Alliance Strategies of Small Firms

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ABSTRACT. The paper concludes that small firms follow one of two alliance strategies. When the firms are small relative to their rivals and to their market, they tend to use alliances to gain economies of scale and scope; when they are large in relative terms, they avoid alliances. This behavior is consistent with alliance usage by large firms. The paper also analyzes the sources of profit for a small firm that uses a "constellation" of allies to compete in a scale-intensive industry. Its profits depend on a combination of the group-based advantages generated by the constellation and the share of these profits that the firm can appropriate from the group. Small firms face particular hazards in this regard when their bargaining power within their constellation is weak. The paper illustrates these arguments with data from a small survey, with case studies from the computer industry, and with a simple mathematical model.

1. Introduction

Students of international business have traditionally believed that success in foreign markets required large size. Small firms were thought to be at a disadvantage compared to larger firms, because of the fixed costs of learning about foreign environments, communicating at long distances, and negotiating with national governments. These costs "constitute an important reason for expecting that foreign investment will be mainly an activity of large firms," argued Richard Caves (1982) in his comprehensive review of the literature on the multinational enterprise.

A number of empirical studies seemed to back up this conclusion. Thomas Horst (1972) found that after controlling for industry effects, the only factor significantly affecting the propensity of firms to invest abroad was their size. Raymond Vernon (1970) found that technological advantages were important in firms' propensity to invest abroad, but that these advantages were often correlated with scale. More recently, Alfred Chandler's exhaustive historical research concluded that "to compete globally you have to be big" (1990).

So what was a small firm to do? Common sense gave one answer: Seek help! Biotechnology firms seemed to follow this advice as they sought out alliances with large pharmaceutical firms to commercialize their inventions. So did semiconductor and software firms that sought investments and support from computer giants. Both Intel and Microsoft got their head start in the personal computer business through their early alliances with IBM. For these firms, key partnerships made up for lack of scale. In the terminology introduced by Acs et al. (1997), alliances are an "intermediated" form of international business by small firms – they rely on larger partners to give them the scale and scope often required for success abroad.

But not all small firms followed this prescription. A substantial number did the opposite – they refused to share their technologies and insisted on going it alone. In a survey of seven small U.S. firms that were successful in international markets, Tomás Kohn and I found a much lower share of joint ventures and licensing than one might have expected based on the traditional view above (see description of sample in Gomes-Casseres and Kohn, forthcoming). Of the 36 foreign investments of these firms, only five (14%) were jointly owned with local firms; by comparison, the share of joint ventures for large U.S. firms has historically hovered around 30% (Gomes-Casseres, 1988). Ninety-two percent of the foreign ventures in our sample were majority-owned by the U.S. parent, compared to 86% of the total population of firms in the U.S. Commerce Department's 1989

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Benchmark Survey (1992). Finally, the firms in our sample had only seven licensing arrangements with foreign firms; and one firm accounted for six of these. However we turned the data, one conclusion seemed inescapable: our firms formed fewer – not more – alliances than one might have expected based on the arguments above. Why?

This paper addresses three questions that follow from these observations. First, when do small firms use alliances to do business abroad? In the next section, I will propose an answer that may also help clarify other issues regarding small firms in international business. Second, how do small firms use alliances? The small firms that use alliances appear to mimic the in-house configuration and sets of capabilities deployed by their larger rivals. And third, what effects do the alliances of small firms have on their competitive performance? The potential for success, it turns out, is high, but so are the risks of failure.

The arguments in this paper are based on my reading of the literature and on ten years of empirical and theoretical research on alliances; they build on the discussion and evidence in Gomes-Casseres (1996). In addition, I use some results from research on small firms conducted jointly with Tomás Kohn. Data and examples will be cited to clarify the arguments, but no attempt will be made to present conclusive tests; on the contrary, this paper is meant to generate discussion and open up avenues for future research.

2. Competitive strategies of small firms

The observations cited above suggest that the propensity of small firms to use alliances might be bimodally distributed – some of them have a higher-than-average propensity to collaborate with others, and others, a lower-than-average. No aggregate data exist to show this, but the previous literature and anecdotal and small-sample evidence point in this direction. As is often the case with bimodal distributions, this pattern may indicate that the population of small firms contains two different subgroups. If so, what might be the distinguishing characteristics of these subgroups?

As a first cut, the key difference between these subgroups may be the *size of the firm relative to its rivals*. In a given population of small firms – where "small" is defined by absolute scale of, e.g., employment, assets, or sales – there will be some firms that are smaller than other firms in their market, and others that are larger than their rivals. Another way of putting this is that a firm may be large or small for its market, regardless of its absolute size. Many small firms, in fact, are large players in their niche – they occupy dominant market positions and outflank their rivals in terms of resources and capabilities. Other small firms are tiny compared to their rivals, and occupy second- or third-tier positions in their markets.

