig. 1). In addition, by this point some robust survivors may have developed first-order change capabilities or ▶ dynamic capabilities, which assist them in adapting and growing their operations as the industry evolves (Teece et al. 1997).

Triggers for Industry Transformation

Several factors or events may trigger periods of industry transformation. The most significant are those that change the rules of competition and, in turn, the efficacy of established firms' strategic positions. How an industry's players respond to the new industry conditions shapes the period of transformation. Indeed, the first cohort of entrants to an industry following a trigger event often plays a significant role in the industry's redevelopment (e.g., Geroski 1995). The primary triggers fall into two general categories: technological and institutional. Both categories, whether exogenous or endogenous, threaten the rules of competition in



Industry Transformation, Fig. 1 Traditional pattern of industry transformation

an industry and, in turn, the industry's state. Two categories of ▶ technological change found to have a significant influence on an industry's trajectory are technological substitution and disruptive innovation.

Technological Substitution

Technological substitution involves the introduction of a radically new technology that yields a larger rate of return on R&D investment relative to the current technology (Foster 1985; Walker 2008). A radically new technology involves a shift in a product or process that fundamentally increases the value created by the product or process and/or lowers the costs incurred to create that value (e.g., Anderson and Tushman 1990). This source of transformation is particularly important because a new technology may erode the competitive positions of incumbent firms (e.g., Teece 1986; Dosi 1988).

Substitute technologies may originate within an industry (an incumbent firm develops the technology) or outside an industry (a potential entrant, *de alio* or de novo, develops the technology) (Schumpeter 1934, 1950; Winter 1974). For instance, a new firm may enter (*de alio* or de novo) with a substitute technology; this exogenous source of innovation often triggers large-scale transformation when incumbents are not able to match the entrant's capabilities. Even when incumbents have the capacity to adopt the substitute technology, some may delay or resist adoption, regardless of the source of the technology. This segments the incumbent population into early and late adopters; this segmentation may have significant consequences for the firms' long-term market positions. Three reasons typically delay incumbent firms' decisions to adopt a technological substitute, even when the technology is available: (1) the degree to which the firm has been profiting from incremental innovations, (2) the ability of the firm to maintain profitability while adopting it (e.g., considering costs of cannibalization and the costs of commercializing the new technology), and (3) the degree of compatibility between the technology and the firm's strategy, structure, operations and culture (including an intense focus on competing effectively without radical product innovation). Strong isolating mechanisms around the new technology may further impede incumbent adaptation. As entrants and early incumbent adopters capitalize on the technological substitute, which increasingly displaces the existing technology, the positions held by late adopters weaken. Over time, these conditions give entrants and early incumbent adopters a lead, and the composition of competitors in the industry shifts.

Disruptive Innovation

The concept of disruptive innovation is not about a breakthrough technology. Instead, it involves the introduction of a simpler, more affordable product or service but with performance attributes that fall below those valued by established customers and with a small market opportunity (Christensen 1997). As a result, incumbent firms often ignore a disruptive innovation and continue serving established customers with innovations on a sustaining technology's trajectory. Sustaining technologies are those that foster improvement along performance dimensions valued by established customers. While incumbents ignore the disruptive innovation, firms with the disruptive innovation take root in an undemanding segment of the market, gain experience, improve their products and begin to move up market. As the performance attributes provided by the sustaining technology begin to overshoot established customers' needs, the established customers begin to seek alternatives. This opens a window of opportunity for products based on the disruptive innovation to invade the established market from below, and to cannibalize products based on the sustaining technology. The incumbent firms are then forced to align their strategies with the shifting market conditions. If incumbent firms are able to control customer access, they may be able to slow the market penetration of the disruptive innovation. Research finds that in most cases, however, incumbents fail, and are ultimately forced to exit their industries.

Institutional Change

The third category of triggers involves radical change in the institutions governing competition

in an industry, such as the deregulation of pricing and entry. Institutions include formal rules or informal constraints (norms, conventions, codes of conduct) governing the behaviour of organizational actors (North 1990). Radical institutional change involves changes in the formal rules governing competition in an industry. Such change may be exogenous, where actors external to the industry, such as regulatory agencies or legislative bodies, play a more significant role than industry players in defining new rules of competition. Alternatively, institutional change might be more endogenous, where firms in a focal industry play a more dominant role in shaping the rules of competition (e.g., capturing regulatory reform) than external institutional actors (e.g., Olson 1965; Stigler 1971). Regardless of the source, interactions among the industry's members and institutional actors influence the scope of the institutional change (Winston 1998).

Research shows that institutional change can set an industry on a dramatic course of transformation. For example, the deregulation of price and entry in the US trucking industry in 1980 was followed by rampant entry and intense price and service competition. Many incumbents struggled to adapt to the new rules of competition and to innovative entrants. As a result, 10 years after deregulation less than 50% of the incumbent population remained, and the industry structure was fundamentally changed (e.g. Madsen and Walker 2007). Incumbent firms that endured the early periods of transformation, however, ultimately became stronger competitors. These firms engaged in a slow process of continuous investment in technology and operations commensurate with the new environment; in contrast, firms that delayed investment were forced to exit the industry (see Winston 1998).

Managerial Implications

Understanding the bases of competition at each stage of an industry's development is critical to building and sustaining a robust position for any organization. Strategies and tactics employed in one stage of an industry's evolution may not support value creation in subsequent stages. Since fundamental industry transformation often changes the rules of competition, resources and capabilities developed to support the pre-transformation context also may become obsolete. Under these conditions, basic adaptation efforts of incumbent firms rarely succeed. For instance, research demonstrates that incumbent firms often fail to adapt effectively even when they have developed a disruptive innovation or have ample time to prepare for changes to the rules of competition (e.g., Christensen 1997). Additionally, research shows that firms using a 'wait and see' approach may survive but only as weak competitors (Madsen and Walker 2007). As a result, extant research offers a variety of prescriptions for managers when anticipating or facing major industry change (see Walker 2008). Importantly, many of these prescriptions point to firms' traditional administrative and organizational processes as constraining the magnitude and pace of adaptation. For instance, incumbent firms' traditional resource allocation processes inhibit their willingness to invest in disruptive innovations (see Christensen 1997). Extant work identifies particular mechanisms and activities that may assist firms in diagnosing the nature of transformation events, navigating new innovation trajectories, slowing the growth of emerging rivals and profiting from innovation (see Teece 1986; Anderson and Tushman 1990; Christensen 1997). The implications for managerial action are broad in scope but are rooted in a willingness to challenge traditional ways of operating.

See Also

- ▶ Complementary Asset
- ▶ Creative Destruction
- ▶ Disruptive Technology
- ▶ Dominant Design
- ▶ Dynamic Capabilities
- ▶ First-Mover Advantage
- ▶ Regulation/Deregulation
- ▶ Technological Change

Appendix 1. Alternative Patterns of Transformation

Persistent Heterogeneity and Semi-stable Structure

The first alternative pattern also begins with an experimentation phase. Here, however, differences among firms persist rather than converge, as firms accumulate unique bundles of resources via path-dependent learning and defend these resources against imitation. For instance, after a break in an industry's history, incumbents and new entrants may vary in their resource stocks, competitive experiences and capabilities and, in turn, in their imitability. Extant work suggests that over time a stable structure should emerge, because any profits above the industry norm should be competed away as rivals imitate a leader's innovation(s) (e.g., Mueller 1977). While imitation may erode a leader's advantage in a focal area, the leader is likely to respond to profit losses with further innovation, thereby restoring heterogeneity among firms (Knott 2003). These dynamics, coupled with variance in firms' imitability, may give rise to sustained (versus temporary) heterogeneity among firms, even in the presence of competitive forces (Roberts 1999). The implication is that transformation may yield a semi-stable industry structure.

Dynamic Equilibrium

A second pattern emerges from work showing that variations in the evolution of the cohorts operating in an industry give rise to differences in their patterns of development, and, in turn, to variance in the industry's overall development. For example, the first cohort of firms to enter an industry after transformation might follow a traditional evolutionary pattern of experimentation, convergence and shakeout. In contrast, the firms that operated in the industry pre-transformation (the incumbent cohort) have a legacy from the prior regime that may slow their adjustment to the new environment. Accordingly, entrants enjoy a window of opportunity during which they can establish an advantage over incumbent firms. Incumbents that survive the early stages of deregulation, however, are not likely to ignore their new rivals. As the surviving incumbents gain experience in the new regime, their competitive intensity increases (e.g., Madsen and Walker 2007) and a second wave of experimentation may emerge. The interaction of the cohorts' evolutionary trajectories yields a dynamic cycle of divergence and convergence in the industry's development.

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Information and Knowledge

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Abstract

Throughout time, alongside human advancement in technology, science and philosophy, the terms information and knowledge have been used to refer to rather different entities. Information, in most European languages, was used to refer to enquiry and education, both in a mathematical sense and in a more qualitative and semantic sense. Although, in the same line of development, knowledge could be defined as information plus justification, belief and truth, it is usually classified in categories of propositional knowledge (knowledge that) and practical or procedural knowledge (knowledge how). The scope and priority of these classes of knowledge are the topic of many philosophical speculations and justifications.

Definition Information is one of the main building blocks of knowledge. Even though the two terms overlap in definition, it is commonly understood that information is the observable pattern, as in data, code or text, while knowledge is the justified belief that the observed pattern is true.

Although 'information', in the colloquial sense, is used to refer to any kind of data, code or text, which may or may not be held as truth, historically, it has evolved into a term with a rather specific reference. The concept of information, from the very start of philosophical reflection, was associated with epistemology, ontology and mathematics; information is defined as the form of an entity conceived as a structure or pattern that could be described in terms of numbers. Such a form has both an ontological and an epistemological aspect: it explains the essence as well as the understandability of the object (Adriaans 2013). Probably starting in the fourteenth century, the term 'information' emerged in various developing European languages with the general meaning of 'education' and 'enquiry'.

Depending on the field of study, the term 'information' has either a quantitative definition or a qualitative one; Fisher information, Shannon information and Quantum information fall into the quantitative definition, mainly regarding the probability of any random variable depending on an unknown parameter (Fisher 1925), while semantic information is a qualitative view on information, with an emphasis on being well formed and meaningful (Floridi 2002, 2003, 2011). At the intersection of the two categories of probabilistic and semantic information, Shannon's information, explained as entropy, suggests that sequences have a meaning, thus reinforcing the semantic view. Furthermore, to Shannon, reduction of order means increase in information content associated with fewer repeating patterns in multiple messages, and decreasing the predictability of sequences repeated in the message (Shannon and Weaver 1949). That is, reduction in order leads to reduction in knowledge.

Hume was the first to bring together formal probability theory with theory of knowledge (Hume 1910: Section VI, 'On probability'). Knowledge about the future as a degree of belief

is measured in terms of probability, which in its turn is explained in terms of the number of configurations a deterministic system in the world can have. However, in such a sense, distinction between information and knowledge might prove to be difficult. Dunn defines information as 'what is left of knowledge when one takes away belief, justification and truth' (Dunn 2001: 423; also 2008). What Dunn defines as information might not agree with the traditional definition of knowledge, that is, 'justified true belief', because no matter which definition one adopts, there is an inevitable overlap between the concepts of knowledge and information. That notion of knowledge was questioned through time, with criticisms of all three pillars of the phrase: justification, truth and belief. Popper had a way out of this problem, by having falsifiability as an important property of scientific knowledge: the logical probability of a statement is complementary to its falsifiability: it increases with decreasing degree of falsifiability. The logical probability 1 corresponds to the degree 0 of falsifiability and vice versa (Popper 1977: 119). Scientific knowledge is, epistemologically, closest to propositional knowledge.

In the more common use of the term, 'knowledge' covers a range of meanings (Ichikawa and Steup 2014), from knowing a fact, such as 'Germany won the World Cup in 2014' (knowledge that, or propositional knowledge), to knowing how to swim (knowledge how, or practical/procedural knowledge) and knowing someone 'Sam knows David' (knowledge by acquaintance). The first two (knowledge that and knowledge how) are the main focus of investigation in the philosophy of knowledge, with debates on which is needed a priori. From one point of view (Stanley and Williamson 2001), knowledge that proceeds knowledge how, while in the other camp (Ryle 1949) it is impossible to reach knowledge that without having knowledge how in advance.

With the current focus on concepts such as 'knowledge economy' and 'knowledge transfer' in, more broadly, social sciences and, more specifically, strategy fields, it is essential to understand the definition, distinction and overlaps of knowledge, information and different types of the two, and how different kinds of each are present or operative in various processes and situations. The broad discussion of philosophy of knowledge and philosophy of mind is beyond this article, although interesting questions on the ontology of information and knowledge and the line separating them arise even in the context of this short introduction, questions such as when information and knowledge are indistinguishable or how one turns into the other – for example, if Turing machines create information or knowledge, if order is knowledge, or if knowledge is a structure on which information is placed and held.

See Also

- ▶ Knowledge Articulation
- ▶ Risk and Uncertainty
- ▶ Tacit Knowledge

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Information Technology and Strategy

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Definition Information technology is an integral component of corporate, business unit and functional level strategy. The strategic application of IT can be used to maintain the status quo, to proactively create new advantage in established lines of business, or to enable new product and process innovation.

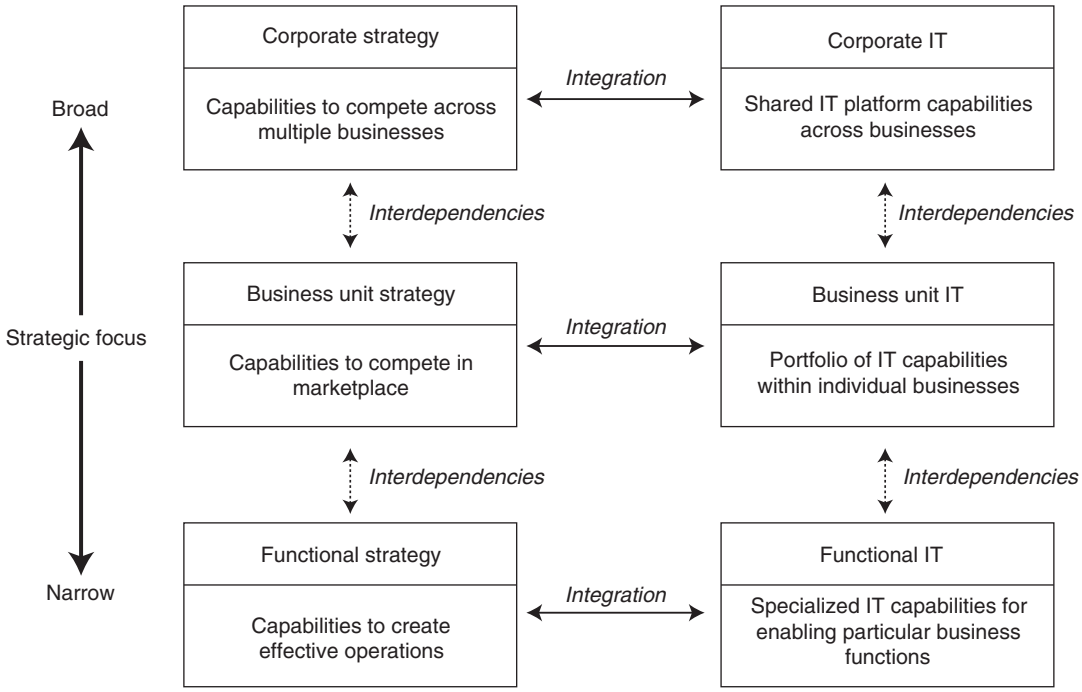
Among many leading organizations, in all sectors of industry, commerce and government, there is considerable evidence to indicate that information technology (IT) is being deployed to achieve strategic goals (Coltman et al. 2007). The emergence of relatively cheap and increasingly easy-to-use IT infrastructure and advanced applications, namely transaction processing, decision support, customer relationship management and enterprise resource planning, provide a base upon which more informed decision-making and enhanced products are built to gain and hold an advantage over competitors.

An intriguing strategy question is 'why are firms situated in the same industry, with similar understanding of the potential business applications for IT, unable to replicate the performance results of high-achieving firms?' The answer is that a firm's ability to create and appropriate value from IT stems not only from differences in the possession of resources but also differences in how IT is used at three strategic levels in the organization: corporate, business unit and functional strategy.

Strategy at the corporate level refers to the set of choices about how to compete across the different businesses that constitute the corporate profile (Rumelt 1974). At this level, strategic decisions are made about how IT can support espoused levels of data sharing and business process standardization across business units (BUs). Corporate level strategy is reflected in the corporate IT platform that includes data, hardware, network, applications and management services that are shared by BUs. Thus, a core function of the IT platform is to provide the foundation that allows BUs to leverage common factors of production and to promote process synergies where the joint value creation is greater than the sum of the value created by individual businesses (Tanriverdi 2006). Realizing these synergies requires continuous alignment efforts to ensure *integration* of ▶ corporate strategy and corporate IT capabilities (see Fig. 1).

Business unit-level strategy refers to the set of choices about how to compete – such as cost leadership, differentiation, focusing on particular niche markets or segments in an industry. Each BU will make a set of strategic choices about the specific business model and IT capabilities required to compete within the specific marketplace. For instance, advanced IT applications for data gathering, storage, and retrieval systems allow BUs to efficiently analyse purchasing behaviour. In turn, this analysis is used to discriminate between customer segments and to craft pricing strategies that enable the BU to cope with market-specific threats and opportunities (Fudenberg and Villas-Boas 2006).

The functional level strategy focuses on the set of choices to maximize resource productivity within primary business functions such as operations, finance or marketing. At this level, the deployment of IT focuses on specialized solutions to enable and support specific business functions. For example, firms have been successful at using IT to automate production routines and digitize simple functional processes such as onboard entry, closing the books, or taking an order.



Information Technology and Strategy, Fig. 1 Integration of strategy and IT at corporate, BU and functional levels

Continuous alignment is necessary to leverage vertical *interdependencies* between all three levels of IT investment and strategy (shown as dotted lines in Fig. 1).

The accelerated emergence of interoperable IT platforms has transformed the way companies work and changed the competitive structure of entire industries. For instance, Apple, Inc. showcases a successful digital platform strategy based on a tightly integrated software base (iOS) that enables seamless integration of iTunes software with a growing catalogue of content-creating partners (application developers and music labels). The content-creating partners enhance the value of Apple's App Store' by populating it with relatively inexpensive music, video content and applications for just about every customer need. The Apple example highlights the importance of IT and strategy.

As firms transition from a narrow application to a more strategic and tightly integrated IT focus, the organizational processes become more complex and more difficult to entirely digitize with IT. For example, the ability to present a single face to customers when data is shared across many processes in the organization is a far more complex task than developing a simple online ordering system at the functional level. Elsewhere we have argued that, while IT itself may represent a revolution in communication and process innovation, the unresolved issue is whether it represents a revolution in the conduct of business (Coltman et al. 2001). Those strategic principles that have served strategists well for a century – identify customer value propositions and put together the right people, processes, and technical resources in an effectively managed manner – are still as relevant today as they ever were.

See Also

- ▶ Corporate Strategy
- ▶ M-Form Firms
- ▶ Strategic Business Unit (SBU)
- ▶ Strategic Fit(ness)
- ▶ Technology Strategy

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Initial Conditions

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Definition Initial conditions refer to the social and economic conditions present at the establishment of a new firm or organization.

By initial conditions, we refer to the social and economic conditions present at the establishment of a new firm or organization. Research demonstrates that both internal and external initial conditions can pattern themselves in the organization's structure, and these conditions often exert effects throughout much of the firm's lifetime (Carroll and Hannan 2000). Strategic decisions about the firm are driven by these patterns as well as constrained by them.

Internal Initial Conditions

The teams assembled by entrepreneurs at the time of a company's founding typically do not reflect rational staffing models formed on the basis of skills or functional backgrounds. Rather, personal relationships with the entrepreneur often prove the norm for inclusion in the team, resulting in relatively homogeneous initial compositions, especially in terms of gender and ethnicity (Ruef et al. 2003). Personal experiences also play a role, since those who previously worked for larger, older, more bureaucratic firms are less likely to establish new firms than their counterparts (Sørensen 2007). These founding teams are particularly influential in that a firm's central processes and structures are designed by its founders and are shaped by their norms (Hannan et al. 1996; Phillips 2005).

External Initial Conditions: Structural Blueprints

Organizations become 'imprinted' at founding by the environment in which they arise. Because resources have to be extracted from the environment, structural blueprints consisting of certain political, demographic and institutional characteristics of the time and place of founding put lasting marks on organizations (Stinchcombe 1965). Given the inertial tendencies of organizations, initial conditions often become structurally embedded in the organization and prove difficult to change (Hannan and Freeman 1984). At founding, a firm also acquires an identity that can remain with it over time (Baron et al. 1999). In general, organizations attempting reorganization of their identity and core structures face heightened chances of failure. For example, employees may become dissatisfied, increasing turnover and hindering operations (Baron et al. 2001).

External Initial Conditions: Density Delay

The competitive environment at founding exerts an indelible impact. Density, or the number of organizations in the population at time of founding, shows a permanent positive effect on a firm's mortality chances (Carroll and Hannan 1989). This 'density delay' effect has been shown to operate in many organizational populations; it has been explained by three possible mechanisms. First, when many firms exist at

founding, the focal firm faces resource scarcity, which adversely affects its life chances. Second, in high density environments, market niches are tightly packed. This condition forces new firms to depend on marginal resources, thus hampering future prospects. Finally, there is a possible trial-by-fire mechanism in which competition early on decreases initial mortality rates but subsequently makes firms stronger competitors (Swaminathan 1996).

See Also

- ▶ Natural Selection
- ▶ Organizational Ecology
- ▶ Red Queen Among Organizations, the

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Innovation

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Abstract

Innovation is the uncertain process of moving from an invention to successful commercial exploitation. Because theory is a weak guide to practice, it depends on incremental experimentation and firm-specific learning. Firms can therefore strategically build and exploit firm-specific capabilities, both internally and in their supplier and customer networks, to create and capture value. As the division of innovative labour has expanded, innovation has become a more distributed, networked strategic activity that can disrupt existing market structures and transform industries. As industries are transformed, the capabilities and ways of thinking about customer offerings that drove past success can constrain effective strategic change.

Definition Innovation is the process that takes an invention, discovery or insight about a new device, process or system to its first successful commercial application. As such it can apply to new products, processes and services, to new markets, to new sources of supply and to new forms of organization.

Innovation is often conflated with invention, but they are fundamentally different. Invention is an event when a new idea for a product, process or service is thought up for the first time. Innovation, on the other hand, is the process that moves from the original invention to its first successful

commercialization (Freeman 1982). As such, innovation is the process of transformation, but is also applied to the final outcome. Innovations can be differentiated along a continuum from incremental to radical, and can be new to the world, new to a country or new to an organization. While radical innovations receive the most attention from management scholars, the accumulation of incremental improvements as innovations diffuse and adapt is a vitally important, and often overlooked, source of strategic differentiation.

History

Joseph Schumpeter (1934) pioneered the modern analysis of innovation and highlighted how capitalist economies are dynamic because of the 'creative destruction' induced by innovative goods, production methods, markets, raw materials and forms of organization. He initially explained innovation in terms of entrepreneurial 'acts of will', but in his later work he argued that innovation had been routinized in the R&D labs of large firms. By treating innovation in both instances as an event, rather than a process, he overestimated the importance of radical innovations and the disruption they cause to incumbent firms. He was also overoptimistic about how easy it would be to overcome the technological and market uncertainties associated with innovation.

By the 1950s Schumpeter's focus on R&D developed into a 'science-push' model of innovation that suggested innovations emerge from ▶ basic research. Such models were appropriate in the postwar period when new markets were opening up for science-intensive technologies such as plastics and antibiotics, and the lack of industrial capacity and competition meant that new products could be successfully launched without much attention to marketing (Rothwell 1992). However, science-push models notoriously have major difficulties explaining why many innovations receive no scientific inputs, why surveys regularly show that universities are substantially less important sources of knowledge than suppliers and customers, or why technologies are sometimes operational and on the market before robust scientific explanations of why they work are formulated. For example, the Wright brothers flew before aerodynamics was understood, steam engines were working before thermodynamics were understood and even today there is little understanding of how many general anaesthetics work.

As competition increased in the 1960s and 1970s, marketing increased in prominence and a new 'market-pull' linear model emerged, which argued that innovations are induced by shifts in demand. Schmookler (1962), for example, found that historical data on patents showed that changes in demand predated inventive activity. Theories that focused exclusively on demand and assumed that technical capabilities can be easily traded were subjected to a devastating critique by Mowery and Rosenberg (1979). These scholars highlighted that lack of technological understanding acted as a major constraint on innovation irrespective of the level of demand, which, in any case, is very difficult to clearly articulate.

Mowery and Rosenberg (1979) argued that innovation should be understood as a matching process that links technology and markets. This received considerable support from detailed empirical studies of success and failure in innovation (Rothwell 1977) and informed Kline and Rosenberg's (1986) influential chain-linked model. This model of innovation incorporated feedback loops between R&D, production, marketing and sales, and allowed for ▶ organizational learning to improve firm performance. Over time, the focus of scholarly research and practice has shifted beyond the boundaries of individual firms to explore links between firms and their supply chains and customers, but the fundamental idea remains that innovation is an uncertain, learning process that matches technology to customers' requirements.

The Evolutionary Synthesis and Complementary Assets

In the early 1980s, a new 'evolutionary' theoretical synthesis emerged that resolved many of the anomalies found in previous models (Dosi 1982;

Nelson and Winter 1982). Evolutionary theory assumes (1) economic agents have bounded-rationality, (2) innovation draws on, and generates, technology-specific know-how, which (3) reduces the inherent uncertainty of innovation, and (4) generates differences in how well firms can follow technological trajectories. Technological trajectories are persistent paths of development, which Dosi (1982) argues parallel Kuhn's ideas about 'normal science'. They are created by shared problem-solving practices that are specific to particular technologies: for example, biotechnology, mechanical design or software have their own established practices that are reapplied to produce new generations of technologies. Because firms' knowledge is imperfect but improvable, strategic investments in formal and informal learning create differences in how firms can identify and pursue the most fruitful (i.e., profitable) technological opportunities along these trajectories. Since this knowledge is partly firm- and technology-specific, it is difficult to trade and therefore generates heterogeneity in firms' technological performance and (eventually) profits (Nelson 1991).

The possibility of untraded, firm-specific capabilities producing sustainable, above-average profits attracted considerable scholarly attention to knowledge and innovation in the 1990s. In contrast to the science-push model, this research found that the knowledge used for innovation (know-how) is not the same as the knowledge generated by scientific research (know-why). Because of the complexity of most technology, theory developed under purified laboratory conditions is generally a weak guide to real-world practice. While theory is often a useful input to innovation, it rarely (if ever) can be relied upon to predict the performance of an artefact under its normal operating conditions. This is why innovation is a cumulative, experimental and largely empirical process, why R&D spending breaks down into about one-third research and two-thirds development, why R&D managers find scientific problem-solving skills to be more important than research findings, and why technological knowledge is partly tacit. Because technological knowledge about the possibilities for improving products and processes typically emerges from incremental learning about production and use, it cannot be reduced to information and codified in patents or blueprints that can be easily transferred, valued or traded (Pavitt 1987).

The imperfect protection provided by patents means most innovations are eventually imitated, with a resulting loss of benefits for innovating firms. Research and practice related to the strategic management of innovation has therefore focused on the role of '▶ complementary asset' that help firms appropriate more of the benefits of innovation (Teece 1986). Complementary assets include such things as marketing efforts that build brands, exclusive distribution channels, proprietary process technologies, associated services, accumulated tacit knowledge and standards. Firms in possession of such assets, in markets where innovations can be easily imitated, often accumulate more benefits than the original innovating firm. As such, complementary assets play a leading role in the strategic analysis of innovation and influence how firms profit from innovation with important implications for the direction of technical change.

Firm and Sector Diversity

Because firms differ in their knowledge, their technological trajectories and their complementary assets, it is no surprise that empirical research has found very diverse patterns of innovation at the firm level. There are persistent differences amongst innovative firms in their *size*, *customer requirements* (low price or product performance), *innovation focus* (product or process or both), *source of innovation* (suppliers, customers, in-house, or basic scientific research), and *location of innovation* (R&D laboratories, production engineering departments, design offices or software systems departments). Given this diversity, great care should be taken when generalizing about innovation from the experience of one firm or sector. To make sense of this diversity Pavitt (1984, 1990) developed a famous taxonomy that distinguishes between five major categories of innovating firms, with distinct innovation strategy implications.

Supplier-dominated firms that produce standard products using process technology they acquire from their suppliers. They are found in traditional manufacturing sectors, construction, agriculture and many services. They have limited opportunities to be innovative and rarely appropriate enough of the benefits of innovation to grow to be large. Innovation strategy focuses on improving production and building complementary assets such as brands to avoid price competition.

Scale-intensive firms produce standard products for customers who are price sensitive by designing, building and operating complex production systems. Such firms are found in scale-intensive mass production sectors such as vehicles, consumer goods and bulk materials. Because the complexity of their production systems makes the knowledge needed to innovate very local, such firms produce innovative process technology within their internal production engineering departments. The resulting production economies allow them to appropriate a lot of value and they typically grow to be large.

Information-intensive firms are a subset of scale-intensive firms that have recently emerged in service sectors such as finance, retailing, publishing and telecommunications. They design and operate complex systems for processing information, rather than goods, using technology developed in their in-house systems departments (often configuring IT hardware and software from specialized suppliers). Innovation strategy typically involves making the provision of services more sensitive to customers' requirements using sophisticated IT systems.

Specialised supplier firms have a symbiotic relationship with their scale-intensive customers to whom they supply specialized high-performance machinery, instrumentation, software and services. The complexity of these production systems is such that innovations are often generated by their customers who provide specialized suppliers with new product ideas, skills and possible modifications based on their operating experience. While such firms are often highly innovative, they have limited opportunities to produce at scale and tend to be small. Innovation strategy involves learning from advanced users and matching new technologies to their needs.

