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Control Without Acquisition: Intellectual Property, Corporate Transactions, and Contractual Control in Cross-Border Technology Partnerships

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ABSTRACT

Escalating use of cross-border technology partnerships provides opportunities to companies to gain substantial commercial and strategic leverage of key technology without actually becoming the technology owner. A range of contractual mechanisms may be considered, such as minority investments, joint ventures, strategic alliances, licensing agreements, cloud and infrastructure agreements, and other contractual arrangements, which may result in a separation of harmonious corporate ownership and control over IP, trade secrets, know-how, technological access or commercialization. However, the definitions and the legal framework for such arrangements is scattered throughout different branches of the law, including corporate law, intellectual property law, contract law, commercial law, competition law, and international economic law. This article will focus on a legal construction of control over technology which does not overlap with acquisition of the firm, and acquisition of its underlying intellectual property. It establishes a workable structure to differentiate corporate control from IP control, contractual control, information control, and technological access and uses that structure to analyze cross-border technology relationships that feature strategically significant intangible assets. The article examines the legal regimes for share transactions, IP licensing, trade secrets, contractual restrictions, technology transfer and other cross-border economic regulation to show that minority stakes, IP licenses, technological and commercial influence provided by means other than traditional acquisition, access restrictions, infrastructure dependence and confidential know-how can combine to give significant technological and commercial influence. It posits that under a conventional ownership-based approach, the characteristics of these partnerships involving the latest technologies can be overlooked, as the legally-relevant control over the project may be split among several rights, contracts, and dependencies, not just a proprietary or corporate relationship. The article aims to suggest a more holistic method of measuring functional technological control, and its consequences for international technology markets, IP commercialization as well as cross-border technology transfers through legal structuring and regulation.

Keywords: Intellectual Property; Corporate Transactions; Commercial Law; Cross-Border Technology Partnerships; Technology Licensing; Contractual Control; Corporate Control; Trade Secrets; Technology Transfer; International Economic Law; International Trade Law; Technology Commercialization



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Introduction

Technological innovation is being commercialized more and more via corporate deals that don't involve an outright buy of the company developing or owning the technology. Cross-border joint ventures, minority investments, strategic alliances, licensing agreements, research collaborations and other contractual arrangements can confer upon the firms significant access to patents, proprietary processes, trade secrets, know-how, or software, and so on. Such agreements fall in an intermediate ground between unsuccessful market contracting and traditional mergers and acquisitions. Finally, as their role becomes ever more important, a basic legal issue arises: When ownership of a technology company, ownership of its technology, rights to use technology under contract, and the actual access to technology may be held by different actors, what is meaningful control in the context of technology?

IP rights have two different roles in the international technology markets. They give enforceable means of protecting innovation and at the same time of organizing the transfer, licensing and commercialization of technological knowledge. Technological capabilities impact the competitiveness of firms and states, and intangible knowledge has a property as opposed to conventional, physical property which is that it can cross national boundaries (Kumar, 1998). Technology transactions across borders can thus not be viewed in the light of tangible transfers or entity transfers alone. They can rely as much on the distribution of patents, copyrights, trade secrets, contractual licenses, technical know-how and ongoing rights of use.

The linkage between proprietary rights and technology transfer had always been appreciated by international IP law. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) provided international minimum standards for intellectual property rights, acknowledged issues with licensing regimes and technology transfer. Studies on these show that multinationals that dominate the IP-intensive technologies can use refusal to license, pricing, and imposing restrictions under the clauses of technology-transfer agreements in ways that impact the rate of technological diffusion and competition (Pandey & Saha, 2015). The link between IP rights, contractual constraints, competition and technology transfer is thus laid down in the literature. A more complex issue is that these mechanisms are not always compatible with the types of corporate transactions and strategic relationships that involve the diffusion of technological control among multiple legal forms instead of being vested in one legal entity.