Relative size is a key factor behind any firm's alliance strategy, regardless of their absolute size. Studies of ownership strategies among *Fortune 500* firms showed that second-tier firms tended to form more joint ventures than first-tier firms (Stopford and Wells, 1972). In industry after industry, dominant firms – which by definition are large for their market – tend to shun alliances, whereas weaker firms use alliances to shore up their capabilities. In contrast, lagging firms – even when they are large by other measures – tend to use alliances to catch up with leaders (Gomes-Casseres, 1996).

The logic of alliance formation for firms that are much smaller in absolute scale is no different. They too tend to seek alliances when they are small relative to their rivals, and shun alliances when they dominate their rivals. To see why, we need to examine two things: (1) the typical business strategies of the two subgroups of so-called small firms; and (2) the general motivations behind alliance formation. I will take up the second question first.

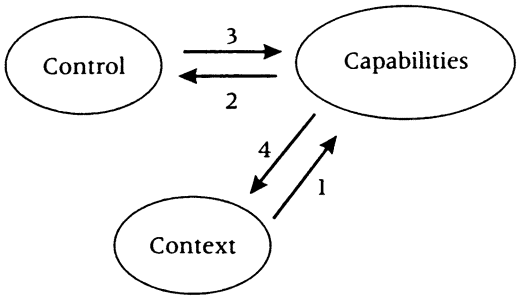
Context, capabilities, and control

I define alliances broadly as an administrative arrangement to govern an *incomplete contract* between *separate firms* in which each partner has *limited control*. These arrangements can take different forms – from joint ventures, to joint R&D programs, to cooperative marketing arrangements – but each aims to govern joint decision making among the partners. I also define a new unit of competition called a "constellation" – a set of firms linked together through alliances. These constellations can consist of any number of allied firms, from pairs to triads to groups of various sizes. Regardless of their size and composition,

however, these constellations compete with other constellations as well as with traditional single firms.

Three factors determine when constellations arise and how they compete: Capabilities, Control, and Context. By *capabilities*, I mean the set of tangible and intangible assets that enable an organization to develop, make, and market goods and services. *Control* stands for the authority of a decision maker in using and deploying these capabilities. And, *context* refers to the environment that places demands and creates opportunities for the organization. In this framework, firms and constellations are different ways of controlling a set of capabilities. The single firm has full control over all its capabilities; in the constellation, control over the set of capabilities of the group is shared among separate firms. Furthermore, constellations typically differ in the way they control capabilities; the pattern of alliances inside a constellation determines the allocation of control.

Some simple relationships among the three factors are indicated in Figure 1. The context of an organization often determines the capabilities that it needs to be successful (arrow 1). If a firm has these capabilities internally, it need not form an alliance; otherwise, it might seek an alliance. In either case, therefore, the set of capabilities needed influences the structure of control in the organization (arrow 2). This structure of control, in turn, influences the way the capabilities are managed, and the degree and type of investments made to upgrade the capabilities over time (arrow 3). As the set of capabilities changes in response to these investments, the organization might offer new products and services; this may transform the pattern of competition and the context facing other players in the industry (arrow 4).



Source: Gomes-Casseres (1996).

Fig. 1. Determinants of alliance strategies.

This framework is applicable to firms of all sizes. It also helps us define more precisely what we mean by *relatively small firms*, the kind of firm that tends to have a higher-than-average propensity to form alliances. The determining factor in our framework is not size, but the competitive demands imposed by the environment – the capabilities required to succeed in a given context. In contexts with high economies of scale or scope, therefore, the most successful firms will tend to be larger than their rivals, all else equal. Firms that are smaller than their rivals will then seek alliances to increase their scale and scope. In other words, what matters is the size of the firm relative to the optimum in an industry.

From this perspective, firms that are smaller than their rivals need not always be at a disadvantage. Picture, for example, an industry that has long enjoyed economies of scale and in which the largest firms are dominant. Historically, therefore, relatively small firms in this industry have been at a disadvantage and can be expected to have used alliances to shore up their capabilities. Now, imagine that a change in the context – say the emergence of a new technology – reduces the advantages of scale, or even generates temporary diseconomies of scale. At this point, the disadvantage of relatively small firms decreases or is reversed – their small sizes may allow them to succeed against their larger rivals, even without alliances. However, if scale becomes an advantage again, only the small firms that have grown substantially will survive a shake out.