Science-intensive firms are found in bio-pharmaceuticals, chemicals and electronics and generate innovation in their R&D laboratories by rapidly developing university research into products for customers who pay for higher performance. They can often appropriate a substantial proportion of the value of their innovations through patents, secrecy, production at scale, marketing, and accumulated scientific and technological knowledge which allows them to grow large. The main tasks of innovation strategy are to monitor and exploit advances emerging from basic research, to develop technologically related products and build the complementary assets in production and marketing to exploit them.

Dynamic Capabilities and Corporate Strategy

Pavitt's taxonomy inevitably oversimplifies but it remains a useful starting point for thinking about innovation strategy. While it is generally empirically robust, research has highlighted the importance of multi-technology firms that span the categories. Many firms now have capacities in *scale-intensive* mechanical and instrumentation technologies and in *information-intensive* software technologies. The existence of multi-technology firms, which have to innovate across a range of technologies, and the more complex flows of technologies and services between firms and their suppliers and customers, has shifted strategic attention from looking only at matching stable technology and stable markets to exploring how rapidly changing markets and technologies can be configured to strategic advantage.

One useful way of understanding these changes is the ▶ *dynamic capabilities* framework developed by Teece and Pisano (1994). This framework looks at the *positions* in which firms find themselves in terms of how they relate to their suppliers, customers and the institutions that support innovation and technical learning. It looks at the *paths* that their particular technological capabilities open up to them and the opportunities they

have to exploit the trajectories described in the Pavitt taxonomy. Finally, it looks at the *processes* that firms use to scan their internal and external environment for potential innovations, select and appraise their merits, resource the projects and them implement them (Tidd et al. 2001).

Such models show innovation as a complex and uncertain process. While they can help guide strategy, because innovation always involves creating something new it cannot be reduced to an exact science. As innovation has moved from being a peripheral concern to becoming central to corporate strategy, there has been a parallel shift in the focus of research and practice from R&D to firms, then their supply chains, and now entire value systems. Throughout this change, even though there has been increased recognition of the diversity of innovation, the central idea of building capabilities to successfully match technology to customer requirements remains.

See Also

- ▶ Basic Research
- ▶ Complementary Asset
- ▶ Dynamic Capabilities
- ▶ Management of Technology
- ▶ Organizational Learning
- ▶ Research and Development (R&D) Organization

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Innovation Diffusion

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Abstract

First we offer a definition of innovation diffusion. We then identify the main stylized fact about innovation diffusion. Finally, we review several alternative explanations of the main stylized fact.

Definition Diffusion is the process by which innovations spread across potential adopters over time. Adoption takes time and may take place at different levels of aggregation: within a firm (i.e., intra-firm diffusion), at the industry level

(i.e., inter-firm diffusion), at the economy level (i.e., inter-industry diffusion).

The Main Stylized Fact

The main stylized fact about innovation diffusion is that the dynamics over time of the adoption of an innovative product (i.e., the percentage of market penetration) is *S-shaped*, indicating: (1) an initial slow increase in the rate of diffusion; (2) a phase of acceleration; (3) a subsequent phase in which market penetration still increases but a decreasing rate; (4) a final phase in which the curve flattens out (Stoneman 2002) (Fig. 1).

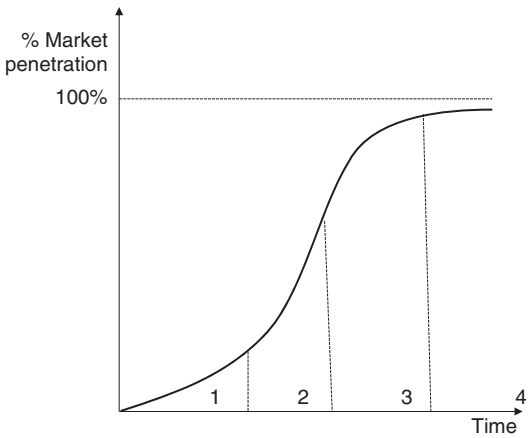
Explanations of the Pattern of Diffusion

Several explanations of this *S-shaped* pattern have been proposed, generating alternative approaches to innovation diffusion.

The Spread of Information

The Static 'epidemic' Approach: Information from Adopters

According to this approach, the major constraint to innovation diffusion is the lack of information about the existence of the innovation itself. The adoption mechanism is the spread of information about the existence of the innovation, which is made available by new adopters to potential adopters who, in turn, contribute to spreading the information further by becoming adopters. This is the so-called 'contagion model' (Griliches 1957; Mansfield 1961). In this context, diffusion is understood as the outcome of a sequence of adoptions which has an upper limit (equilibrium) constituted by the total number of adopters within the population. While the basic approach assumes that diffusion depends on *demonstration effects* and *learning* from the experience of others, interpersonal contact (i.e., *word of mouth*) is generally assumed to be the mechanism for spreading information. However, in many cases, information may reach potential adopters through other channels.



Innovation Diffusion, Fig. 1 The S-shaped innovation diffusion curve

Diversity in the Sources of Information

One series of contributions has focused on the role of the diversity in the sources of information. These approaches (Bass 1969; Lekvall and Wahlbin 1973) distinguish between internal and external sources. *Internal information* sources are those concerned with the transmission of information through social interaction and/or the mere observation of the usage of a new product. They are dependent on the mass of previous adopters. *External information* sources are those from 'public and constant' sources such as mass media, salesmen and specialized trade press. These sources convey information which is not necessarily dependent on the experience of previous adopters but may instead reach all the potential adopters uniformly.

User Learning and the 'dynamic' Epidemic Approach

Epidemic models are *static* to the extent that they assume both the absence of further improvements in the innovations once introduced in the market and the existence of a fixed population of adopters (Thirtle and Ruttan 1987). Mansfield (1968) elaborates on the basic contagion model to investigate the speed of response of individual adopters to the appearance of an innovation. In his model, *learning* plays an important role in determining the timing of adoption. Learning impinges upon the extent of use of the innovation, which reduces,

over time, the overall uncertainty about the fixed profitability of the new technology and leads to an increase in the proportion of new adopters. The emphasis on risk, uncertainty and learning is the main driving force behind diffusion.

Changes in Expected Benefits

Reduction of uncertainty alone can induce a self-propagating pattern of diffusion typical of epidemic models only when the expected profitability of the new technology is not changing. However, if adopters change their estimates of expected benefits as they collect information, it is the interplay between changing estimates and reduction of uncertainty rather than the latter effect alone which influences the decision to adopt. This interplay is the focus of the so-called *mean-variance approach* to innovation diffusion (Stoneman 1981), which represents adoption as a portfolio choice based upon an evaluation of both the expected returns and the variance of innovation.

The Heterogeneity of Adopters

The *equilibrium approach* to innovation diffusion assumes that adopters have perfect information about both the existence and the nature of the innovation. As a consequence, the spread of information to potential users cannot be the mechanism explaining heterogeneity of diffusion rates. Two broad types of equilibrium models can be identified, according to the mechanism they embody.

Heterogeneity in Some Objective Characteristics

Probit models assume that potential adopters differ according to some 'objective' characteristics, which directly influence the benefits deriving from innovation adoption (David 1966; Hannan and McDowell 1984; Colombo and Mosconi 1995). The basic characteristic of *probit models* is the possibility of identifying each potential adopter by means of an 'ordering' variable (e.g., a firm's size) which governs the adoption decision. Adoption occurs if, at a certain point in time, the individual value of this variable exceeds a critical *threshold level*. Within this framework, the probability to observe an adoption at a certain point in time can be determined as the probability to find a potential adopter whose level of the variable exceeds the critical level. Two crucial assumptions are made that both the distribution of the variable and the threshold level over the population of potential adopters are independent of each other. The main consequence of these assumptions is that the applicability of *probit models* is restricted to innovations which do not entail the possibility of expanding productive capacity far beyond the existing (pre-adoption) level, and which impact mainly on the costs and not on the benefits that adopters may receive from the exploitation of the innovation itself.

Heterogeneity and Changes in the Benefits and Cost of Adoption

Stock models address this limitation. *Stock models* assume that different rates of diffusion across different adopters or differences in the individual propensity derive from differentials in the benefits that the adoption of the innovation has created through its impact on the price of the final product (Reinganum 1981). For *stock models* the timing of adoption may be influenced by the benefits that the innovation will generate *ex post*. When such dependence is acknowledged, provided that a suitable specification for the future pattern of adoption costs is put forward, the sequence of adoption is influenced by the intertemporal evaluation of the pattern of costs vis-à-vis the speed of change in the benefits from adoption. When both costs and benefits of adoption fall over time but benefits fall faster than costs, it may be in the interest of potential adopters to wait for adoption costs to decrease and let their rivals precede them in adoption. *Stock models* employ game theory to model this strategic interaction as a 'waiting contest' among the potential adopters.

Improvements in the Original Innovation or Truncated Diffusion Processes

The basic versions of these models have been extended to cases in which innovations undergo a series of improvements which impact on the timing of adoption either through expectations of further

improvements and/or price reductions (Rosenberg 1976; Balcer and Lippman 1984) or through changes in the supply of innovation (Stoneman and Ireland 1983). Other models take into account the emergence of a radically new product that substitutes the product that is undergoing diffusion, and therefore truncates the diffusion curve.

Evolutionary Models of Diffusion

Evolutionary models of diffusion are disequilibrium ones. They are usually divided into two groups: *selection models* and *density-dependent* models. The two types differ in the determinants of adoption behaviour and in the impact on individual decisions of the possibility that the available best practice technique may change over time. *Selection models* take ▶ technological change explicitly into account and explain diffusion as a result of a process in which innovators displace traditional firms as they are progressively selected out of the market (Silverberg et al. 1988; Metcalfe 1994). *Density-dependent* models are concerned with the issue of payoff interdependencies (i.e., ▶ network effects) which affect the decisions of adopters (Farrell and Saloner 1985; Katz and Shapiro 1986; Arthur 1989).

See Also

- ▶ Learning and Adaptation
- ▶ Network Effects
- ▶ Technological Change

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Innovation Networks

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Abstract

Innovation networks enable agents (individuals, firms, universities etc.) to pool, exchange and jointly create knowledge and other resources. By providing network members access to a wider range of resources than

individual members possess, innovation networks can enable members to achieve much more than they could individually. This entry gives an overview of what innovation networks are and why they matter. It then discusses some of the key factors that have been found to influence the degree to which networks can improve the innovative outcomes of their members.

Definition An innovation network is a group of agents (e.g., individuals, teams, organizations) that are connected via relationships that enable the exchange of information and/or other resources.

There is growing recognition of the importance of networks for successful innovation. Relationships between agents (individuals, firms, universities etc.) enable them to pool, exchange and jointly create knowledge and other resources to fuel innovation. As agents forge these collaborative relationships, they weave a network of paths between them that can act as conduits for information and other resources. By providing network members access to a wider range of resources than individual members possess, innovation networks can enable members to achieve much more than they could individually.

Innovation networks can be formal or informal, they can be at different levels of analysis (e.g., inter-individual, inter-organizational), and they can also be composed of a wide range of relationship types, including social relationships, co-working relationships, referral roles in an organization, ▶ research and development (R&D) alliances, ▶ joint ventures, licensing, joint membership in research associations, or others. Innovation networks are thought to be especially important in high-technology sectors, where it is unlikely that a single individual or organization will possess all of the resources and capabilities necessary to develop and implement a significant innovation.

Why Innovation Networks Matter

Though research in ▶ new product development had long considered collaboration an important strategy for innovation, researchers had traditionally only considered the role of direct relationships such as a firm's relationships with its customers or suppliers (Schilling 2010). In the late 1990s, however, rapid advances in network analysis tools made it possible to examine the structure and dynamics of the larger networks that emerge from such relationships. This raised the first and most obvious question: Does the larger network, that is, connections beyond an agent's immediate contacts, matter to innovation? Some scholars were quick to point out that individuals and firms go to great lengths to protect their proprietary information from being transmitted within or beyond a particular collaboration, suggesting that the appropriate level of analysis is the dyad, and the larger network ought not to matter very much. Others pointed out, however, that much of the information exchanged between individuals and firms is considered non-proprietary and thus is not deliberately protected from diffusion. For example, firms engaged in technological collaboration might freely exchange information about their suppliers, potential directions for future innovation or scientific advances in other fields that are likely to impact the industry. There is considerable evidence, for example, that a firm's alliance partners are a key source of referrals to other potential partners that possess needed technologies, are trustworthy or possess other desirable qualities (Gulati 1995). Other information exchanged between firms is considered proprietary but is imperfectly protected from diffusion. Even when collaboration agreements have extensive contractual clauses designed to protect the proprietary knowledge possessed by each partner or developed through the collaboration, it is still very difficult to prevent that knowledge from ultimately benefiting other organizations. Secrecy clauses are very difficult to enforce when knowledge is dispersed over a large number of employees or embedded in visible artefacts. Even patenting provides only limited protection for knowledge embedded in technological innovations. In many industries it is relatively simple for competitors to 'invent around' the patent (Levin et al. 1987). A rich history of economic

research provides further evidence of the positive externalities, known as technological spillovers, created by an organization's research and development efforts (Jaffe et al. 2000), suggesting that information diffuses between organizations whether intended or not, fuelling innovation in the broader community.

Consistent with this, a considerable body of evidence has emerged showing that networks do significantly influence the innovation of their members (Powell et al. 1996; Ahuja 2000; Schilling and Phelps 2007). This, in turn, has spurred researchers to explore how factors such as network size and structure, the nature of network membership, incentives and governance mechanisms influence innovative outcomes.

The Influence of Network Size and Structure

One of the most obvious characteristics of an innovation network that may influence its members' innovative outcomes is its size. In general, a larger network should give members access to more information and other resources to be recombined into new innovations. Consistent with this, there is plenty of evidence indicating that a network member's innovativeness is positively related to the number of both their direct and indirect relationships (e.g., Ahuja 2000; Owen-Smith and Powell 2004).

A number of structural characteristics of networks also affect their ability to influence member innovativeness. The first is clustering. Innovation networks tend to be highly clustered: some groups of agents will have more links connecting them to each other than to the other agents in the network. Clustering arises because agents tend to interact more intensely or frequently with others with whom they share some type of proximity or similarity, such as geography or technology. Clustering also increases the information transmission capacity of a network (Schilling and Phelps 2007). First, the dense connectivity of individual clusters ensures that information introduced into a cluster will quickly reach others in the cluster. Second, dense clustering can make agents more willing and able to exchange information by fostering trust, reciprocity norms and a shared identity (Granovetter 1992; Ahuja 2000). In addition to stimulating greater transparency, trust and reciprocity exchanges facilitate intense interaction among personnel from partnered firms (Uzzi 1997), improving the transfer of tacit, embedded knowledge.

The average path length of the network (i.e., the average number of links that separates each pair of agents) also determines its ability to improve the innovation of its members. Other things being equal, having members connected by short paths increases the amount of information that can be exchanged, and the speed and fidelity of its exchange (Schilling and Phelps 2007). Three primary mechanisms shorten the path length of a large network: density, atypical/random paths and hubs. A dense network is one in which agents are directly connected to a large portion of the members of the network – that is, the ratio of links to nodes is high. Dense networks are uncommon however – in most networks there are significant costs to forming links. Both individuals and firms are constrained in the number of relationships they can meaningfully sustain. Thus, in practice, most innovation networks tend to be quite sparse rather than dense. The path length of an innovation network can also be shortened by atypical or random shortcuts that create bridges between clusters of agents. While atypical or random short-cuts are uncommon in innovation networks (social processes tend to impose a considerable amount of 'order' on networks by making the likelihood of connection between two members a strong function of proximity or similarity), it turns out that it takes only a very small percentage of random or atypical links in a network to dramatically shorten its path length. This is known as the 'small-world effect': a network can be sparse, decentralized and highly clustered, yet have a remarkably short path length if it has a small percentage of random links that connect otherwise distant portions of the network (Watts and Strogatz 1998).

Network members that are the source of an atypical path are often in brokerage roles. Brokers are agents that connect groups of other network

members that would otherwise be disconnected. The broker might be a firm that occupies an industry-spanning role (such as Silicon Graphics, which has extensive ▶ alliances in both the computing industry and the basic chemicals industry), or individuals that have wide-spanning interests or general purpose expertise that enable them to form connections to diverse fields (such as Thomas Edison, who was involved in the development of products for telecommunications, lighting, railroads, mining and more).

As mentioned, hubs can also create shortcuts in the network. Many studies have shown that both formal and informal networks very often exhibit skewed degree distributions, meaning that there are a few members in the network that have significantly more connections than does the average member of the network – they are 'hubs'. Individuals can become hubs in an interpersonal network by virtue of their role within an organization, because of their reputation for exceptional performance, their propensity for social exchange or a myriad of other reasons. In alliance networks, firms may become hubs by virtue of their size (larger firms can attract, forge and sustain more alliances) or their expertise (firms that possess valuable technology or other competencies are more attractive to alliance partners) in the innovation network (Stuart 2000; Schilling 2013). A hub is also, however, in a position to capture a disproportionate amount of the information and other resources that travel through the network, and can exert great influence over whether, how and to whom information and other resources are transmitted. It may thus be erroneous to assume that hubs always facilitate information transmission (Schilling and Fang 2011).

The Influence of Network Member Characteristics

One of the main benefits of membership in an innovation network is access to information a member might otherwise not have, suggesting that greater diversity in membership is better for innovation. The flipside of this hypothesis is that diversity can also make it harder to transfer knowledge because members of a network that are quite different from each other may lack shared interpretation schemes, well-defined reciprocity norms and other homophily benefits. The balance of these competing effects appears to come down in favour of diversity, with a number of articles finding benefits in network diversity (e.g., Ruef 2002; Rodan and Galunic 2004; Phelps 2010).

There are also reasons to suspect that the presence of an 'anchor tenant' (a large, prestigious or otherwise exceptionally visible or capable organization) in an innovation network can have a positive effect on innovation (Agrawal and Cockburn 2002). In addition to serving as potential hubs, large and/or prestigious firms or universities often have scale advantages that enable them to perform the kind of basic research activities that are likely to create technological spillovers; they tend to have reputation advantages that both attract other members to the network and lend credibility to those members (Stuart 2000), and by virtue of their many connections, they may become a stable scaffolding that holds the rest of the innovation network together (Schilling 2013).

Incentives and Governance

As noted previously, both individuals and firms may be motivated to protect their valuable information and other resources, and thus invest effort in limiting their diffusion. This has prompted interest in the incentives network members have for information exchange. Allen (1983) noted that individuals and firms may be motivated to freely diffuse their information if they believe that their losses will be offset by reputation gains, market growth or the development of complementary assets. Those who work on ▶ open source innovation add an additional class of incentives relevant to user innovators: they may benefit from network externality benefits if revealing their innovations facilitates diffusion, and they may simply enjoy the process of development and exchange for its own sake (Lakhani and Wolf 2005; von Hippel 2007). Reciprocity norms may also induce individuals and firms to exchange information within the innovation network (Uzzi

1996). In fact, research suggests that evolution may select for cooperative behaviour through the benefits of indirect reciprocity: I help you and somebody else helps me (Nowak and Sigmund 2005).

A related line of work has begun to explore how governance of relationships within a network may influence the ability and willingness to exchange knowledge. At the inter-firm level, researchers have found that the governance form of ▶ alliances can significantly influence the ability and willingness of partners to exchange knowledge, with the general finding being that having some hierarchical governance and shared ownership can promote knowledge-sharing (e.g., Mowery et al. 1996; Sampson 2007). Most of these studies, however, have focused on dyadic exchange (e.g., individual alliances); there remains an interesting opportunity to more deeply explore how network-wide governance forms (e.g., standardized systems of information codification, network-wide norms of cooperation and sharing) influence innovative output.

See Also

- ▶ Alliances
- ▶ Embeddedness
- ▶ Information and Knowledge
- ▶ Joint Venture
- ▶ Knowledge Spillovers
- ▶ New Product Development
- ▶ Open Source
- ▶ Research and Development (R&D) Alliances
- ▶ Research Consortia
- ▶ Strategic Groups
- ▶ Tacit Knowledge

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Innovation Policy

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Abstract

This entry outlines the concept of innovation policy in the domain of strategic management. First, an overview of the history, goals and underlying principles of innovation policy is presented. Next, the primary functions and possible means of implementing innovation policy are described with an emphasis on theoretical foundations. Finally, the evaluation of innovation policy outcomes, including the intended and unintended consequences of policy changes, are briefly discussed.

Definition Innovation policy refers to the collection of laws, standards, regulations, incentives and programmes that governments (at the supranational, national, regional and local levels) utilize to promote the development of new inventions including products, services, technologies, systems and infrastructure. Innovation policy encompasses initiatives in commerce, education, trade, finance and immigration to spur economic growth by increasing productivity, competitiveness and social welfare.

History, Goals and Underlying Principles of Innovation Policy

Modern innovation policy emerged in the mid-twentieth century amidst earlier government efforts specifically designed to strengthen national productivity, competitiveness and social welfare during the Second World War, according to a World Bank study (2010) of Organisation for Economic Co-operation and Development (OECD) member countries. Primarily in the US and Western Europe, postwar era innovation policy led to the establishment of publicly funded research labs and industry-specific technical centres in the 1950s, and the expansion of large-scale research programmes beyond defence into related strategic areas such as spaceflight, ocean exploration and nuclear energy in the 1960s. During this initial phase of innovation policy, the US National Science Foundation (NSF) began measuring inventive activity in terms of the number of new commercialized technological innovations introduced (Godin 2002).

The publication of the landmark US Department of Commerce study known as the Charpie Report (1967) reoriented the focus of national innovation surveys to measure the *input* rather than the *output* of inventive activities in research and development (R&D), design engineering, tooling and engineering, manufacturing and marketing (Godin 2002). The report drew important distinctions between innovation policy's emphasis on fostering the commercialization and application of new technologies and ▶ science policy's emphasis on supporting more basic and fundamental R&D, which produces these new technologies. Summarizing Kuznets' (1962) view on this distinction, ▶ Kenneth Arrow (2011) describes *invention* as a new combination of existing knowledge to create something useful, and *discovery* as the development of new knowledge. Thus, *innovation policy* primarily deals with *catalysing inventions* while *science policy* deals with *generating discoveries*. Both are different from

► industrial policy, which is focused on *advancing specific industries or economic sectors* deemed to be in the national interest of particular nations (Johnson 1982).

Governments in European countries and Japan launched a wide array of innovation policy initiatives in the 1970s (Ray 1975). These efforts ranged from greater financial incentives for increased corporate investment in R&D to more flexible regulatory frameworks facilitating enhanced cooperation among firms in the same industry and between industries and universities (Peck and Goto 1981). In contrast to the highly centralized government ministries that formulated and directed innovation policy in many European nations and Japan, the approach followed by the US Federal Government was much more decentralized and spread across a large number of independent or semi-autonomous agencies such as the Small Business Administration (SBA) and the Defense Advanced Research Projects Agency (DARPA).

The World Bank (2010) identified two important global shifts in innovation policy in the 1980s: (1) the formation of clusters, technopoles, special economic zones and science parks in subnational regions (Castells and Hall 1993); and (2) the emergence of a network of supporting institutions as part of a national innovation system (Nelson 1993). From a strategic management perspective, clusters are an important phenomenon, since maintaining a presence in an industry cluster may be a source of competitive advantage for firms. This is because access to highly specialized and valuable knowledge, relationships and resources from a critical mass of local firms is often difficult for more geographically distant rival firms to capture (Porter 1998). National innovation systems are also strategically relevant for firms because they appear to offer firms substantial advantages in enabling inward technology transfer by building national absorptive capacity and boosting industry competitiveness (Mowery and Oxley 1995).

Another major shift in thinking about innovation policy occurred in the 1990s, namely the conceptual evolution from a simplified linear model of innovation (Bush 1945) to a more complex and holistic view of innovation (Nelson 1993). 'The linear model postulated that innovation starts with basic research, is followed by applied research and development, and ends with production and diffusion' (Godin 2006: 639). In contrast, more recent thinking about innovation policy is based on 'the analysis of well performing regions, dealing with the questions of why such industries concentrate in particular locations, which kinds of linkages and networks exist, and to which extent knowledge spillovers can be observed' (Tödtling et al. 2006: 1204).

By the early twenty-first century, an understanding of the strategic importance of innovation policy gained widespread acceptance not only among governments in developed countries but in emerging markets as well. In particular, the so-called BRIC (Brazil, Russia, India and China) countries actively crafted their own innovation policy ideas suited to their unique local macro- and microeconomic environments by adapting policy concepts drawn from around the world (Lundvall et al. 2009). A considerable innovation policy challenge faced by governments in developing countries is determining the optimal level of protection for intellectual property rights (IPRs) such as ► patents. Governments in developing countries with weak IPRs must balance the trade-offs of enabling the imitation of advanced technologies from developed countries while simultaneously nurturing the introduction of home-grown innovations by local firms (Chen and Puttitanun 2005). A strong patent system with appropriate protection of IPRs enables useful knowledge to be disclosed and shared across organizational boundaries without fear of misappropriation or loss of compensation (Arrow 1962). A weak patent system with limited protection of IPRs discourages foreign direct investment (FDI) and technology transfer.

Although the concept of innovation policy has evolved significantly since the 1950s, the overarching goal of innovation policy has largely remained the same: to drive economic growth by creating conditions under which inventive activity flourishes. The implicit assumption underlying innovation policy is that increased inventive activity eventually leads to greater economic growth. However, understanding the specific causal mechanisms linking inventive activity to

economic growth remains an extensive ongoing area of research enquiry (see Lerner and Stern 2012 for a comprehensive overview of the economics of innovation).

This fundamental assumption became more explicitly acknowledged as economists formulated models which incorporated technology as an *endogenous* factor for economic growth (Romer 1986), rather than as an *exogenous* factor (Solow 1957). In other words, instead of the neoclassical approach of modelling economic output as a function of capital and labour, scaled up or down by the degree of productivity-enhancing external technical change, new growth theory modelled economic output as a function of capital, labour, R&D and human capital.

In this new formulation of growth theory, technology is explicitly defined as a function of R&D and human capital. Innovation, the engine of economic growth, is 'endogenously generated by competing profit-seeking firms' (Caballero and Jaffe 1993: 16) that are engaged in a Schumpeterian process of 'creative destruction' (Schumpeter 1942). Knowledge may be characterized as global public good (Stiglitz 1999) and the public stock of knowledge accumulated from prior spillovers is combined and recombined via inventive firms' organizational routines to produce technical and managerial innovations (Nelson and Winter 1982). Furthermore, positive externalities and knowledge spillovers may generate *increasing returns*, rather than *decreasing returns* to marginal productivity (Romer 1986). A major implication of new growth theory is that policies which expand incentives for investing in R&D (e.g., tax credits or subsidies) or improving human capital (e.g., universal education) may influence long-term economic growth by shaping the nature and scope of innovation and the ensuing technological progress (see Aghion and Howitt (1997) for a review of endogenous growth theory and its implications).

Functions and Implementation of Innovation Policy

In mature and emerging economies alike, government institutions, entities and actors responsible for innovation policy typically perform two essential functions: (1) encouraging and expanding innovation and entrepreneurship; and (2) establishing and enforcing laws and regulations.

From a strategic management perspective, the theoretical underpinnings of modern innovation policy are based on understanding the vital link between innovation and entrepreneurship. Joseph Schumpeter (1883–1950) was the first theorist to propose that innovation and technological change are primarily driven by entrepreneurs, and that entrepreneurs are central to economic change. Schumpeter's (1942) concept of 'creative destruction' refers to the disruptive impact of entrepreneurs. In this view, entrepreneurs transform the economy by creating new value in the market through the introduction of innovations while simultaneously destroying the value of earlier innovations previously introduced by established firms. This early theory is commonly referred to as Schumpeter's Mark I. Schumpeter's later refinement of this theory, known as Mark II, is that large firms have greater resources than small firms or individual entrepreneurs, and therefore have more ability to adapt and avoid the forces of creative destruction.

Modern innovation policy typically embraces the principles of Mark I and Mark II and includes a balanced and pragmatic set of initiatives for fostering innovation and entrepreneurship across a diverse cross-section of industries and firms, large and small. Examples of these programmes include training and education for individual entrepreneurs (e.g., the European Union's Leonardo da Vinci Programme), supporting the formation of small entrepreneurial startups (e.g., offering tax incentives for venture capital investment), facilitating technology transfer from university and government research labs (e.g., enactment of the Bayh–Dole Act of 1980), and funding the R&D efforts of large firms (e.g., government procurement activities in defence, security, energy, space etc.).

As described above, the link between innovation and entrepreneurship is critical for economic growth. Equally important are the 'rules of the game', the prevailing reward structure in the

economy, which determines the allocation of entrepreneurial effort between productive activities such as innovation, unproductive activities such as litigation, and destructive activities such as organized crime (Baumol 1990). In a country with strong IPRs that are clearly defined and consistently enforced, entrepreneurs may have ample incentives to patent their inventions and productively earn supernormal profits or entrepreneurial rents until patent expiry. In a country with weaker IPRs that are less clearly defined and not consistently enforced, entrepreneurs may perceive the potential payoffs from litigation to be more lucrative than the potential payoffs from actual invention, and the allocation of entrepreneurial activity may correspondingly shift from productive innovation to unproductive litigation. In a country with minimal IPRs that are vaguely defined and rarely enforced, entrepreneurs may perceive the relative rewards from the unauthorized appropriation of others' inventions to be much more financially attractive than engaging in either innovation or litigation. Accordingly, the allocation of entrepreneurial activity may shift to a destructive and undesirable form of imitation such as counterfeiting.