This problem is well correlated by the difference between investment and effective technology transfer. Foreign investment is often seen as linked with technological diffusion, knowledge transfer and productive development. But with foreign capital does not necessarily mean foreign technology has been transferred to the recipient firm (or economy). Lowe (2014) challenges the notion that FDI automatically plays a catalytic role in technological development and highlights the role of domestic technological capability and under what circumstances the knowledge transfer takes place. Financial involvement in a technology company, corporate involvement in a technology company and control of technology must, therefore, be considered as separate, but related phenomena.

This difference is quite relevant in technology-intensive business relationships. When a Corporation acquires a minority equity position in a technology firm, it also can obtain wide-ranging licensing or commercialization rights. The location of the underlying intellectual property does not necessarily follow the flow of contractual control of its exploitation, but may end up in the hands of the technology developer. Likewise defined



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rights for a joint venture may be granted to use proprietary technology with important know-how and trade secrets being retained by one of the partners. At the time of an acquisition, an acquirer can acquire control over a target company but still not have access to the commercially critical technologies, as these technologies could be bound by third party licenses, territorial restrictions, confidentiality covenants, sublicensing agreement restrictions or change of control provisions. On the other hand, a company may not have any equity stake in the company whose technological operations it manages but have 'exclusivity' and obtain this influence through licensing, supply of infrastructure, acquisition of technical resources or long-term contractual dependency.

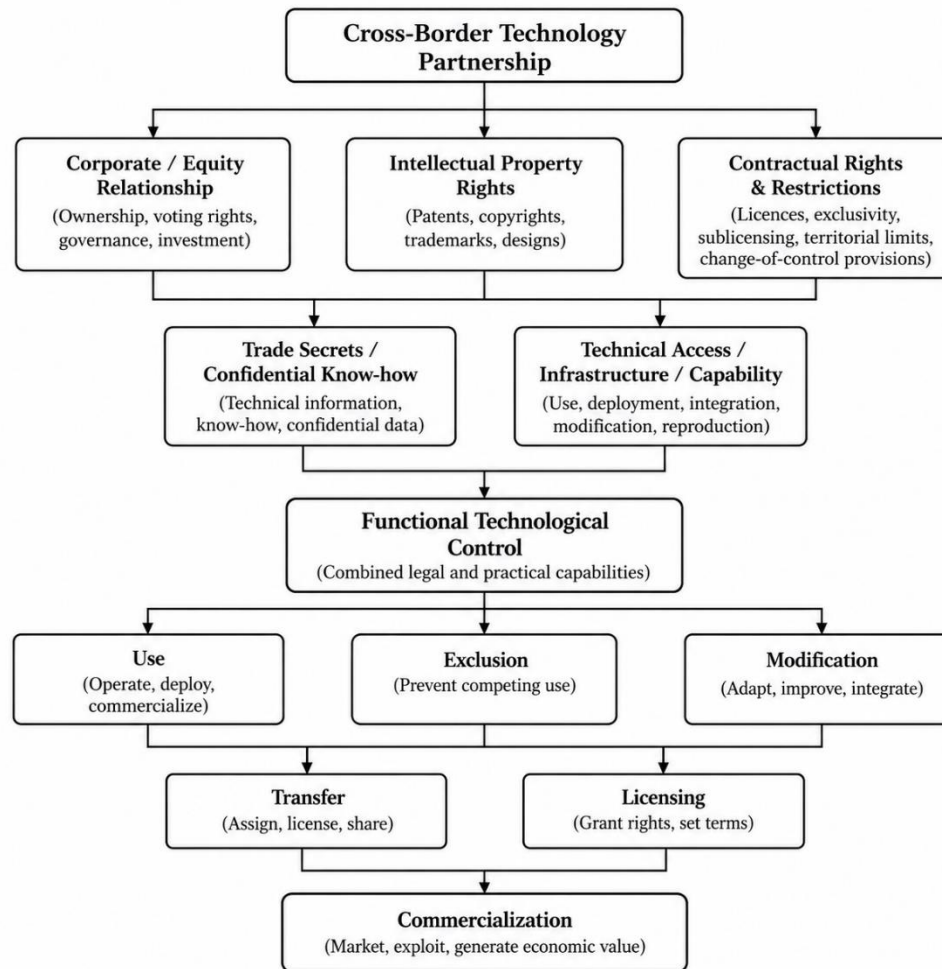
The difficulty in this conceptual arrangement is revealed by these arrangements, which are predicated on a separation of the control over technology between the various legal fields. Corporate law is the law that governs upon who owns, governs, votes and can influence a business. IP law is law that gives exclusive rights regarding the subject matter which is legally protected as a non-tangible good. Private rights and obligations between people are determined by contract law. Confidential information and know-how is also protected by trade-secret law. International trade and economic regulation can limit the transfer, licensing or exploitation of technology from one country to another. These sets of law serve other purposes, but there can be commercially significant technological control that comes about from their interaction with each other.