This scenario is what has been occurring in computers, and perhaps in pharmaceuticals. In both industries, scale and scope have traditionally been essential to success, and huge multi-national firms dominated markets. But the rise of microelectronics and biotechnology suddenly created advantages for small, entrepreneurial firms and challenges for the large, bureaucratic incumbents. This window for small firms, however, did not remain open forever, as the large firms restructured themselves or the erstwhile small firms grew to exploit new economies of scale. Apple, Compaq, Microsoft, and Intel, for example, could enter the market and establish themselves when

IBM's dominance in mainframes was more of a hindrance than a help in the PC business. But today, scale and scope helps determine who will survive in the PC market.

These considerations suggest that we need to examine the competitive context and general business strategies of small firms to explain their alliance behavior. Firms in each of the two subgroups identified above, in fact, follow radically different business strategies. The first type of firm relies on its own capabilities to exploit market niches; the second tries to succeed in a larger market by using alliances to reach the required scale and scope.

Exploiting niches

A traditional explanation for the success of small firms was that they chose their battles carefully. They focus on areas where there are either no scale economies or even some diseconomies of scale. In Edith Penrose's words (1959; 1980, pp. 222–223):

> The productive opportunities of small firms are . . . composed of those interstices left open by the large firms which the small firms see and believe they can take advantage of. . . . [T]he nature of the interstices is determined by the kind of activity in which the larger firms specialize, leaving other opportunities open.

Previous studies of small firms investing abroad found patterns that seem consistent with this view (Hackett, 1977; Newbould et al., 1978; and Buckley et al., 1983). In Hackett's words, "Multinational firms typically concentrate on expansion into those markets that offer the greatest profit potential and knowingly bypass smaller market segments" (1977, p. 11). He found, as did Mascarenhas (1986), that small firms often went abroad in order to avoid head-on competition with larger domestic rivals. Mascarenhas (1986) and Namiki (1988) also found that "follower" firms tended to be most successful internationally when they focused on specialty markets or products, where economies of scale were not critical. Sweeney (1970) and Vlachoutsikos (1989) described how the "low profile" of small firms gave them an advantage over larger firms in gaining concessions from host governments.

The first type of small firm thus competes in niche markets that were of minor interest to large firms. Because of their narrow bases of expertise, these firms would probably have found it easier to expand their business into new markets abroad than into new product markets at home. The move abroad, in other words, is not an afterthought but is quite important to these firms. Once operating abroad, the firms would inevitably face new demands from buyers and gain opportunities to draw on resources in foreign production sites. This, in turn, might lead to a learning process that would further deepen the firms' capabilities in their niche. Because of the firms' dependence on leadership in their product niche, they cannot afford to fall behind in any country, and so need to adapt to disparate country environments. Through this learning process – which may well be enhanced by the flat organizational structures typical of small firms – the firm gets even more experienced and specialized.

The combination of narrow focus and depth of expertise in this type of firm led Kohn and I to call this a "deep niche" strategy (forthcoming). The behavior of the twelve small firms in our sample was consistent with these arguments. Their business strategies were characterized by these three elements:

- *Market dominance.* The firms in our group were generally large relative to their direct competitors. They usually occupied strong – even dominant – positions within their narrow market niches and typically had few direct competitors. Two companies reported that they held approximately a 30% share of the U.S. market, while three others estimated that they each held over of 40% of the world market for their products. Other researchers working on related projects found similar patterns of market dominance by small firms originating in Canada (Niosi, forthcoming), the United Kingdom (Buckley and Mirza, forthcoming), and Japan (Ozawa, forthcoming).
- *Technological leadership.* The firms were also often technological leaders within their industries. We asked interviewees to rank their firms' relative technological position in the industry between one (absolute leader) and five (last follower). Eight of the twelve firms reported that they were absolute leaders and only one reported that it was a follower; the average score for this question was 1.6. A number of

them learned from experience that they had to acquire and maintain technological leadership in their niches. One company, for example, entered the testing equipment business in the late 1940s, even though larger firms were already well established. It focused on specialized engineering, expanded its customer service network worldwide, and developed deep expertise in applications-specific fixtures and adapters. Today, the company has almost one-third of the U.S. market and it continues to deepen its capabilities by spending over 7% of sales on R&D. As a result, it pioneered the use of digital test and measurement instruments.

- *Producer-good focus.* A corollary to the specialty role of the small firms was that they usually sold producer goods to a limited group of industrial buyers. One manufacturer of aerosol valves, for example, reported that 80% of its sales were to 20% of its customers. Furthermore, many of its customers were themselves multinational firms buying similar types of valves in several countries. The valve producer, therefore, like other specialty suppliers in our group, did not need to invest in extensive distribution networks or advertising. Rather, its sales strategy consisted of maintaining a leadership position in technology and cost, and cultivating relationships with a handful of multinational buyers. Kohn (1988) found a concentration on producer goods in a larger sample of small firms and provides a detailed analysis of the reasons for this pattern.