Historical evidence across different societies and eras suggests that property rights in general, and IPRs in particular, play an enormous role in igniting and sustaining entrepreneurship, innovation and economic growth. North and Thomas (1976) posit that the key to ten centuries of growth in Western Europe, from feudalism to a modern capitalist economy, was the emergence, reinforcement and refinement of an efficient economic system. The authors argue that the system of property rights which spread throughout Europe encouraged incentives for innovation and the production of new goods while simultaneously reducing incentives for the misappropriation, theft, confiscation or burdensome taxation of these goods.

The central finding of Baumol's (1990) historical analysis is that policy is largely effective in influencing the allocation, but not the supply, of entrepreneurship. This implies that if innovation policymakers want to drive economic growth by encouraging entrepreneurs to innovate, they should focus on firmly establishing and properly enforcing the 'rules of the game' in critical areas such as IPRs. Beyond IPRs and patent systems, policymakers should consider the role of culture, secular and religious values, formal and informal institutions, and legal mechanisms such as antitrust laws, bankruptcy protection and banking regulations, in influencing and supporting productive entrepreneurship (Landes et al. 2012).

Evaluation of Innovation Policy Outcomes

From a strategic management perspective, one of the methodological challenges of evaluating innovation policy outcomes empirically is the lack of monocausal relationships among the multitude of policy parameters and decision variables, and the measureable indicators of inventive activity and economic growth. As Kline and Rosenberg (1986: 275) explain, 'Models that depict innovation as a smooth, well-behaved linear process badly mis-specify the nature and direction of the causal factors at work. Innovation is complex, uncertain, somewhat disorderly, and subject to changes of many sorts.'

One approach to evaluating innovation policy is to make systematic comparisons across countries using a comprehensive and standardized set of observable indicators. The 2012 Global Innovation Policy Index assesses and quantifies the relative strength of 55 developed and developing nations (including all OECD and European Union members) in seven core policy areas: (1) market access and FDI; (2) science and R&D policies; (3) domestic competition and new firm entry; (4) protection of IPRs; (5) information technology; (6) transparency in government procurement; and (7) immigration.

Another approach is to pinpoint possible sources of failure in the design of innovation policy based on the interactions between actors and the 'rules of the game'. Klein Woolthuis et al. (2005) propose a conceptual framework that deconstructs the sources of failure in innovation policy design into eight distinct categories of systemic imperfections: (1) infrastructure;

(2) technology transitions; (3) lock-in/path dependency; (4) regulatory or legal system; (5) culture and values; (6) strong networks or myopia; (7) weak networks or dynamic complementarities; and (8) capabilities.

An advantage of both of these approaches is that they enable researchers to readily identify similarities and differences in innovation policies across countries. Both approaches are also practical because they yield useful insights for improving various aspects of innovation policy. However, from the viewpoint of strategic management, a major limitation of both approaches is that they do not enable policymakers to determine the consequences of innovation policy shifts on inventive activity at the firm level. For instance, as Jaffe (2000: 531) explains, 'despite the significance of the policy changes and the wide availability of detailed data relating to patenting, robust conclusions regarding the empirical consequences for technological innovation of changes in patent policy are few'.

Further empirical research on the firm-level strategic impact of innovation policy is needed to guide policymakers because, in addition to their intended effects, policy shifts may also produce unintended consequences for firms, competitors and even entire industries. For example, two recent empirical studies (Lampe and Moser 2010; Joshi and Nerkar 2011) investigate the phenomena of patent pools in two vastly different industries and eras (the sewing machine combination, 1856–1877, and the optical disc industry, 1997–2006). A *patent pool* is a single entity that licenses the patents of two or more patent owners to third parties as a package; patent pools are useful because they enable licensees to conveniently obtain the rights to use a set of complementary patents from a single entity rather than negotiate separate licensing agreements with each of the patent owners (Shapiro 2000). Both studies find that after the formation of patent pools, the rate of innovation by participating firms actually decreases rather than increases, apparently due to changes in incentive structures and expected payoffs. Furthermore, both studies find that the unexpected decline in innovation rate is also observed in other firms that are in the same industry but remain outside the patent pool. Policymakers had assumed that the formation of patent pools in these industries would enhance, rather than inhibit, subsequent innovation and, based on that assumption, changed innovation policy and antitrust guidelines to facilitate the formation of future pools in other industries.

The preceding example illustrates why innovation policy shifts matter for firms and why strategy scholars and policymakers need a theoretically grounded and empirically tested understanding of the intended and unintended consequences of innovation policy to guide their decision-making.

See Also

- ▶ Arrow, Kenneth J. (Born 1921)
- ▶ Industrial Policy
- ▶ Innovation Diffusion
- ▶ Patents
- ▶ Public Policy: Strategy in the Public Interest
- ▶ Science and Innovation
- ▶ Science Policy
- ▶ Trade Secret

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Innovation Strategies

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Abstract

A firm's ▶ innovation strategy can be described as a vector of firm choices spanning the domains of technology development and commercialization. Within this area, we review the main research contributions concerning key choices such as the decision to conduct research, research intensity, the allocation of research dollars between ▶ basic research, applied ▶ research and development, the organizational locus of research activities, the geographical locus of research activities, the nature of technologies targeted, the breadth of technologies worked on, the knowledge management strategy employed, the value appropriation strategy pursued by the firm and the mode of technology commercialization.

Definition A firm's innovation strategy is a vector of firm choices spanning the domains of technology development and commercialization.

Definition and Relevance

A firm's innovation strategy can be described through a vector of firm choices spanning the domains of technology development and commercialization. The choices faced by firms in these domains include the decision to conduct research (e.g., develop rather than imitate), research intensity, the allocation of research dollars between ▶ basic research, applied ▶ research and development, the organizational locus of research activities, the geographical locus of research activities, the nature of technologies targeted, the breadth of technologies worked on, the knowledge management strategy employed, the value appropriation strategy pursued by the firm and the mode of technology commercialization. Many of the decisions entail trade-offs with each other or with other decisions of the firm, and the goal of innovation strategies in for-profit firms is to identify and execute the configurations of those choices that maximize firm value. ▶ innovation serves as a key basis for value creation and competitive advantage, and innovation strategies represent significant investments for firms, especially in technology-intensive industries.

The Dimensions of Innovation Strategies

The Decision to Conduct Research

Firms may choose not to engage in research, and instead simply imitate the innovations created by others to create saleable goods and services. However, the ease and profitability of imitation varies according to factors such as the modularity of the focal innovation, the complexity or tacitness of the underlying technology, specificity in a firm's skills and causal ambiguity (Lippman and Rumelt 1982; Reed and Defillippi 1990). Pre-emption of scarce resources, development of brands, switching costs or accumulated expertise by innovators may make imitation not just less feasible but also less profitable (Lieberman and Montgomery 1988). Further, imitation may not be effective without some investments in research (Cohen and Levinthal 1990).

Research Intensity

Conducting research is costly; however, underinvesting in research may lead to insufficient innovation and loss of competitive position. Key antecedents of research intensity include the level of technological opportunity (Cohen and Levin 1989), liquidity (Grabowski 1968), the debt position of the firm (Smith and Warner 1979), industry concentration and organization size (Scherer 1980; Kamien and Schwartz 1982), the source of financing (Long and Ravenscraft 1993), the level of fragmentation of property rights (Clark and Konrad 2008), the composition of the top management team or board (Kor 2006) and the current performance of the firm (Greve 2003; Chen and Miller 2007).

The Allocation of Research Effort

Basic research, applied research and development represent alternative destinations for research investments and can be distinguished through (a) the *ex ante* clarity with which the goals of the project itself are defined (Nelson 1959), and (b) the *ex ante* uncertainty about the results of the research project. The outcomes of the research process may not be helpful in distinguishing between the two as applied research has on occasion led to fundamental and general scientific discovery (Nelson 1959; Rosenberg 1990). There is also a contradiction between the high social benefits of basic research and private profits (Nelson 1959; Pavitt 1990; Rosenberg 1990).

Development can be defined as the application of the scientific knowledge created in the first stage of R&D (Rosenberg and Steinmueller 1988), for example through products. Effective communication and sharing of internal and external knowledge within the organization (Clark and Fujimoto 1990; Iansiti and Clark 1994; Hoopes and Postrel 1999) and a consistency between the organizational structure, technical skills,

problem-solving processes, culture and strategy (Clark and Fujimoto 1990; Brown and Eisenhardt 1995) are key to successful product development.

The Organizational Locus of Research Activities

Firms can vertically integrate R&D activities or use contractual arrangements such as licensing, strategic alliances or contracted research (Arora and Gambardella 1990; Pisano 1990; Ahuja 2000; Dushnitsky and Lenox 2005). Conducting R&D internally protects firms better against knowledge leakage (Pisano 1990), and potentially offers an ability to tightly target research to their strategic needs and their customers' preferences (Helfat 1994); however, it may lead to higher expenditure and risk and constrain the firm to operate with a limited portfolio of knowledge, resources and capabilities (Argyres 1996; Ahuja and Katila 2001; Fleming 2001). The source of R&D also affects the use of the knowledge within the organization (Katz and Allen 1982; Menon and Pfeffer 2003). Research also suggests complementarity among external sources of R&D (Arora and Gambardella 1990) and between internal and external sources (Cohen and Levinthal 1990; Cassiman and Veugelers 2006).

The Geographical Locus of Research Activities

Knowledge often leaks from its source. Such spillovers are often localized and lead to the development of differentiated clusters of knowledge (Jaffe et al. 1993, vs. Thompson and Fox-Kean 2005; Thompson 2006). To benefit from such spillovers or to tailor products to target markets firms may disperse their R&D locations. The spatial proximity effect on spillovers is moderated by factors such as social proximity (Audretsch and Stephan 1996; Agrawal et al. 2008), the interaction between spatial and social proximity (Gittelman 2007); individuals' characteristics (Almeida and Kogut 1997; Zucker and Darby 1997), knowledge characteristics (Caballero and Jaffe 1993), firm characteristics (Feldman 1994) and network structure (Fleming et al. 2007). The geographical dispersion of a firm's R&D activities (Singh 2005, 2008) as well as the location of these activities within the organizational structure (Van den Bulte and Moenaert 1998; Argyres and Silverman 2004; Alcacer 2006) can impact on firms' innovation performance.

The Nature of Technologies Targeted

Innovation strategies may target the development of technologies that solve contextual techno-economic problems (i.e., specific technologies) versus technologies that solve broader classes of problems (i.e., general technologies), (Bresnahan and Trajtenberg 1995; Bresnahan and Gambardella 1998). More general technologies benefit firms in the context of high uncertainty by helping them to enter new product markets (Novelli 2010).

Targeted technologies may be simple or complex (Zander and Kogut 1995; Singh 1997), with the latter being more difficult to imitate (Macmillan et al. 1985) but involving higher failure rates, degradation in performance if even a few interdependences are ignored (Singh 1997), and leading to difficulties in subsequent innovation by the focal firm (Kogut and Zander 1992; Sanchez and Mahoney 1996; McEvily and Chakravarthy 2002). Firms can target incremental innovations, wherein they focus on making minor improvements in existing technologies, or they can target breakthrough innovations which lead to new technological trajectories and paradigms and replace existing technologies (Tushman and Anderson 1986; Henderson 1993; Ahuja and Lampert 2001).

Innovation strategies may also vary by targeting component versus architectural innovations (Henderson and Clark 1990), or targeting sustaining versus disruptive innovations (Christensen 1997). Architectural innovations preserve the usefulness of the knowledge about the products' components but destroy the usefulness of the extant knowledge on how the components are related. Disruptive technologies are technologies that, despite their inferior performance on focal attributes and unsuitability for mainstream markets, eventually displace the mainstream technology from the mainstream market (Christensen 1997; Adner 2002).

The Breadth of Technologies Worked On

Firms may focus narrowly on a single technological domain or broadly on technologies in multiple areas. Technological diversification may help firms improve their ability to deal with suppliers, introduce special features into products (Argyres 1996; Granstrand et al. 1997; Gambardella and Torrisi 1998; Brusoni et al. 2001), expand their opportunities to tap into new product markets (Kim and Kogut 1996; Silverman 1999), and enable development of more general technologies by stimulating greater abstraction through induction (Novelli 2010). Although technological diversification requires superior R&D coordination (Argyres 1996), it can affect performance positively (Nesta and Saviotti 2005; Garcia-Vega 2006) under certain circumstances such as underlying coherence (Steinneman et al. 2007).

The Knowledge Management Strategy Employed

An effective knowledge management system allows firms to store, update and retrieve organizational knowledge, and deters its erosion through individual forgetting, misplaced manuals and personnel turnover (Argote et al. 1990; De Holan and Phillips 2004). Knowledge management strategies vary in that some rely on embedding knowledge in organizing principles and routines (Kogut and Zander 1992) while others lay out the fundamental tenets at the basis of the firm's knowledge and articulate them through collective discussions, debriefing sessions and performance evaluation processes (Zollo and Winter 2002). Knowledge management practices can also be distinguished on the basis of whether they rely on the creation of formal archives (e.g., electronic archives) and retrieval systems or whether they rely on people-centred practices of knowledge sharing and social interaction within the organization (Walsh and Ungson 1991).

The Value Appropriation Strategy Pursued by the Firm

Firms use strategies such as patents, secrecy, control of complementary assets, to protect their innovations from imitation, though the effectiveness of using these mechanisms is contingent upon environmental factors, such as the strength of the appropriability regime, the stage of the industry lifecycle and the characteristics of the industry (Teece 1986; Levin et al. 1987; Cohen et al. 2000).

The Mode of Technology Commercialization

To monetize their research investments firms can embody their technologies in products they manufacture and sell (Teece 1986), ally with a partner who provides access to the complementary assets required (Mitchell and Singh 1996) or they can commercialize the technology in disembodied form through licensing (Teece 1986; Arora et al. 2001). The appropriateness of a given mode is contingent on firm characteristics (e.g., the ability to continuously produce innovations, ownership of supporting assets) and on the characteristics of the environment in which the firm operates (e.g., the strength of the IP regime, level of transaction costs).

See Also

- ▶ Absorptive Capacity
- ▶ Basic Research
- ▶ Geography of Innovation
- ▶ Innovation
- ▶ Knowledge-Based Strategy
- ▶ Management of Technology
- ▶ Research and Development (R&D) Organization
- ▶ Technology Strategy

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Innovation-Driven Capitalism

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Abstract

The mainstream intellectual tradition analysing capitalism uses a static lens with a focus on efficiency as the underlying driving force. However, when viewed through the dynamic lens with an emphasis on ► innovation as the driving force, a very different view of capitalism emerges. The purpose of this entry is to explain innovation-driven capitalism and how it contrasts with the static efficiency view of capitalism.

Definition Innovation refers to the introduction in the market of new products, processes and management approaches.

The intellectual characterization of capitalism has been articulated, modelled and analysed predominantly in terms of allocative efficiency. The prevalent theoretical approach to understanding and thinking about capitalism is reflected by general equilibrium theory. In particular, general equilibrium theory makes a positive case for the superiority of capitalism over centralized planning. General equilibrium theory has provided a virtually airtight case to show why and how the allocation of resources is superior under free markets as opposed to under centralized socialistic planning.

An alternative approach to understanding and analysing capitalism argues that the inherent focuses on prices and efficiency in general equilibrium models masks the essential salient feature of capitalism – ► innovation. According to this alternative view, the salient feature of capitalism is the central role that innovation plays. For example, Baumol's (2002) critique of the models of welfare economics is not that they are incorrect but rather that they are misleading, in that they suggest a focus on an aspect of capitalism that is less important while ignoring that aspect of capitalism, innovation, that serves as the underlying driving force. According to Baumol, a very different aspect of capitalism, innovation, is actually the more compelling case for capitalism. To prove his point, in *The Free-Market Innovation Machine* Baumol lays out the case that it is, in fact, the capacity of capitalism to generate innovation and growth, and not only an efficient allocation of resources in a static context, that renders the market economy superior to alternative economic systems. According to Baumol, innovation is the tour de force, delivering a level of economic performance unmatched by any rival economic system. While the traditional model views the benefits of a market economy through a static lens, Baumol offers a series of compelling dynamic analyses, where the payoff from free markets is not in terms of static economic welfare but rather in terms of change, development and growth.

The lens for analysing and formulating strategy in innovation-driven capitalism is inherently dynamic and puts the focus on change, and, in particular, on innovative change. This provides a sharp contrast to the focus on static efficiency in models of general equilibrium efficiency. Such an emphasis on static efficiency is reflected in Winslow Taylor's noteworthy *The Principles of Scientific Management*, where he articulated how

labour could be transformed into an unthinking commodity, that, when combined with precious capital – factories, machines and plants – could generate output at an unprecedented level of efficiency and productivity (Taylor 1911). In laying out the principles underlying his new scientific management, Taylor made it clear that a sharp division of labour was appropriate between those doing the thinking and those doing the heavy lifting: 'the science of handling pig iron is so great and amounts to so much that it is impossible for the man who is best suited to this type of work to understand the principles of the science, or even to work in accordance with those principles without the aid of a man better educated than he is' (Stewart 2006: 81).

▶ Joseph Schumpeter provided a pioneering intellectual framework analysing innovation-driven capitalism. Schumpeter's focus was on the dynamic forces underlying the economy and ultimately generating economic performance. With regard to economic performance, Schumpeter used a dynamic lens, and thus was particularly concerned about growth and economic development. Schumpeter had a particular focus on innovation. More than any of the great economists before him, he viewed innovation as the driving force of progress and development. According to Schumpeter:

> It is therefore quite wrong . . . to say . . . that capitalist enterprise was one, and technological progress a second, distinct factor in the observed development of output; they were essentially one and the same thing or, as we may also put it, the former was the propelling force of the latter. (Schumpeter 1942: 110)

However, the innovative activity driving economic progress, according to Schumpeter, was achieved only at a price – perhaps the most poignant and enduring concept of Schumpeter's – *creative destruction*. Just as the factory wiped out the blacksmith's forge and the car superseded the horse and cart, Schumpeter argued that incumbents will be displaced by innovating entrepreneurs. According to McCraw:

> Schumpeter's signature legacy is his insight that innovation in the form of creative destruction is the driving force not only of capitalism but of material progress in general. Almost all businesses, no matter how strong they seem to be at a given moment, ultimately fail – and almost always because they failed to innovate. (McCraw 2007: 495)

As McCraw (2007: 3) explains, 'The notion of creative destruction expresses two clashing ideas, not surprising for someone whose personal life embodied so many paradoxes.' McCraw emphasizes how the paradoxes inherent in Schumpeter seemingly shaped the development of a startlingly different and unique view of economics. Whereas the classical and neoclassical economists viewed the most essential tension in society as emanating differences in interests between classes representing capital and labour, Schumpeter was prescient in focusing instead on the clash between the entrepreneurs and the incumbents dependent upon the status quo. As McCraw (2007: 6) points out, 'He knew that creative destruction fosters economic growth but also that it undercuts cherished human values. He saw that poverty brings misery but also that prosperity cannot assure peace of mind.'

Perhaps it was Schumpeter's earlier (1911) work, highlighting the role of entrepreneurship in the process of creative destruction, which motivated Alfred Marshall in 1920 to link the degree of turbulence in a market to economic growth. Marshall (1923) described the process of industrial evolution where one can observe 'the young trees of the forest as they struggle upwards through the benumbing shade of their older rivals'.

Not only did Schumpeter identify a new force, in terms of economic thinking – creative destruction – that was pivotal for the functioning of capitalism and consequently economic development, he also identified the mechanism upon which creative destruction rested – the entrepreneur, who served as an agent of change in the economic system. According to Schumpeter, the entrepreneur was the driving force for innovation upon which economic development, growth and progress rested. Schumpeter argued that what made the entrepreneur different from other agents in the economy was his willingness to pursue innovative activity:

> The function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention, or more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way . . . To undertake such new things is difficult and constitutes a distinct economic function, first because they lie outside of the routine tasks which everybody understands, and secondly, because the environment resists in many ways. (Schumpeter 1942: 13)

Without the entrepreneur, new ideas would not be implemented and pursued. The status quo would tend to be preserved at an opportunity cost of forgone innovative activity, growth and economic development.

Baumol extends Schumpeter's focus on innovation by analysing the dynamic mechanisms of growth under capitalism. In particular, Baumol (2002) establishes the central role that innovation plays as the driving force underlying economic growth. While this may sound reminiscent of endogenous growth theory, in fact Baumol's (2002) decidedly microeconomic analysis, with the reliance on the oligopolistic firm as the key actor, provides a marked departure from the macroeconomic models typical of endogenous growth theory. Indeed, emphasizing the propensity for oligopolistic rivalry to transform innovative activity from an unpredictable shock to an activity that can be harnessed and managed through routinization is more likely to invoke comparisons with the postwar Schumpeter than with Paul Romer (1986) or Robert Lucas (1993).

Schumpeter was consistent throughout his life's works about the source of economic growth – creative destruction, which in turn was fuelled by entrepreneurs. Where he was less consistent, and what has generated considerable ambiguity and contention, was about the organizational form and industry structure most conducive to entrepreneurs and innovative activity.

The type of organization, along with its structure and strategy, rendering the competitive advantage in innovation-driven capitalism has been the subject of considerable debate and controversy. In his 1911 classic treatise, *Theorie der wirtschaftlichen Entwicklung*, Schumpeter proposed a theory of creative destruction, where he was unambiguous about the organizational structure most conducive to entrepreneurs – new firms infused with entrepreneurial spirit would displace the tired old incumbents, ultimately leading to vigorous innovative activity which, in turn, would generate a higher degree of economic growth. As Scherer points out:

> In his 1911 book, Schumpeter insisted that innovations typically originated in new, characteristically small, firms commencing operation outside the 'circular flow' of existing production activities. To be sure, the small innovating firms that succeeded would grow large, and their leaders would amass great fortunes. They started, however, as outsiders. (Scherer 1992: 1417)

However, Schumpeter's thinking about the innovative advantage of small firms had begun to change by the time he published *Business Cycles* in 1939. Rather, he began to recognize that the link between organizational size, age and entrepreneurship was more nuanced than he had characterized it in his 1911 book. According to Schumpeter:

> It is, of course, true that mere size is not necessarily an advantage and may well be a disadvantage. Judgment must turn on the merits of each case. But statistical evidence to the effect that smaller concerns often do better than the giants should not be uncritically accepted. The smaller concerns may now often be in the position of the new, and the giants in the position of the old firms in our model. It is held . . . that the big concerns . . . implied technological and organizational improvement when they were founded. It is not held that they retrained their advantages until the present day. Our theory would in fact lead us to expect the contrary. (Schumpeter 1939: 4040, cited in Scherer 1992: 1417)

By 1942, in *Capitalism, Socialism and Democracy*, Schumpeter had rescinded his earlier view about the innovative efficiency of the small enterprise. Schumpeter concluded that, owing to scale economies in the production of new economic knowledge, large corporations would not only have the innovative advantage over small and new enterprise but that ultimately the economic landscape would consist only of giant corporations: 'Innovation itself is being reduced to routine. Technological progress is increasingly becoming the business of teams of trained

specialists who turn out what is required and make it work in predictable ways' (Schumpeter 1942: 132).

This is not to say that Schumpeter changed his view about the underlying motivation for innovation:

> Spectacular prizes much greater than would have been necessary to call forth the particular effort are thrown to a small minority of winners, thus propelling much more efficaciously than a more equal and more 'just' distribution would, the activity of that large majority of businessmen who receive in return very modest compensation or nothing or less than nothing, and yet do their utmost because they have the big prize before their eyes and overrate their chances of doing equally well. (Schumpeter 1950: 73–74)

Rather, what had changed was the organizational structure best able to spark and harness entrepreneurial forces. For Schumpeter in his earlier years, and certainly in his 1911 book, it was the small and new enterprise that was most conducive to the entrepreneurial spirit. But by the time he wrote *Capitalism*, *Socialism and Democracy*, he concluded that while entrepreneurship was needed to generate the process of creative destruction, this could best be financed, organized and harnessed within the organizational structure of the large corporation.

Thus, what changed in *Capitalism*, *Socialism and Democracy* was that Schumpeter rejected his own earlier (1911) conclusion that the organizational form of the small business was most conducive and hospitable to the entrepreneur. Instead, by 1942, not only was the large corporation thought to have superior productive efficiency, but Schumpeter (1942: 106) also believed it to be the engine of technological change and innovative activity, 'What we have got to accept is that (the large-scale establishment or unit of control) has come to be the most powerful engine of . . . progress and in particular of the long-run expansion of output not only in spite of, but to a considerable extent through, this strategy which looks so restrictive.'

This was a reversal of not only Schumpeter's own earlier thinking but also a challenge to the prevalent view in economics. According to Scherer:

> Previously it was suggested that monopolists, sheltered from the stiff gale of competition, might be sluggish about developing and introducing technological innovations, which increase productivity (reducing costs) or enhance product quality. Yet, some economists, led by the late Professor Joseph A. Schumpeter, have argued exactly the opposite; firms need protection from competition before they will bear the risks and costs of invention and innovation, and that a monopoly affords an ideal platform for shooting at the rapidly and jerkily moving targets of new technology. If this is true, then progress will be more rapid under monopoly than under competition. (Scherer 1992: 20–21)

The implication of the emergence of the dominance of the large corporation and competitive unsustainability of the small business for the viability of the model of the perfect market and ultimately capitalism was clear to Schumpeter (1942: 106), 'In this respect, perfect competition is not only impossible but inferior, and has no title to being set up as a model of ideal efficiency.'

Galbraith viewed the large corporation as having an inherent innovative advantage: 'Because development is costly, it follows that it can be carried on only by a firm that has the resources which are associated with considerable size.' In unequivocally rejecting the Schumpeter of 1911 while endorsing the Schumpeter of 1942, Galbraith concluded that:

> There is no more pleasant fiction than that technical change is the product of the matchless ingenuity of the small man forced by competition to employ his wits to better his neighbor. Unhappily, it is a fiction. Technical development has long since become the preserve of the scientist and engineer. Most of the cheap and simple inventions have, to put in bluntly and unpersuasively, been made. (Galbraith, 1979: 86–87)

Thus, Galbraith, in *The New Industrial State* (1979: ix), concurred with Schumpeter's view in *Capitalism*, *Socialism and Democracy* that the large corporation was the most efficient form of organization. In describing the economy as he saw it:

> This was the world of great corporations – a world in which people increasingly served the convenience of those organizations which was meant to serve them. It was a world in which the motivation of those involved did not fit the standard textbook mold. Nor did the relationship between corporation and state. Nor did markets. So far from

> being the controlling power in the economy, markets were more and more accommodated to the needs and convenience of the great business organizations.

In this sense, both the later Schumpeter and Galbraith echoed the fatalistic prognosis of Karl Marx (1912: 836) that capitalism would ultimately bear the seeds of its own self-destruction because of 'a constantly diminishing number of the magnates of capital, who usurp and monopolise all advantages of this process of transformation'.

Interpreting Marx, Alfred Marshall was moved to write that:

> Marx and his followers resolved to be practical, and argued that history showed a steadily hastening growth of large business and of mechanical administration by vast joint-stock companies, and they deduced the fatalistic conclusion that this tendency is irresistible; and must fulfill its destiny by making the whole state into one large joint-stock company in which everyone would be a shareholder. (Marshall 1923: 176–177)

After all, according to Karl Marx, the advantages of large-scale production in the competitive process would lead to small firms inevitably being driven out of business by larger corporations in a never-ending race towards increased concentration and centralization: 'The battle of competition is fought by the cheapening of commodities. The cheapness of commodities depends, *ceteris paribus*, on the productiveness of labour, and this again on the scale of production. Therefore, the large capitals beat the smaller' (Rosenberg 1992: 197).

Schumpeter, in his later years, concluded that the economic system in the US had evolved away from an entrepreneurial-driven capitalistic economy. What exactly had replaced the entrepreneurial-driven capitalist economy was a point of contention. Schumpeter was more pessimistic in his 1942 book about socialism replacing capitalism. He gloomily concluded that:

> Since capitalist enterprise, by its very achievements, tends to automize progress, we conclude that it tends to make itself superfluous – to break to pieces under the pressure of its own success. The perfectly bureaucratic giant industrial unit not only ousts the small- or medium-sized firm and 'expropriates' its owners, but in the end it also ousts the entrepreneur and expropriates the bourgeoisie as a class which in the process stands to lose not only in its income but also, what is infinitely more important, its function. (Schumpeter 1942: 134)

Thus, the postwar intellectual tradition did not acknowledge entrepreneurs and entrepreneurial firms as making a positive contribution to economic performance. As Baumol (1968: 66) pointed out, 'The theoretical firm is entrepreneurless – the Prince of Denmark has been expunged from the discussion of *Hamlet*.' According to Baumol (1968), there is one residual and rather curious role left to the entrepreneur in the neoclassical model. He is the invisible and non-replicable input that accounts for the U-shaped cost curve of a firm whose production function is linear and homogeneous.

Perhaps in response to Baumol's concern about the missing entrepreneur in the analysis of innovation-driven capitalism, the knowledge spillover theory of entrepreneurship explains why the entrepreneur serves as a key agent of innovative change in dynamic capitalism (Audretsch et al. 2006; Audretsch and Keilbach 2007). Entrepreneurship is most generally referred to as behaviour identifying and creating new opportunities and then acting upon and pursuing those opportunities. Such entrepreneurial opportunities actually originate and are created within a non-entrepreneurial context. Investments in R&D and human capital, along with employee experience, generate opportunities within incumbent firms. Similarly, research generates opportunities at universities and non-profit research organizations. When the organization creating that knowledge does not choose to commercialize that knowledge through innovative activity, an entrepreneurial opportunity is generated. The startup of a new firm or organization to commercialize such knowledge facilitates the spillover of knowledge generated in one organizational context but actually commercialized in the context of a new organization (Audretsch 1995, 2007). Thus, entrepreneurship emerges as playing a pivotal role in innovation-driven capitalism by serving as a conduit for the spillover of knowledge from the

organization producing knowledge to the newly founded organization actually commercializing that knowledge.

