The Alliance Revolution:
The New Shape of Business Rivalry
Benjamin Gomes-Casseres
Cambridge, MA: Harvard University Press, 1996

Summary of chapters

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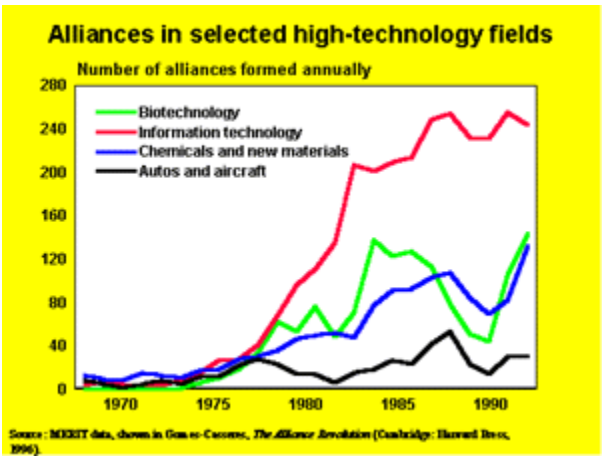
Introduction: Competition despite Cooperation

Cooperation among firms has grown rapidly since the early 1980s, as alliances have proliferated in one industry after another (see chart). At the same time, however, the competition in these industries has in many ways become even fiercer than before. The persistence of competition despite extensive interfirm collaboration flies in the face of traditional economic thinking. Why is it occurring? This book shows that alliances do not so much suppress business rivalry as transform it, giving it a new shape that is often even more virulent than the old.



The interplay between alliances and rivalry is still a puzzle for analysts. For centuries, economists have thought that collaboration between firms inevitably leads to a suppression of competition. Adam Smith observed: "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices." But in most businesses where collaboration is intense, there now seem to be more, not fewer, competitors. The race for new products is quickening, contrary to what one would expect if cartels were suppressing technological rivalry. As a result, widespread collaboration has not eased the job of business managers they now need to attend to the rising tide of alliances as well as to the intensifying rivalry. They, too, face the puzzle of the coexistence of these two seemingly opposing processes.

The Alliance Revolution suggests a new answer to this age-old puzzle. Modern-day collaboration has created new types of competitors, restructured industries, and generated new forms of rivalry. In the process, alliances have frequently intensified competition. In the modern world of large firms, global businesses, and advanced technologies, the relationship between these two processes is much more complex. The type of business rivalry emerging in this environment grows out of the very dynamics of collaboration. Simply put, business rivalry now often takes place between sets of allied firms, rather than between single firms. This book explains the rise and mechanics of this new "collective competition."

The book is organized around two different types of segments. Traditional chapters contain conceptual and empirical analysis and present the unfolding argument of the book. In between these chapters, there are the most important case studies. To see how the alliance revolution transforms business rivalry, we must first understand the basic logic of collaboration. The first chapter develops a general conceptual framework that revolves around the idea that the competition between constellations depends on the processes of

collaboration within them. The two sides of this coin are examined in the next two chapters. Chapter 2 analyzes the interaction between competition and collaboration in alliances. Chapter 3 then examines how constellations compete and, in particular, how their designs yield group-based advantages. These early chapters show how alliances can transform the relationships among a few firms. In Chapters 4 and 5 we see how this transformation often spreads to engulf a whole industry. The proliferation of alliances was driven by reactive strategies of constellations, in which each tried to outdo the other. The alliance rage led to diminishing returns for some groups, but not before competition in the industry was transformed. And, contrary to the received wisdom, the spread of alliances in the industries studied increased the intensity and pace of competition, as Chapter 5 documents. The last chapter outlines the main findings and sketches their implications for economic theory and business practice.

Case Study: How Fuji Xerox Saved Xerox

The Alliance Revolution shows that modern competitors can take on a variety of shapes, from single firms to multi-firm "constellations." In copiers and laser printers, for example, the competition between Xerox and Canon was not one on one, firm against firm. Instead, a constellation of firms around Xerox competed with Canon, which operated as a single firm. The Xerox constellation is complex, but at its core is a pair of allied firms Xerox Corporation and Fuji Xerox (see chart). Together this pair develops products, penetrates markets, manufactures hardware, and so on all the things that Canon does on its own. The Xerox constellation has enjoyed some powerful advantages as well as suffered some serious disadvantages because of this structure.

The history of Xerox and Fuji Xerox--told in detail in this segment of the book--illustrates how collaboration between firms can help them compete. Over the thirty-plus years of its existence, this constellation has evolved into a tight pair of partners, each with a unique role and contribution. This division of labor has allowed the pair to benefit from specialization and to combine the best in Japanese and American business practices. At the same time, collaboration between the companies has not been without friction; but the partners have successfully managed these frictions to face external competitors.

Fuji Xerox was a 50/50 joint venture established in 1962 to market xerographic products in Japan and certain other countries in the region. But the joint venture was destined to become much more than a marketing outlet for Xerox products it helped defend Xerox against crippling competition from Japan. No one could have predicted this outcome. For a long time, Xerox executives treated Fuji Xerox with a benign neglect that sometimes bordered on condescension. This attitude changed dramatically in the 1980s, as Fuji Xerox came to the rescue of Xerox. By 1990 Fuji Xerox had become "a critical asset of Xerox," as Xerox CEO Paul Allaire called it.

In the 1990s, Xerox and Fuji Xerox competed more than ever as one unit. To succeed, Fuji Xerox's traditional autonomy that had been instrumental in that company's success had to be replaced by tighter integration and closer coordination with Xerox. The outcome would turn partly on features that distinguished a constellation of two allied firms from a single firm. The following chapters identify these features.

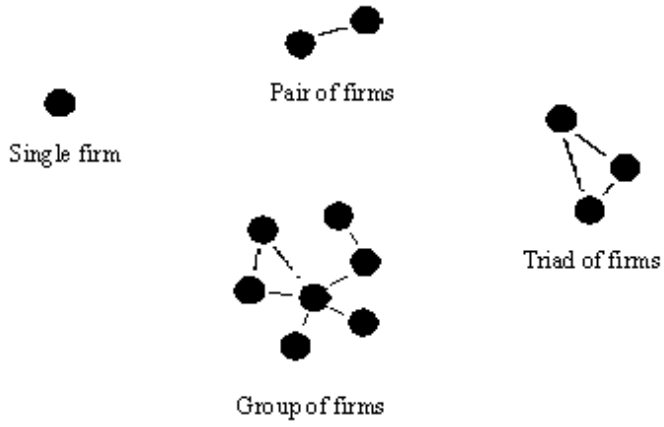
Chapter 1: Firms, Alliances, and Constellations

Definition of "Alliance" The Alliance Revolution defines an alliance as any governance structure involving an "incomplete" or open-ended agreement between separate firms and in which each partner has limited control. An alliances is always deeper than an arm's length transaction, and always falls short of a full merger between the partners. Because the partners remain separate firms, there is no automatic convergence in their interests and actions. As a result, to deal with unforeseen contingencies that arise in incomplete contracts, the partners need to make decisions jointly.