The type of firm represented in our sample, therefore, relied on in-house capabilities to compete in a narrow market segment. Not only did they not need alliances, but they preferred not to share control over key resources and technologies with partners.

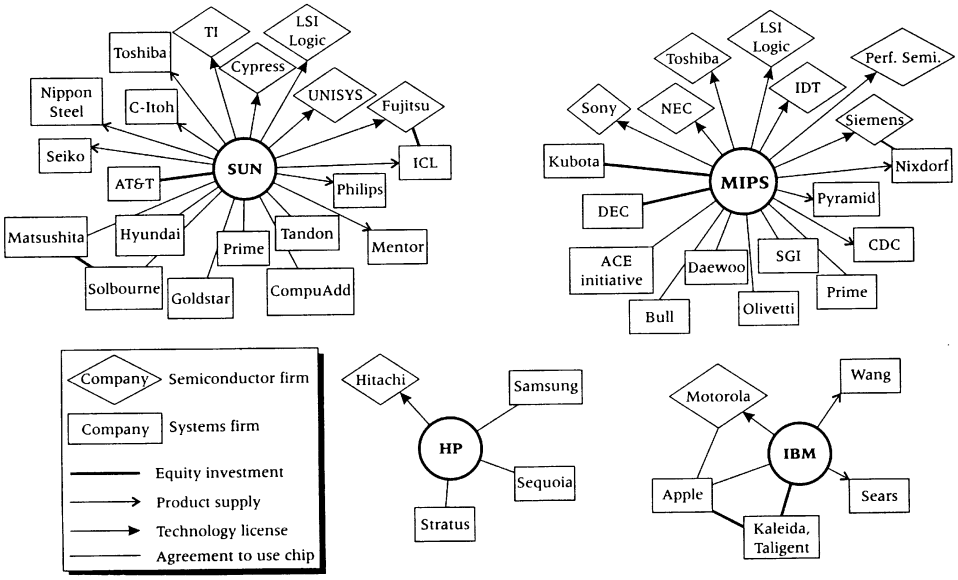
Reaching for scale and scope

Mips Computer Systems was a very different type of small firm. It employed fewer than 1000 people, yet chose to take on huge, well-established companies, including IBM and Hewlett-Packard (HP). And, it did this in a field where production scale and market penetration were critical to commercial success – the reduced instruction-set computing (RISC) industry. On its own, Mips clearly did not stand a chance.

Mips managers concluded early on that they needed allies – not one, but many. The Mips constellation started small, but it soon included six semiconductor partners and countless systems vendors. Allies brought production capacity, market presence, technologies, and cash. In return, Mips provided a unique semiconductor design and it coordinated the activities of the constellation. This strategy implied a transformation of the unit of competition. Legally, Mips remained a small corporation. But, economically, it was part of a much larger whole; and it was this larger whole that competed against other firms and groups. Increasingly, the talk in the industry became one of how the Mips "camp" was faring versus the camps centered around other firms.

This strategy was mandated by the firm's context. Even though Mips was one of the pioneers in the field of RISC processors, the successful production and sale of these chips required large-scale operations. Because of these scale economies, it was clear that only a few of the six or seven RISC designs on the market in the early 1990s could survive in the long run. This also meant that those designs that gained the largest market share had the greatest chance of survival. Market share, in turn, depended on the availability of hardware systems and software applications. This combination of factors led to a fierce standards battle among the RISC firms in which scale, scope, and sponsorship were key.

In standards battles, the number of firms in a network and especially their combined share of the total market are critical. These numbers reflect the degree to which the standard has been accepted among potential sponsors (see also Cusumano, Mylonadis and Rosenbloom, 1992). Early in the RISC battle, for example, Sun Microsystems persuaded a large number of firms to sign on to its technology, because Sun was already dominant in technical workstations. As a start-up company, Mips had a more challenging task in attracting partners; but, after DEC, NEC, and other major firms joined its group, others followed. Still, the growth of the Mips network was more modest than that of Sun. In 1991, however, Mips tried to leap-frog Sun with its Advanced Computing Environment (ACE) initiative. Figure 2 shows the



Source: Gomes-Casseres, Benjamin. 'Group Versus Group: How Alliance Networks Compete', *Harvard Business Review*, July–August, 1994.

Fig. 2. RISC alliance groups in early 1992.

structure of the main RISC alliance groups in early 1992. As can be seen, the large firms in this battle – IBM and HP – also used alliances to spread their standards, but they relied much less on their partners than did Mips and Sun.

Mips and Sun thus used allies to reach the scale, scope, and market impact that they could never hope to achieve on their own. "Because of the NEC connection," explained one Mips executive, "we are almost bigger than life in Japan." Central to this strategy, however, was a view of competition in which constellations – groups of firms – do battle with each other, not just firm against firm. Only as part of such a constellation could the small firms hope to succeed.