See Also

- ▶ Innovation
- ▶ Schumpeter, Joseph (1883–1950)

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Institutional Environment

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Abstract

The institutional environment is composed of regulations, customs and taken-for-granted ▶ norms prevalent in states, societies, professions and organizations, which impinge upon and shape organizational behaviour and outcomes. In early work in the field, the institutional environment was portrayed as an exogenous force that shaped and constrained organizational actions and policies. More recently, however, researchers have suggested that organizations can take steps to shape the institutional environment in which they are embedded. Here, we provide a brief summary of research on the institutional environment and discuss how it affects and can be affected by organizational actions.

Definition The institutional environment consists of normative and regulatory pressures exerted on organizations by the state or society and the professions. These pressures can be coercive and direct and enforced through mechanisms such as courts and regulations. The institutional environment can also affect organizations indirectly by creating expectations and norms that organizations must conform to in order to acquire legitimacy and resources.

In economics, Douglas North and other new institutionalists who followed him recognized the importance of the institutional environment and convincingly asserted that institutional arrangements can have profound long-term effects. They argue, for instance, that countries with superior institutions which respect property rights will have better long-term outcomes in the form of higher productivity and economic growth (North 1971; North and Thomas 1973; Acemoglu et al. 2001). While North and other economic

institutional theorists did not specifically say that the most efficient institutions would naturally arise, they did suggest that individuals would rationally attempt to build institutions that maximize net benefits. However, North (1988) recognized that historical factors could limit the options available to decision-makers and that the costs of changing to a more beneficial institutional arrangement could outweigh the gains associated with it. Essentially, this approach characterizes individuals as making boundedly rational choices within the constraints presented by the institutional environment (Ingram and Clay 2000).

In ▶ organization theory, the institutional environment was accorded a primary role in a seminal article by Meyer and Rowan (1977). Up to this point, much work in this area had assumed that formal organizational structures arise to rationally deal with environmental contingencies. In contrast, Meyer and Rowan (1977) suggested that many ▶ norms and ways of doing things that are taken for granted proliferate in societies and create expectations about the appropriate way to accomplish tasks that can be independent of technical considerations. The institutional environment is a key strategic concern because conformity to institutional norms can confer legitimacy and provide increased access to resources.

Early organizational research in sociological institutional theory tended to sharply differentiate between technical and institutional environments. Meyer and Scott (1983), for instance, suggested that organizations such as those producing products in clearly defined markets may primarily exist in technical environments in which they are rewarded for technical efficiency and effectiveness. Other types of organizations, such as schools, in which outputs are somewhat ambiguous, may be most strongly affected by the institutional environment. It is likely, however, that all organizations are subject to pressures from both their institutional and task environments. While some scholars (Carroll and Huo 1986) argue that task and institutional environments have distinct effects on organizational outcomes, others maintain that the technical environment is embedded within the institutional environment (Powell 1991). As Scott (1992: 140) observes, 'the markets that reward organizations for effective and efficient performance are themselves institutionally constituted and supported. They are supported by rules regarding private property, norms governing fair exchange, definitions concerning legitimate economic actors, beliefs regarding the appropriate role of the state in governing economic transactions, and so on.' And as we suggest below, the institutional environment can vary in many aspects, including across sectors and countries.

Effects of the Institutional Environment on Organizational Actions and Outcomes

Because of its superordinate status and its ability to generate and enforce regulations, rules and practices through formal and informal means, the state is clearly a central strategic factor in the institutional environment that organizations must take into account. However, the state should not be considered a unitary actor since it can be composed of multiple entities and jurisdictions among which power is unevenly distributed (Meyer et al. 1987; Carroll et al. 1988a, b). Meyer and Scott (1983) suggested that institutional fragmentation would lead to more inter-organizational linkages, greater administrative components and a greater diversity of organizations. In support of this view, Meyer et al. (1987) found that greater fragmentation generated higher administrative intensity in school districts. Similarly, Carroll et al. (1988b) showed that fragmentation led to more elaborate inter-organizational networks and greater competition, while Barnett and Carroll (1993) provided evidence that more jurisdictional boundaries led to an increase in the number of organizations in the early telephone industry.

Organizations often create specialized formal structures to cope with normative pressures from the institutional environment and gain social legitimacy. In some instances, when such structures are at odds with efficiency considerations, organizations have undertaken the strategy of decoupling these structures from the technical core of the organization. For example, Meyer (1979)

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suggested that simply having a department of affirmative action may signal that a firm is responding to this issue even if affirmative action policies are not actively pursued. In some cases, policies that were initially adopted by organizations for rational reasons may, over time, become institutionalized regardless of whether they contribute to organizational efficiency. In support of this view, Tolbert and Zucker (1983) showed that, while the adoption of civil service reform by cities could be predicted early on by efficiency considerations, later adoption could not. Indeed, in later periods, civil service reform was institutionalized and adopted regardless of whether there were technical and efficiency reasons to do so.

The creation and diffusion of institutional practices and norms can lead organizational fields to become more similar over time due to coercive, normative and mimetic institutional pressures (DiMaggio and Powell 1983). Coercive pressures such as rules and regulations emanate from the state, which can lead to organizational ▶ isomorphism through formal and informal means (DiMaggio and Powell 1983). Normative pressures towards isomorphism often occur through professionalization in which professions generate practices and policies that serve to enhance and reinforce their status. Mimetic isomorphism can emerge when organizations model themselves on other, often more prominent, organizations, particularly under conditions of uncertainty (Haveman 1993).

These institutional pressures are not mutually exclusive – for example, coercive pressures could, in turn, lead to normative pressures. Edelman (1990) found, for instance, that civil rights legislation in the 1960s created a normative environment that led many employers to adopt formal grievance procedures for their employees even though such steps were not required by law. The extent to which an institutional practice has diffused and become taken for granted is quite important for strategists to consider because adoption of an institutionalized practice, even if it yields no technical benefits, can ultimately lead to a competitive advantage through increased legitimacy and easier access to key resources.

Another strategy for coping with the institutional environment is to develop institutional linkages. Singh et al. (1986) showed that voluntary organizations such as day care centres that registered and were listed in metropolitan directories enjoyed enhanced legitimacy and were less likely to fail. Similarly, Miner et al. (1990) provided evidence that Finnish newspapers that established institutional linkages with political parties were less likely to fail and were buffered from possible detrimental effects of organizational change. While pursuing institutional linkages could be a viable strategic move, caution is warranted since the acquisition of such linkages is not always the choice of the organization but is also a function of those granting institutional linkages and can be subject to forces that are beyond an organization's control.

Effects of Organizations on the Institutional Environment

In much early research the institutional environment was perceived as an exogenous force that had a significant influence on organizations but was not subject to influence by organizational actors. Scott (2008) notes that naturalistic accounts of institutionalization assume that the construction of institutional environments occurs through a process that is unconscious and not subject to the influence or direction of agents. Indeed, the ability to strategically influence the institutional environment is in many ways counter to the views expressed by Meyer and Rowan (1977) and DiMaggio and Powell (1983) where actors are subject to taken-for-granted assumptions about the institutional environment and are constrained by them.

DiMaggio (1988), however, proposed that the institutional environment is influenced by interested actors and that their relative power has a strong effect on its ultimate form. He noted that actors with sufficient resources can act as institutional entrepreneurs and attempt to shape the environment in accordance with their own interests. Similarly, Oliver (1991) made the point that organizations are not always passive and accepting of

institutional pressures but may respond strategically in a variety of ways, ranging from negotiating with key institutional stakeholders to trying to manipulate and change the underlying rules and practices. Subsequently, numerous studies have shown how actors can have powerful effects in creating and changing the institutional environment. In a detailed case study, DiMaggio (1991) illustrates this point by showing how museum professionals and the Carnegie Foundation influenced the evolution of art museums from an educational focus to one centred around the acquisition and display of high art. Greenwood et al. (2002) argued that professional accounting associations served to legitimate changes in practices favoured by large accounting firms in Canada. Vogus and Davis (2005) provided evidence that states in which corporate elites had denser interlock ties were less likely to adopt legislation that reduced hostile takeovers. Similarly, Ingram and Rao (2004) showed how the political strength of groups that supported and opposed anti-chain store laws influenced their likelihood of adoption and repeal.

Research in economics and political science has also suggested that the institutional environment is subject to influence. More specifically, research in this area finds evidence that firms and industries have the incentive and sometimes the means to capture the regulatory process so that it primarily serves their interests (Stigler 1971; Peltzman 1976; Olson 1982). For example, de Figueiredo and Edwards (2007) found that the regulated prices for new entrants to access the telecommunications networks of incumbents was influenced by the relative campaign contributions of incumbents versus those of new entrants. Hansen and Park (1995) investigated the likelihood that the International Trade Administration (a branch of the US Commerce department) would grant protection to industries after complaints had been filed by US firms that foreign competitors were subsidized by their government. They found that higher industry contributions to congressional members of the trade oversight committee increased the chances of a favourable decision by the agency.

While many studies have illustrated how involved actors influence and sometimes shape the institutional environment, it is unclear if this is actually the result of strategic forethought and action, particularly at the firm level. Attempts to influence the institutional environment can often have unanticipated consequences (Merton 1936). Henisz et al. (2005) provided evidence of such consequences when they examined how the IMF and the World Bank applied coercive pressures (by attaching conditions to loans) on countries in order to encourage them to adopt market-oriented reforms. One of their findings was that, while increased dependence on and pressure from these agencies increased the likelihood of privatization, they did not affect the liberalization of competition as intended. Similarly, Dowell et al. (2002) illustrated the difficulties involved when interested parties attempt to use collective action to influence and shape technological change. In investigating the development of a high-definition television standard, they showed how changes in technology and the subsequent entrance of new populations with differing interests often made the existing strategies of incumbents ineffective. Even state-level attempts to influence organizational outcomes can have unanticipated aftereffects. ► Selznick's approach to strategy (1949) seminal study of the Tennessee Valley Authority illustrated this point by showing how the agency's attempt to gain support for its conservation mission by including local officials and institutions in its decision-making process led to changes in its policies that favoured local agricultural business interests. In a similar vein, Wade et al. (1998) found that state-level prohibitions on alcohol production paradoxically strengthened the brewing industry in surrounding states and may have increased the power and concentration of the industry. Such unexpected consequences can arise because actors are embedded in a wider system, and attempted strategic actions and subsequent changes in the environment attract responses from others that are difficult to predict *ex ante*.

Determining whether an outcome is truly the result of purposeful action is difficult because of possible post hoc rationalizations. As Merton (1936) observes, a horseman who is thrown from

his horse may say after the event that he was simply dismounting. Similarly, researchers may be retrospectively making sense out of what has occurred and attributing the chain of events to 'institutional entrepreneurship'. Such an interpretation is consistent with the romance of the leadership phenomenon in which organizational leaders are retrospectively given credit for extreme outcomes (Meindl et al. 1985). In this case, the leaders are assumed to be institutional entrepreneurs who are endowed with exceptional foresight and abilities (Aldrich 2010, 2011).

Complicating the case for institutional entrepreneurship further are the long time horizons that most institutional change requires. For example, the changes in norms that made it possible for the Canadian accounting firms studied by Greenwood et al. (2002) to expand their practices occurred over decades. Potential designers of institutions are unlikely to have such long time horizons and, as we noted above, their actions are likely to have unanticipated consequences, particularly as the environment and the actors involved change over time (Pierson 2004; Scott 2008). Thus, we agree with Scott (2008: 96), who noted that the difficulties inherent in strategically changing the institutional environment 'should make us mindful of the assumptions we make when assessing agency, interest, and rationality in the design of institutions'.

The concept of institutional logics features prominently in current depictions of the institutional environment. In their seminal article, Friedland and Alford (1991: 248) note that, 'each of the most important institutional orders of contemporary western societies has a central logic – a set of material practices and symbolic constructions – which constitutes its organizing principles and which is available for organizations and individuals to elaborate'. Friedland and Alford (1991) conceived institutional logics at the societal level and proposed that five institutions – capitalist market, nation-state, families, democracy and religion – each have a central logic that influences both individual behaviour and organizational action. The concept of institutional logics has since been applied more broadly across multiple levels of analysis and has incorporated the existence of competing logics. In the process the connection to the inter-institutional system described by Friedland and Alford (1991) seems to have been lost. In their thorough review of research on institutional logics, Thornton and Ocasio (2008: 120) argue that this disconnect may be due to several reasons – the page limitation requirements of journals, a focus on alternative units of analysis and, more worryingly, authors who are uninterested in causal relationships. Thornton and Ocasio (2008: 108), who are pioneering exponents of the 'institutional logics' approach to organizations and their environments, acknowledge weaknesses in the approach in that 'the breadth of the meta-theory may have encouraged imprecision in research, and it could be inferred that any logic or interpretive scheme, at any level of analysis, may be characterized as an institutional logic'. Such undisciplined use of the institutional logic concept could result in post hoc rationalizations to explain past outcomes and, as a consequence, overstate the ability of actors to influence the institutional environment. In more recent work Thornton et al. (2012: 50–127) refocus attention on inter-institutional systems as the unit of analysis.

Undoubtedly, organizations do try to influence the institutional environment and sometimes succeed. In certain cases, opportunities to influence the institutional environment come about because of exogenous shifts in the institutional environment, such as policy changes. In support of this view, Fligstein (1987) argues that finance-oriented managers who advocated diversification were able to take control of large corporations as a result of the Celler-Kefauver Act passed in 1950, which indirectly encouraged conglomerate strategies. Similarly, Dobbin and Dowd (2000) theorize that when the status quo is changed by government policies or other exogenous shocks, competing groups attempt to advance their interest by redefining elements of the institutional environment in their favour. More generally, Teece (2007) makes the case that entrepreneurial firms with dynamic capabilities can sometimes seize opportunities to reshape their business ecosystem which, of course, includes the institutional environment.

As noted earlier though, the multitude of private and public actors involved makes *ex ante* predictions of outcomes difficult. In the case of European integration, Fligstein and Stone Sweet (2002: 1236) argue that the activities of market actors, public interest groups and government officials became linked in a self-reinforcing causal system. They stress, however, that in this case, 'European integration has been structured by crucial events that were not predictable from any ex-ante historical moment.' In summary, while organizations do sometimes have opportunities to influence the institutional environment, successfully doing so remains challenging.

See Also

- ▶ Isomorphism
- ▶ Norms
- ▶ Organization Theory
- ▶ Selznick's Approach to Strategy

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Intangible Assets

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Abstract

Intangible assets are a very economically significant asset class yet are largely excluded by accounting conventions from corporate balance sheets. Ownership (or control) of intangible assets can allow firms to differentiate their offerings to customers and establish some degree of ▶ competitive advantage. However, intangibles do not, apart from isolated instances where licensing is possible, generate value on their own. To generate value, they must be combined with complements and be astutely managed.

Definition Intangible assets are identifiable, non-financial elements of an enterprise's productive resources that lack the material substance of physical assets.

Intangible assets are identifiable, non-financial elements of an enterprise's productive resources that lack the materiality of physical assets. They can

sometimes be acquired, but are more often generated internally.

Under international accounting standards (IFRS 2012), non-physical, non-financial assets that are potentially separable from the physical and human resources of the firm can be considered assets. Examples include patents, copyrights, trademarks, customer lists, franchises, marketing rights, software and digital content.

However, international accounting rules exclude investments for internal use – that is, investments not intended for sale, which include software programming for internal use, improvements in business processes, training and advertising. Thus, accounting, with its emphasis on what can be accurately priced, makes the potentially serious error of omitting a great deal of value from corporate balance sheets. In fact, the level of under-representation has probably been increasing. By some measures, investment in intangibles in the United States has grown considerably since 1980 (Nakamura 2010). By 2000, US investment in intangibles had reached the same order of magnitude as investment by US firms in physical plant and equipment – more than a trillion dollars (Nakamura 2001).

For the purposes of this article, intangible assets are defined to include the results of investments for internal, as well as external, use. Even so defined, the category excludes many important elements that make up the broader category of ▶ intangible resources, such as organizational capabilities.

Growing Economic Importance

Intangible assets have grown in economic prominence during recent decades. In the nineteenth and twentieth centuries, the assets that economists saw as sources of value were the traditional factors of production: land, labour and capital. While these factors remain important, their ownership by firms does not guarantee financial success.

Today's global economy offers ready access to intermediate goods, investment capital and many types of information. Because these factors are in many cases competitively supplied to all firms that seek them, it is hard for a firm relying primarily on them to earn better than a competitive return (Barney 1986).

While barriers to global trade and investment have fallen, the transfer of intangible assets, such as manufacturing processes and service formulas, remains difficult. The resource cost of ▶ technology transfer depends in large part on the nature of the intangible; the cost is higher, for example, when the intangibles are less codified or have not previously been transferred (Teece 2005). The general complexity of trading intangibles limits arbitrage opportunities in comparison with most physical goods. As a result, the development and astute management of intangible assets is now central to creating a ▶ competitive advantage based on differentiation.

Characteristics

Intangible and physical assets differ along a number of significant dimensions. A comparison puts the salient features of intangible assets in sharp relief.

First, intangibles are not what economists call 'rival in use'; consumption by one entity does not reduce the amount left for another, as would be the case for physical goods. One person's use of Microsoft's Windows operating system does not affect the ability of other people to use it. In fact, operating systems and many other intangibles (e.g., a social networking website) benefit from ▶ network effects, so that the more users who adopt the technology, the more valuable the technology becomes. In other cases, multiple use of a technology may cause it to decline in value to the owner, especially if some users are direct competitors.

Whereas physical assets lend themselves to an inventory, intangible assets are less readily counted and, as noted above, are virtually absent from corporate financial statements. The chief exception is the purchase premium (over book value) left over from mergers and acquisitions, which accounting rules allow to be recognized as 'goodwill'.

Another important difference between intangible and physical assets is the availability and enforceability of property rights. The property rights to physical assets such as land or machinery are generally clear and well protected by law in most developed economies. Whether theft has occurred is relatively easy to ascertain. Property rights to intangibles can be 'fuzzy', and theft (e.g., patent infringement) costly and complicated to prove.

Most physical assets can be bought and sold with relative ease, although prices for certain highly specialized items may be difficult to negotiate. The difficulty arises from the small numbers of buyers and sellers. 'Thin' (i.e., not liquid) markets of this type are the rule rather than the exception for intangible assets. This limited tradability is part of what makes them hard for rivals to access and therefore a potential source of competitive advantage.

Other characteristics of intangibles also make them hard to trade in organized market transactions. The value of an intangible asset is rarely ascertained until its details have been revealed, which, apart from legally protected intellectual property, will provide the potential buyer sufficient knowledge to have the benefits of the asset without paying for it. Arrow (1962) first brought this disclosure problem to light.

Physical and intangible assets have in common some form of depreciation, but intangibles can generally lose their value much more quickly. While knowledge does not wear out as most physical assets do, it is frequently subject to rapid loss of value because the creation of new knowledge will render it obsolete. In fact, if a firm's own renewal process does not make its existing knowledge obsolete, then a competitor's knowledge activities will. And ▶ brand value, which is expensive to create and maintain, can vanish almost overnight following a corporate misstep, or even just bad luck.

Types

There are many types of intangible assets. The patent, a form of intellectual property, is perhaps the best known. A valid patent provides rights for exclusive use by the owner, but patents have weaknesses despite their legal support. Depending on the scope of the patent, it may be possible to invent around it at some cost. There can be 'holes' and 'gaps' in intellectual property coverage. Ascertaining whether trespass or theft has occurred can prove difficult. And patents (and copyrights) eventually expire.

Trade secrets, another class of intangible, can augment the value of a patent position. They do not provide rights of exclusion over a knowledge domain, but they protect covered secrets in perpetuity. Trade secret protection is possible, however, only if a firm can put its product before the public and still keep the underlying technology secret. This is most likely to be true of industrial processes.

Another intangible asset of central importance is the firm's ▶ business model, that is, the logic of how a business creates and delivers value to customers while earning a profit for itself (Chesbrough and Rosenbloom 2002; Teece 2010). A business model in its entirety is generally not protectable by intellectual property rights. At most, certain elements of a model might qualify for patent or copyright protection. Business model innovations are critical to success in unsettled markets. The growth of the Internet is both allowing and requiring business model innovation in many industries, ranging from music to insurance. In particular, the Internet requires new pricing structures for many products because users are accustomed to getting information for free. In other industries, middlemen serving as information brokers are being disintermediated.

Other interesting classes of intangible assets include brand image, customer and business relationships, and organizational culture.

Profiting from Intangibles

Markets are a great leveller. If an asset or its services are traded in a market, it can be accessed by all who can pay. It therefore cannot provide any competitive differentiation.

The range of domains in which competitive advantage can be built narrows as more and more activities become outsourceable. The Internet and other recent innovations have vastly expanded the number and type of goods and services that can be readily accessed externally. Non-tradable assets, of which intangible assets are the most important group, have the potential to form a basis for competitive advantage.

Intangible assets by themselves, however, will not generally yield value; they must almost always be combined with other intangible and physical complements in a way that yields value for customers. The best 'governance' mode for managing the complements of a firm's intangibles depends on the characteristics of the intangible, the relevant appropriability regime, and the structure of the markets for the necessary complements (Teece 1986, 2006). Generally, the successful leveraging of a potentially valuable intangible asset requires that the firm own any key complements that are not competitively supplied.

See Also

- ▶ Brand
- ▶ Business Model, the
- ▶ Competitive Advantage
- ▶ Imitability
- ▶ Information and Knowledge
- ▶ Intangible Resources
- ▶ Network Effects
- ▶ Profiting from Innovation
- ▶ Research and Development (R&D) Investment
- ▶ Technology Transfer

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Intangible Resources

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Definition Intangible resources are stocks of strategic information and intangible assets that the organization can employ as needed in pursuit of its goals.

Intangible resources are stocks of strategic information and ▶ intangible assets that an organization can employ as needed in pursuit of its goals. Such resources are idiosyncratic in nature. This in turn is a key driver of heterogeneity among firms. They are difficult to trade in most cases because their property rights, if they exist at all, are likely to have fuzzy boundaries and their value is context-dependent. As a result, there is unlikely to be a well-developed market for most intangible

resources, and they are also generally difficult to transfer amongst firms.

A key exception to this otherwise limited tradability is codified knowledge for which transferable rights have been conferred by government, such as patents, trademarks, and copyrights. Trade secrets are an example of knowledge that is protected under law but which may nonetheless be hard to transfer unless it takes a simple form, such as a secret recipe for a beverage.

Some intangible resources are carried in the minds of specific employees. This human capital can include technical knowledge, relationships and creativity.

Most intangible resources are tied to the organization, but not to specific individuals. The leading examples of these are the organizational culture (norms and values), the organization's reputation and brand image, and the organization's capabilities (operational and dynamic).

An important example of this organizational category of resource is an organizational competence that is underpinned by routines (Nelson and Winter 1982). These routines involve numerous people, none of whom could, alone, replicate the same set of activities with a different group of people. This difficulty in replication, even within the same company, exists because so much knowledge is tacit (Teece 1981, 1989; Teece et al. 1997). Even where a company has invested in codifying its routines, which separates the actual routine from its written representation, tacit knowledge will be added over time to improve effectiveness.

A common feature of all these intangible resources is that they take time to build, which makes them hard to imitate. This in turn makes them a potential source of sustained competitive advantage, a proposition that has already received some empirical verification (Villalonga 2004).

Awareness of the strategic value of intangible resources has been building steadily (e.g., Teece 1981, 1989, 2000; Itami 1987; Dierickx and Cool 1989; Hall 1992), although such resources are sometimes called by different names or referred to with overlapping concepts.

See Also

- ▶ Information and Knowledge
- ▶ Intangible Assets

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Intellectual Capital

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Abstract

Intellectual capital is an important production factor and often the basis for competitive advantages. Together with physical and financial capital, intellectual capital completes the set of organizational resources. The multifaceted concept of intellectual capital has found its

way into many diverse management disciplines (Marr 2005). Different definitions of intellectual capital exist in various disciplines and theories and a multitude of words is used to describe the concept (Marr and Moustaghfir 2005). Terms such as assets, resources or performance drivers are used interchangeably and combined with terms such as intangible, knowledge-based or non-financial.

Definition Intellectual capital is the collection of intangible and knowledge-based assets a company (or individual) possesses. Components of intellectual capital include human capital, relationship capital and structural capital.

Classification of Intellectual Capital

Most definitions seem to converge towards a generally accepted definition that splits intellectual capital into three component classes: human capital, structural capital and relational capital (Marr 2008).

Human capital. The principal subcomponents of an organization's human capital are naturally its workforce's skill sets, depth of expertise and breadth of experience. ▶ Human resources can be thought of as the living and thinking part of the intellectual capital resources (Roos et al. 1997). These can therefore walk out at night when people leave; whereas relational and structural capital usually remains with the organization even after people have left. Human capital includes the skills, knowledge and competencies of employees, as well as know-how in certain fields that are important to the success of the enterprise, together with the aptitudes and attitudes of its staff. Employee loyalty, motivation and flexibility will often be significant factors too, since a firm's 'expertise and experience pool' is developed over a period of time. A high level of staff turnover may mean that a firm is losing these important intellectual capital elements.

Relational capital. Relational capital includes all the relationships that exist between an organization and any outside party, both with key individuals and other organizations. These can include customers, intermediaries, employees, suppliers, alliance partners, regulators, pressure groups, communities, creditors or investors. Relationships tend to fall into two categories – those that are formalized through, for example, contractual obligations with major customers and partners, and those that are more informal. Other factors that fall into this category are brand image, corporate reputation and product/service reputation as reflections of the relationships between organizations and their (current and potential) customers.

Structural capital. Structural capital covers a broad range of vital factors. Foremost among these factors are usually the organization's essential operating processes, the way it is structured, its policies, its information flows and content of its databases, its leadership and management style, its culture and its incentive schemes, but can also include intangible resources that are legally protected. Structural capital can be subcategorized into *culture*, *practices and routines*, and *intellectual property.*

Organizational culture is fundamental in achieving organizational goals. Organizational culture provides a common way of seeing things, sets the decision-making pattern and establishes the value system (Itami 1987). Culture resources embrace categories such as corporate culture, organizational values and management philosophies. They provide employees with a shared framework to interpret events, a framework that encourages individuals to operate both as an autonomous entity and as a team in order to achieve the company's objectives.

Processes and routines can be important organizational resources. Shared knowledge in organizations is expressed in processes and routines. Processes and routines include internal practices and processes; these can be formal or informal procedures and tacit rules. Formalized routines can include process manuals providing codified procedures and rules; informal routines could be codes of behaviour or understood (but unstated) workflows.

Intellectual property. Owned or legally protected intangible resources – are becoming increasingly important. ▶ Patents and trade

secrets have become a key element of competition in high-tech organizations (Teece 2000). Here intellectual property is defined as the sum of resources such as patents, copyrights, ▶ trademark, ▶ brand, registered designs, trade secrets, database content and processes whose ownership is granted to the company by law. Intellectual property is an element of intellectual capital that is owned by the organization and not its employees. It represents the tools and enablers that help to define and differentiate an organization's unique offering to the markets in which it operates.

Historical Developments Across Disciplines

The term 'intellectual capital' was first used by economist Nassau William Senior in 1836. Economists have for many years highlighted the importance of intellectual capital as a production factor. The debate reached its pinnacle in the development of the New Growth Theory by Paul Romer (1986), of Stanford University, who highlights that economic growth is based on knowledge. The theory is in strong opposition to the classical economic theory and is based in many respects on the works of Nobel Prize winner Robert Solow. While the parts of the economic model of Solow are capital, technology and labour, Romer has added knowledge as a superior part that directs the use of capital, technological development and quality of labour.

Some of these developments in economics were picked up in the strategic management field. The development of the resource-based theory (Penrose 1959; Barney 1991) in the 1980s and the knowledge-based theory (Grant 1997) in the 1990s challenged the traditional market-based theories. It is argued that a sustainable competitive advantage results from the possession of resources that are inimitable, not substitutable, tacit in nature and synergistic. With this newly developed emphasis on internal resources, special attention was placed on competencies, capabilities and knowledge-based assets.

In parallel, there have been developments in the field of accounting, with attempts to develop approaches to place a financial value on intellectual capital. An ever-increasing gap between market value and book value highlighted the fact that intangible assets were not sufficiently reflected in balance sheets. This debate started in the 1970s and new guidelines relating to accounting for intangible assets have emerged on a regular basis. Accounting takes a statutory inside-out view of the firm in order to externally disclose performance data in a standardized format driven by stringent accounting rules. This has led to quite narrow definitions and excludes many important elements of intellectual capital. Surrendering to the thought that the rigid postulates of accounting will not allow the deserved treatment of intellectual capital, another research stream looked at creating separate intellectual capital statements. This movement has resulted in various initiatives in Europe to design guidelines for firms to create intellectual capital reports.

There have also been attempts to better value intellectual capital from an outside-in perspective. In finance, approaches such as EVA™ (Economic Value Added), Discounted Cash Flow and Real Options Models were developed (Hand and Lev 2003). In similar developments, the legal profession is concerned with how to legally protect intellectual capital such as patents, trademarks or copyrights.

See Also

- ▶ Brand
- ▶ Human Resources
- ▶ Patents
- ▶ Trademark

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Inter-and Intra-industry

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Abstract

What better explains firm profitability: Position within an industry or industry membership? Intra-industry performance heterogeneity indicates the importance of unique business strategies. Inter-industry performance heterogeneity indicates the importance of industry structure to firm performance. Both are important. Yet, it appears that firm position matters to performance heterogeneity more than industry membership. Recent work shows the importance of corporate ownership and nationality.