Although all alliances share these basic attributes, they come in a myriad of different structural forms. Jointly owned ventures, licensing relationships, joint R&D programs, co-marketing programs, and partial equity investments are all alliances by my definition. The relationship between a buyer and supplier of an intermediate product, too, may represent an alliance, provided that the contract between the two is in some substantial sense open-ended. The analysis in this book is not restricted to one type of alliance. Every type of alliance is represented in our sample, and the analysis is applicable to the full range of relationships just described.

From Alliances to "Constellations" The alliance itself is not the unit of competition we have been calling a constellation. Rather, alliances are the links between firms in a constellation the firms are the building blocks, and the alliances are the mortar that holds them together. In most instances, the alliances inside a constellation are bilateral, that is, they link one firm to another. But sometimes a subset of the firms in a constellation may join in a common, multilateral agreement. The constellation itself can consist of any number of allied firms, from pairs to triads to groups of various sizes (see chart).

Firms, Alliances, and Constellations



Source: Gomes-Casseres, *The Alliance Revolution* (Cambridge: Harvard Press, 1996).

In the framework developed in the book, firms and constellations are different ways of controlling a set of capabilities. The single firm can be thought of as having 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.

The number of member firms in a constellation affects how the constellation competes. Having more members, for example, may give the constellation access to a broader range of capabilities; but a larger size also tends to make it harder for the group to unite behind a common strategy. Later chapters in the book explore these and other advantages and disadvantages of group size. In addition, they show how other group characteristics affect the way a constellation competes.

Firms Versus Constellations In an increasing number of fields, constellations compete with other constellations as well as with traditional single firms. In these battles, the groups have distinct advantages and disadvantages that depend on their design and on the external context of the battle.

Constellations have a different type of advantage compared to single firms. Even though they lack unified control over their capabilities, they have more freedom in assembling, managing, and upgrading these capabilities, in other words, they have the advantage of flexibility. In the case study preceding this chapter, we saw how Xerox gained flexible capabilities from its alliance with Fuji Xerox. But we also saw that the context of this constellation was changing in the 1990s, requiring new structures and strategies. In future chapters, we will follow this story for the lessons that it teaches about how constellations adapt to address the demands of their environment. We will see how the two firms drew closer together and intensified their collaboration in an effort to compete more effectively against Canon.

Not all constellations react to new challenges in this way; some are torn apart by changing circumstances. But to succeed, a constellation must find mechanisms to manage internal rivalry among member firms. The following case of Honeywell and Yamatake-Honeywell illustrates just how delicate the balance is between cooperation and competition.

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Case Study: Did Honeywell Create a Competitor?

Honeywell's relationship with Yamatake-Honeywell exemplifies the old dictum that trust is hard to build and easy to destroy. The same is true of successful collaboration. A long history of harmonious relations in this alliance was threatened in the early 1990s after Honeywell reduced its investment in Yamatake-Honeywell. This move raised the possibility that the alliance might break up; if that happened, Honeywell would face a new global competitor of its own making.

A History of Cooperation *For almost forty years, the relationship between Honeywell and Yamatake-Honeywell had been a model of U.S.-Japanese collaboration. With its 50 percent share in the Japanese venture, Honeywell was by far the largest shareholder in the company. Yamatake-Honeywell prospered in Japan's postwar boom. It established a dominant market share in electrical controls for buildings and residences, a position it maintains today. Even though the American parent transferred technology to the Japanese venture during these years, it developed a distinct "hands-off" approach to Yamatake-Honeywell that lasted well into the 1980s.*

Disagreements between Honeywell and Yamatake-Honeywell managers surfaced from time to time, but these were usually resolved smoothly through the personal attention of the

company's CEOs. All of Yamatake-Honeywell's major business lines (industrial controls, components, and home and building controls) trace their origins to an injection of Honeywell technology. Honeywell maintained loose restrictions on its technology, consistent with its hands-off policy. For a long time the company's managers believed that personal relationships, rather than legal documents, would steer the alliance; territories, dispute-resolution mechanisms, and conditions for access to technology remained undefined.

Honeywell's decision to reduce its ownership in Yamatake-Honeywell in 1989 was driven by circumstances outside the alliance itself. Honeywell faced takeover threats at home and needed cash to build a credible takeover defense. Honeywell's management believed that selling half their equity in Yamatake-Honeywell could be accomplished without threatening the excellent relationship between the companies.

Replacing Equity with Contracts*At the same time that it reduced its equity stake in the Japanese venture, Honeywell signed a Strategic Alliance Agreement (SAA) with Yamatake-Honeywell. In the late 1980s Honeywell had already begun to look for ways to strengthen the structure of the alliance, so that it relied less on personal relationships. Despite Honeywell's best efforts, however, the mutual trust that had characterized its relationship with Yamatake-Honeywell was shaken. One Honeywell executive described the sale of equity as "dropping a bomb;" another's analogy was "picking a scab." A third one saw the sale as a true turning point: "We had been making a lot of progress in collaboration throughout the mid- and late 1980s. Things were really starting to cook for us. Personnel exchanges were accelerating; product specializations were being carved out; mutual understanding was deepening. And then we sold the stock. I think it was the right decision, but the relationship suffered. It generated bitterness at Yamatake-Honeywell."*

From Global Cooperation to Global Competition *The change in the relationship between the two companies was most striking in the global market for industrial controls. Industrial controls was the largest and most global of Honeywell's business lines. Industrial-control systems are specific to an industry rather than to a country or customer, unlike, say, home and building controls. Global product applicability creates both opportunities and threats for an alliance. For more than two decades, Yamatake-Honeywell and Honeywell took advantage of opportunities for shared research.*

The 1989 SAA agreement between Yamatake-Honeywell and Honeywell specified that each company would be responsible for selling in particular countries and regions. But it left open the question of which company would serve an area called "Other Asia." This loose end in the agreement was a sure source of future conflict, which first manifested itself in China. This market had been left for both companies to pursue "independently," on the theory that the vast opportunities there made it unlikely that the two companies would bid for the same sales. But this is exactly what happened. For a time, the two companies went head-to-head in competing for the same customers in China.