This article recognizes five types of control which can coexist in a cross-border technology partnership: that of the company; IP; contractual; informational; and technological. The control of the corporate business entity is an aspect relating to the power to influence the entity by way of equity shares, voting rights, governance or similar structures. Intellectual-property control is issues related to the rights that are legally recognized over the protected technological subject matter. Contractual control concerns are those arising from the contractual permissions, restrictions and dependencies established through licenses or joint-venture, exclusivity, sublicensing, territorial restrictions, change-of-control and other related commercial arrangements. Informational control relates to the access to and the protection of trade secrets, confidential information and technical know-how. Technological access: Practical ability to use, deploy, modify, integrate, reproduce or otherwise exploit a technological capability.



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Figure 1. Analytical Framework for Control in Cross-Border Technology Partnerships



The approach taken in Figure 1 is to conceptually regard functional technological control as an analytical, but not autonomous, term in the realm of law. Focuses on the dynamic legal and practical contribution to the use, limitation, modification, license and transfer and commercialization of technology, rather than an exclusive issue of formal ownership. This allows analysis of the circumstances in which one partner has a controlling stake of the corporation, others have IP rights that are relevant to its product or business, and substantial capabilities for commercialization exist elsewhere as an agreement or a technical arrangement.

These relationships are cross-border and so bring a further layer of complexity. Although multinational enterprises (MNE) arrange innovation, investment, production and commercialization in transnational networks, intellectual property is still very much territorial. Internationalization of R&D has made global aspects more crucial in R&D and technological innovation decisions as well as IP-related decision making (Kumar, 1998). Private arrangements relating to technological resources can therefore overlap with international commitments in the field of intellectual property, competition law, foreign investment screening, technology transfer, export controls and other economic-security policies.

Strategically sensitive technologies have increasingly found the interest of the regulatory authorities in this cross-over between private transactions and public economic



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regulation. Concern that the technological and economic implications of foreign-investment transactions can go beyond the actual acquisition of shares or assets has led to a greater use of foreign investment screening. The regulatory issues raised about the technology suppliers have also highlighted the issues of dependence, access, infrastructure and technological vulnerability, as well as traditional ones of ownership. Such developments suggest that control need not be formal title, but perhaps could include relationships which make it possible to exercise control over so-called strategically or commercially important technological capabilities.

Technological leadership and diffusion further complicates control at the international level. There are incentives in technological innovation through IP protection as well as international economic relations, creating international situations of conflict on technology transfer, technology diffusion, market restrictions and technological capabilities access. As these tensions illustrate, modern technology partnerships are dependent on private ordering and international economic regulation—corporations organize access and control through transactions and contracts, whereas states and international legal regimes shape the conditions for the acquisition, transfer, license and/or commercial exploitation of technology.