Definition When business strategy emerged as a unique field of study in the 1970s and 1980s there were two basic perspectives on the sources of firm performance variance. Inter-industry heterogeneity relates to the structural differences between industries. Intra-industry heterogeneity (or competitive heterogeneity) covers the differences within an industry (usually attributed to managerial decision-making).

Economists have discussed the importance of industry membership since the work of Mason (1939, 1949). The argument was taken up in strategy following Schmalensee (1985). To many strategy scholars the issue was to demonstrate the importance of managerial decision-making to firm performance. When this argument emerged in the strategy field in the 1980s many economists believed that competition both within and across industries would result in all firms obtaining some reasonable return on investment.

Basic price theory suggests that competition will weed out weak performers and that competitors within an industry will converge on a best way of doing things. Thus, in equilibrium, we should see that firms within an industry offer similar products that cost the same to produce, and that each firm will make at least positive accounting profits. In equilibrium, industries too should offer capital markets similar rates of return. An industry with higher than normal profits will attract entry, and profits will be pushed down until marginal cost equals price and industry members all earn positive accounting profits, but zero economic profits.

However, Mason (1939, 1949) observed numerous examples of industries where price competition did not seem to occur. His observation was that in concentrated industries firms were able to avoid price competition. Then, in a series of papers, Bain examined the relationship between industry concentration and profitability (e.g., Bain 1949, 1950, 1951). By 1970 there were over 40 such studies and the consensus in economics was that, through monopoly power or oligopolistic collusion, firms in concentrated industries could price above marginal cost (Brozen 1970, 1971a, b). The public policy implication was that for consumer welfare to be maximized the industries needed to be more competitive.

In the 1970s, Demsetz (1973), Mancke (1974), and Mueller (1977) examined the theory of

monopoly power and the empirics used in showing the correlation between concentration (or market share) and profitability. Demsetz argued that a well-managed firm will gain market share and have high profits. Mancke argued that the empirical work was indeterminate regarding the source of the correlation. And Mueller argued that data at the firm level were necessary to understand the extent to which profits could persist above competitive levels. Further, Mueller pointed out that firm-level data would be necessary to show why profits do or do not converge.

The issue became more salient to strategy scholars when Schmalensee (1985), using 1 year of Federal Trade Commission (FTC) data, found that there were significant accounting profit differences between industries. However, within-industry differences were not found. Within a few years a number of papers were published that did find firm influence on profitability important (Wernerfelt and Montgomery 1988; Hansen and Wernerfelt 1989; Amel and Froeb 1991; Montgomery and Wernerfelt 1991; Rumelt 1991). Rumelt, using Schmalensee's data and additional years of FTC data, found that the stable industry variance was much smaller than the within-industry variance. Rumelt attributed this to 'the unique endowments, positions, and strategies of individual businesses' (Rumelt 1991: 168).

The discussion then moved in various directions. McGahan and Porter (1997) used a different statistical approach and found stronger industry effects. They further examined industry's importance and the issue of persistence: how durable are industry and firm effects (McGahan and Porter 1999)? Brush and Bromiley (1997), Brush et al. (1999), and Bowman and Helfat (2001) took up the issue of corporate effects, arguing that this influence is much more important than previous works indicated.

Since then the dominant finding has been that within-industry differences are the largest. Further, the importance of corporate effects has also found support (Brush and Bromiley 1997; Bowman and Helfat 2001). However, as methods have become more nuanced the discussion has broadened to include not only corporate effects but country of origin (Bou and Satorra 2007, 2010), the stability of effects (Ruefli and Wiggins 2003), strategic groups (Short et al. 2006) and, perhaps most importantly, the interdependence of effects (Hough 2006; Misangyi et al. 2006; Greckhamer et al. 2008).

It seems apt that the basic argument has now greatly changed. Initially, strategy scholars felt compelled to show that managerial decision-making mattered. The discussion quickly shifted to more nuanced examination of stability of effects and the perplexing issue of corporate effects (perplexing because they seemed not to exist).

For a long while methods have overshadowed the substance of the argument. This has perhaps had the fortunate effect of paving the way for a more nuanced discussion of how business unit, corporate, industry and international strategy combine and interact to offer firms opportunities to outperform rivals and develop unique competitive positions. Business unit effects are most important and probably should be the unit of analysis. Still, industry, corporate and international effects are important. It is time to articulate how these factors interact in particular situations and to examine the extent to which the various effects interact across situations (Misangyi et al. 2006; Greckhamer et al. 2008).

See Also

- ▶ Competitive Heterogeneity
- ▶ Industrial Organization
- ▶ Market Power

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Inter-Firm Cooperation

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Abstract

The entry discusses the topical and important issue of inter-firm cooperation, paying particular attention to strategic alliances and clusters. It also delves on the issues of intra- organizational and intra-alliances conflict and how to achieve value co-creating inter-firm-co-opetition.

Definition

Inter-firm cooperation (IFC) can be defined as quasi-stable, durable, formal or informal arrangements between two or more independent firms, aiming to further the perceived interests of the parties involved. It involves independent firms (hierarchies) that pursue their interests, without resorting to full integration, but in a way that involves a more durable relationships than a spot-market contract; IFC is thus 'between market and hierarchy'. IFC can take various forms, such as subcontracting/outsourcing, equity joint ventures (EJVs), strategic alliances, and 'clusters'. An important characteristic of such arrangements is that to varying degrees co-operation can co-exist with competition between firms – hence the presence of co-opetition.

Introduction

While competition plays a critical role in the theory of the firm, business strategy and international business (IB), this is mostly seen as being inter-firm competition (or rivalry). For example, in the canonical works of Stephen Hymer in the case of the multinational enterprise (MNE), and more recently ▶ Michael Porter in the case of mostly national firms, the role of competition is basically limited in the pursuit of 'rivalry reduction' (Hymer [1960] 1976), or reduction of the 'forces of competition' (Porter 1980). Yet the relationship between competitors need not always be portrayed in such a dim light. After all, competitors can help create awareness of the products and services of the sector, benefiting other participants, too. In this and other ways (notably the stimulus to efficiency and innovation) they help create and co-create the market and the supporting environment, what we will call the business and the wider ecosystem. This of course need not mean the end of rivalry; it is just rivalry of a different, more sophisticated type, arguably nearer to today's complex business world. All these require a more nuanced approach to 'competition' than is extant. In addition, despite a large and fast growing literature on inter-firm cooperation, such as joint ventures, strategic alliances, clusters and so on, the relationship between competition, and cooperation (co-opetition), and the way in which they are linked to sustainable competitive advantage (SCA), both in firms and in constellations of firms, such as 'clusters' and business ecosystems, remains under-conceptualized. Critically, intra-organization and intra-alliance tensions and competition are often ignored. This entry focuses on the very topical issue of inter-firm cooperation and co-opetition, paying particular attention to strategic alliances and clusters.

Inter-firm Cooperation (IFC): Definition and Theories

Definition

IFC can be defined as quasi-stable and durable, formal or informal arrangements between two or more independent firms, aiming to further the perceived interests of the parties involved (Pitelis 2012). In this generic definition, IFC involves independent firms (hierarchies) that pursue their interests, without resorting to full integration, but in a way that involves more durable relationships than a spot-market contract; IFC is thus 'between market and hierarchy' (Williamson 1996; Ménard 2004). IFC can take various forms, such as subcontracting/outsourcing, equity joint ventures (EJVs), strategic alliances, and 'clusters' etc. (Gulati et al. 2000; Pitelis 2012). An important characteristic of such arrangements is that to varying degrees co-operation can co-exist with competition between firms, especially when co-operating firms are involved in similar activities (Porter 2000). In cases like strategic alliances or alliance portfolios, for example, cooperation can be in one activity, while firms compete in other areas (Hermens 2001; Child et al. 2005; Ozcan and Eisenhardt 2009). Types of IFC, such as EJVs and strategic alliances became so topical in the 1990s, that John Dunning (1997) defined the whole era as 'alliance capitalism'.

Perspectives on IFC

We can distinguish three major analytical perspectives on IFC: the 'industrial organization' (IO), the transaction costs and the resource-knowledge-capabilities-based. There also exist variants within each perspective. Given extensive coverage, for example, in, Arikan (2009), Pitelis (2012), here we provide a bird's eye view.

From the IO perspective, IFC is seen partly in terms of price collusion. Firms have an incentive to collude so as to raise price–cost margins, by influencing the structure of the industry (Cowling and Waterson 1976). Game theoretic work on IFC such as Axelrod's (1997), provided additional important reasons and evidence as to why firms may have an incentive to co-operate in terms of retaliatory ('tit-for-tat'-type and/or other variants of) strategies of economic agents. More efficiency-based arguments within IO, such as Demsetz's (1973) 'differential efficiency hypothesis', can also be used to explain IFC in terms, for example, of production-side, synergy-related efficiency gains. Whether for market-power in the

form of collusion and/or for efficiency reasons however, within IO there is no comparative governance-based analysis between different modes of organizing economic activity – that task was undertaken by the transaction costs economics (TCE) project.

The origins of TCE-based explanations of IFC go back to Coase's (1937) article. Coase focused on the nature, or existence, of the firm, vis-à-vis the market, and attributed integration by firms to high market transactions costs. Oliver Williamson (1985, 1996), a co-founder of TCE, originally viewed such co-operation (and what he called hybrids) as a transient phenomenon, a progression from market to hierarchy. In this perspective, there can be transaction costs benefits of co-operation vis-à-vis markets, but generally not vis-à-vis hierarchy, which is superior in terms of transaction costs savings. This is not surprising, given for example that the quantity of transactions increases as the number of transacting parties increase. Moreover, for Williamson (1985), hierarchy could alleviate transactions cost, even given the number of transactions, by reducing negotiation costs through the leverage of authority. Important contributions in the transaction costs tradition involve Hennart's (1991) analysis of joint ventures, Oxley's (1997) analysis of alliances, and Williamson's (2008) analysis of outsourcing. An implication of the transaction costs perspective is that *ceteris paribus*, in transactional terms (and subject to increases in organizational costs not fully offsetting any transaction costs saving), IFC is an inferior form of organizing economic activity in terms of economizing behaviour than integration by firms, or 'hierarchy'.

TCE is predicated on the assumption, that the production side can be assumed to be constant for different modes of the organization of economic activity (Williamson 1985). This need not and realistically cannot be the case (Langlois and Robertson 1995; Aoki 2004). Different organizations are likely to possess different capabilities, advantages and disadvantages. The resource-knowledge-capabilities-based perspective is based on the observation that institutions and organizations differ in terms of their value-creation and capture capabilities. For Penrose (1959/1995), firms are superior to markets in terms of their endogenous creation of knowledge, innovation and value. For other 'resource-based' and capabilities scholars, for example Peteraf and Barney (2003), Dosi et al. (2003), Teece et al. (1997), Teece (2014), each firm, too, is unique in its ability to create and appropriate value (Eisenhardt and Schoonhoven 1996).

Recognizing that the production-value creation side is not constant implies that one needs to analyse the differential advantages and disadvantages of each organization in terms of its costs and its value-creation and capture benefits. For example, even if IFC is inferior to integration in terms of transactions cost, it may be superior in terms of value creation advantages (Kale et al. 2001). These cost–benefits calculus is more complex than that based on the transactions cost alone, and is important to be pursued. In one of the earliest resource-based approaches to IFC, Richardson (1972) had drawn on Penrose ([Penrose 1959] 1995) to produce a template, or 'good practice', for the choice of mode of organizing economic activity, in terms of his proposed concepts of similarity and complementarity of activities. He defined similar activities as those that require the same capabilities in order to be performed, while complementary activities as those that require complementary capabilities. In Richardson's schema, similar and complementary activities are best integrated in a single firm. Dissimilar but complementary activities are best undertaken through co-operative arrangements.

Richardson's focus was exclusively on production costs efficiency in terms of requisite production capabilities. He did not deal explicitly with other potential advantages of alternative modes, for example those arising from the 'revenue' side. His analysis is complementary to TCE by looking at the production efficiency side. On the other hand, it failed to consider explicitly transaction costs, knowledge-creation, as well as power-control-related factors.

Such issues feature more prominently in the literature on strategic alliances and clusters.

Strategic Alliances

Four major theoretical approaches have been employed in the alliance field. First, TCE (e.g. Parkhe 1993; Olk and Young 1997). Unlike Williamson, these applications took the view that alliances can maintain stability if the sum of transaction costs can be minimized through the partnership arrangement (Hiroshi 2005). They also argued that alliance success is determined by coordination and appropriation costs (Gulati and Singh 1998).

Major weaknesses of the TCE approach as applied to the alliances include the fact that it is essentially a single-party analysis of cost minimization; this neglects the interdependence between exchange partners potentially seeking joint value. It also overlooks resource sharing and different types of alliance formation. Moreover, it does not recognize alliance benefits associated with inter-partner learning, the pooling of resources, and the reduced uncertainty associated with relational development (White 2005). In addition, it emphasizes structural versus process factors and underplays learning and organizational image (Lorenzoni and Lipparini 1999).

Thuy and Quang (2005) have argued that relational capital such as mutual trust, respect, understanding and inter-personal relationships within a business alliance, is important. In addition, in a review of inter-organizational relationship literature Barringer and Harrison (2000) have noted that a cost–benefit analysis underplays constructs such as organizational reputation, visibility, new knowledge and broadened social networks, which are very hard to put a monetary value on.

The resource-based view (RBV) has also been applied extensively to the study of strategic alliances (e.g. Lavie 2006; Teng 2007). The RBV drew attention to the link between an entity's internal resources and capabilities and its performance (Barney 1991), in particular how organizational resources and capabilities generate sustainable competitive advantage (SCA). While TCE emphasized cost minimization, RBV emphasized value maximization through the pooling of valuable resources (Das and Teng 2000). The RBV sought to identify the nature of organization focusing on capabilities and resources that are not necessarily transaction-specific (Poppo and Zenger 1998). Contrasted with neoclassical theory, including TCE, which assumes homogenous firms, RBV emphasized heterogeneity (Hunt et al. 2002).

It has been suggested that the RBV is particularly appropriate for examining strategic alliance performance, as organizations seem to form alliances in an effort to access other organizations' valuable resources (Das and Teng 2000; Lockett et al. 2009). This highlights the importance of resource alignment, partner selection and inter-partner learning (Tsang 2002). However, whilst the RBV has merit in focusing on the organization, not just the transaction, it tends to overlook the role of the network of relationships in which the organization is embedded (Dyer and Singh 1998) and that an organization's critical resources can extend beyond its boundaries (Dyer and Singh 1998).

A third approach employed to the study of alliances is the resource dependency theory (RDT). The theory argued that organizations must inevitably engage with their external environment to access resources and foster performance (Barringer and Harrison 2000). This theory has roots in intra-organizational behaviour, but has potential for explaining some inter-organizational or domain-level phenomena because of its focus on minimizing inter-organizational dependency and preserving one's autonomy while also recognizing the value of resource sharing through inter-organizational relationships (Gray and Wood 1991).

When applied in an inter-organizational alliance context, the focus of RDT shifts to allocation of resources among partners and the recognition of resource sharing between organizations. As such, RDT is somewhat similar to the RBV. On the other hand, as noted by Barringer and Harrison (2000), the RD view ignores variables such as transaction costs, opportunities for learning and organizational legitimacy.

A fourth approach to alliances involves social exchange or social network theories. These consider the social context in which decisions are made and actions carried out (Granovetter 1985).

Social exchange theory has been applied to the study of various aspects of strategic alliances, with the premise of social exchange found to play a central role in alliance stability (Das and Teng 2002). Alliances are recognized as complex organisms of groups or individuals, whose personal mindsets influence the relationship dynamics and function. Therefore, social exchange is thought to be just as important in inter-organizational relationships as it is more broadly in interpersonal relationships (Muthusamy and White 2005).

Social network theory alludes to the importance of reputation and long-term relationships in the formation of strong partner affiliations. Larson's (1992) study of network dyads had highlighted the importance of reputation, trust, reciprocity and mutual interdependency. Reciprocity was thought to minimize alliance instability by fostering cooperation and coordination between organizations (Oliver 1990). Relationship-based theories hence focus on creating benefit for multiple entities through their exchange, including social elements of cooperation, trust and commitment.

Hermens (2002) observed that prior research on alliance outcomes had largely ignored the relationship between strategic choice, strategy fit, alliance process and evolution. That was despite the demonstration in Doz's (1996) longitudinal study of alliances, that the initial structural conditions and subsequent evolutionary processes influence alliance outcomes (see also Noorderhaven 2005). Three scholars, Arthur (1996) (whose view of organizations is embedded in institutional theory) and Das and Teng (2001) (whose perspective of alliances is as organizations emerged in internal tension), essentially shared a similar perspective – that alliances are based on a tentative equilibrium of reciprocal opposing forces that can quite readily shift if one force gains strength.

It is apparent from the above that strategic alliances are too complex a phenomenon to investigate through a single theoretical lens. As many scholars have concluded, standalone theoretical approaches applied to the study of alliances and alliance instabilities face inadequacies and limitations (Das and Teng 2000; Bell et al. 2006). Similar considerations apply for the case of clusters to which we now turn.

Clusters

Interest in and literature on, 'clusters', agglomerations, 'networks', 'industrial districts', 'webs', local production systems, regional systems of innovation, innovative millieux, neo-Marshallian nodes, business ecosystems and so forth has taken off following, in particular, the work of Michael Porter (1990). Clusters have risen from relative obscurity to being seen by some as the most potent production-side-based strategy for the international competitiveness of regions and nations (see Porter (2000), Matthews (2010)).

Work on cluster-type forms of economic organization go back to Alfred Marshall (1920), who stressed the benefits from co-location, such as availability of labour and knowledge. More recent contributions on clusters include literature that focuses on advantages of clusters in terms of co-location, social embeddedness and value creation (see Pitelis (2012) for a survey).

There are five major elements of clustering that have emerged from the theory and the evidence discussed in the aforementioned literature. These are geographical agglomeration (co-location), linkages, supporting environment, 'social capital', competition with co-operation (co-opetition) and a perceived shared objective or vision by cluster members. The following definition of clusters covers all five characteristics (Pitelis 2012: 1361).

'Clusters' are geographical agglomerations of firms in particular, related, and/or complementary, activities, with a perceived shared objective-vision, that exhibit horizontal, vertical intra- and/or inter-sectoral linkages, which operate within a facilitatory socio-institutional setting, and which can co-operate and compete (co-opete) in national and international markets.

This could be seen as the definition of a developed or mature cluster, such as the Cambridge high-tech cluster, Silicon Valley or the Hsinchu science-based cluster in Taiwan. Real-life clusters

are usually the result of a path-dependent, evolutionary, socio-political, historical and entrepreneurial process that unfolds in real time and as such, they will tend to differ as to the extent to which they are characterized by all the above features depending among others on their stage of development (Markusen 1996; Gordon and McCann 2000; Arikan 2009).

A common approach to the question 'why do clusters exist?' in the literature involves listing a number of absolute advantages of clustering. These involve agglomeration and external economies from co-location, concentration of skilled human resources in the region, social embeddedness and capital that reduce transaction costs due to trust, the flexibility and entrepreneurship of small firms involved in clusters, economies of diversity, as well as the existence of untraded interdependencies that emerge from dense inter-firm linkages and networks of associations and interest groups. The last mentioned, and the associated creation of 'organizational fields' (Scott 1994), are said to be capable of reducing 'cognitive distance' (and/or engender enhanced associational cognition, Aoki 2010), aggregating diverse interests, mediating conflicts and diffusing information (Krugman 1992; Locke 1995; Gordon and McCann 2000; Nooteboom 2008).

In addition to such 'supply-side externalities', further benefits of clustering are said to include the reduction of consumer search costs and associated demand side effects (McCann and Folta 2009). On the negative side, there can be agglomeration dis-economies (due, for example, to 'congestion effects') and also the possibility of institutional and organizational sclerosis-inertia and lock-ins. For example, the impact of 'embeddedness' on innovation can help create such advantages and eventually disadvantages (Robertson et al. 2008). In some cases success can eventually engender failure (Martin and Sunley 2006; Matthews 2010).

More recently, knowledge and associated cognition-based theories aimed to explain clusters in terms of their knowledge-value-creation advantages, for example through enhanced associational cognition, increased variation, and deepened division of labour and learning. In this framework the additional value created through clustering is said to be able to offset any costs of clustering (Maskell 2001; Aoki 2010).

It is notable that the influential work of Michael Porter (1998a, b), demonstrated no conceptual framework as such, and made no reference to transactions cost, resources and capabilities or power. Accordingly, Porter's work is *sui generis* and detached from important contributions on IFC and other contributions on clusters, and more widely. Arguably, the useful elements of Porter's work need to be placed in context and combined with other insights, for further progress to be made.

Despite progress, it is arguable that the extant literature on clusters fails to adequately address the question 'why clusters?' comparatively – that is, relative to alternatives, notably 'integration' by firms and as compared with markets and other types of economic organization, involving cooperation between firms. In addition, and importantly, extant theory fails to adequately address the role of human agency, in particular the role of entrepreneurs and entrepreneurial management in creating and co-creating clusters, as well as markets and business ecosystems, with an eye to engendering appropriable value creation (Pitelis and Teece 2010). Indeed, it is arguable that appropriability and value capture are all but ignored in cluster theory – the focus instead being on economizing, efficiency and value creation.

Pitelis (2012) has attempted to address the aforementioned limitations. The paper adopted a comparative governance perspective (first static and then dynamic) that looked at the relative (not just absolute) advantages of clusters, in terms of three major conceptual lenses – transaction costs, power-control and resource-knowledge creation. Towards this purpose the paper employed the notions of dynamic transaction costs and 'joint productive opportunity', and showed that the differential advantages of clustering help explain the limited occurrence of integration in clusters, even when Richardsonian conditions favoring integration are satisfied. Following on from the static analysis, the paper then explained the emergence of clusters in terms of entrepreneurial agency

informed by value appropriation potential of co-created value. The paper claimed that clusters like other forms of economic organization are the outcome of appropriability-informed purposive entrepreneurial action that motivates the creation and co-creation of organizations, markets and supporting ecosystems. In this wider context, the emergence and resilience of some, but not other, clusters is explicated in terms of value appropriation, not just value creation potential. This differs from extant literature that bases its predictions on clusters, on value creation potential alone. The paper also proposed that in cases where a degree of strategic choice is involved, the choice of location by appropriability-informed entrepreneurs can help trigger a market, ecosystem and cluster co-creation process. In this context, the process of cluster co-creation is partly endogenized.

Some Limitations and Opportunities

A limitation in the literature of IFC is the limited consideration on tension and conflict between co-opeting firms as factors that can threaten the survival of IFC. This is particularly the case with literature on clusters. Instead in the case of alliances it has been observed that espite their ubiquitous presence, strategic alliances are often highly unstable. The duality of inter-organizational alliances presents discrepancies, instabilities and inter-partner conflicts. Factors influencing internal tensions and alliance stability include availability of resources, differential bargaining power, type of alliance, alliance goals, stage of industry life cycle, and changing market conditions. These destabilizing factors can constrain efficient decision-making, and diminish organizational energies, and thus can lead to alliance failure. In recognizing this, Das and Teng (2000) have developed a framework to identify and interpret internal tensions within a strategic alliance. The premise of this framework is that as conflicting forces develop, creating instabilities and internal conflicts, it is these tensions that may catalyze the erosion of an alliance or even its collapse.

Guided by Das and Teng's (2001) classification framework for investigating alliance structures and tension, Hermens (2002) identified the origin of internal alliance tensions as being the product of the variance between partner's strategic intent for perceived collaborative conditions, actual alliance conditions and perceived risk. His case study-based evidence found that the overall tension levels and sub-systemic dialectic tensions (i.e. short term versus long term; flexibility versus rigidity; collaboration versus competition; common versus private benefits) evolve over time, reconstituting relationships and shaping the evolutionary trajectory of an alliance. These findings suggest a process of accelerating tensions and significant imbalances in their configuration will favour certain outcomes. The governance process of alliance resources, in the context of the value creation process and perceived risk, was a key strategic element that influenced internal tensions and alliance evolution. Intra-IFC tensions arguably deserve more attention, especially in the case of clusters, hence they are also an opportunity for further research.

In conclusion, IFC is an important and fast rising field of enquiry, indeed far too big to be addressed in an entry of this size. Our focus in part reflects our own interests, expertise and limitations. The main conclusion is that IFC is a multi-faceted phenomenon that requires a synthetic lens to be more adequately understood. In addition, the role of intra-organizational and intra-IFC conflict has to be given more prominence, alongside governance structures designed to alleviate it and/or leverage it creatively (Pitelis 2007). The area of strategic alliances has proven a fertile ground and has seen progress on this front. More is hoped for and should be expected in order to give a fuller understanding of what is arguably one of today's most intriguing and complex issues.

See Also

- ▶ Alliances
- ▶ Cooperation and Competition
- ▶ Co-opetition
- ▶ Porter, Michael E. (Born 1947)

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Interlocking Directorates

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Definition Interlocking directorates, or board interlocks, occur when two firms have the same person serving on their respective boards of directors.

An interlocking directorate exists when one person serves concurrently on the board of directors of two firms. This tie is considered to be directional if the director is an officer or other representative of either firm. Indirect interlocks represent the broader pool of board ties held by other directors at the two firms. While interlocks between independent companies are the focus of most research, interlocks have also been studied between the boards of parent and subsidiary organizations (Kriger 1988) and between members of a common business group (Boyd and Hoskisson 2010). Network analysis (Stokman et al. 1985) is often used to analyse patterns of ties among a group of firms.

Data Sources and Characteristics

Data on interlocking directorates can be obtained from multiple sources. For publicly traded US firms, proxy statements list other directorships held by each board member. Proprietary databases such as Risk-Metrics, Disclosure and BoardEx also provide information on directorships with varying geographical emphasis. BoardEx, for example, provides information on roughly 400,000 directors and officers, mainly in Europe and North America. When interlock data is unavailable, one tactic used by researchers is to compare lists of directors across a group of firms. Since directors typically serve multi-year appointments, patterns of interlocks are relatively stable over time. Historically, current CEOs have been the most common source of interlocks. Recent governance guidelines discourage such activity (Geletkanycz and Boyd 2011), and retired CEOs have become a more common source of interlocks as a result. General information on board characteristics, including some interlock trends, are published in annual surveys by Korn/Ferry and Spencer Stuart.

Theoretical Perspectives

Interlocks have been studied from a wide range of disciplines, including management, finance, accounting, economics, sociology and even geography. Consequently, there are a wide range of theoretical perspectives that have been used to study interlocks. Early interest in this topic emphasized the potential for interlocks to facilitate collusion between firms, and the ability to support an 'old boy's network' among the corporate elite. The resource dependence and embeddedness perspectives (Boyd 1990) emphasize how interlocks aid firms in managing external constraints, through access to information and resources. Institutional theory examines how board ties provide legitimacy, and also serve as a basis for imitative behaviour (Haunschild 1993). Upper echelons (Geletkanycz and Hambrick 1997) view interlocks held by individual directors as an influence on strategic behaviours. Social capital theory can be applied at both the individual director and firm levels, and examines characteristics of interlocks within a broader network of connections. Finally, ▶ agency theory views interlocks as a mechanism for executives to

facilitate their own agenda (Davis 1996). Also, in business groups, interlocks are used to represent ownership interests (Yiu et al. 2007). Koenig et al. (1979), Mizruchi (1996), and Mizruchi and Schwartz (1987) provide reviews of theory development in this area, while Boyd et al. (2011) offer a more recent summary of key theories used in governance studies.

See Also

► Agency Theory

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Internalization Theory

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Abstract

Internalization theory explains the existence of the firm because it is the most efficient way of coordinating a set of activities rather than market exchange. The firm grows when it can absorb markets and it will do so until the costs to the firm of further growth exceed the benefits. This principle is combined with theories of trade and innovation to explain the location and relative success of firms. It has proved particularly useful in explaining the growth and organizational development of multinational enterprises (MNEs) in combination with theories of entrepreneurship and culture. Recent theorizing distinguishes operational internalization from knowledge internalization, with the empirical argument that the former is declining, the latter increasing. Spatial and governance implications of the theory are at the frontier of knowledge.

Definition Internalization is a general principle that explains the existence of the firm as an organizational type that coordinates activities more efficiently than can its principal alternative – the market. The boundaries of the firm are set where the costs to the firm of further internalizing markets are greater than the benefits.

The Concept of Internalization

Internalization is a general principle that explains the nature and boundaries of organizations; its

application to the multinational enterprise (MNE) is just one of its many spin-offs (Coase 1937). It is a highly specialized principle, targeted specifically at explaining where boundaries lie and how they shift in response to changing circumstances. By itself, it does not explain other aspects of organizations. Progress in internalization theory is achieved by combining this core approach with other principles to generate a wide range of predictions about different aspects of organizational behaviour. It can be combined with trade theory to explain the location of the firm's operations, with organization theory to explain international joint ventures and with theories of innovation to explain the kinds of industries in which a firm will operate. It applies not only to the geographical boundaries of the firm, but also to other boundaries, such as the boundary of a firm's product range, which is normally studied as a separate subject – namely product diversification. Combination with theories of entrepreneurship allows an analysis of culture to be developed.

Most organizations purchase inputs from independent suppliers, and so the question naturally arises as to whether they should produce these inputs for themselves. In management studies this is often called the 'make-or-buy decision'; in economics it is referred to as the 'backward integration' issue. Backward integration by MNEs is exemplified by 'resource-seeking investment'. Similarly, many organizations use independent agents to distribute their product, or to add further value to it before it is passed to the final user. This is the 'forward integration' issue; in the context of distribution management, for example, it is related to the 'channel leadership' issue, and in particular to whether a producer should also control the wholesalers and retailers that handle its product. In the context of international trade, the question arises as to whether producers should establish overseas sales subsidiaries to monitor and control distribution operations in foreign markets.