Honeywell had effectively created a competitor in Asia. Yet the new rivalry was embedded in a long history of cooperation, and both companies saw future benefits in continued cooperation. The new rivalry, therefore, did not completely destroy the old alliance. Cooperation was indeed strained during the two years after Honeywell's sale of equity; but it gradually improved.

At the very least, however, valuable time had been lost. More important, the reservoir of goodwill accumulated over the years had been drained. The Honeywell constellation survived, but it was weaker and more fragile than before. The pair was still confronted by powerful global competitors such as Omron, Yokogawa Electric, Siemens, and Johnson

Controls. To face this external competition, the Honeywell partners would need to strengthen their alliance and reduce the rivalry between themselves.

The next chapter examines how companies can manage the delicate balance between competition and collaboration in their alliances.

Chapter 2: Allies or Rivals?

It is often hard today to distinguish rivals from allies. Firms often are forced to compete with one another in one instance and then collaborate with in the next. Some have seen this as a sign that the dividing line between collaboration and competition is vanishing, or that a new process is emerging out of the mix of the two a process of "co-opetition." The Alliance Revolution takes a different approach. It is true that competition and collaboration are inextricably intertwined in the web of relationships surrounding modern businesses. Precisely because of that, it is important for us to separate the two forces in our thinking. The book proposes an approach that decomposes a relationship into separate collaborative and competitive parts and maps out the effects that each part has on the others.

Interactions between Competition and Collaboration Separating the effects of competition and collaboration in the web of business relationships requires carefully defining where, when, and how each process occurs. It seldom happens that a firm competes with another firm in precisely the same place, at the very same time, and in the same activity in which the firms are also trying to collaborate. Usually firms will compete in one market and collaborate in another, or in one stage of the business but not in others; sometimes the two processes are separated by time; often firms collaborate with each other in order to compete against a third party. In one sense, therefore, the traditional view is correct: like oil and water, competition and collaboration do not mix. Instead, they operate side by side, one after the other, or layered one on top of the other.

The process of collaboration in an alliance often depends on an absence of competition between the partners. This view is consistent with traditional economic theory, which sees collaboration and competition as inextricably opposed. But this is only the simplest form of interaction between alliances and rivalry, as we shall see.

In the case of a single, direct relationship between only two firms operating in only one market, collaboration and competition are indeed polar opposites. The direct effect of one is to counteract the other. Collaboration between the firms is reduced whenever competition between them rises, and the reverse. In more complex situations, the interaction between competition and collaboration depends on indirect effects of other contacts between the firms. The following situations generate these indirect effects: (1) multipoint relationships between the actors; (2) repeated relationships through time; and (3) third-party relationships. These situations are discussed at in detail in this chapter.

Collective Competition The book coins the term "collective competition" to describe an increasingly common way in which competition and cooperation interact. The essence of collective competition is that alliances inside constellations influence rivalry among constellations, and the reverse. Alliances thus create aggregations that compete with other such aggregations, or with single firms, at a "higher" level. This notion of multilevel competition applies to simple bilateral alliances as well as to large groups. Xerox and Fuji Xerox, for example, collaborated at one level and competed at a higher level with Canon; the same can be said for the many members of the Mips group, which collaborated with one

another in order to compete with other RISC groups at a higher level. Collaboration within constellations thus occurs in tandem with competition between constellations.

Collective competition does not eliminate rivalry among the firms inside the constellations. But because intra-group rivalry is "nested" in a larger competitive process, the incentives generated by that larger process can moderate rivalry inside groups. Conversely, competition between groups is driven by the effectiveness of collaboration inside the groups. The following chapters examine this interaction in detail. The following propositions summarize the general findings of these chapters:

- Collaboration within a constellation tends to enhance the group's competitive advantage, because it allows the group to marshal its internal resources more effectively.
- By the same token, competitive friction within a constellation usually dulls its competitive edge, by diverting and duplicating internal efforts.
- Competition between constellations tends to enhance collaboration within them, because it draws members closer together behind a common goal.
- Conversely, forces that reduce rivalry between groups such as common standards or common allies tend to hurt the unity of each group by generating split loyalties.
- Finally, rivalry among members of a constellation, while usually reducing the effectiveness of the group as a whole, sometimes benefits individual members by increasing their bargaining power over other members.

Succeeding in collective competition thus requires that firms walk a fine line between rivalry and collaboration. More so than single firms, constellations have within them sources of conflict that can tear them apart. At the very least, internal frictions can reduce a constellation's ability to exploit benefits from collaboration. And lacking these benefits, the group stands little chance in the competitive marketplace.

In many modern businesses, constellations do not face all-powerful single firms. Instead, the battle is one of group versus group. In this context, all competitors share the basic handicap of internal friction, even though some might manage to overcome this handicap more effectively than others. Furthermore, differences in the composition and structure of the constellations are likely to provide one group competitive advantage over another. Competing in constellations, therefore, calls for effective design and management of collaboration.

The managers at Mips Computer Systems tried to exploit these ideas. They used a large constellation of allies to take on the giants in their industry. Their story, told in the next case, shows both the promises and the pitfalls of collective competition.

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Case Study: Tiny Mips Takes On the Giants

Mips Computer Systems began as a Stanford University research project led by three professors, who went on to found the company in 1984. The professors intended to develop and commercialize the first microprocessor based on reduced instruction-set computing (RISC) principles. Their story is a striking example of how a constellation can create the scale and scope necessary to compete against large single firms.

RISC was a streamlined approach to computer design. This approach challenged the traditional design (called complex instruction-set computing, or CISC) which was at the heart of every computer in the market at the time. Like other RISC designers, the founders of Mips saw performance, cost, and time-to-market advantages in their approach. As with CISC, however, the manufacture of RISC chips required a high level of capital investment and volume production.

