

Learning and Specialization in Strategic Alliances

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Abstract

We explore the conditions enabling partners in strategic alliances to acquire valuable technological knowledge from each other, and to specialize in complementary areas. Our findings show that knowledge acquisition across alliance partners is maximized when the technological knowledge bases of alliance partners are moderately similar, whereas highly similar or highly dissimilar knowledge bases enable partners to specialize in complementary areas. Moreover, both knowledge acquisition and specialization are enhanced when partners have experience in prior alliances. In rare cases, we observed knowledge acquisition and specialization occurring simultaneously between partners with similar knowledge bases and prior alliance experience.

Over the past decades, we have witnessed a strong growth in alliance activity in virtually all industries. In particular, in high-tech sectors companies have successfully employed alliances for access and utilization of technological knowledge. External knowledge allows them to keep track of new technological developments, to share costs of R&D and to create synergies and learning among partners. For many companies, alliances have become an important part of their strategic weapons employed to combat issues related to fast technological change, rising costs of R&D and shrinking product life cycles.

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A widely acknowledged benefit of alliances for companies is the possibility to develop new competencies by learning from their partners. In a prominent example, the NUMMI joint venture between General Motors (GM) and Toyota, in which the two companies jointly manufactured cars from 1984 through 2010, allowed GM to learn about lean manufacturing from its Japanese competitor, leading to substantial efficiency gains in other GM plants.¹ More recently, computing giants IBM and Apple have been collaborating to combine IBM's expertise in big data analytics with Apple's user-friendly hardware to develop enterprise apps. The alliance enables IBM to draw on its partner's expertise to improve its hardware offerings, while providing Apple valuable opportunities to develop new capabilities in enterprise solutions.

In addition to knowledge acquisition (KA) from partners, alliances also allow companies to combine their complementary capabilities to achieve a joint commercial outcome while specializing in their own areas of expertise. An example of such a complementary specialization alliance is CFM International, a joint venture between General Electric and SNECMA (now acquired by Safran) started in 1974 and still successfully operating today. The JV produces jet engines for the civilian market, and has been successful over its long lifetime. CFM International pools the considerable technological capabilities of the two parent companies, but the intention is not to learn from each other; rather, the operational activities of the two companies remain almost completely separate, with final assembly of the engines taking place at either parent, depending on the engine type.² The allocation of tasks between the partners was fine-tuned to be 50/50, with no money being exchanged or transfer prices set. GE concentrated on the development and production of engine "cores", while SNECMA looked after the fans.

Although complementary specialization alliances are common, we know little about the factors affecting how companies effectively organize their "division of labor" in these alliances. Based on an empirical study of 841 technology alliances in the IT industry (computer equipment, electronics, telecommunications, and software) we aimed to shed more light on the drivers of knowledge acquisition and complementary specialization in alliances. In particular, we looked at two important antecedents of external knowledge utilization –technological overlap and alliance experience.³ Knowledge acquisition was measured by the reciprocal patent citations of the respective partners. Citing the partner's patents is an indication of the use of its knowledge for the development of new technological competencies by the focal company. Complementary specialization on the other hand is measured by the degree to which partners become more dissimilar yet complementary in terms of their patent profiles after the alliance.

First, we explored the role of technological overlap for knowledge acquisition and complementary specialization in alliances. We found that knowledge acquisition performance is higher when partners have a moderate level of technological overlap. Alliance partners need a certain degree of similarity in their knowledge bases in order to understand each other's knowledge. However, too much similarity might decrease the novelty of the partner's knowledge, thereby decreasing the value of cooperation.⁴

In complementary specialization alliances, this relationship is mirrored: either low or high levels of technological overlap lead to specialization. When technological overlap is low, the division of labor is straightforward: alliance tasks can simply be assigned according to partners' respective competencies. Although high levels of technological overlap also means redundant competencies, it provides companies with flexibility in allocating alliance tasks since either partner can carry out most of the tasks. Collaborating companies can evaluate each other's competencies and allocate tasks to the partner who is relatively more competent in a certain area.

CFM International exemplifies a high level of technological overlap. This is illustrated for example by the ability of the partners to reverse their roles in the development of certain engines, with SNECMA developing the engine "core", and GE the fans.⁵

Second, we explored the role of alliance experience in affecting the role of technological overlap to determine division of labor within an alliance. Alliance experience has been noted as a critical factor for overall alliance success, and is widely heralded as one of the most critical factors in building alliance capabilities in organizations.⁶ Partnering companies with high levels of prior alliance experience are often better at absorbing external knowledge than companies with less experience. We indeed found this, particularly at low-to-moderate levels of technological overlap where partners have more opportunities to learn from each other. At high levels of technological overlap, we find that more experienced companies are less likely to successfully acquire knowledge. This is probably because they perceive each other's knowledge transfer abilities as threatening, causing them to become more protective of their own knowledge.

Moreover, we found that alliance experience strengthens the role of technological overlap in facilitating complementary specialization both at low and high levels of overlap. Companies with higher levels of alliance experience are likely to be more effective in their ability to coordinate the execution of alliance tasks at low levels of technological overlap because they are better able to manage potential conflicts that can arise because of combining dissimilar technological knowledge bases. At high levels of

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overlap, experienced companies are likely to be more efficient in achieving optimal results of their alliances and managing the division of tasks.

The CFM International alliance illustrates the benefits of experience for optimizing the benefits of complementarity at a high level of technological overlap. The experience in this case is specifically accumulated within the alliance itself, which is extraordinarily long-lived. Over time, this allowed the parent companies to adapt their organizations and decision-making processes to each other.⁷

Finally, we have studied the conditions under which knowledge acquisition and complementary specialization occurred simultaneously. Realizing both outcomes in a single alliance is possible but only under certain conditions. We found that technological overlap is one of the drivers of simultaneous knowledge acquisition and complementary specialization in an alliance. When technological overlap reaches high levels, companies can engage in complementary specialization by dividing certain tasks to the partner that has a comparative advantage, while at the same time strive to learn from each other in other areas.

Furthermore, alliance experience is also conducive to knowledge acquisition and complementary specialization. It allows companies to employ intensive knowledge-exchange mechanisms for reciprocal knowledge acquisition in some areas and coordinating their specialization in others. This is a difficult task, which often creates confusion and leads to confusion and misapplication of alliance practices.⁸ Prior alliance experience aids companies to mitigate these issues because companies are more adept to identify the required set of alliance practices for knowledge acquisition and complementary specialization, and better able to manage complex alliance processes.⁹

While it is too early to tell, the alliance between IBM and Apple is a likely candidate to facilitate simultaneous knowledge acquisition and complementary specialization. The unlikely partners share a substantial degree of competing expertise, allowing them to understand each other's competencies, while maintaining distinct niches of non-overlapping expertise, offering valuable learning opportunities. Since both IBM and Apple are experienced collaborators, their partnership is likely to proceed smoothly without valuable knowledge lost in translation.

In their search for external knowledge, companies employ various knowledge acquisition and complementary specialization practices in their alliances. Our study shows that companies can benefit from certain degrees of technological knowledge overlap and alliance experience to undertake both activities. Managers can enhance their companies' gains from alliances by screening their potential alliance partners in terms of their technological

overlap. Likewise, executives that view alliances as opportunities to build alliances management capabilities, rather than one-time events, are more likely to benefit from knowledge acquisition and complementary specialization practices in their alliances.

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Endnotes

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