Several measures of size can be used to illustrate how the Mips and Sun groups attempted to reach the scale and scope of their larger rivals, IBM and HP. Table I shows these measures.

The table shows that in the semiconductor portion of the business, the Mips and Sun constellations produced more RISC chips in 1992 than did the IBM and HP groups; this advantage was partly a result of the late start by the latter two groups. Even so, Mips and Sun had more semiconductor partners, and the combined production of these partners was larger than of that of the IBM and HP partners. But note that Mips itself did not make *any* semiconductors.

Total semiconductor production is also a relevant measure of size in this case, because investments in process technology, equipment, and human resources could often be shared between different types of semiconductor devices. For example, even though NEC produced only 110,000 RISC chips in 1992, it could draw on capabilities developed in its $6 billion semiconductor business. The two small firms, lacking their own semiconductor production facilities, used alliances to "match" the capabilities of the two large firms. (This is a rough measure of relevant capabilities, as not all semiconductor capacity is applicable to the RISC field. Even so, Mips designed its chip so that it could be produced on semiconductor lines intended for S-RAM chips, in an effort to benefit directly from its partners' capacity in S-RAMs.)

In the systems portion of the business, too, Mips and Sun used their alliances to approximate the scale of operations of the much-larger HP and IBM businesses. Because of Sun's early dominance of the technical workstation business, the

TABLE I
Market presence and production scale of RISC groups, c. 1992

	Mips	Sun	HP	IBM
Semiconductor Business				
RISC chips shipped (1992)				
Thousand units	331	295	64	67
Number of suppliers	7	5	1	1
Share of lead firm[a]	0%	0%	100%	100%
Total semiconductor production (1991)				
US$ (billions)	$14.5	$11.7	$5.0[b]	$10.0[b]
Number of suppliers	6	7	2	2
Share of lead firm[a]	0%	0%	10%[b]	60%[b]
Systems Business				
RISC workstation revenues (1992)				
US$ (billions)	$2.1	$3.0	$1.8	$1.5
Number of suppliers	7	5	2	1
Share of lead firm[a]	0%	92%	95%	100%
Total microcomputer revenues (1991)				
US$ (billions)	$5.5	$7.3	$2.2	$15.4
Number of suppliers	8	11	2	5
Share of lead firm[a]	0%	24%	46%	47%

Sources: RISC semiconductor and systems data from Dataquest; other data from Dataquest and Gartner Group. The table includes only the members of each group for which data were available; data on the most important members were available for all groups.
[a] 'Lead firm' refers to the firms in the column headings.
[b] Estimated, as most of this production is captive and not reported.

Sun group sold more RISC workstations in 1992 than did any of the other groups ($3 billion). Considering that Mips had no head start in workstations, the $2.1 billion sales of its group is remarkable. The Mips sales figure is due to the strong collection of firms in this group, which included DEC and major Japanese and European firms. HP and IBM were not far behind Mips, but they relied mostly on their in-house capabilities.

Taking total microcomputer revenues as the measure of scale, the IBM group surpassed all the others because it combined the systems business of IBM and Apple. An alliance between two, or a few, large firms can thus overwhelm groups of smaller firms in terms of scale of operations. Still, the number of firms in a group remains important, regardless of their combined scale. IBM recognized this when it began in 1994 to distribute technical information to all firms, large or small, that were interested in making personal computers based on the PowerPC RISC chip.

In sum, the situation facing Mips and Sun was radically different than that facing the dominant niche firms discussed earlier. The niche players could rely on their in-house capabilities to battle their relatively smaller rivals. Small firms facing large rivals in a market with increasing returns to scale, on the other hand, cannot expect to succeed on their own – alliances are critical in expanding their reach. As they gather allies, these firms are transformed, or rather, they become part of a larger whole. The larger whole – the constellation – then competes against other firms and other sets of allies.

These results are consistent with studies of *Fortune 500* firms, which have found that dominant firms rarely use alliances (Gomes-Casseres, 1996). As a general matter, alliance use is much more common among second- and third-tier players than among industry leaders. IBM, for example, has traditionally dominated the computer mainframe field and has almost no alliances in that business. But, IBM has struggled in the personal computer field, where Intel and Microsoft dominate; in that business IBM has used alliances extensively, including its famous PowerPC

alliance with Motorola and Apple. In other words, just as "small" firms can be "large" within their niche, so can "large" firms be "small" in comparison with their rivals. And, the logic of collaboration among *Fortune 500* firms is completely parallel to what was described above – the relatively large firms shun alliances, while the relatively small firms use them to overcome disadvantages of scale.