The Odds against Mips *Notwithstanding these apparent technical advantages, there was much debate in the late 1980s about whether RISC would ever become commercially viable. Ten years after its invention at IBM in 1975, not one major chip manufacturer or computer firm had introduced a RISC-based product. The two major U.S. microprocessor makers (Intel and Motorola) were slow in developing the new technology, being reluctant to cannibalize their existing CISC-based product lines. HP, DEC, and IBM all had established RISC R&D programs, but lack of confidence in the market's acceptance of RISC kept these projects on a wait-and-see status. The three Stanford professors thus entered a business that had already been examined and rejected by the giants of the computer industry.*

Against all these odds, Mips Computer Systems was instrumental in changing the industry's opinion of RISC technology. In 1985 Mips brought to the market a RISC chip (the R2000) that represented a tenfold increase in processing power at a fraction of the price of a CISC chip. This demonstration of RISC's commercial feasibility caused other firms, including Sun Microsystems, HP, IBM, Motorola, and DEC, to launch full-blown RISC development programs.

But by early 1987, despite the adoption of its chip by several computer vendors, Mips had accumulated a deficit of $16 million; less than $1 million of its original venture capital was left. Despite Mips's acknowledged leadership in RISC technology, customers were hesitant to adopt Mips technology because they could not be sure that the young company would survive.

The Mips Constellation *That is when newly-hired CEO Robert Miller radically transformed the company's strategy. He proposed launched an ambitious partnership campaign and declared the goal to "make the Mips architecture pervasive worldwide." He began by licensing Mips technology to semiconductor firms that could use leading-edge process technology to manufacture Mips chips and could also help to market the product. By the end of 1987 he had succeeded in signing on three small California firms--LSI Logic, Integrated Device Technology, and Performance Semiconductor. Later, NEC, Siemens, DEC, and Toshiba would be added to this group.*

Mips began to build up a systems business to complement the company's technology revenues. If Mips remained simply a design house for RISC technology, Miller realized, it would never have the marketing clout needed to convince software developers to write applications. The company thus began to form alliances with computer companies known for their strong marketing and service capabilities. These companies would act as resellers for Mips systems products, either licensing its technology for use in their own systems or purchasing computer systems products from Mips.

By 1991 Mips had established itself as a one-stop source for RISC technology, designing RISC microprocessors, compiler and operating system software, board products, and RISC systems. All Mips products were based on a single, compatible RISC architecture. Chip and software designs were licensed for production to six semiconductor partners, who marketed these products. Mips licensed its systems products (including software, board products, and systems architecture) to systems developers, OEMs, resellers, and integrators.

How Mips Transformed the Competitive Landscape *In each part of its business, therefore, Mips found partners--not one, but many. This constellation was essential to whatever commercial success Mips achieved. Without it, the company would probably have gone bankrupt in 1987. Because of it, the start-up not only survived but grew into a serious challenge to the likes of Intel, Sun, HP, and IBM.*

This strategy transformed the competitive landscape in the RISC field. 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 focused on how the Mips "camp" was faring versus the camps centered around other firms.

In time these competitors redoubled their efforts, and many formed their own constellations to counter the Mips threat (see chart in next chapter). In the process, collective competition engulfed the whole RISC industry.

The story of how group-based competition spread in this industry will be told later. In the chapter that follows, we pause to analyze the nature of this new type of competition.

Chapter 3: Competing in Constellations

The Mips strategy described in the previous case effectively transformed the unit of competition in the RISC field. Alliances can thus reshape rivalry by elevating the battle to a level above that of single firms. As this happens, competition increasingly takes place among constellations of allied firms. In this new style of group-based competition, who wins and who loses depends on the competitive advantages that each group of firms creates through collective action.

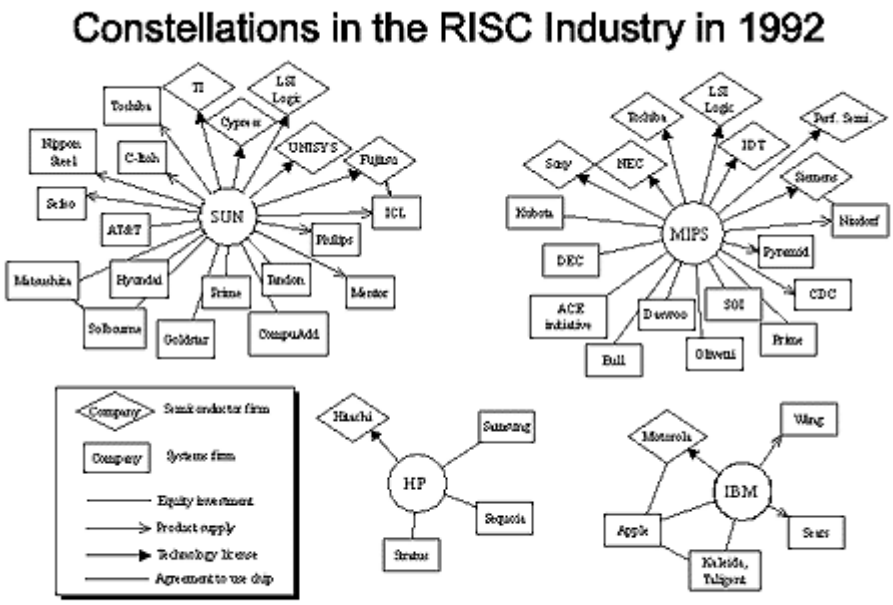
Yet even for firms heavily involved in such competition, what counts to their owners is the profits of the firm, not those of the group. Although the game has changed, we still keep score the old way. In the long run, each group member must benefit from the collective effort. Without private gains, or at least the expectation of such gains, the group will fall apart.

What determines the performance of firms competing in constellations? The answer lies in the pattern of collaboration inside the constellations. This chapter explores the ways in which the design of constellations affects the competitive performance of the groups as a whole and of the firms within them. It draws extensively on the example of the RISC business, but derives lessons that are widely applicable to other sectors.

Success Factors in Collective Competition Competition in the RISC industry in the late 1980s and early 1990s was driven by groups, not by firms. Lacking scale or other overriding competitive advantages, each RISC player chose to abandon the idea of competing as a single firm. By 1990, alliance groups had become the true units of competitive and economic power in this field.

The main groups competing in 1992 are shown in this chart. At the core of each major RISC group was a microprocessor-design firm--Mips, Sun, HP, and IBM. The other firms in each group based their components, systems, and software on the technology designs of this lead firm. Other firms--like DEC, Intel, and Intergraph--had their own RISC designs, but

they were less important players in the early 1990s. Motorola was an early entrant to the RISC field, and developed its own group, but it soon dropped out of the race and joined IBM's group.