The current literature has dealt individually with intellectual property protection, technology licensing, technology transfer, foreign investment, competition, corporate relations, and international economic control. It is at this intersection of these bodies of scholarship that the central problem that is addressed in this article arises. If one focuses only on the corporate ownership, this analysis fails to account for contractual and/or proprietary limitations on the exploitation of the technology, and if one focuses only on the intellectual property, this analysis will miss out on the commercial influence that can be derived from corporate, informational, infrastructural, and contractual mechanisms. Ownership of shares does not necessarily mean that a company holds the right to use the associated technology, the company may own the technology without the unrestricted right to commercialize it, it might be a company with very broad contractual rights but little actual ownership of the company or technology, or it may be a company with some technology and know-how that, although not owned outright, creates an important commercial influence.

Hence, the main research question is:

What is the interplay between intellectual property rights, corporate transactional structures, contractual arrangements, confidential know-how and access to technology to establish effective control over technology in cross-border partnerships without any of the usual forms of complete acquisition?

Three subsidiary questions serve as a guide to the analysis. What are the circumstances in which there is a gap between the actual capacity to exploit and commercialize technology, and who has the tools to do so, that is, corporate and IP owners? Second, how do licensing and contracts like exclusive licensing, trade-secret agreements, joint ventures, minority investments, etc. shift the control of technology between firms? Thirdly, how well do international economic and regulatory arrangements accommodate other non-traditional mechanisms of technological influence, beyond those of standard acquisition and proprietary rights?

The method used in the article is doctrinal approach and comparative legal approach. It explores corporate transaction structures as well as intellectual-property licensing, contractual allocation of technological rights, trade-secrets and know-how protection, technology-transfer and various facets of international economic regulation. Selected publicly announced cross-border technology transactions and partnerships are used to



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complement the doctrinal analysis, providing an analysis of the functioning of formal legal rights in real commercial settings. The comparative approach does not aim to provide a comprehensive overview of national legislation but concentrates on a number of jurisdictions and legal frameworks, enabling a more detailed discussion of the different legal instruments used to split or merge ownership, access, exploitation and control rights.

As for technological control, the article explores the possibility that control can be split between the control of corporate entity, IP rights to technology, contract rights, confidential knowledge and technical access in the modern cross-border partnership. This fragmentation knocks down strategies of technological control based on corporate acquisition or on intellectual-property rights. An integrated analysis could therefore give a more precise picture of the allocation and commercialization of technological capabilities in the contemporary cross-border business relations.

The inquiry is of significance both for law and business. The various aspects of technological control are important issues regarding due diligence, valuation, licensing, drafting of contracts, allocation of risks, design of joint ventures, or even commercialization strategies for corporations and transactional lawyers. The question is about intellectual property law: who does the ownership correspond to and who does the contractual allocation for exploitation. It illustrates in the area of international trade and economic law how technological skills can transfer from one country to another, via licensing, investment, collaboration and other private means but without formal transfer of ownership. The analysis thus shifts the focus from the binary one of ownership of a firm or an IPR to the much broader one of who is able to control and commercialize technology based on which mix of legal rights and commercial relationships.

The rest of the article is divided into six parts. Section 2 reviews the literature on intellectual property, corporate control, technology licensing, commercial transactions, technology transfer and international economic regulation, and then identifies a gap between the review of these literatures. Section 3 elaborates on how to distinguish between corporate, proprietary, contractual, informational and technological dimensions of control. It is transactional structures that are looked at in Section 4, in which these forms of control are allocated in cross-border technology partnerships. The framework is applied in Section 5 by means of comparison and some selected real world transactions in a doctrinal analysis. Understandings of the interaction of privately structured technological control with international economic regulation are examined in Section 6. An analysis of corporate transactions, intellectual-property commercialization and cross-border commercial practice and their implications in terms of completion of the analysis is provided in section 7.

Literature Review and Research Gap

Intellectual Property, Technology Transfer, and International Economic Exchange

The first stepping stone towards the understanding of control in cross-border technology partnership is the relationship between intellectual property and technology transfer. IP rights are not just for protecting the exploitation of innovation. They turn technological knowledge into legal form and offer it for licensing, sell it to other businesses, sell it to joint ventures, share it in other collaborations or keep it and sell commercialization rights to others. The resulting separation of ownership of technology from permission to use technology is basic to technology transactions today.