3. Competitive advantage in groups

When small firms create constellations of allies, what determines their competitive advantages? I propose to examine that question here with a simple conceptual framework. The appendix contains a more formal statement of this framework.

All firms – large and small – engaged in group-based competition can draw on two sources of competitive advantage. The first is group-based advantage; it is derived from who is in the group and how the group is managed. Competing groups are usually driven by the same underlying economic factors, such as economies of scale and scope. But, precisely how the groups respond to these factors differentiates one from the other. This differentiation, in turn, can become a source of potential advantage or disadvantage.

The second source of advantage available to firms engaged in group-based competition is firm-based; it is derived from the distinctive capabilities of each firm. This conventional type of advantage takes on a special role in group-based competition. First, the pooling of these distinctive capabilities of firms in a group helps to create group-based advantages; there is thus a spillover effect whereby members of the group benefit from each other's firm-based advantages. Second, firm-based advantages determine the position and power of each firm within its group.

The benefits that each firm derives from participation in a group, therefore, are a function of the total benefits of the group and the firm's share of this total. This will be true of large as well as small firms. But in the case of small firms, their dependence on the group is likely to be greater than for larger firms, and so their share of the total correspondingly smaller.

Total benefits of the group

The economic viability of a group depends on the existence of a positive "network effect" – this is the pay-off to collaboration (Church and Gandal, 1992). If the network effects were negative – i.e. if an alliance between firms led to a reduction of their overall advantage – then there would not be any group surplus to distribute among members, and so no incentive for firms to stay together. With a positive network effect, the surplus created through collaboration is distributed among members.

The extent of the group-based advantages of a constellation depends on the design of the group. Alliances, as noted above, are specific systems for controlling a set of capabilities. So, the choice of which capabilities are in the group is one critical design decision; the second is how the control system is structured, because that determines whether the potential synergies among the capabilities are realized.

The share of each member

The share of the group surplus that each firm receives also depends on the design of the group, but in a different way. The network effect of a group is generated by the way the group's structure differentiates it from other groups and from single firms. This effect is attributable to the group as a whole, and is identical for all members of the group, regardless of their position in the group. But, the share that each member in fact receives from the group's surplus depends on the unique position of that member in relation to others in the network.

The total set of capabilities is not important in determining the share of each member; only the firm's capabilities *relative* to those of its partners. Firms can be thought of as bargaining over the spoils of their joint action; their contribution to the joint enterprise is then a prime source of bargaining power. We would expect that a firm contributing a highly valued capability is able to claim a higher share of the group surplus than one contributing something of lesser value. Furthermore, a firm may improve its bargaining power in the group by changing its position in the group.

Benefits from group membership

The combination of network effects and network position is a distinguishing mark of collective competition. The competitive advantage of each member depends critically on who its partners are and on the structure of the alliances among the partners.

The benefits due to each member in a group vary with total network effects as well as with the bargaining power of each firm. As a result, it may appear attractive for a firm to join a group even if the network effects are low, as long as the firm can be enticed by a large share of total benefits. Conversely, a firm in a poor bargaining position may benefit little from participating in a powerful group, even when the total benefits of the network are high.

Network effects and bargaining power of members are likely to change over time as groups grow and relationships between members evolve. Because of these changes, firms may choose to join constellations even in the absence of immediate benefits if they expect network effects to rise with the growth of the group. Similarly, a member's position in a group may become more or less attractive over time, depending on its relative position. Ironically, the position of some firms may deteriorate as a group grows – their internal bargaining power may decline even while the overall economic power of the group increases.

Risks of constellations

The evidence suggests that Mips was substantially aided by its alliance group – it simply would not have survived beyond its infancy were it not for the alliance strategy and the support of Kubota, DEC, NEC, and other giants. Furthermore, its technology would not be in contention today were it not for ACE and the Mips alliance with Microsoft. But the fact that Mips ultimately merged with one of its partners (Silicon Graphics) demonstrates that alliance groups are not all-powerful; at the heart of the group there must be a viable firm. And, in fact, alliance strategies such that of Mips carry high risks for the firm.

Loss of control. The extensive use of alliances leads to two problems of particular urgency for small firms: loss of control and loss of appropriability. Central to any alliance is a sharing of control (Stopford and Wells, 1972). Even minority partners in a joint venture influence the decisions of the joint venture and thereby affect the degree of control of the majority partner. Licensors often allow others to use their technology in ways that may not be specified precisely in advance, and they usually have little control over the marketing of the end-product. The more alliances a firm has, therefore, the more influence its partners will have on its destiny and overall performance. Firms that pursue business strategies centering around alliances – such as IBM in PCs, and Mips and Sun in RISC – run the risk of losing effective control over the performance of these businesses.