Source: Gomes-Casseres, *The Alliance Revolution* (Cambridge: Harvard Press, 1996)

Having formed their groups, the RISC firms discovered that mere numbers were no guarantee of success. As in simpler constellations, internal structures determined how the entities competed. As a consequence, each group had to find the best way to control the capabilities of its members--capabilities in semiconductor production, in systems design and manufacture, in software development, and in sales and service. How the groups mixed and matched these capabilities was critical.

Aside from size, therefore, the composition of a group, the degree of internal competition, and the form of collective governance shaped their competitive behavior and performance. Because of the importance of integration in technical development, the loose constellations were at a disadvantage compared with tight constellations and with the large, single firms. Internal coordination was less important in marketing, although here too internal competition reduced group-based advantages.

The internal structure of a constellation also affected the fate of each individual group member. In some cases, members competed fiercely with each other. Sometimes one firm--often the lead firm in a group could play off one ally against another. These internal processes influenced the bargaining power of one group member versus another, and so helped determine the private benefits that members drew from their groups.

The chapter discusses in detail these four parameters of group design: size, composition, internal competition, and governance. Theory and the experience of other industries show that these are critical elements in any constellation.

Even as the RISC firms sought new competitive advantages through alliance groups, they encountered new challenges. The growth of their groups was often driven by a race to surpass other groups. Collective competition thus spread rapidly through this industry. As

this happened, new challenges and hidden costs emerged, as discussed in the next case and chapter.

Case Study: The ACE Bandwagon Runs Out of Steam

Until about 1990, the Mips group was an extensive and well-organized network of alliances. Its growth in the previous three years had been gradual and deliberate. The alliance strategy had saved the once-floundering Mips by furnishing resources, credibility, and market access. This strategy entered a new phase in late 1990, when the Advanced Computing Environment (ACE) initiative was launched.

The greatest potential for RISC sales lay in the personal computer segment of the industry, which was dominated by Intel's proprietary standard--85 percent of PCs were made with Intel chips. Going after the PC market, then, would mean competing against Intel; that is exactly what ACE intended to do. The growth of ACE was explosive and shook the industry. But ACE's grandiose plans ultimately failed. The rise and fall of ACE teaches important lessons about the dynamics of alliance groups.

The Rise of ACE *When the ACE initiative was formally announced in April 1991, over twenty-one firms had already joined. Key members included DEC, Control Data, Silicon Graphics, Prime, Wang, and Pyramid Technology in the United States; Olivetti, Siemens-Nixdorf, and Bull/Zenith in Europe; and NEC, Sony, Sumitomo, and NKK in Japan. Robert Miller summed up the challenge for Mips: "At the end of the day, the winner--a relative term, anyway--will be the one who gets the customers' desktops converted. Our new mission is to provide as much enabling technology to the ACE members as possible."*

ACE membership grew rapidly, topping sixty in July and approaching two hundred in October. Many of these new members were foreign clone makers and small software firms. But in October Mips announced a new semiconductor partner: Toshiba. As it had done with its other semiconductor partners, Mips licensed Toshiba to make, sell, and develop Mips R3000 and R4000 chips and incorporate these into its systems. The signing of Toshiba was particularly noteworthy because that company had been one of the first licensees of SPARC, Sun's RISC technology.

The Fall of ACE *Even as ACE and the Mips architecture seemed to be gaining momentum in the second half of 1991, Mips's financial prospects began to look less promising. The company incurred a loss of $597,000 in the second quarter of 1991, which compared unfavorably with its $624,000 profit in the first quarter and $4 million profit in the second quarter of the previous year. The third quarter of 1991 was equally unkind to Mips. "Mips Computer has a beautiful future behind it," wrote Business Week in October; the article reported an expected loss of $15 million for the quarter. By then investors had driven Mips stock down to $11 per share from its earlier level of $21 in March 1991.*

On March 12, 1992, Mips announced that it would merge with one of its biggest customers, Silicon Graphics, Inc. (SGI). Through stock swaps, SGI was to pay nearly $400 million for Mips. On May 5, after first-quarter results were available, the two parties announced an amended merger agreement, which lowered the sale value to near $200 million.

The ACE group, which by now was a key element in Mips strategy, continued to crumble. Compaq left ACE in April of 1992; shortly after that, Santa Cruz Operations announced the

suspension of its efforts to develop a Mips version of its Unix system. By the time the merger between Mips and SGI was complete, Compaq, Santa Cruz, DEC, Olivetti, and Bull had all left the Mips group. ACE was dead.

ACE had come and gone in the span of a few years. Apart from the changes it wrought in the computer industry, this episode posed central questions about the dynamics of constellations. Why did the group grow so rapidly? Why did it collapse so suddenly? Was it a fad? If so, are we in danger of falling prey to similar fads again? The next chapter analyzes how alliance groups grow and why they tend to spread so rapidly in an industry.

Chapter 4: The Spread of Collective Competition

The rise and fall of ACE was not an isolated event. Rather, it reflected the general tendency of collective competition to spread in waves. The rise of ACE encouraged other groups, notably those of HP and IBM, to form and expand. These groups also grew in spurts, though none exploded on the scene the way ACE did. Perhaps because of that, none reached limits to growth as rapidly as ACE did, either.

Waves of Alliance Formation This pattern is repeated in many businesses. Once alliance groups appear on the scene, they are often contagious and cause collective competition to spread throughout an industry. But a period of increasing alliance formation is also typically followed by a slowdown. In the computer hardware industry, for example, the formation of both international and domestic alliances increased dramatically in the first half of the 1980s and declined in the second half. A new wave of alliance formation seemed to start in the early 1990s.

At the level of individual firms, too, the rate of alliance formation has risen and fallen in waves. During the 1980s and early 1990s, IBM experienced three such waves, with peaks in 1984, 1988, and 1992. In each wave, IBM's rate of alliance formation rose from under five per year to over ten or fifteen per year. At DEC, which was second to IBM in terms of total number of alliances in our sample, the rate of alliance formation peaked once in 1988 and appeared to be headed upward again in the early 1990s. Olivetti and Fujitsu--the non-American firms with the largest number of computer alliances--also experienced bursts of alliance formation, which peaked in about 1985.

Similar patterns of alliance formation can be seen in other industries and firms. In the early 1990s, there were waves of alliance formation in the telecommunications, airline, health-care, and commercial real estate industries, to name a few disparate examples. Biotechnology alliances were most popular in the mid-1980s. Earlier, the late 1970s and early 1980s saw alliance waves in the automobile, aircraft, and chemicals industries. Historical data on the foreign operations of large U.S. manufacturing firms indicate an increase in the use of joint ventures in the late 1950s, followed by a sharp decline in the 1960s.