In general, most organizations use a range of *intermediate inputs*, and generate a range of *intermediate outputs*. It is the markets for these intermediate inputs and outputs that may be internalized. Markets for factor inputs and final products cannot normally be internalized by firms, as this would be tantamount to enslaving households, but households can internalize these markets, and to some extent they do. The classic example of household internalization is 'do it yourself' production, where the owners of a household employ themselves to do a job that independent workers would normally do instead, and then purchase the output from themselves instead of selling it on to others. The popularity of the 'do it yourself' principle illustrates the practical importance of internalization decisions, not only for large MNEs, but for individual households carrying on the ordinary business of life.

Internalization theory assumes rational action. Rational agents will internalize markets when the expected benefits exceed the expected costs. The profit-seeking managers of a firm will internalize intermediate product markets up to the margin where the benefits and costs of internalization are equalized. Within this margin, firms will derive an economic rent from their exploitation of the internalization option, equal to the excess of the benefit over the cost.

Two distinct forms of internalization are identified – operational internalization, involving intermediate products flowing through successive stages of production and the distribution channel, and knowledge internalization – the internalization of the flow of knowledge emanating from R&D (Buckley and Casson 1976). The gains from knowledge internalization can be substantial. The most important of these gains stem from what is nowadays called 'asymmetric information'. In particular, the 'buyer uncertainty' problem means that licensees are reluctant to pay for technology that might be flawed, or that might not be as novel as is claimed. Licensors could increase the price at which they could sell the technology by providing detailed evidence to a potential licensee, but this would be tantamount to sharing the knowledge with the licensee before any contract had been agreed. Unless they held a patent on the knowledge, the licensee could then exploit the knowledge free of charge. Even if the licensor held a patent, a potential licensee might be able to 'invent around' it. Furthermore, if a patent were granted, the licensee might sell the knowledge on to a third party in competition with the licensor, or

might make some improvement to the technology and patent it in their own name, thereby rendering the original technology obsolete. In the absence of such problems, licensing would be a very attractive option. A firm that employed a creative R&D team could specialize in developing new knowledge and licensing it to independent production firms that were better equipped to exploit the technology themselves. The research-oriented firm could therefore concentrate on what it did best, and avoid diversifying into complementary activities in which it had no particular skill. By comparing the types of industry in which knowledge flows were intensive with those in which they were not, it is possible to identify a set of industries in which knowledge internalization gains could be substantial. Within this set, it is then possible to compare types of knowledge for which internalization gains were high – for example, unpatentable knowledge – with those in which it was low – for example, patentable knowledge. It is then relatively straightforward to demonstrate that the knowledge-intensive industries with substantial internalization gains are the ones in which MNE operations were most commonly found (Buckley and Casson 2009).

Buckley and Casson (1976) suggested that MNEs were 'a two-edged sword', improving welfare by seeking and replacing imperfect external markets with more perfect internal ones but potentially reaping rewards by reducing competition. This assessment paid particular attention to the role of MNEs in the creation and diffusion of knowledge. The indivisibility and public good aspects of knowledge make the replication of knowledge-producing activities inefficient. In the absence of free competitive auctioning of knowledge, MNEs represent a second-best solution but one that is likely to outperform alternative, more wasteful institutional choices. The welfare implications derived from internalization theory are therefore contingent on a number of factors which the theory itself identifies. It is therefore a mistake to claim, as some writers have done, that internalization strategies are unambiguously 'good' or 'bad' from a welfare point of view.

Internalization theory analyses the choices that are made by the owners, managers or trustees of organizations. The theory assumes that these choices are rational ones. In this context, rationality signifies that the decision maker can identify a set of options, has an objective by which these options can be ranked, and an ability to identify the top-ranked option and select it. The assumed form of rationality is instrumental, in the sense that it does not concern the rationality of the objective, but merely the process by which the best option is identified, irrespective of the nature of the objective.

Rationality does not imply complete information. When confronted with search costs, a rational decision maker will collect only sufficient information to make the risks surrounding the decision acceptable, recognizing that mistakes are always possible. In a similar vein, the theory does not assume that the decision makers can identify all available options; indeed, in rational action models the number of options that decision makers consider is often restricted in order to simplify the model. In the context of market entry, for example, only a limited number of entry strategies is usually appraised, as explained above. However, the theory always makes the set of options considered fully explicit. Thus, while rationality may be 'bounded' in the sense that information is incomplete, behaviour is not irrational, in the sense that the information collected is a rational response to the information available.

The Coasian Heritage: Internalization as a General Theory of the Firm

It might well be asked why these different activities, located in different countries, needed to be coordinated by a firm. Why not use Adam Smith's (1776) 'invisible hand' to coordinate these activities through impersonal markets? Why is the 'visible hand' of management preferred to the 'invisible hand' of the market? Indeed, why not coordinate the operations of an ordinary domestic firm using market forces? If a small firm employs two people, they could make contracts directly with each other instead of through a third party – their employer. Economies of internalization provide the answer. Employment with a

firm provides an independent monitor – the employer – who ensures that the workers do not impede each other. The employer has an incentive to monitor well because the stronger the cooperation the higher his or her profit. Furthermore, the monitoring need not be intrusive; loyalty to the firm may encourage spontaneous hard work. This is an example of operational integration in a small firm. Knowledge internalization may be important, too. The employer may have discovered a new product and, while he cannot license his knowledge of this product to his workers because they do not share his good opinion of the product, he can employ them for a wage and then direct them to produce it. Working for a fixed wage insures them against a loss should their employer's judgement turn out to be bad.

Internalization, therefore, holds the key to the formation, not only the boundary, of any firm, whether multinational or not. Typically, an entrepreneur recognizes a product market opportunity, hires a team of workers to exploit it (knowledge internalization), coordinates the work of the team, possibly through a manager or supervisor (operational internalization), and makes a profit if his judgement is correct. A team can be configured in all sorts of ways. It does not have to be concentrated in a single plant, or even a single country. The most appropriate configuration depends upon the entrepreneur's idea and the best means of exploiting it.

This line of argument goes back to Coase (1937). Coase had noticed that in lectures on price theory markets were said to coordinate the economy and in lectures on business studies managers were said to coordinate the economy. Furthermore, he might have added, in lectures on socialism, planners were said to coordinate the economy. There seemed to be 'over-kill' where coordination was concerned. Coase concluded that, given the existence of alternative coordination mechanisms, economic principles suggested that the cheapest form of coordination would be selected in any given circumstances (Coase 1937). In arriving at this verdict, he assumed that the economy was basically market-driven, and that firms would only arise when managerial coordination proved itself superior to the market.

A key insight of the systems view is that the internalization decisions are interdependent. Furthermore, they are interdependent in two distinct ways.

Firstly, firms are typically involved in multiple internalization decisions. These decisions are interdependent; the outcome of one decision cannot be fully understood without reference to other decisions. Consider, for example, an MNE that operates three facilities – R&D, production and marketing. Internalizing one linkage, say between R&D and production, involves the firm in the ownership of two facilities, but internalizing a second linkage – say between production and marketing – automatically internalizes a third – between marketing and R&D. Whilst acquiring a second facility internalizes only one linkage, acquiring a third facility internalizes two. This demonstrates that internalization decisions taken as part of a restructuring operation need to be analysed holistically. Focusing exclusively on a single linkage, such as the link from R&D to production, rather than the full set of linkages, can create a misleading picture. The second interdependency concerns the internalization decisions of different firms. From a systems perspective, a facility that is wholly owned by one firm cannot be simultaneously wholly owned by another firm, because the principle of private property rights does not permit this. As a consequence, if one firm internalizes a linkage to a given facility then other firms cannot internalize linkages to that facility, because to do so they would have to own it as well. They may have linkages to it – but only external ones. Thus, the internalization decisions of different firms are interdependent when they compete to internalize linkages to the same facility.

The key issue is that the underlying theory does not change but the actions of firms respond to changing circumstances. The balance between externalization and internalization has shifted but the principles underlying the decisions determining the boundaries of the firm have remained. These may be listed as advantages and disadvantages of internalization (or, conversely, the costs and benefits of using the market). These shifts over time are traced below.

The Advantages of Internalizing a Market

The general advantages of internalizing an imperfect or missing external market can be listed as follows:

1. Coordination of multistage process in which time lags exist but futures markets are lacking.
2. Discriminatory pricing in internal markets allows efficient exploitation of market power.
3. Bilateral concentration of market power – internalization eliminates instability.
4. Inequalities of knowledge between buyer and seller ('buyer uncertainty') removed.
5. Internal transfer pricing reduces tax liability on international transactions (Buckley and Casson 1976: 37–39).

These factors drive the consolidation of firms and account for both large uni-national and multinational firms.

The Costs of Internalizing a Market

In every case the advantages of internalizing a market must be compared to the costs.

1. Higher resource costs when a single external market becomes several internal markets (can be reduced by partial internalization).
2. Communication costs in internal markets rise (vary with psychic distance).
3. Political problems of foreignness.
4. Management costs in running complex multiplant multicurrency operations (Buckley and Casson 1976: 41–44).

The costs of internalization are often underemphasized, or even ignored, leading to an unbalanced view of the theory. Where costs exceed benefits, markets will not be internalized and market solutions (external licensing, outsourcing) will be sought. The (changing) choices of foreign market entry and development are key features of the internalization approach (Buckley and Casson 1981, 1996, 1998, 2001).

Transaction Costs Minimizing Configurations in the Firm

Transaction costs exist in assembling the business processes of firms – collections of activities which are technologically or managerially linked so that they jointly affect value added. The overall costs of organization are determined by losses due to the imperfect motivation of process members (which result, in part at least, from the incentive structure) and imperfect information and coordination, which flow from the architecture of the firm (the allocation of responsibilities amongst individuals and groups and communication between them), together with the resource costs associated with incentives and architecture (Buckley and Carter 1996). Thus, transactional links within the firm enable us to split up the 'black box' and trace costs and benefits of combining activities within intra-firm processes. Further, it is possible to specify losses from imperfections in motivation, information and coordination, and to balance these against the costs necessary to correct these imperfections.

Views about the nature of human behaviour and actions will influence how an outsider might feel about the likelihood of these costs being significant; for example, motivation loss (and the cost of correcting it) will be greater, the greater the degree of opportunism ('self-seeking with guile'). However, if we believe that individuals naturally seek and appreciate team-working, then motivation costs will be low.

Buckley and Casson (1988) applied internalization theory to international joint ventures (IJVs). IJVs are conceptualized as arising from three key factors: internalization economies in one or more intermediate goods markets, indivisibilities and barriers to merger. Under certain environmental conditions, IJVs can be an optimal organizational solution (Buckley and Casson 1996). In joint ventures, mutual trust can be a substitute for expensive legalism. Joint ventures can provide an ideal institution for the exercise of mutual forbearance, leading to a commitment to cooperation and to the creation of reputation effects where a reputation for cooperative behaviour can lead to further coordination benefits. These effects can be good substitutes for

ownership. Skills in joint venturing and the learning effects that arise can lead to a widespread drive for non-ownership forms of cooperation, as in many global factories.

Unresolved Issues

Two issues of considerable importance may be considered unresolved. The first is the spatial element in internalization. The advantages and disadvantages of internalization are assumed to be invariant to distance. This issue is resolved by the addition of the location factor, which is then combined with internalization to give a more satisfactory explanation of the growth and development of MNEs. The investigation of spatial elements in the internalization decision itself may be a fruitful avenue for further research.

Second, there is an unresolved conflict in modelling MNEs between the role of human agency and the result of impersonal forces. How far is human agency (management decision-making) the determinant of outcomes? Much of economics assumes that impersonal forces determine the configuration of the world economy. The strategy literature sometimes reads as if all managers had to do to change the world is to exercise will and decide. Work around entrepreneurship (Casson 2000) decision-making under uncertainty (Buckley and Casson 2001) and investigations of 'how managers decide' (from Aharoni (1966) onwards, including Buckley and Casson (2007)) are attempting clarify this issue in the ► international business area; but the philosophical problems run deep (and long – back to Adam Smith (1976a, b)).

See Also

► International Business

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International (Cross-Border) Operations

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Abstract

This short entry defines the term "cross-border operations" and explores the main theories that try to explicate the choice of different types of cross-border operations ("modalities"), by firms.

Definition

The term international or cross-border operations refers to the operations by companies originated

from and having their headquarters in a particular nation, in a different nation. Examples are exports, licencing/franchising, foreign direct investment and inter-firm cooperation such as joint ventures and alliances.

Background

The term cross-border operations or international operations were first coined by Stephen Hymer (1976). Hymer focused on the international operations of national firms, such as exports, licencing/franchising, tacit collusion and inter-form cooperation such as joint ventures and alliances, and aimed to devise an analytical framework in order to explicate the reasons behind the choice between alternative operations/"modalities" of cross-border entry. Hymer focused on the archetypical choice between a market-based transaction (licensing) and an intra-firm-based one (► foreign direct investment).

Key Theories

Hymer's lead was followed by a huge literature on the topic of modalities, and a number of theories which tried to explicate the make/buy (sell)/ally decision by firms – namely the decision to produce in-house, sell or buy using market transactions and/or ally/co-operate with other firms.

Hymer had argued that firms integrate and/or internalize in order to reduce rivalry, profit from their advantages and diversify risk. When it came to profiting from the in-house internalization of advantages he referred explicitly to transaction costs (Hymer, 1968), rivalry reduction and other efficiency-related factors such as speed of technology transfer (Dunning and Pitelis, 2008).

The dominant theory that emerged to explicate the choice was called ► internalization theory. That theory refers to organizations undertaking in-house activities that could in principle be left to the "open market." The idea had been first developed by Ronald Coase (1937) for the case of the national firm, and it had been linked directly with the need to foster efficiency in terms of saving transaction costs.

The modern variants of internalization theory are due mostly to ► Buckley and Casson (B&C) (1976), ► David Teece (1976), Jean-François Hennart (1982), Oliver Williamson (1981) and Kogut and Zander (K&Z) (1992). While B&C and Williamson focused on transaction costs (and in particular those resulting from the public goods attribute of intangible intermediate assets in the case of B&C, or asset specificity in the case of Williamson), Teece has focused on the differential cost of technology transfer intra- versus inter-country, Hennart on the superior ability of firms to coordinate and manage foreign resources, including labor, and K&Z on the differential benefits of intra-firm technology transfer. ► John Dunning's (1980) eclectic theory and then Ownership, Location, Internalization (OLI), generalized the Hymerian and B&C contributions in terms of the three sets of O, L, and I advantages, all of which should be present in order to explain FDI, the MNE and cross-border operations.

Although the term internalization is usually linked to the transaction costs variants of the theory possibly reflecting the influence of Coase, Williamson and B&C, all the aforementioned theories deal with the question why and when do companies undertake activities in house (internalizse), hence they are all internalization theories.

Limitations and Critiques

Despite its establishment as the dominant paradigm in international business (IB) for many years, there is arguably now a pressing need to go beyond internalization theory in order to better explicate international operations. This is for at least the following reasons.

(a) The first is the very need for/added value of the term internalization. This is closely linked to the more common term "integration" (such as in vertical integration, horizontal integration, etc.). While integration normally refers to existing firms, internalization refers also to

the very nature or the existence of the firm (Coase, 1937). In this context internalization appears to be a more general term. It is arguable however that the very act of a firm's birth is an act of integration (Pitelis, 1991). In a very similar spirit, Penrose (1959) had questioned the need for and usefulness of this then new separate term.

(b) Internalization theory needs to explain what is specifically inter-national about it – in that, with the one exception of Teece (1976), there is little in internalization theory that is not equally applicable in the case of national firms integrating within a particular country.

(c) It is arguable that internalization theory remains rather comparative static, economics-based, agency-agnostic or cryptic, history-neutral, choice-theoretic, hence it needs to be rendered more dynamic, entrepreneurial, history and learning-based (Doz, 2004; Jones and Pitelis, 2015). Ideas from Penrose (1959) pertaining to history, learning, capabilities and "productive opportunity" (the dynamic interaction between the internal and external environment of firms as perceived) by its managers can help in the above direction.

(d) Market power, control and rivalry reduction are central in Hymer but also in Porter (1980). These ideas can be an integral part of internalization, not polar opposites, in that through internalization companies can acquire market power advantages. Accordingly, these terms need to be brought back in and integrated within a more general internalization theory.

(e) Internalization underplays the role of complementarities and the coexistence between competition and co-operation (co-opetition). For example, some internalization activities can be motivated by the anticipated impact on complementors or a company's rival's complementors

(f) Internalization does not fully explain the ally part of cross-border operations. In particular Williamson's transaction cost economics (TCE) approach considered "hybrids" (such as alliances) as intermediate form in transit between markets and hierarchies. This is myopic in that it downplays the often huge significance afforded by firms to complementarities and stable relations with complementors such as suppliers and customers. Hymer and Porter (1980)-type rivalry reduction ideas also are limiting in that the only conception they have of the ally part of the make/buy/ally triad is in terms of rivalry reduction (as opposed to, let's say, resource and capability acquisition and development). To that effect, resource and capability-based theories have proven rather more prescient (Richardson, 1972; Pitelis, 2012).

(g) Internalization theory needs to explicate better the more recent emphasis by firms on externalization (such as outsourcing), and open innovation, which seem to run counter to its alleged advantages of internalization-hence questioning the basic premises of the dominant theory of cross-border operations (Pitelis, 2012). Hymer's emphasis on control can be a critical missing link here, as Hymer had predicted externalization on cases where firms could maintain control without the vagaries of ownership (Pitelis, 1991).

(h) The theory takes the context within firms operate as given, it is important to explain how entrepreneurs shape, create and co-create the context within they operate, including markets and business ecosystems (Pitelis and Teece, 2010; Jones and Pitelis, 2015).

(i) Internalization's exclusive focus on the efficiency advantages of the MNE/FDI versus other types of cross-border operations may require some soul-searching and an analysis of the impact of the MNE on economic, social and environmental sustainability, particularly as a result of the potential problems that emerge as a result of concentrated power that internalization mantra helped engender. As Penrose (1959) had noted while the process of growth is usually efficient, the outcome (large size) usually is not. It is arguable that internalization has served as a cheer leader of market fundamentalism and de-regulation hence in part contributing to current systemic sustainability challenges (Pitelis, 2013).

Conclusion

In conclusion, cross-border operations can be explicated in terms of firm-level decisions informed by dynamic transaction costs, but also resources and rivalry reduction considerations. These decisions should also recognize the importance of complementarities and complementors, hence co-opetition. They must be undergirded by strong dynamic capabilities to anticipate, sense, seize and transform/maintain sustainable competitive advantage. This involves adopting the right cross-border modality at the right time for the right activity in the right place. In so doing MNEs can become portfolio holders of different modalities depending on the different circumstances/conditions. Instead of being just internalizers, MNEs can internalize/externalize, buy/sell and/or ally – and, importantly, help create and co-create the market, business ecosystem and sometimes institutional context nationally and inter-nationally, in which the narrower (albeit important and context shaping) choice of cross-border modality takes place (Jones and Pitelis, 2015).

See Also

- ▶ Buckley and Casson
- ▶ Dunning, John H. (1927–2009)
- ▶ Hymer, Stephen Herbert (1934–1974): The MNE and International Business
- ▶ Internalization Theory
- ▶ Teece, David J. (Born 1948)

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International Business

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Abstract

This entry provides a critical account and proposed forward research agenda of international business (IB), the scholarly business and management subdiscipline that deals with the nature, objectives, functions, strategies, organization, management, performance, interactions and impact of economic actors involved in cross-border operations, notably multinational enterprises (MNEs).

I

Definition While international business (IB) refers to business enterprises with foreign (cross-border) operations-presence, our focus in this entry refers to the scholarly business and management subdiscipline that deals with the nature, objectives, functions, strategies, organization, management, performance, interactions and impact of economic actors involved in cross-border operations, notably multinational enterprises (MNEs).

Raison d'être

It has been (and it is sometimes still) suggested that because most businesses today are involved with cross-border operations of one type or the other (e.g., they export), issues pertaining to IB need not constitute a distinct field of enquiry, but can be subsumed within, for example, strategy, marketing, management and entrepreneurship as part of these fields' 'international' dimension. This view ignores the fact that IB has become a large and vibrant community of scholars with a distinct set of research questions (some main ones examined later in this article), who are also content to self-identify as such. Among them there even exist reasonably coherent and self-contained subdivisions, the most generic of which are IB and international management (IM). From these, IB is often more economics and strategy content-inspired and deals with the nature, essence and modalities of cross-border entry by MNEs, while IM focuses mainly on issues of MNE agency, process, internal organization/management, subsidiaries and cultures. Mastering both of these is becoming a challenge even for specialist IB (M) scholars; hence the idea of IB being a non-distinct field of scholarly endeavour is rather contestable. An important reason is that the nature of cross-border operations (such as differences in regulatory regimes and cultures) and the (partly concomitant) quasi-autonomy of subsidiaries of MNEs are sometimes sufficiently distinct from such differences within nations, so as to present questions and challenges that might well not have been identified in the absence of a cross-border-related research question, and have, as a result, often led, rather than followed, literature in related intra-national-focused fields. Many are contributions of general applicability that appear to have been made in the context of analysing IB-related issues. This suggests the need to explore whether a focus on the I (international) of IB (that is, the cross-border operations of firms) is a factor that can help explain such a successful record – and if it is, to develop the theory of IB in order to account for the 'I' aspect more explicitly.

That being said, it is arguable that the current framework of thinking about IB issues might have become outmoded. New developments point to a new phase of globalization, with new strategies by MNEs that require innovative ways of dealing with IB innovations. We discuss some such innovations and highlight what we consider to be the most challenging – namely the sustainability of the wealth-creation process – in a globalizing environment. We suggest that knowledge, agency, learning and capabilities are critical factors in appreciating such innovations and in extending extant paradigms to embrace and explicate such developments.

Structure wise, the next section examines critically the conceptual foundations and extant perspectives of IB scholarship and its wider contribution to business and strategy scholarship. The subsequent section discusses IB innovations that call for an appropriate conceptual lens to be better appreciated, and claims that placing agency, capabilities and learning centre stage is critical in this direction. We submit that this has to be extended to account for learning in creating and co-creating organizations, markets, ecosystems and institutions across borders. The final section provides discussion and concluding remarks, as well as policy implications.

Conceptual Foundations and IB Contributions and Challenges

Conceptual Foundations and Contributions of IB

The foundations of IB as a separate field of scholarship are the economic theory of the firm and industry organization (Hymer [1960] 1976;

Horst 1972). Other fields, such as strategic management, have benefited from similar cross-fertilization with economics, but in the case of IB it is arguable that its very genesis (and much of the subsequent development of its core foundations) was economics-based. While early works on issues pertaining to international production and the MNE were topical in the 1950s (e.g., Penrose 1956; Dunning 1958), it was the Canadian economist ▶ Stephen Hymer ([1960] 1976) who helped found IB as a new field (Dunning and Pitelis 2008). Hymer claimed that the pursuit of profits by growing firms already established in developed nations would eventually lead them to consider 'foreign operations' such as exports, licensing, franchising and ▶ foreign direct investment (FDI). These modalities had their own advantages and disadvantages, but on balance FDI was superior in terms of the control it afforded to the firms. This superior control allowed firms to deal with international Rivalry (R) (specifically reduce it), as well as exploit better their (in Hymer's view monopolistic) Advantages (A), by leveraging them in house, instead of relying on the open market.

For Hymer, the benefits from leveraging the advantages in house related to market failures (such as fear of appropriation by rivals, and importantly in a 1968 article published originally in French, the high costs of market transactions), as well as to firm-specific advantages, such as the speed and efficiency of transferring intra-firm (versus inter-firm) advantages, which had the characteristic of a 'public good' (non-excludability) and/or involved tacit knowledge (Dunning and Pitelis 2008). FDI also had the benefit of risk Diversification (D), but that was a lesser reason for Hymer because it did not involve control (Hymer [1960] 1976: 25). Overall, the RAD (from Rivalry reduction, Advantages, Diversification of risk) benefits of FDI explained both its existence (hence the MNE) and why MNEs were able to compete with locally based rivals in foreign countries, despite inherent disadvantages ('liability') of being foreign (Hymer [1960] 1976: 46).

Subsequent development in the theory of FDI and the MNE focused upon and developed from the A(dvantages) part of Hymer's work. In particular, the contributions of Buckley and Casson (1976), Teece (1976, 1977), Rugman (1980), Williamson (1981), ▶ John Dunning (1988), and Kogut and Zander (1993) explored the various reasons why intra-firm exploitation of advantages can be preferable to inter-firm ones (see later in this article). The R element has been downgraded, except in works such as Vernon (1966, 1979) and Graham (1990; see also Buckley and Casson (1998) and Cantwell (2000). The D element has not been very influential, partly due to a widespread idea that shareholders can diversify risk by themselves, and therefore there is no need for firms per se to do this (e.g., Porter 1987). Nevertheless, gradually a sub-area emerged within IB, exploring the impact of international diversification on firm performance (e.g., Delios and Beamish 1999; Qian et al. 2008).

In terms of the explanandum, 'internalization' scholars such as Buckley and Casson (1976) and Hennart (1982) focused mainly on explicating FDI and the MNE. Vernon's (1966, 1979) 'product-lifecycle' (PLC) approach and Dunning's eclectic paradigm or OLI instead had the wider objective of explaining international production (Dunning 1988, 1995). The last mentioned involves broader considerations than the mere internalization of advantages, hence Dunning's focus on location and Vernon's emphasis on inter-firm rivalry both intra- and internationally.

In addition, Vernon's two variants of the PLC (Vernon 1966, 1979) involved an element of evolution/dynamics, as he aimed to explain the process of internationalization. This is mostly absent from internalization theories. Dunning aimed to rectify this by developing the concept of the investment development path (see Cantwell 2000, for a critical account). The Uppsala/Scandinavian School (e.g., Johanson and Vahlne 1977; Steen and Liesch 2007) has developed a stages approach, which explained the choice of location by MNEs partly in terms of familiarity and 'psychic distance' of markets first and more recently out/insideness (Johanson and Vahle 2009). 'Psychic distance', in turn, is likely to be positively related to Hymer's liability of being foreign.

The idea of the ▶ liability of foreignness emerged as an important subcategory of IB scholarship (Zaheer 1995).

While most authors have touched upon the theme of knowledge and learning, this has become more popular following the emergence of the resource-based view (RBV) and knowledge-based views of the firm (Penrose [1959] 1995; Teece 1977, 1982; Wernerfelt 1984; Barney 1991; Peteraf 1993; Foss 1996; Mahoney 2005). RBV and learning-based ideas have been used to provide more dynamic interpretations and updates of Dunning's OLI (as an envelope of other theories) (e.g., Pitelis 2007a), and to explore linkages between theories, such as Penrose and the Scandinavian approach (Steen and Liesch 2007). More, recent interest in institutions and development (e.g., North 1994) has led to cross-fertilization between IB and the related focus of development economics on knowledge and learning for development and catching up (Dunning 2006; Pitelis 2009).

IM had paid attention to entrepreneurial agency and, in this context, also to issues such as international entrepreneurship and born global firms (Oviatt and McDougall 1994; Doz 2004; Jones and Pitelis 2015). One of the 'advantages' of being an MNE involves the existence of a portfolio of subsidiaries. Leveraging subsidiary skills, as well as identifying the best way to do this (e.g., through 'granting' subsidiaries relative autonomy or keeping 'tight' controls) has emerged as an important issue in the IM sub-branch of IB (Hedlund 1986; Eden 1991; Birkinshaw 1997a, b; Birkinshaw and Hood 1998, 2000; Yamin and Forsgren 2006; Papanastassiou and Pearce 2009). The extent to which MNEs are genuinely 'global' or just regional remains an issue or debate (e.g., Rugman 2005; Collinson and Rugman 2008), and so is the issue of the degree of 'flatness' or 'integration' of global economy (see Friedman 2005; Ghemawat 2007, for opposing views). The inter-relationship between globalization or regional integration of nations (e.g., the EU, NAFTA, ASEAN) and between MNEs and regional clusters has also acquired significance (Cantwell and Iammarino 2001; Pitelis 2009, 2012). The former is a variant on the old theme of the relationship between MNEs and nation states (see Penrose 1956; Hymer 1970, 1972, for original views). The latter the relationship between local and global importance of location and their impact on economic development (Hymer 1970; Dunning 1998, 2006; Birkinshaw and Hood 2000).

The above are but vignettes of the fascinating journey of IB(M) scholarship over the past 55 years or so. Much more happened – perhaps too much to mention here without a serious risk of upsetting the major protagonists (Cantwell 2000 provides a comprehensive account of developments up to the late 1990s). Examples include the use and development of Hymer's early ideas in formal economic models (see Markusen 1984) and the exploration of linkages between finance and IB (Agmon 2006). Others include the incorporation of MNEs in competitiveness models, such as Michael Porter (1990) by, for example, Dunning (1993 and Rugman and Verbeke (1993), and in formal international trade theory (Head and Mayer 2004; Krugman and Obstfeld 2006).

It follows that IB as a field has good reason to celebrate its achievements. Hymer's RAD framework introduced explicitly for the first time in the literature the concept and importance of firm advantages and how best to exploit them intra-firm versus inter-firm. Hymer's answers included the first post-Coase transaction-costs analysis applied to the international context (Hymer 1968), which predated Williamson (1975), see Casson (1990). Hymer also employed capabilities, knowledge and learning-based arguments that predated many an important subsequent contribution (see Dunning and Pitelis 2008). His R reduction thesis, leading to collusion and the interpenetration of investments and market-sharing ideas, predated and/or informed literature in international organization (see Cowling 1982), and Michael Porter's (1980) work on competitive strategy.

The works of Buckley and Casson (1976), Teece (1976, 1977), and Kogut and Zander (1993) on 'internalization' helped inform not just the MNE and FDI but also intra-national

integration/internalization strategies of firms. Dunning's pursuit and generalization of the advantages thesis was path-breaking not only for IB. Today, general management scholars move increasingly towards the appreciation of the ▶ capturing value from advantages approach that Hymer established and Teece (1986) and then Dunning (1988) developed and completed.