This loss of control manifests itself in various ways. One problem is that alliance groups may reduce the range of instruments available to the firm in implementing its business strategy. For example, a firm selling exclusively through OEM alliances usually lacks the ability to promote sales with advertising or direct sales forces. Mips also encountered problems with dependence on external suppliers, which in turn delayed the launch of critical new products.

Another way in which small firms risk losing control over their destiny as their alliance network grows is by a subtle shift in the center of gravity of the group. Initially, the loss of control is limited to bilateral alliances – a risk of technology leakage here, a loose marketing approach there. But, particularly for small firms building large groups, the network may begin to assume a life of its own. Mips began building its group consciously and carefully, and initially had great success with this strategy. However, as its partners came to include giants such as Compaq, Microsoft, DEC, NEC, and Siemens, it became unclear who was in control. Particularly after ACE was formed, the strategy seemed to be succeeding and spinning out of control at the same time. From then on, Mips's future depended on ACE, and ACE, in turn, depended on collaboration among a handful of big players. In the end, a series of defections by Compaq, DEC, and others doomed both ACE and Mips.

Limited appropriability. Besides forcing a sharing of control, alliances inevitably imply a sharing of

returns. In equity joint ventures, profits are usually shared according to ownership percentages. Non-equity alliances also imply a sharing of profits, although the distribution among partners is less clear. Still, license contracts, for example, are notoriously poor at maximizing the return to the technology provider, due to high transaction costs. As a result, firms that rely heavily on licensing can expect to earn lower returns than comparable firms that are able to use their technology in their own operations (Caves, Crookell and Killing, 1983).

This appropriability problem is exacerbated when alliances are motivated by a race to diffuse the technology in a standards battle. The objective of technology diffusion contradicts the objective of profit maximization, at least in the short run – the fastest way to diffuse technology is to give it out freely. In reality, few firms go to this extreme, if only because they need to recoup costs of technology development and transfer. Still, firms that pursue alliance strategies with the objective of diffusing technology may suffer sluggish profitability early on. They may, of course, reap benefits in the long run, but only if over time they can increase their share of profits from their technology.

When a small firm expands its alliance group to promote its technology, it must cleverly maneuver a dangerous path. On the one hand, a large group usually helps spread its technology more quickly and widely. On the other hand, if the firm does not appropriate enough of the returns on its efforts, then it will lack the cash needed to invest in further R&D, causing it to fall behind competing technologies.

That is what happened to Mips. Without sufficient profits to invest, Mips could not maintain product leadership. At the same time, rivals HP, IBM, and Intel redoubled their investments and R&D efforts. A powerful new generation of Mips chips arrived too late to counter this onslaught. The growth of an alliance group in a competitive standards game thus may represent either a virtuous or a vicious cycle, depending on how growth is managed, and, possibly, contained (Conner, 1992).

4. Conclusion

This paper has shown that there is no such thing as the typical small firm, at least not as regards their alliance and general business strategies. It may well be that all firms of a certain size share certain characteristics, such as flat organizational structures or nimbleness. But we have seen how these firms can follow one of two different approaches to alliances, depending on their *relative size*. Firms that are small relative to competitors and to the requirements of the market tend to use alliances to reach scale and scope; firms that are large relative to the same benchmarks, rely on internal capabilities. Both types of firms, it should be noted, use alliances according to the same logic. Their starting condition – not the costs and benefits of alliances – is what differs.

This paper did not attempt to test formal hypotheses, but rather to generate arguments and concepts useful in further research. The analysis suggests two general hypotheses to be addressed in future work:

1. *The importance of alliances in the strategy of a small firm will rise with the importance of scale economies in its market and decline with the size of the firm relative to its competitors.* In other words, small firms will seek scale through alliances if that is required for competitive success in their market; but they are less likely to do so if they occupy a niche in which they themselves are large relative to competitors.
2. *The benefits that a small firm can derive from a constellation will rise with the sum of the capabilities assembled in the constellation as well as with the capabilities of the firm relative to its partners in the constellation.* More broadly, small firms will benefit from the total value created in their network; but their share of these benefits will depend on their bargaining power within the network. The net gains to the firm depend on the interaction between these two factors. The concepts of "total value" and "bargaining power" can, of course, be operationalized in different ways; the various measures of capability used here are only examples.

There is a more general conclusion and perhaps

a paradox in the arguments and stylized evidence considered in this paper. We saw that there are two types of small firm in terms of the propensity to use alliances. Both types of firm, it appears, succeed because the firms find ways to *overcome their smallness*. The deep-niche firms do so by finding markets in which there are no large rivals, that is markets in which they can act as large players. The other firms – which do have large rivals – seek allies to nullify their disadvantages; the new unit of competition that is created in that way transcends the small firm itself.