The Logic of the Alliance "Fad" These observations raise two related questions. First, why do firms in an industry seem to increase their use of alliances at about the same time? This clustering of alliance strategies, of course, is what causes the rate of alliance formation to rise for the industry as a whole. Second, why does the rise in alliance formation come to a halt and even decline after a few years? Because the rises in alliance formation among firms in an industry are typically correlated, the declines are too. As a result, we see the popularity of alliances wax and wane in the industry.

For some analysts, the answer to these questions is that alliances are a fad a temporary, popular fashion without economic rationale. Managers have been known to follow fads in other instances. A diversification fad occurred in the 1960s, a portfolio planning fad in the 1970s, and merger-and-acquisition fads have swept through at several points, most recently in the late 1980s. This explanation has a ring of truth.

But there is more method to the madness. The temporary nature of the popularity of a strategy does not make the strategy irrational. Nor does a decline in alliance formation prove that an earlier rise was a mistake. Similarly, competitors often have good economic reasons to imitate one another's moves. The alliance "fad" too has an underlying economic logic.

To understand this logic, The Alliance Revolution examines two sets of forces: those that drive and those that limit the formation of alliances. The clustering of alliance formation among firms can be explained by the existence of drivers that are common to all the competitors in an industry. Some drivers stem from trends in demand and technology. In this Chapter, we focus on those drivers that are inherent to collective competition itself and that are not imposed on an industry from the outside. Chief among these is rivalry among constellations, which causes them to react to one another in ways that accelerate the formation of alliances. Another driver inherent in the process of collective competition is synergy among the alliances of a firm, which causes one alliance to breed another.

Similarly, the decline in alliance formation in a firm can be in part explained by limits that arise only after a firm's network of alliances has grown to a certain size. Some of these come about as competing constellations crowd out one another's alliance opportunities. But many limits are internal to the firm's network--they depend on the rising costs of controlling a large and complex alliance network.

The Future of the Alliance Boom This analysis begs the question of whether the high-technology alliance boom of the late 1980s and early 1990s will come to an end. Certain limits to growth, as we have seen, result from overcrowding of the alliance field. When this happens, it is likely to affect all firms in an industry or geographic segment, whether or not they have been directly involved in creating the previous alliances. In addition, a distinctive feature of the alliance boom of the 1980s and 1990s is the involvement of leading firms from all countries. As a result, a few firms in each segment are responsible for much of the new activity. When the constellations of these firms reach their internal limits, the aggregate trend, too, may well peak.

But nothing in The Alliance Revolution predicts when this retrenchment might occur. It is possible--even likely--that retrenchment from alliances in one field will occur while other fields experience an increase in collaboration. In the RISC field, for example, many more alliances were formed in the second half of the 1980s than in the first half of the 1990s. Yet the latter period saw a new boom in the formation of alliances in the multimedia field. Although alliance activity in different fields may be "bunched" in time, the overall pace of collaboration in the economy will show less variability.

The phenomenon of inter-firm collaboration, in other words, is here to stay. In industry after industry, the alliance revolution is likely to transform the way firms compete. Strong external pressures for alliance formation will often mean that the rise of one constellation will lead to another. Internal limits to growth might give managers pause, but these limits are unlikely to halt the alliance bandwagon until it has progressed far. In this chapter, we saw these processes at work in the RISC industry. In the next case study we see how

collective competition engulfed another industry--the field of personal digital assistants. The result, again, has been a transformation of the structure and dynamics of competition.

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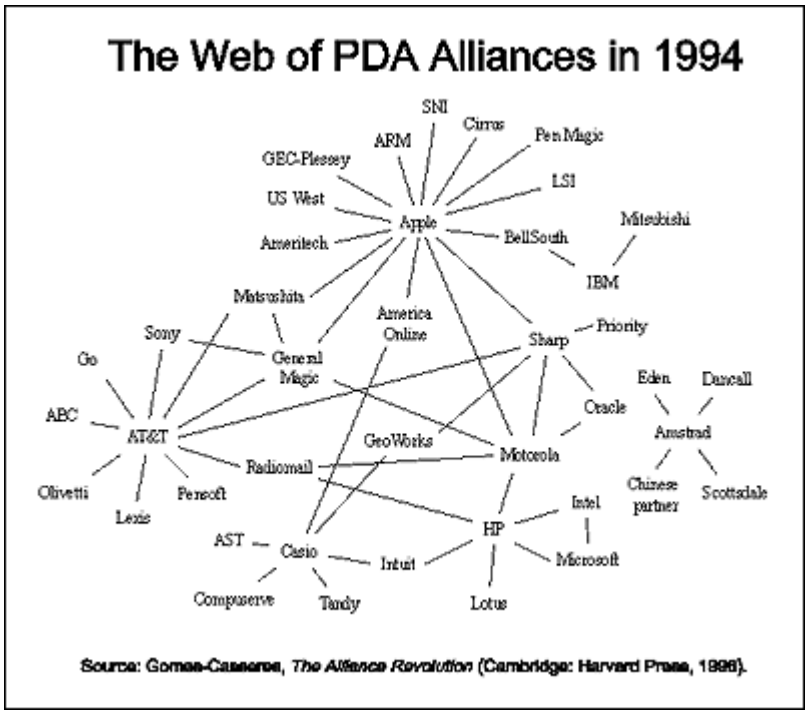
Case Study: The Thickening Web of Multimedia Alliances

Personal digital assistants (PDAs) burst onto the market in the early 1990s. These hand-held electronic gadgets were one of the first installments in the emerging business for multimedia products. They were intended to be part cellular phone, part notebook computer, part electronic calendar, part information organizer, and part computer game. An AT&T commercial showed their promise: sitting on the beach in the Caribbean, a relaxed businessman received a fax from one office, sent a reply to another, and then returned to his favorite electronic entertainment.

The product concept was not the only thing that was novel so was the new industry's structure. From the start, the business of developing, making, and selling PDAs was conducted through a thick web of alliances (see first chart). Collective competition did not spread gradually as it did in computers; it arrived full-blown with the first PDAs. As a result, the organization and dynamics of the industry revolved around the patterns of alliance formation and the competitive behavior of constellations. Alliances were no longer just the result of environmental forces--they were the environment.