Moving to the more IM-related ideas, the idea of leveraging subsidiary skills and reverse-knowledge-transfer are of the essence in appreciating the advantages of multi-divisionality. The early works of Chandler (1962) and Williamson (1981) that examined the M-form organization and its profitability, vis-á-vis the unitary (U)-form firm, focused more on the cost-reduction side and benefits accruing from the tight control of divisions than on the revenue-enhancing side through knowledge, learning and resource redeployment (especially Williamson 1981). The works of Bartlett and Ghoshal (1993), Birkinshaw and Hood (1998), and Papanastassiou and Pearce (2009) helped rectify this and develop the issue of the advantages of multi-divisionality by looking at the revenue side, too, and the degree to which this can be affected by the integration/autonomy trade-off.

The above instances where IB scholarship has given rise to significant contributions that lead the work on general (strategic) management raises the question of whether a particularly I(nternational) focus is of importance in developing ideas of more general use and applicability, but which might well have not appeared, delayed to appear or remained less developed in the absence of the I-focus of IB scholars. While the answer is hard, as it involves a counterfactual, we feel it is likely to be affirmative (see Pitelis and Boddewyn 2009). Dealing with international firms helps zero in on the essential issues that can be clouded within a national focus. By way of an example, while a US firm can take licences from other US firms, at the time of Hymer's writing, licensing by American firms to Japanese ones and/or undertaking FDI in Europe (and, especially for him, Canada) were far more pressing, politically loaded and visible issues than licensing to another US firm.

Challenges, Limitations and Scope for Possible Extensions

Despite this impressive journey, important challenges and limitations remain, especially with regard to the ability of IB scholarship to appreciate and leverage the nature and importance of cross-border operations (the *International* in IB). For example, all three elements of Hymer's triad (R, A and D) also apply to diversified firms within a nation. This is also true concerning subsequent 'internalization'-type theories and the OLI. In the OLI, for example, O, L and I apply at the national and international levels (Pitelis and Boddewyn 2009): our observation generalizes an earlier insight from Penrose (1976) that Hymer- and Coase-type theories on the MNE failed to deal with the differential specifics of being an MNE – being multinational. What is distinct about FDI and the MNE is the *foreign* (*F*) *and multinational* (*MN*), respectively. Hence only theories that account explicitly for factors that are unique to F and MN and could not be relevant to the core of non-F, are of added value in explaining any unique character of the MNE and FDI.

Unique about F and MN is the existence of borders, the existence of different sovereign nations, all with a legal monopoly of violence over their subjects (individuals and firms) to include the legal monopoly to *tax* them (see North 1994). Once integration is perfect, we no longer have different nations, therefore the I in IB, the F in FDI, the MN in MNE. In a semi-integrated world, the theory of IB should be about the uniqueness of I (i.e., of cross-border operations). This has to do primarily with resource-knowledge-learning endowments and potential institutional, regulatory, cultural and economic developmental and macroeconomic policy (to include tax) issues. Accordingly, a legitimately international theory of IB needs to explore the differential costs and benefits of the existence of different sovereign legal jurisdictions or, differently put, the scope to leverage any net benefits from the absence of flatness, or the presence of semi-integration (Ghemawat 2007).

With regard to extant theories of FDI, the MNE and international production, existing frameworks such as Hymer's RAD and Dunning's OLI are

arguably in need of development. The OLI focuses on the A element of RAD at the expense of R and D. There is little that it is unique about R and D in being I. Both need a refocus on the specifics of the foreignness or cross-border.

Extant theory can also benefit from an integration of the frameworks provided by Hymer and Dunning, with the contribution of Penrose ([1959] 1995), notably her focus on capabilities, learning and their impact on organizational growth and performance. In particular, OLI is part of Hymer's RAD, where A involves O, L and I-types of As. A(dvantages) are not just monopolistic (as claimed by Hymer), but involve both efficiency and (temporary) monopoly; they can better be described as potentially value-creating advantages. The objective of firms, in this context, is to capture value from perceived value-creating advantages (Pitelis and Teece 2009, 2010). To do this, firms need to identify, leverage and keep upgrading their 'productive opportunity' (a term proposed by Penrose ([1959] 1995), to describe the dynamic interaction between a firm's internal resources and external environment, the last mentioned including competition). For Penrose ([1959] 1995), firm growth is not motivated simply by the pursuit of higher profit rates, resulting from increased levels of output, leading to lower unit costs (as in Hymer), but also from endogenous pressures due to intra-firm learning, which release 'excess resources' that can be put to profitable use at minimal marginal cost (as they have already been paid for).

The concept of 'productive opportunity' includes Hymer's R(ivalry) reduction idea. It accounts for more recent RBV developments that focus on firm heterogeneity and can incorporate the concept of inter-firm rivalry, but also intra-firm rivalry and intra-; and inter-firm cooperation (Pitelis 2007b, 2012). A(dvantages), Foreignness (F) and Productive Opportunity (PO) are three major elements that need to be woven together to develop a more comprehensive theory of FDI, the MNE and IB.

In order to develop the F part, more resources need to be leveraged on the issues of different stages in national development; different macroeconomic, institutional, regulatory and cultural regimes; and, importantly, capabilities and learning accumulation by firms and nations (Kudina and Pitelis 2014). Work on the importance of institutional and cultural determinants of FDI acquires increasing interest (Dunning and Lundan 2010). On the other hand, the role of different regulatory contexts on FDI so far concerns economists more than IB scholars (Culem 1988; Wheeler and Mody 1992). More work is needed on these fronts to help delineate and sharpen the distinction between B and IB. Such work can build, among others, on the contributions of the liability of foreignness literature (Zaheer 1995); uneven development (Eden 1991); Dunning's work on the investment development cycle; the risk diversification afforded by investing in different countries; existing literature on institutional, cultural and regulatory differences among nations, capabilities and learning by firms and nations; Bartlett and Ghoshal's (1989) integration/national adaptation contribution; 'born globals' and international entrepreneurship.

As noted, a number of theories and sub-themes within the IB exhibit an understanding of the need to deal with more with F. So does work on the importance of the national business cycle on outward investment and the importance of national characteristics, such as taxes and differential risk, in explicating FDI (Head and Mayer 2004). Arguably, more needs to be done in this direction. We identify different degrees and stages of development, institutions and culture, and the process of capabilities development and learning across the board, as particularly important areas in need of development within IB. This means a shifting of balance in IB to issues of international political economy (IPE), institutional economics, intercultural management, and the role of learning and capabilities in organizational and national development (Brouthers 2013; Kudina and Pitelis 2014; Teece 2014).

IB Innovations and (a New) Learning

Significant innovations by MNEs include the coincidence of internalization and externalization and the move from closed to open innovation by

MNEs, and/or the combination of the two; what we call the 'portfolio approach' to entry modalities; the leveraging of the advantages of others; foreignness as an asset, not a liability; MNEs as 'global optimizers' and orchestrators of the global wealth creation process; tensions between global value capture and the sustainability of the global wealth creation process; and the challenge of 'supranational governance'. Some of these have received attention, others less so. Increasingly, we feel they are becoming topical and pressing. We discuss them in turn.

Historically, firms grew through integration. Hymer predicted externalization through subcontracting, but externalization and outsourcing has only acquired significance since 1995 or so (Teece 2006). There is nothing inherent about growth through integration. Firms can grow by combining integration with disintegration, internalization with externalization, specialization with diversification (Kay 1997). We need a better appreciation on the role of F in this context. For example, could it be that increased global integration helps engender specialization alongside the outsourcing of some activities? Which activities do (should) firms externalize and which should (do) they keep in house?

One major activity that firms, especially MNEs, have used to internalize is R&D. These days, many firms move to open innovation or combine 'closed' with 'open' innovation (Chesbrough 2003). Often this involves keeping sufficient in-house R&D to create the 'absorptive capacity' to identify (or even develop) 'open' innovation opportunities created by, or in collaboration with, others (such as universities) that can be captured by the MNEs (Research Policy 2006). Can IB scholarship help us understand this better? In particular, does being an MNE help explicate the move from closed to open innovation, or their combined use?

Despite Hymer and much of IB scholarship's focus on the advantages of FDI, many MNEs today (e.g., Starbucks) adopt a 'portfolio approach', combining, simultaneously, FDI, franchising and inter-firm cooperation in different countries. What are the implications of this on, for example, the unit of analysis? Would it be more appropriate to move from the firm level to the activity or even the project levels to analyse the choice of modality? As noted below for example, the focus on activities is important in the context of Global Value Chains (GVCs), see UNCTAD (2013).

The decisions of many MNEs today on the issues of RAD and OLI seem to be synchronous, based on learning, anticipatory change and proactive behaviour aiming to make these changes come true, to the extent possible (Penrose [1959] 1995). Extant theories of the MNE are not well designed to account for such behaviour; they remain rather positivist, rationalist and static (Doz 2004). It is also challenging to marry the ideas of MNEs as 'global learners' and 'global optimizers' prevalent in the literature on the 'transnational solution' (Bartlett and Ghoshal 1993) and 'meta-nationals' (see Doz et al. 2001) with the ideas of bounded rationality, uncertainty, path dependence, anticipatory, proactive and conflict-ridden (and frankly quite messy) behaviour implied by less positivist works such as those of Cyert and March ([1963] 1992), Nelson and Winter (1982), and Simon (1995). A better understanding of such issues is essential for progress within IB scholarship, especially given a tendency by supporters and critics alike to regard MNEs as omniscient and omnipotent.

Hymer and the subsequent literature on the liability of foreignness (e.g., Zaheer 1995) usually fails to look at the flip side: foreignness being an asset or indeed being turned into an asset. This can happen in numerous ways quite independent of the advantages MNEs need to develop in order to offset the liability. Foreignness can be an asset per se, when foreign is perceived as novel or better (even when it is not), for example foreign cars in China; when it can allow one to be forgiven for making errors (not allowed to locals); when it can provide a requisite 'distance' that can help morals become more (or less) loose, allowing more grey (or no) acts than a local politician, for example, might be prepared to consummate with a local firm-entrepreneur. Firms could try over time, moreover, to turn foreignness from a liability to an asset or even to a (dynamic) capability. These issues need more exploration and development.

In trying to capture value from their value-creating advantages, but also those of others, MNEs become increasingly more aware of the systemic benefits of overall value creation. They can help the creation of value by funding universities, collaborating with rivals, encouraging their employees to set up their own firms (sometimes competitors) and helping competitors to innovate. Large companies like Siemens and Microsoft do this; many others like IBM and Apple focus on their complementary integration, design and marketing capabilities to package extant knowledge in attractive new products. Gradually, from 'system integrators' within the firm, sector, region or nation, MNEs tend to become orchestrators of the global value-creation process – a role traditionally the pre-rogative of nation states or international bodies. This can be good because it makes MNEs interested in global value creation, in order to capture as large a part of it as possible, but also a challenge because value capture, when blindly pursued, may undermine the sustainability of global wealth creation (Mahoney et al. 2009).

Critical for an appreciation of the IB innovations discussed is the role of capabilities and learning. While integration was the conventional wisdom of the post-Second World War era, capitalism was founded on the putting-out system, a form of outsourcing (Marglin 1975; Williamson 1985). In this context, the move was from externalization to internalization to externalization. Accepting that the issue of control is critical for firms, one should anticipate that whatever could be outsourced without loss of control will actually be outsourced. As firms learn which activities and resources are core, they will tend to keep them in house and outsource the rest. Until such learning takes place, integration is the safe route, hence the norm.

Similar considerations apply to the move from closed to open innovation (Panagopoulos and Pitelis 2009). The portfolio approach is a result of firms learning what best is for purpose – namely in which locations and activities a particular modality is best. This engenders a portfolio of modalities within the same firm. That some firms adopt a stages approach has already been attributed to learning by the Scandinavian School (Johanson and Vahlne 1977). Capturing value from one's own advantages and the advantages of others requires learning by doing, often learning from earlier failures (Jones and Pitelis 2015).

The tendency for some firms to orchestrate the overall value creation process, through, for example, the development and control of GVCs (UNCTAD 2013), is predicated on learning. This involves the identification of gaps to be filled, market failures and the possibility to capture value by entering new parts of the value chain (e.g., DHL in China). Such developments also point to limitations of extant theory. MNEs learn how to capture value through strategies that minimize production and transaction costs and maximize revenue through differentiation and quality. Learning, however, also involves the setting up of organizations, the construction of organizations, markets and business ecosystems, and the co-creation of institutions (Pitelis and Teece 2010; Jones and Pitelis 2015; Teece 2007, 2014). A focus on agency, capabilities and learning requires fuller development of the learning and capabilities view – no less than a new learning. Critical in this are the recognition of the Penrosian contribution and the importance of organization, market, ecosystem and institution creation and co-creation, alongside the requisite entrepreneurial and organizational (dynamic) capabilities to devise and implement these (Pitelis and Teece 2009; Teece 2014; Jones and Pitelis 2015).

Concluding Remarks, Policy Implications and Future Research

We suggested that IB(M) scholars have made very important contributions of general value and applicability that might not have happened were they not working in an international context; nevertheless, extant theories and models on FDI, and the MNE, require integration and development in order to better delineate the foreignness aspect of MNE operations. These need to draw on issues pertaining to liability/advantages of foreignness and the resource, capabilities, learning and institutional, regulatory and cultural

differences between countries. Importantly, extant knowledge-learning-based approaches are limited in scope. They can benefit if extended to address the wider issues of organization, market, business ecosystem and institution creation and co-creation cross-border, alongside the requisite ordinary and dynamic capabilities to achieve these. This requires no less than a 'new learning'.

The above claim is strengthened when one considers other innovations in IB, which include the issues of a portfolio approach to entry modalities; a combined approach to internalization and externalization; a combination of closed and open innovation; and the potential benefits of foreignness. Further, the apparent tension between MNEs' attempts to act as global learners and global optimizers in an environment characterized by imperfect knowledge, path dependencies and uncertainty, which requires marrying stability and change through decision-making based on anticipatory change and proactive behaviour aiming to align anticipation and reality and the ability of MNEs to capture value from the advantages of others, may help turn them gradually into orchestrators of the global value-creation process. Tensions between value capture and value creation, to include problems of time inconsistency, may, on the other hand, prejudice the global value-creation process, rendering, in our view, the question of learning how to bring about best-practice supranational governance for sustainability a critical concern for the future of IB scholarship.

The policy challenge for MNEs and government policymakers alike is to identify ways through which mutual long-term benefit can be achieved. For MNEs, this would involve the avoidance of restrictive practices; for policymakers, this would involve the setting up of institutions, regulations and policies that promote innovation and sustainability. These could include strengthening the 'third sector' (or polity) and potentially a supranational organization with sustainability at its core agenda (Pitelis 2013).

More research is required to address these issues, to appreciate better the innovations we discussed, to delineate the I in the IB and to appreciate better the tensions between bounded rationality, learning and attempts to global optimizing, value capture and value creation. Placing learning and capabilities centre stage is of the utmost importance in helping to effect these.

See Also

- ▶ Capturing Value from Advantages
- ▶ Dunning, John H. (1927–2009)
- ▶ Foreign Direct Investment (FDI)
- ▶ Hymer, Stephen Herbert (1934–1974): The MNE and International Business
- ▶ International (Cross-Border) Operations
- ▶ Liability of Foreignness
- ▶ Multinational Corporations

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International Political Economy

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Definition International political economy looks at the international relations of political economy. In doing so it draws from the traditions of political economy and the study of international relations in order to look at how the international economy is politically constructed and managed.

International political economy (IPE) is an area of study that draws from the discipline of international relations and from the tradition of political economy. Despite that, IPE can be seen to go back to classic texts in political economy written by prominent figures such as Thomas Mun, Adam Smith and Karl Marx. It did not emerge as a subject in its own right until the collapse of the dollar system that was set at the Bretton Woods conference in 1944. The Nixon administration's decision to suspend the dollar's convertibility to gold in 1971 effectively ended the Bretton Woods system of economic governance and prompted many to look into the economic aspects of international affairs. The fear of renewed protectionism during the oil crisis that emerged in the 1970s, led to a renewed attempt, keenly supported by the US government, to understand ways in which states might reconfigure their economic relations in the subsequent years. These early studies were to focus upon the decline of US economic hegemony or leadership, institutional interdependence between states and economic actors and the emergence of international economic regimes in order to promote greater cooperation.

If the initial studies of IPE were born from the strategic state interests associated with wider studies in international relations (IR), a broader, more interpretive set of questions were posed concerning its nature and purpose. These were concerned with the manner in which the discipline had become state-centric and argued for more inclusivity, so that it engaged with wider multidisciplinary studies within the social sciences. This included a re-engagement with classical political economy and with building a body of critique that engaged with neo-Marxist and radical liberal theory. Such a move prompted Benjamin Cohen to write an intellectual history of the discipline, in which he argued that there was a geographical transatlantic split between the American 'empirical' approach and the British 'inclusive' or 'critical' school (Cohen 2008). Despite this, many of those holding to the former approach subsequently emerged from parts of Europe and many from the latter ironically emerged from North America. Yet, as the subject developed, a difference seemed to emerge between those whose focal point of study was largely based on understanding economic regimes and forms of integration, and those seemed concerned with wider questions on ▶ globalization, class, global production, and the division of labour and ideological change.

More generally, the increasing globalization or integration of the international economy has led

the subject move towards the study of a truly 'global' political economy, where studies (both interpretative and empirical) have looked at the roles that international finance, foreign direct investment (FDI) and multinational investment have played in this transformation. Fresh questions have been asked about the role of the state vis-à-vis non-state international actors; the multilateral increase of trade, especially in light of the establishment of the World Trade Organization; the institutional role of the World Bank in development policy; and the emergence of 'new' regionalism and regional blocs as new forms of regulatory governance. Theoretically, discussions have been centred on how globalization should be understood and what power relations have developed and been (re)configured around it.

In recent years, IPE has taken on even greater importance in the light of the global economic crisis. The subject has attracted a great deal of interest from the wide scholarly, financial and policymaking community as the financial crisis demonstrated the global, interconnected reality of the international economy. Recent introductions to the subject have looked to add the importance of studying 'crisis' as a key component on teaching courses (Ravenhill 2011). In addition, many have engaged from outside the discipline, which has furthered its multidisciplinary attraction. There have also been renewed debates over the sustainability of the contemporary form of global capitalist governance, with normative arguments pursuing the reforms of the financial and global monetary system, while others have used the crisis to show the fallacies of the capitalist system as a whole. Increasingly, for example, the sustainability of the environment and the potential effects regulation might have on the nature of the global economy. In terms of policy, the recent debates on austerity and growth are also generating much discussion, particularly in relation to the long-term implements of the international economy as a whole.

The study of international political economy can therefore be seen as one that emerged as a response to a specific concern in the subject of IR, but has a wider attraction, which contains a far broader history and has far wider appeal. Rooted in the general traditions of political economy, it has a reach which is truly multidisciplinary.

See Also

- ▶ Capitalism
- ▶ Comparative Advantage
- ▶ Globalization
- ▶ Regional Development

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I

Inter-organizational Learning

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Abstract

Inter-organizational learning has become a primary focus for scholarly research examining how firms learn and develop new, strategically relevant competencies. Tracing its origins to early work in management sciences, economics and organization theory exploring how individuals and organizations learn, the emerging literature on inter-organizational learning looks at how organizations learn from their environment and how this is translated into firm-specific capabilities that drive competitive advantage. In this article I examine the origins of this stream of research and outline the ways in which organizations acquire knowledge from each other, the factors impacting the amount of learning that takes place in inter-organizational alliances, and some of the risks and benefits of inter-organizational learning.

Definition Inter-organizational learning refers to the process by which organizations access, acquire and exploit knowledge developed by others or new knowledge created via specific governance mechanisms such as joint ventures and strategic alliances. Organizational learning, and specifically inter-organizational learning, are increasingly believed by scholars and practitioners alike to be a primary source of the unique skills and competencies that are at the root of a firm's competitive advantage.

A fundamental question in the field of strategic management concerns how firms achieve and sustain competitive advantage. Over the last three decades, a number of business scholars have approached this question by emphasizing the importance of internal firm competencies. Drawing on the work of Selznick (1957) and Penrose (1959), the resource-based view of the firm, for example, argues that enduring competitive advantage is primarily rooted in a firm's unique, strategically relevant resources and capabilities. Building upon this literature, others have argued that the firm's ability to 'integrate, build, and reconfigure internal and external competencies' is the source of its competitive advantage (Teece et al. 1997: 86). Collectively, this focus on 'core competencies' and 'dynamic capabilities' has led to a renewed interest among scholars and practitioners alike in understanding ► organizational learning and, in particular, learning that crosses organizational boundaries. Put simply, if a firm's proficiency in performing a given activity (e.g., process development) largely determines its competitive advantage, understanding how that proficiency can be improved over time must be of primary strategic importance. As Gary Pisano notes, without learning, it is difficult to imagine where a firm's unique skills and competencies would come from (Pisano 1994).

This article provides an overview of the organizational learning literature, focusing particularly on inter-organizational learning. A large and growing body of empirical research suggests that core competencies and value-creating resources are not evenly distributed among firms. In such an environment, an advantaged competitor can exploit the competency deficiencies of other firms to achieve superior performance. Thus, firms have an incentive to effect a redistribution of skills through various methods that facilitate inter-organizational learning, such as collaborations, alliances and capturing knowledge spillovers. The scholarly research focusing on interorganizational learning has its origins in various fields, including organizational behaviour, economics and management science. This article starts with a relatively brief review of these antecedents before turning to an overview of the current theoretical and empirical work on inter-organizational learning.

Antecedents to the Inter-organizational Learning Literature

As suggested above, a premise of much of the organizational learning literature is that firms differ in strategically relevant capabilities and that these differences result, in large part, from variation in their capacity for learning. What determines the actual levels of organizational learning is, in turn, presented as a function of various individual and organizational factors.

Individual Learning

A starting point for most models of individual learning are the concepts of bounded rationality and decision-making under uncertainty. The rationality assumptions of traditional neoclassical economics limited the role of learning since decision-making is based on (1) a known set of alternatives with corresponding outcomes, (2) an established rule for ordering alternatives and (3) a maximization criterion that is perfectly applied by economic agents. Starting with Simon (1955), however, scholars formally began to recognize that human cognitive limits and environmental uncertainty significantly affect the ability of economic agents to optimize. Instead of maximizing, the concept of *satisficing* is introduced in which individuals find a course of action that is 'good enough' (Simon 1957). They do so, in part, by constantly updating preferences as additional information is revealed.

Managers, for example, may acquire a better understanding of relationships between actions and outcomes the more exposure they have to a given set of decision-making problems. Similarly, individuals may gain additional relevant information through trial and error learning.

Early models of bounded rationality have been extended in three important ways. First, a number of scholars have emphasized that, in the face of cognitive limitations and uncertainty, economic agents may economize on learning by using simple heuristics and imitation. Rather than striving for complete information, economic agents select an optimal amount of learning such that costs and benefits are equated. Alchian (1950), for example, argued that, for lack of information or computational skills, economic agents may choose to imitate others who appear to be doing well. Second, given cognitive limitations and the costs associated with searching for relevant information, various mechanisms arise to assist agents in learning relevant information. Advertising, repeated interactions, signalling and product branding are all mechanisms for learning in the face of uncertainty (Stigler 1961; Akerlof 1970). Finally, a growing body of research in behavioural economics explores how the updating processes and heuristics typically employed by individuals are themselves imperfect and subject to biases (Kahneman and Tversky 1982; Rabin 1998). For example, economic agents tend to look for signals that conform to strongly held prior beliefs (i.e., confirmatory biases) or cling to previously held beliefs in spite of new signals (i.e., belief perseverance).

Beyond the approaches noted above, individual learning has been explored in a number of other contexts, notably social learning (Banerjee 1992; Bala and Goyal 1998; Blonski 1999) and learning by doing (Arrow 1962; Becker 1964; Rosen 1972). These latter approaches have been directly extended into models of organizational learning.

Organizational Learning

The strategic management literature focusing on organizational learning is voluminous and multifaceted. Starting with the work of Cyert and March (1963) and Argyris and Schon (1996), scholars began translating the insights regarding individual learning processes to the organizational setting. While no widely accepted theoretical framework informing organizational learning has emerged in the intervening decades (Pisano et al. 2001), a number of themes are present.

First, learning in organizations is a deliberative process characterized by seeking, selecting and adapting new routines (Nelson and Winter 1982; March 1988). Routines are patterns of behaviour that characterize organizational responses to internal or external stimuli. Much like the genes of biological evolutionary theory, routines are patterns of interactions that represent successful solutions to particular problems. These routines shape how firms comprehend and address both familiar and unfamiliar situations and are, thus, central to how organizations learn. Teece and colleagues (1994) distinguish two types of routines. Static routines are those that enable firms to replicate previously performed functions. Dynamic routines, in contrast, are directed at new learning and the development of novel products and processes. The search routines that firms employ in innovative activities, for example, typically rely on dynamic routines.

Second, the specific processes for learning within organizations must accommodate the complexity of what is being learned. Complexity in this context means that knowledge, which can be easily codified, is rarely a sufficient guide to practice. Rather, firms frequently rely on knowledge that is difficult, if not impossible, to articulate and codify. This tacit knowledge is acquired through experience and on-the-job training in multiple learning activities. Ultimately, this tacit knowledge comes to reside within an organization's routines and operating procedures (Nelson and Winter 1982).

Third, organizations tend to have different capacities for learning (Cohen and Levinthal 1990). Learning in organizations results from a complex set of routines that tend to be organization-specific. Likewise, various firm-specific cognitive (Senge 1990), managerial (Dutton and Thomas 1984) and structural (Duncan and Weiss 1979) factors may be at play. As a result, firms in the same industry may possess

significantly different levels of learning capabilities (Pisano 1994).

Finally, because firms differ in their stock of knowledge and the learning processes they employ, the trajectory of learning also differs. Specifically, how a given firm responds to a novel issue or challenge may be constrained by previous responses. For example, researchers have found that product and process developments for a particular organization tend to lie in the technological neighbourhood of previous successes (Nelson and Winter 1982; Levinthal and March 1993; Teece 1996). Path-dependent learning and technological 'lock-in' are explored more extensively in Arthur (1989, 1990) and David (1986, 1990). The key insight in all of this work is that 'history matters' in organizational learning – initial conditions and chance events can dictate how effectively organizations acquire and exploit new knowledge.

The theoretical insights highlighted above have spurred a large and growing body of empirical analysis. One of the most significant areas has been in relation to the learning curve. Learning curve models have been explored in a variety of industries and sectors, including aircraft production (Wright 1936; Asher 1956; Alchian 1963), shipping (Rapping 1965), power plants (Joskow and Rose 1985) and electronics (Adler and Clark 1987). A key finding from this research is that productivity tends to improve with the accumulation of production experience. These and other studies have provided a strong empirical foundation for the concept of 'learning-by-doing'.

Traditional learning-by-doing is but one category of organizational learning that has been the subject of empirical research. Scientific learning, which entails organizations acquiring knowledge about fundamental laws of science and nature, has been explored by Nelson and Winter (1982), Evanson and Kislev (1976), Cohen (1998), and Cohen and Klepper (1992). A second category of learning, learning-by-searching, entails searching out and discovering the optimal design of a new product or process (Rosenberg 1982). This form of learning is most closely associated with development activities and has a strong commercial dimension. A number of authors, including Dosi (1988), Metcalfe (1995), and Winter (1986), have examined the various search routines that firms employ. A final category of learning, learning-by-using, is the process by which the performance and maintenance characteristics of a new product are determined through feedback from consumers who have experience with the product. Learning-by-using has been examined empirically by Pisano et al. (2001), among others.

While by no means comprehensive, the overview of the organizational learning literature above highlights a few contributions that are relevant as we explore inter-organizational learning. First, organizational learning is a problem-solving process in which firms attempt to bridge the gap between actual and potential performance (Iansiti and Clark 1994). Second, in response to specific internal or external stimuli, firms employ a host of learning mechanisms. Eventually, insights from learning are incorporated into firm-specific routines and processes. Finally, as a result of the processes noted above, firms – even those in the same industry – may develop different levels of learning proficiency, which, in turn, can have significant competitive implications.

Inter-organizational Learning

While scholarly interest transitioned relatively quickly from individual to organizational learning, the management science literature on interorganizational literature has only begun to emerge in recent years (Larsson et al. 1998). Much of the focus on inter-organizational learning has its origins in the dynamic capabilities literature. Nelson and Winter's work on dynamic routines began to explore the internal processes by which firms learn and develop new, strategically relevant competencies. This perspective was more fully elaborated in Teece and Pisano (1994), Teece et al. (1997) and others. An important implication of this collective work is that, once embodied at the organizational level, knowledge can then be made available to affiliated organizations such as subsidiaries, customers, suppliers and even competitors. The specific mechanisms by

which these inter-organizational transfers of knowledge occur have been the subject of considerable interest among social scientists. Mowery et al. (1996, 1998), for example, suggested that inter-organizational collaboration provides a means by which firm-specific knowledge can be exchanged between organizations. Likewise, Hamel (1991) and Kogut (1988) observe the use of joint ventures as a means of transferring knowledge. Learning through acquisitions is examined in Hayward (2002).

There are at least three ways in which a given organization acquires knowledge from another. A passive form of learning occurs when codified knowledge spills over from one organization to another (Griliches 1991). This may take the form of knowledge about technical know-how from journals, patents, conference presentations or consultants. For example, Arora and Gambardella (1990), Jaffe (1989), and Mansfield (1991) each note that firm-level innovation is influenced by knowledge from university research. A more active form of learning occurs via benchmarking and competitive intelligence. However, both of these learning processes allow an organization to benefit from the observable portions of another organization's experiences. The very fact that knowledge in these contexts is observable means that it is no longer rare or otherwise costly to imitate. As Lane and Lubatkin note (1998: 462), 'such readily transferred knowledge may guide capability development much like industry recipes, but they do not permit a firm to add unique value to its own capabilities'.