Why do small firms need to overcome their smallness? The pervasiveness of scale economies in modern industry is probably the chief reason. Very few modern industries can be said to have no scale economies in any part of their value chain. And deregulation and globalization in the 1980s and early 1990s has only served to reduce the number of markets in which sub-scale firms can survive.

Yet, the venture capital business is booming, even in industries with demonstrated economies of scale, such as computers. One reason may be that emerging business are tailor made for small firms; they often require flexibility, personal creativity, business focus, and commitment – all characteristics that we generally associate with small firms. Even so, more and more new ventures seem to require alliances for legitimacy or for reaching minimum scale and scope in key parts of the value chain. Furthermore, returns to scale are likely to increase as the new business mature, leading to a new demand for alliances.

Appendix

The profits of firms in groups: a simple model

This appendix presents a limited formal model of the determinants of profitability of firms competing in groups. It does not attempt to explain why firms choose to form groups or how many groups can exist in an industry. Rather, it identifies the sources of value (or profit) that become available to a firm, given that it has decided to participate in a group.

The profits that firm *i* derives from participation in group *G* can be defined as follows:

$$\pi_i^G = \pi^G \times \alpha_i \qquad (1)$$

where

π^G = total profits of group *G*

α_i = the share of firm *i* in group *G*'s profits

The total profits of group *G* are the sum of the profits that group members would have generated in the absence of the group, multiplied by a factor σ that represents the "synergy" or "network effect" of the group:

$$\pi^G = \pi_n \times \sigma \qquad (2)$$

where

π_n = sum of the profits of the n firms in the group, in the absence of the group

$\sigma > 0$

The share of firm *i* in group *G*'s profits can be assumed to be based on the ratio of the profits that the members would have had without the group, multiplied by a factor ρ_i representing the "extra" bargaining power of firm *i* in the group:

$$\alpha_i = \pi_i/\pi_n \times \rho_i \qquad (3)$$

where

π_i = profits of firm *i* in the absence of the group

$\rho_i > 0$; and

$\Sigma\, \alpha_i = 1$

Substituting (3) and (2) into (1) gives:

$$\pi_i^G = \pi_i \times \sigma \times \rho_i \qquad (4)$$

Equation (4) can be interpreted to mean that the profits a firm derives from participating in a group depend on three factors:

1. It's own firm-specific advantages, which are its sole source of profits if the group has no network effect ($\sigma = 1$) and if the firm has no bargaining power to increase its return in the group ($\rho_i = 1$);
2. The network effect generated by the group's organization (but not the firm-specific advantages of the other group members); and
3. The firm's bargaining power based on its position in the group (again, power based purely on relative firm-specific advantages are not important).

These conclusions help delineate certain regions in the mapping of σ against ρ_i (Figure 3).

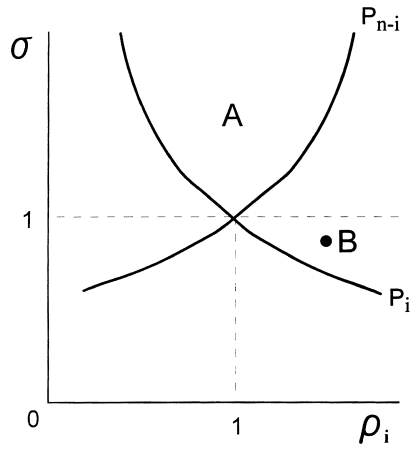


Fig. 3. Profits of firms in groups.

The figure shows the iso-profit lines for Firm i (P_i) and for the rest of the group's members collectively (P_{n-i}). Both curves are drawn to go through the point 1,1, where profits from group participation are equal to profits without the group.

The figure illustrates the necessary conditions for the sustainability of a group. In the region to the upper-right of P_i, Firm i is better off with the group than without it. In the region to the upper-left of P_{n-i}, Firms $n - i$ are better off with the group than without it. These two regions overlap in region *A*, which is the only region where all firms are better off. In all other regions, cooperation will not be sustainable, because one firm or another, or all, will be worse off inside than outside the group.

The figure also helps illustrate when a firm might join groups whose organization fails to add to the total profits of the members ($\sigma < 1$). Any given firm might be willing to do this if it can acquire a sufficiently large claim on the group's profits, that is, if it can exploit the other group members ($\rho_i > 1$). For example, Firm i would be willing to join at point *B*.

But the other members (Firms $n - i$) would not be willing to join at point *B*, because it is to the bottom-right of P_{n-i} – they are better off staying out of the group. However, they might be willing to join if they expected that the network effects were increasing with time or with group size, so that *B* would move upward and into region *A*. Bandwagon growth can arise when this expectation is based on group size.

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