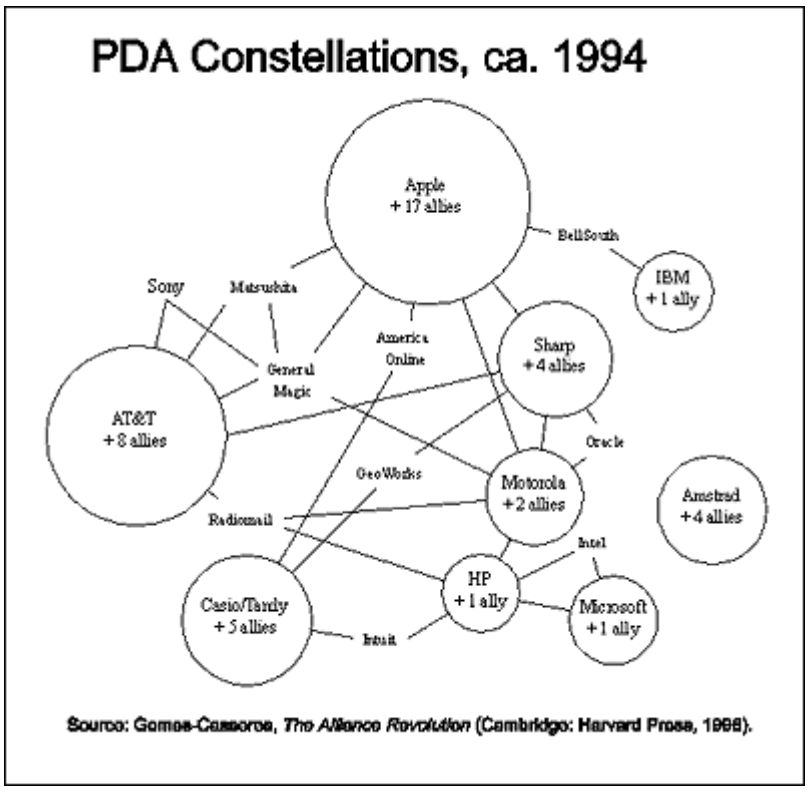
Convergence, Uncertainty, and Alliances *Alliances were so pervasive in PDAs for three reasons. First, the field was born from the convergence of at least four industries computer hardware, computer software, telecommunications, and consumer electronics. Major companies in each of these areas participated in the PDA business, but each had a different vision of the new product. Even though there were giants among them, these*

companies also were limited in their ability to enter the PDA market. Depending on its industry of origin, each firm was strong in one aspect of the PDA emerging business, but lacked other needed capabilities. IBM, Apple, and HP approached the PDA business from their experience in computer hardware; Microsoft and Lotus, from computer software; AT&T, BellSouth, and Motorola, from telecommunications; and Sharp, Casio, Tandy, and Amstrad, from consumer electronics.

Second, alliance formation in PDAs was driven by the great uncertainty regarding several aspects of the business, including customer demand and product and process technologies. This uncertainty was a function of the immaturity of the field, but also of the fact that the product was to represent a merging of capabilities from different existing industries. Uncertainty and convergence compounded each other, so that, although would-be PDA producers knew that they had to combine technology and components from different industries, they did not know the precise "mix" of ingredients needed for a successful product. As a consequence, they used alliances to experiment with different mixes.

Third, most of the players thought that the timing of the introduction of their product to the market was critical. An early introduction, they believed, would boost their recognition and image; more important, it might help them set technical standards that would sustain their market position as the industry matured. Conversely, a latecomer was likely to have to follow design standards set by the first-movers, and might even have to pay royalties for technologies that had become widespread. Many firms saw alliances as a way to get a product to market quickly.

Another Battle Between Constellations *These incentives for alliance formation led to the thick web of linkages shown in the chart above. From that chart, it looks as if every firm is connected to every other firm. In reality, however, there were distinct groups, organized around leading firms, as shown in the second chart below.*



From the start, therefore, the competition in the PDA field was not among individual firms, but among groups of allied firms. All the PDAs studied here were developed in a collaboration between two or more firms. The number of alliances in each of the competing groups varied from over twenty in Apple's group to four in Amstrad's. But in every group, each member contributed specific capabilities and fulfilled specific functions in the cycle of product development and launch. As a result, the design of each group and the effectiveness of collaboration among group members helped shape the product offerings and the competitive advantage of the groups.

Even this brief sketch indicates how deeply collaboration shaped business rivalry in the emerging PDA industry. No firm competed on its own in this market, and all products were an amalgam of ingredients from allied producers. Alliances were the norm here--as they were in the RISC field--and collaboration became part of the very fabric of competition. This admittedly extreme case holds important lessons for other industries characterized by collective competition. The implications of the alliance revolution for the structure and dynamics of competition are explored in the next chapter.

Chapter 5: Alliances and the Organization of Industry

When collective competition spreads widely in an industry--as it has in RISC, PDAs, and other high-technology fields--the whole climate of business changes. Competition is restructured and transformed; in the process, rivalry often intensifies, as it did in the industries studied here. This chapter returns to the question posed in the introduction to the book: the puzzle of how collaboration may enhance--not reduce--competition.

How Alliances Intensify Rivalry The answer to this puzzle stems from the basic rationale for alliances. As we have seen, firms use alliances to combine capabilities, thus creating a competitive entity that is stronger than the members would be by themselves. Dominant firms seldom do this, but second-tier firms often form alliances to catch up with the leaders. At the same time, the firms that form alliances tend to mimic one another and create units of competition that are more or less evenly matched. All these conditions--stronger competitors, narrower competitive gaps, and less differentiation among players--tend to intensify rivalry in a business.

This does not mean that alliances never suppress rivalry. A key condition for an effective constellation is precisely the suppression of internal competition. Every constellation suppresses rivalry among its members; in that sense, the traditional view of competition and cooperation is correct. The suppression of internal rivalry, however, often translates into fiercer external competition, as constellations marshal the combined resources of their members to compete against other constellations. It is therefore important to recognize the multiple levels in collective competition: alliances always suppress rivalry at one level and often intensify it at another, higher level.

The broad evidence in this book supports this view of how alliances reshape business rivalry. To be sure, alliances may have another effect; they may contribute to the formation of industry-wide cartels and to a general reduction in competitive rivalry. But the systematic and anecdotal evidence suggests that these outcomes are exceedingly rare. The mechanisms through which alliances can enhance rivalry are diverse, powerful, and widely applicable.