A primary means by which organizations acquire more tacit components of knowledge is via interactive forms of learning such as alliances and joint ventures. The face-to-face, repeated interactions afforded by such mechanisms allow one organization to tap into the unique, less imitable expertise of a partner organization. A growing body of empirical and theoretical work has emerged exploring these alliances (see, for example, Hamel 1991; Mowery et al. 1996; Larsson et al. 1998; Stuart 2000; Simonin 2004). A common theme of all of this work is that a primary objective of alliances is to facilitate firms' acquiring and exploiting knowledge developed by others.

The actual amount of learning that takes place via these alliances is determined by a number of factors. For example, the extent to which knowledge is transferable within an alliance an important determinant of success in a learning alliance. Research, drawing mainly on transaction cost economics, suggests that the more tacit the knowledge being shared, the less likely it is that market or even hybrid forms of governance (e.g., alliances) will be as effective at organizing knowledge-based transactions within the firm (Williamson 1985; Kogut and Zander 1996). Prior experience – both in managing alliances and with respect to a given partner – also plays a key role in the success of learning alliances (see Argyris and Schon 1996; Hayward 2002; Kale and Singh 2007). Simonin (1997) and Barkema and colleagues (1997) have explored the performance implications of prior experience in various forms of inter-organizational learning. In addition, one firm's ability to absorb knowledge obtained via alliances is a key determinant of its learning effectiveness. This subject has been most thoroughly addressed in the work of Cohen and Levinthal (1990). These authors argue that the ability of an organization to recognize the value of new information, assimilate it and apply it commercially (i.e., 'absorptive capacity') is connected to its prior related knowledge. Organizations, they argue, are better able to absorb new knowledge when it is closely related to the firm's existing stock of knowledge. One important implication of this insight in the field of innovation is that investments in a firm's own R&D not only facilitates generating new knowledge, but also facilitates its ability to learn in the future. Finally, Hamel (1991) notes that partner intent (e.g., collaborative versus competitive) affects the success of learning alliances.

This latter research is part of an important stream of work on inter-organizational alliances that looks at the risks of these forms of governance. The risk of uncontrolled information disclosure, non-transparent withholding of key information, asymmetric diffusion of capabilities among the partners, and weak incentives to perform are all risks associated with alliances and learning partnerships that have been explored

both empirically and theoretically. Simonin (2004), for example, examined 147 multinational strategic alliances and found that partner learning intent as well as knowledge ambiguity and tacitness were significant determinants of the effectiveness of knowledge transfer. Oxley and Sampson (2004) explore how firms, in turn, manage these potential hazards. They find that partners to alliances may leverage alternative governance structures to address the risks of R&D cooperation. The implication of this stream of research is that the way partners manage collective learning processes plays a central role in the success or failure of strategic alliances (Larsson et al. 1998).

Conclusion

With its origins in the scholarly research examining how individuals and organizations learn, the interorganizational learning literature has emerged as an important area of scholarly research. As competition has become increasingly knowledge-based and firms have been forced to more quickly develop and evolve strategically relevant capabilities, the importance of learning from outside the organization has become paramount. Put simply, the speed of competition does not always allow firms to exclusively develop knowledge and capabilities internally. Thus, firms have begun to rely more and more on learning through alliances. As these forms of learning have become more relevant for practitioners, scholars have begun to elucidate the key benefits and risks associated with them.

While scholarly attention to inter-organizational learning has increased significantly in the last couple of decades, what emerges from a review of this literature are useful vignettes of various critical aspects of learning processes but not a complete portrait of inter-organizational learning. Considerable work remains to piece these snapshots together into a more unified framework for understanding how organizations learn from one another as well as how the proficiency of learning differs across various industry settings.

See Also

▶ Organizational Learning

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Intrapreneurship

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Abstract

Intrapreneurship is a manifestation of the irrepressible individual drive to innovate in organizational contexts. To maximize the effectiveness of intrapreneurship as a rational individual and organizational pursuit, it needs to be managed as an integral part of the strategy-making process. Effective organization designs support intrapreneurship as a discovery process and help maintain collaboration with other parts of the corporation throughout the development process. By seeking out new, viable environmental segments, intrapreneurship helps balance efforts to maintain fitness with the existing environment and thereby plays a key role in the organization's capacity to stay adaptive at the edge of chaos and to maintain evolvability.

Definition Intrapreneurship concerns the autonomous innovative initiatives of organizational employees acting as internal entrepreneurs in driving novel combinations of the organization's resources towards the development of new businesses (or new capabilities or new administrative methods). It is the organizational equivalent of external entrepreneurship.

On the Nature of Intrapreneurship (or Corporate Entrepreneurship)

The neologism *intrapreneurship* – a portmanteau word combining 'internal' and 'entrepreneurship' – was coined by Pinchot (1985) and became part of the management lexicon during the late 1980s. Intrapreneurship – also known as corporate entrepreneurship (Burgelman 1983b; Guth and Ginsberg 1990) – is the organizational equivalent of external entrepreneurship, something akin to an internal Schumpeterian process (Schumpeter 1934). Intrapreneurship can be defined as involving the autonomous innovative initiatives of organizational employees acting as internal entrepreneurs in driving novel combinations of the organization's resources towards the development of new businesses. Intrapeneurship can also be directed towards developing new capabilities (e.g., Keil et al. 2009) or new management models (e.g., Mol and Birkinshaw 2007), but in what follows the focus is on intrapreneurship related to new business development.

Economic theorists have elucidated the role of internal entrepreneurship in the economic theory of firm innovation and growth (e.g., Penrose 1959; Kirzner 1973; Gompers et al. 2005), as well as incentive-related constraints of corporate support for internal entrepreneurship and governance mechanisms to try to overcome them (e.g., Rotemberg and Saloner 1994, 2000). By the early 1980s, a significant amount of academic research into internal entrepreneurship had also emerged in the strategic management and organization theory literatures (e.g., Peterson and Berger 1971; Mintzberg 1973; Kimberly 1979; Miller and Friesen 1982; Teece 1982; Burgelman 1983b).

A considerable body of evidence suggests that internal entrepreneurship is a natural phenomenon of organizational life and the manifestation of the irrepressible human drive towards autonomous innovative activity. Kiser (1989), for instance, reports how in communist bureaucracies – the most repressive socio-economic systems – it was not possible to entirely eliminate individual entrepreneurial drive; and Lewis (1984) documents how internal entrepreneurial activity helped shape major public agencies in the early and mid-twentieth century. Research of internal corporate venturing (Burgelman 1983a) suggests that intrapreneurship is a collective entrepreneurial process in large, complex corporations, in which several levels of management contribute interlocking key activities to the development process – sequentially and simultaneously. At the operational level, intrapreneurial employees engage in technical linking and need linking activities to define a new business opportunity, internal-oriented product championing activities to secure resources outside of the regular resource allocation process and external-oriented strategic forcing activities to create a beachhead for the fledgling venture in its market. At the middle/senior level, intrapreneurial executives engage in strategic building activities to scale up the venture, organizational championing activities to convince top management to continue to support the growing venture and make it part of the corporate strategy going forward, and delineating activities that determine the strategic position ('the contour lines') of the growing venture in the newly entered industry. Top executives in the intrapreneurial process engage in structuring activities to alleviate the inherent internal selective pressures that impede new venture activities, and retroactive rationalization of the venture-related activities of the lower levels of management after they have demonstrated a threshold level of viability. These top management activities are not 'reactive'; rather, they require intelligence in suspending the rules of the structural context for some time and tolerance for ambiguity. Only after major technical and commercial uncertainties are reasonably resolved, and a measure of support among senior executives is forthcoming, does top management commit the corporation to a new business. A company's intrapreneurship capability depends on learning to perform these interlocking sequential and simultaneous activities on an ongoing basis.

Research of internal corporate venturing, however, also suggests that top management is tempted to view the intrapreneurship capability as 'insurance' against the core business becoming insufficient to sustain profitable growth, rather than as an integral part of the long-term strategic leadership capability of the company. The result is a predictable cyclical pattern of support and abandonment of intrapreneurship: repeated cycles of 'now we need it, now we don't'. And each time a new cycle is initiated the company starts from scratch (Burgelman 1983b; Burgelman and Valikangas 2005).

Rationale for Pursuing Intrapreneurship

Intrapreneurial behaviour, therefore, is inherently risky and raises questions as to why individual employees would engage in it and why top management would tolerate it. From the perspective of the individual, the strategy-making process constitutes an 'opportunity structure' for individual careers (Burgelman 1983b, 1991). Either because of temperament (March 1988) or because their access to career-advancing opportunities in the mainstream businesses has become restricted (for a number of possible reasons), individual participants may seek to pursue intrapreneurial opportunities. Research has attempted to determine organizational factors that lead individual employees to choose the entrepreneurial route rather than the intrapreneurial one (e.g., Dobrev and Barnett 2005; Sorensen 2007; Elfenbein et al. 2010). While an individual's choice to pursue intrapreneurship may seem less risky than the choice to pursue external entrepreneurship, there are significant potential career risks associated with intrapreneurship, especially in terms of employees staying too long associated with ventures that eventually fail and because intrapreneurs often develop a reputation for being hard to manage, which makes their redeployment into

the mainstream businesses in case of failure difficult.

From the perspective of top management, tolerating a certain amount of intrapreneurial initiatives seems rational because such initiatives explore and potentially extend the boundaries of the company's competencies and opportunities: they generate learning about variations in markets and technologies and help the company enter into new environmental niches in which competition or institutional pressures are as yet less strong, and/or which might eventually pose a threat to its current strategic position when they involve, for instance, disruptive technologies (Christensen 1997). Through intrapreneurship, myopically purposeful individual initiatives may help the company find out what its future corporate strategic intent could be. On the other hand, such initiatives can potentially have a dissipating effect on the company's resources and distinctive competencies. Resources can be spread thinly if too many intrapreneurial initiatives are supported, perhaps at the expense of the mainstream businesses. Distinctive competencies can also be diluted or lost if an intrapreneurial initiative is not internally supported and important talent decides to leave the firm. Most dangerously, intrapreneurial initiatives may undermine the existing competitive position of a company without providing an equally secure new one (Burgelman 2002b).

Integrating Intrapreneurship with the Strategy-Making Process

A long-standing theoretical argument in the literature posits that firms should be concerned about both strategic management and intrapreneurship (e.g., Burgelman 1983b; Guth and Ginsberg 1990) or 'strategic entrepreneurship', defined as the firm-level combination of advantage seeking and opportunity seeking (e.g., Ireland et al. 2003). To effectively integrate intrapreneurship with the company's strategy-making process, it is useful to conceptualize strategy-making in terms of two distinct processes within which strategic initiatives emerge in patterned ways and compete for the firm's limited resources: (1) an *induced* strategy process and (2) an *autonomous* strategy process. In general, the effectiveness of the company's strategy-making process depends on maintaining its ability to exploit existing opportunities through its induced strategy process, while simultaneously maintaining its ability to pursue new opportunities through the autonomous strategy process (Burgelman 1983b; Burgelman and Grove 2007).

Through its induced strategy process a company exploits opportunities in its familiar environment. To do so, top management sets the corporate strategy and induces strategic actions by executives deeper in the organization that are aligned with it. The induced strategy process, however, limits entrepreneurial initiatives that deviate from the corporate strategy for at least two reasons. First, the company survived environmental selection by satisfying its customers and other constituencies in reliable ways and wants to continue to do so. This propensity constitutes a source of strategic inertia (e.g., Hannan and Freeman 1984). Second, to the extent that the company succeeds strongly at shaping the environment to its advantage, co-evolutionary lock-in with that environment may become another source of strategic inertia (Burgelman 2002a).

Through its autonomous strategy process – associated with intrapreneurship – the company explores new opportunities that are outside the scope of the existing corporate strategy, that relate to new environmental segments and are often based, at least in part, on distinctive competencies that are new to the company. Autonomous intrapreneurial initiatives often come about fortuitously and somewhat unexpectedly as a result of the company's dynamic capabilities (e.g., Teece 2007). To overcome the selective effects of the company's structural context, which is set up to support initiatives that are aligned with the current corporate strategy, the initiators of an autonomous intrapreneurial initiative try to activate a process of strategic context determination (Burgelman 1983a, b) to convince top management to amend the corporate strategy, thereby integrating their initiative into the induced process going forward.

In the light of this, intrapreneurship can be viewed as concerned with turning the results of

exploration into exploitation (March 1991, 2006). And while it can also be viewed as closely related to the capacity of producing 'radical' innovation in the context of *ambidexterous organizations* (O'Reilly and Tushman 2008), it suggests that such radical innovations usually start rather small and come about fortuitously and unexpectedly. Top management has initially no clear understanding of the strategic importance of an intrapreneurial initiative and how it relates to the company's distinctive competencies. Resolving this indeterminacy is the most difficult challenge facing intrapreneurial initiatives.

Organization Designs for Intrapreneurship

Research has confirmed the pitfalls of establishing a corporate new venture division (NVD) as the dominant organization design solution for intrapreneurship (e.g., Burgelman 1985). This is in part so because intrapreneurship unavoidably requires collaboration with various mainstream business and functional groups of the corporation at different points of – or even sometimes throughout – the development process, and the NVD tends to isolate ventures from effectively establishing internal collaborative relationships. A strategic management approach in which the organization design chosen is a function of the venture's strategic importance (for the corporation) and degree of operational relatedness to the core business as understood at a particular moment in time may be more effective (Burgelman 1984, 2002b). Such an approach views intrapreneurship as a discovery process through which more information about strategic importance and operational relatedness is gained over time. Based on this additional information, the appropriate organization design may need to change over time to sustain the development process as a collaborative (rather than competitive) game between the intrapreneurial actors and the corporation. In the light of this approach, the NVD design is to be considered a transit station (not a destination) for new ventures.

Intrapreneurship, Complexity and Self-Organization

Finally, intrapreneurship as a natural phenomenon in organizations can be linked to complexity theory and theory about self-organization and adaptation at the edge of chaos (e.g., Brown and Eisenhardt 1997). For instance, Prigogine (1980: 128), in relation to complexity theory and self-organization in far-from-equilibrium systems in the physical sciences, posits:

> This 'over creativity' of nature emerges naturally from the type of description being suggested here, in which 'mutations' and 'innovations' occur stochastically and are integrated into the system by the deterministic relations prevailing at the moment. Thus, we have in this perspective the constant generation of 'new types' and 'new ideas' that may be incorporated into the structure of the system, causing its continual evolution.

Prigogine's observation of 'mutations' and 'innovations' occurring stochastically would seem to map onto the autonomous intrapreneurship process, and his observation that they can become integrated into the system by the 'deterministic relations prevailing at the moment' onto the induced process.

Furthermore, the importance of maintaining a balance between induced and autonomous (intrapreneurship) processes for sustaining organizational adaptation (Burgelman and Grove 2007) seems clear in view of Gould's (2002) succinct translation of the importance of adaptation at the edge of chaos (Kauffman 1993) in terms of 'evolvability'. Gould observes:

> that a system must be adaptive, but that too much (and too precise) a local fitting may freeze a system in transient optimality with insufficient capacity for future change. Too much chaos may prove fatal by excessive and unpredictable fluctuation, both in external environments and internal states. (...) Adaptation at the edge of chaos balances both desiderata of current functionality and potential for future change, or evolvability. (Gould 2002: 1273–1274)

The framework of induced and autonomous strategy processes thus could possibly provide a stepping stone in developing a theory of organizational adaptation as 'becoming': a view of an

open-ended, unpredictable but potentially manageable future (Burgelman 1983b; Nicolis and Prigogine 1989; Tsoukas and Chia 2002; Burgelman and Grove 2007) based on strategically sustained evolvability.

Conclusion

There remains much more to be learned about intrapreneurship/corporate entrepreneurship. Additional rigorous research will further identify and elucidate the inherent vicious circles, managerial dilemmas, instances of indeterminateness and structural and cultural inhibitors that affect the intrapreneurship process. But even as more is learned and better strategic management tools are made available, responsible scholars will have to continue to emphasize that intrapreneurship will always be extremely hard work and depend on the courage of conviction in the face of reasonable doubt.

See Also

- ▶ Exploration and Exploitation
- ▶ Organizational Ambidexterity

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Irreversibility

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Definition An action or a choice is irreversible if it is difficult or impossible to change.

An action or a choice is irreversible if it is difficult or impossible to change. From the perspective of a firm, irreversibility introduces intertemporal linkages into the profit function.

Insofar as strategic management is concerned, it is an intermediate degree of irreversibility that is of greatest interest. In the absence of irreversibility, choices could be reversed costlessly and there would be no need to look deep into the future (Arrow 1964). In fact, a series of myopic decisions would be a perfectly adequate approach to strategy. Nor could the kinds of moves and commitments aimed at influencing rivals (to which Schelling (1960) first drew attention) be credible and therefore influence competitor behaviour. If, on the other hand, irreversibility were total – a possibility raised, for example, by theories of imprinting (Stinchcombe 1965) – there would be no room for managerial action, at least once an organization has been founded – nor, indeed, for strategy.

Irreversibility was first explicitly highlighted as important to the strategy field by Ghemawat (1991), who identified four sources of irreversibility: lock-in, lock-out, lags and inertia. A firm may be irreversibly locked into, or locked out from, a particular course of action by the choices or investments it has made. Even when the barriers can be overcome, it may take time to do so, engendering lags. And even when change is, in principle, possible, organizational inertia may ultimately still prevent the firm from reversing its choices.

Despite its importance to strategy, irreversibility has attracted far less attention in that field than it has in the natural and social sciences. Thus, a search of scholarly articles on business strategy reveals irreversibility being cited far less than the ▶ resource-based view of the firm or ▶ dynamic capabilities – even though it crucially underlies those two conceptions of strategy, both of which make specific (but usually implicit) assumptions about the form that irreversibility takes.

The resource-based view of the firm (first articulated by Wernerfelt 1984) sees differences among firms as the result of unavoidable heterogeneity in specialized factors or factor

combinations, rather than as the result of purposeful positioning or differentiation (Rumelt et al. 1994). This emphasis on intrinsic heterogeneity is evident, for instance, in Barney's (1991) frequently cited characterization of three bases of sustained superior performance: the ability to obtain a particular factor may be dependent on 'unique historical circumstances' (p. 107); the link between the factors possessed by a firm and its sustained competitive advantage may be causally ambiguous (p. 108), or the factor responsible for the advantage may be socially complex, and therefore 'beyond the ability of firms to systematically manage and influence' (p. 110). The irreversibility implicit in such a characterization significantly narrows the scope for managerial action – not unlike strategy frameworks that focus on fixed strengths and weaknesses.

The dynamic capabilities view of the firm seeks to explain how capabilities that enable firms to perform activities better than their competitors can be built and redeployed over long periods of time. Unlike resources in the resource-based view, such capabilities are to be developed rather than taken as a given, as described more fully by Teece et al. (1997: 514–515):

> If control over scarce resources is the source of economic profits, then it follows that such issues as skill acquisition . . . and learning become fundamental strategic issues. It is in this second dimension, encompassing skill acquisition [and] learning . . . that we believe lies the greatest potential for contributions to strategy.

Here the degree of irreversibility is less than in the resource-based view: changes in firms' resources are feasible and in fact emphasized. Nevertheless, significant irreversibility is clearly evident in the notion that different firms' choices propel them along very different paths. With zero irreversibility, firms could switch costlessly between paths, eliminating the possibility of sustained interfirm performance differences that motivate both the resource-based and capability views.

It is important to add that, in both accounts, a firm's current opportunity set is often assumed to depend on its entire history of choices. While this approach is very 'realistic', it poses a challenge for both theoretical and empirical analysis (Page 2006). For these reasons, industrial economists have often focused on studying competition in settings where the path of past choices (and outcomes) is summarized in terms of one or more state variables. Although this focus on state-dependence is coarser than full path dependence and therefore not always as 'realistic', it does simplify the analysis in important ways. And – unlike extreme characterizations of intrinsic inimitability – it expands the domain of analysis to situations in which imitation is costly but not strictly infeasible – that is, situations with intermediate levels of irreversibility.

See Also

- ▶ Dynamic Capabilities
- ▶ Lock-in Effects
- ▶ Path Dependence in Technologies and Organizations
- ▶ Resource-Based View
- ▶ Sustainable Competitive Advantage

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Isolating Mechanisms

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Abstract

Isolating mechanisms are the reason why firms can *sustain* competitive advantage in the resource-based framework (Rumelt RP Towards a strategic theory of the firm. In: Lamb R (ed) Competitive strategic management. Prentice Hall, Englewood Cliffs, 1984). Isolating mechanisms (also known as barriers to imitation) explain a stable stream of economic profits, and help explain why intra-industry firm differences persist over time (Mahoney and Pandian Strateg Manag J 13: 363–380, 1992). Isolating mechanisms protect individual firms from competition *within* a particular strategic group or while being uniquely positioned in the industry. Resource *uniqueness* and causal ambiguity are at the heart of isolating mechanisms (Lippman and Rumelt Bell J Econ 13: 418–437, 1982). When key decisions concerning resource acquisition, development and allocation cannot be imitated, inter-firm efficiency differences persist.

Definition Isolating mechanisms are the reason why firms can *sustain* competitive advantage in the resource-based framework (Rumelt 1984). Isolating mechanisms (also known as barriers to imitation) explain a stable stream of economic profits, and help explain why intra-industry firm differences persist over time (Mahoney and Pandian 1992).

Isolating mechanisms are the reason why firms can *sustain* competitive advantage in the resource-based framework (Rumelt 1984). Isolating mechanisms (also known as barriers to imitation) explain a stable stream of economic profits, and help explain why intra-industry firm differences persist over time (Mahoney and Pandian 1992). Isolating mechanisms are akin to entry barriers and mobility barriers, but they operate at different levels. Entry barriers prevent (and/or make it costly for) newcomers to enter an industry. Mobility barriers reduce firms' mobility among strategic groups. Isolating mechanisms protect individual firms from competition *within* a particular strategic group or while being uniquely positioned in the industry. Examples of isolating mechanisms include unique or rare resources that are imperfectly mobile (Barney 1991), unique managerial and entrepreneurial talent that is inimitable (Penrose 1959; Rumelt 1987), resources with limited strategic substitutability by equivalent assets (Dierickx and Cool 1989), corporate culture (Barney 1986), invisible assets that are by their nature difficult to imitate (Itami and Roehl 1987), time compression diseconomies (Dierickx and Cool 1989) and response lags (Lippman and Rumelt 1982).

The notions of resource *uniqueness* and ▶ causal ambiguity are at the heart of isolating mechanisms (Lippman and Rumelt 1982). Resource uniqueness (e.g., a patent on an invention) often involves firm-level investments in resources and capabilities. Firms' idiosyncratic investments give rise to asset specificity, such as human capital specificity (Williamson 1979, 1985). Asset specificity and ambiguity are highly interdependent (Lippman and Rumelt 1982) because idiosyncratic deployments and applications of resources produce tacit (experiential) knowledge (Polanyi 1958), which contributes to causal ambiguity about how resource uniqueness was created originally. Causal ambiguity can serve as a barrier to imitation for observers external to the firm, such as competitors wanting to replicate a unique resource. However, some level of causal ambiguity may even exist inside the firm because of bounded rationality (Reed and DeFillippi 1990), where individuals' neurophysiological limits and language limits prevent a comprehensive articulation of the resource utilization process (Simon 1947). In the presence of high tacitness and idiosyncratic routines, 'even successful replication [within the firm] is problematic, let alone imitation from a distance' (Nelson and Winter 1982: 124). Causal ambiguity escalates with increased complexity of the resource

deployment process, especially when it embeds complex social interactions within group settings (Barney 1986). Further, the *interaction* (i.e., simultaneous presence) of high levels of tacitness, complexity and specificity can magnify causal ambiguity and heighten barriers to imitation (Reed and DeFillippi 1990).

Lippman and Rumelt (1982) distinguish between *uncertain* ▶ imitability and the ambiguity caused by bounded rationality. In uncertain imitability, ambiguity is not simply (or solely) driven by bounded rationality, but involves decision-making under uncertainty. The authors explain that '[t]here is a difference, for example, between being unable to predict the exact size of an underground oil deposit, and being unable to work out the optimal drilling policy in the face of uncertainty' (Lippman and Rumelt 1982: 421). The presence of uncertainty explains the origin of efficiency differences. Decisions about *which* idiosyncratic investments to make and *how* to deploy, allocate and combine resources under uncertainty involve subjective entrepreneurial judgements (Foss et al. 2008). Some of these decisions can be imitated by incumbents or new entrants, but others cannot because of market imperfections under conditions of uniqueness, ambiguity or enforceable property rights to factors; thus, the efficiency differences persist (Lippman and Rumelt 1982). Indeed, 'it may never be possible to produce a finite unambiguous list of the factors of production responsible for the success of such firms [with superior performance]. This ambiguity is not just a private embarrassment to economists, but is the heart of the matter. Factors of production cannot become mobile unless they are known' (Lippman and Rumelt 1982: 420). Therefore, sustained ambiguity surrounding the linkage between a firm's decisions and actions and the performance guarantees the existence of uncertain imitability.

However, some researchers argue that the height of imitation barriers is a function of the competition in the environment (Reed and DeFillippi 1990). Imitation barriers are subject to erosion over time, and the sustainability horizon of a competency-based competitive advantage is (in part) determined by *reinvestments* in causally ambiguous competencies with elements of tacitness, complexity and specificity. This time horizon is affected by industry dynamism and environmental shifts (e.g., changes in technology, consumer tastes and regulation) and the firm's ability to generate *adaptive and creative* responses to such disruptive changes (Helfat et al. 2007; Teece 2007). Rumelt summarizes it well: 'It is the juxtaposition of isolating mechanisms with uncertainty that permits the modeling of heterogeneity in an equilibrium framework . . . a *firm's strategy may be explained in terms of the unexpected events that created (or will create) potential rents together with the isolating mechanisms that (will) act to preserve them*. If either element of the explanation is missing, the analysis is inadequate' (Rumelt 1984: 568).

See Also

- ▶ Causal Ambiguity
- ▶ Imitability
- ▶ Imperfect Resource Mobility

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Isomorphism

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Definition Isomorphism is a concept derived from population biology and mathematics and is applied to organizations in order to understand the constraining processes that force one unit in a population to resemble other units that face the same set of environmental conditions. Increases in structuration of organizations' environments increases isomorphism in their forms and practices. Structuration is driven by competition and the activities of the state and the professions; organizations seek legitimacy by conforming to state mandates and professional norms.

Strategic management of an organization's ▶ institutional environment requires an understanding of isomorphism. Hawley (1968) defined isomorphism as a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions. With their path-breaking analysis of environmental effects on organization structure, Meyer and Rowan (1977) first applied the term isomorphism to institutions. DiMaggio and Powell (1983) elaborated the concept in their influential theory of institutional isomorphism in organizational fields.

The organizational field is defined in relational network and social constructionist terms as the organization's environment, including in aggregate key suppliers, resources, product consumers, regulatory agencies and other organizations that produce similar services or products. There are two types of isomorphism – competitive and institutional. The first refers to competition among organizations in an organizational field for resources and customers – the economic fit. The second refers to the quest for political power and legitimacy – the social fit. Distinct from efficiency motivations for organizations' adaptation to their environment, institutional isomorphism assumes that organizations seek legitimacy by conforming to a socially constructed environment.

The overarching proposition is that increases in 'structuration' in an organizational field lead to increases in isomorphism in organizational forms and practices. The activities of the professions, the state and competition are the key drivers of organizational field structuration. This occurs by (1) an increase in interaction among organizations in the field; (2) the emergence of inter-organizational structures of domination and patterns of coalition; (3) an increase in the information overload to which organizations must attend; and (4) the development of mutual awareness among participants in a set of organizations that they are involved in a common enterprise.

Institutional isomorphic change occurs when organizations seek legitimacy by three mechanisms – coercive, mimetic and normative. Coercive isomorphism originates from political influence, for example from government mandates derived from contract law; mimetic isomorphism occurs in response to uncertainty, for instance when management models diffuse

through consulting firms; and normative isomorphism stems from alignment with professional values based in licensing and educational credentialing, for example with organizations voluntarily adopting green movement practices. Organizations centred in institutional environments where the professions and the state have a heavier hand are more susceptible to isomorphic pressures.

Boxenbaum and Jonsson's (2008) review concludes that it is difficult to determine the degree of empirical support for the concept of institutional isomorphism because DiMaggio and Powell's (1983) constructionist definition of isomorphic forces in an organizational field renders few studies directly comparable. Quantitative studies, for example, may apply the theory to an industry, not an organizational field-level data set. Quantitative studies focus on the mechanisms in which practices spread, not the level of isomorphism in the field, suggesting that diffusion is synonymous with isomorphism. This may conflate legitimacy-driven isomorphism with the concept of diffusion, which can be explained by competing theories, such as resource-dependence. In the 1980s and 1990s, isomorphism studies became so prevalent that Mizruchi and Fein (1999) studied their implementation, concluding that among the three isomorphic pressures identified by DiMaggio and Powell (1983) mimesis has overwhelmingly received the most attention, and suggesting this research is shaped by academic trends. Clearer evidence of isomorphism is found within the world system literature, where the unit of analysis is better defined and highly aggregated, prompting the question of how observer distance and level of abstraction contributes to findings. Kraatz and Zajac (1996) showed that the increasing maturity of an organizational field did not lead to the expected isomorphism in educational programmes, but instead to differentiation due to increasing competitive pressure. Boxenbaum and Jonsson (2008) note that scholarly attention to isomorphism research has peaked, with more recent emphasis on culture and cognition and individual- and organization-level agency and institutional logics (Thornton et al. 2012).

See Also

► Institutional Environment

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