This chapter discusses in detail how the spread of alliances changed the nature of competition in RISC, PDA, and other industries. The alliance revolution typically transforms not only the players in an industry but the organization of industry itself. Collaboration can systematically change the profile of competitors in an industry. It increases the size and number of competitors and made them more evenly matched; it strengthens each competitor even while drawing in partners from disparate backgrounds.

Alliances also typically change the dynamics of competition. Early in the spread of collective competition, our alliances encouraged new entry. But later they raised barriers to entry by tying up sources of technology and access to markets and by raising scale and scope requirements. They also tended to raise the costs of exit, forcing more competitors to stay in the game. Finally, they usually increased the pace of innovation and shortened the life cycle of products.

The net result of these changes was intensified business rivalry. This finding does not rule out the possibility that alliances might be used for anticompetitive purposes, that is, to suppress rivalry and generate monopoly power. But our analysis suggests that mergers have a comparative advantage over alliances when it comes to collusion. Alliances are ill suited for this purpose--they are too fragile and quickly fall apart under the pressures of internal conflict.

This study of alliances thus helps us to resolve the puzzle of why competition persists in the face of cooperation. The answer, it turns out, does not come out of conventional approaches to economics and business strategy. As a result, many conventional arguments may need to be modified to account for the new realities explored in the preceding chapters. The broader implications of these findings are discussed in the concluding chapter.

Conclusion: Rethinking Alliances and Rivalry

This book has sketched the new reality of the alliance revolution and provided a conceptual approach for understanding the phenomenon. It purposely focused on companies and industries in which this revolution has progressed far--that is, where alliances are common and penetrate every aspect of business. Examining the extreme cases has made it easier to recognize the radical changes wrought by the rise of collective competition.

Recognizing Collective Competition But the focus on extreme cases means that the conclusions here may not apply equally to every business. The arguments in this book are likely to apply best in complex businesses undergoing rapid change and where collective competition dominates an industry. To determine whether collective competition is emerging in an industry, one has to look carefully at the competitors in the industry and examine how products are developed, manufactured, and sold. Are alliances becoming important in many parts of the value chain? Is the web of relationships in the industry growing in density? Are there few firms left that still compete as single entities, relying mostly on internal capabilities and on arm's length contracts with outsiders? Have constellations changed the terms of competition, such as the scale and scope required for success?

Notwithstanding this book's focus on high-technology businesses, we can expect collective competition to emerge in a wide variety of environments. Other manufacturing sector have seen a proliferation of alliances in recent decades, as have service sectors. In many cases, the spread of alliances has created rival constellations like those we have examined; often,

these constellations contain a large number of members. The book describes briefly the emerging constellations in several businesses: interactive TV, video CDS, global telecommunications, automobiles and trucks, biotechnology research, pharmaceuticals marketing, global airlines, and commercial real estate.

Even in those businesses not dominated by collective competition, the framework developed here should be valuable. This book's underlying theme applies practically everywhere in modern business: competition and collaboration have become intimately intertwined.

The book shows how the alliance revolution alters business rivalry in two basic ways. The first is a change in the firm as an economic unit. Alliances create new units of competition that supersede firms, and on which firms depend for their competitive advantage. The second is a change in the market as an economic environment. The proliferation of alliances generates new patterns of competition, in which collaboration inside economic units affects their market behavior. The chapter elaborates on the implications for economic theory and research.

Managing Alliance Strategies The intimate connection between cooperation and competition also suggests that our practical approach to business strategy needs to change. The nature of collaboration within a constellation, as we have seen, helps determine the group's competitive advantage. Two implications for strategy follow. First, by exploiting barriers to collaboration, firms may interfere with a rival's alliances and so place the rival at a disadvantage. Second, firms that build and manage their constellations more effectively than others may have an edge in the marketplace.

Exploiting "Barriers to Collaboration" In the traditional approach to competitive strategy, the notion of barriers to entry or to mobility is central. By raising these barriers, incumbent firms can keep potential competitors at bay and exploit market power. When rivals can gain advantage through collaboration, however, another type of barrier can be used: barriers to collaboration. Anything that makes it costly to form and manage an alliance successfully constitutes a barrier to collaboration.

Like barriers to entry, barriers to collaboration are not absolute prohibitions to potential competitors--but they make life more difficult and more costly for them. And, like their traditional counterparts, barriers to collaboration are not always amenable to change through the actions of incumbents. But there are at least three strategies that a constellation can use to raise barriers to collaboration for a rival constellation. The first is to disrupt rival's alliances, for example by forming alliances with the rival's partner. The second is to pre-empt the rival's alliances, by beating them to the dance-floor, so to speak. The third strategy is to change the terms of competition so as to place strain on the rival's alliances. Each of these strategies is discussed in the book. While firms often do not openly publicize these types of strategies, several examples are noted.

Building and Managing a Constellation A constellation is only as good as its design and its management. In order to wield its weapons effectively, a constellation must also be able to defend itself from attack. In other words, it must organize itself internally to maximize the benefits of collaboration and minimize conflicts among members. Five lessons for alliance management can be distilled from the analysis; each is elaborated upon in this chapter:

1. Develop comprehensive alliance strategies, and don't expect magic from high-profile "strategic alliances."
2. The balance between competition and collaboration is delicate and needs to be managed constantly.
3. Alliance instability should be not feared, but embraced.
4. Polygamy is often better than monogamy, but promiscuity is not.
5. Firms must position themselves strategically between as well as within constellations.

Taken together, these lessons emphasize that alliances are inherently neither good nor bad for a firm--it depends on how they are managed. Constellations, we have seen, have advantages over single firms in given contexts; but it remains the task of management to realize these advantages.

Changing Our Mindset The alliance revolution not only affects economic theory and management practice--it also modifies our world view. Collaboration is now increasingly accepted by managers as a way of doing business, and scholars have begun to explain the existence and behavior of alliances. Our analysis of collaboration strikes deeply at the conventional view of the firm and of competition. Collaboration between firms upsets this view because it dethrones the firm as the prime source of economic power.

If we are to understand the radical economic changes underway, we must change the way we think about competition and collaboration. The two are not mutually exclusive, but neither can they be blended and mixed to produce a "softer" form of rivalry. Rather, collaboration between firms yields a new type of competition between sets of firms. These constellations are new players on the economic scene; we must broaden our conception of the firm to include these and perhaps other types of competitors. Externally, constellations often compete fiercely with one another. But their competitive power grows out of internal processes--the dynamics of collaboration among their member firms. That is the essence of collective competition, the new shape of business rivalry.