The link between proprietor right and technological dissemination is a direct one for which there is express recognition in international IP law. The Agreement on Trade-



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Related aspects of Intellectual Property Rights (TRIPS) puts intellectual property in the multilateral trading framework and makes protection and enforcement linked with technological innovation and transfer and dissemination of technology. Technology transfer was an integral part of the policy bargain for the globalization of intellectual-property protection, especially from the point of view of the developing countries' demand for technological capabilities, Lowe (2014) writes. However, the link between increased intellectual property rights countries, investment, and technology diffusion is much more complicated than expected (Lowe, 2014).

This duality is also manifested in the international legal structure itself. TRIPS Article 7 is related to intellectual property protection to technological innovation and the transfer and dissemination of technology and TRIPS Article 66.2 states that developed country members shall provide incentives for enterprises and institutions for the purposes of encouraging technology transfer to least developed countries (Lowe, 2014). All these provisions show that proprietary protection has been conceived neither as a complete break with the circulation of technologies nor as a goal of international IP law in itself. Protection, innovation, diffusion and economic welfare are not, instead, one in an international regulatory frame and the other in another.

The economics literature also points to the fact that technological knowledge can cross borders via a number of channels. Transfer of technology and know-how can be achieved through Foreign Direct Investment, international trade, licensing, joint ventures and other business partnerships. But Lowe (2014) warns that the inflow of foreign capital does not necessarily equate with technology transfer success. While FDI has the potential to bring technological knowledge and to create spillovers, the capacity to acquire, absorb, adapt and use the technological knowledge is crucial to actually achieve technological development.

This distinction is more significant for legal analysis, in particular. Technology can be transferred economically and ownership of the intellectual property might remain unchanged. On the other hand, a company can be acquired and its ownership transferred without the transferring company gaining full control over the company's technologies. Thus, the best understanding of technology transfer is as a continuum of legally formalized relationship(s).

Intellectual Property Licensing and Contractual Allocation of Technology

Perhaps the most obvious instance of separation of ownership and exploitation is in the form of licensing. While assignment conveys an intellectual-property right, licensing typically grants the right to use certain intellectual property rights to another party who continues to hold the intellectual property. The economic value of the license then hinges on the area of operations and limitations spelt out in the license agreement.

Contractual provisions have long been known to have a significant impact on the economic value of access to technology. Both international technology transfer and domestic technology transfer have been issues of historical debate involving exclusive dealing, grant-back requirements, restrictions on research and adaptation, tying arrangements, export restrictions, cross licensing, territorial restrictions and post expiration obligations. The proposed UNCTAD International Code of Conduct on the Transfer of Technology expressed concern that the very terms and conditions of the same might determine how the technological capability is actually being disseminated without changing the original intellectual property rights (Pandey & Saha, 2015).

A further example of the relevance of contractual structure on the relationship between IP and competition law. IP law provides a limited degree of exclusivity to incentivize



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innovation, and competition law may come into play in situations where IP laws and/or their enforcement create an unlawful restraint of competition through an IP license or, in any other way, through an IP exercise of rights. Thus, the 2 regimes of projects implement technological control from distinct yet related directions (Anderman, 2007; Drexler, 2008; Nguyen, 2010). These well-settled scholarly strands agree that it is not enough to have ownership of a technology to create a legally binding control over it, as this depends on the contractual conditions that are put in place to control the exploitation of the technology.

These capabilities can be disseminated to a target area with a great degree of precision through licensing agreements. A licensor can be the legal owner, but be giving another company the exclusive commercialization rights, in a territory or for a field of use. A license can be sublicensed with the licensee not allowed to assign it. For an agreement to allow use but not modification, reverse engineering, disclosure or transfer. Joint-development arrangements can make a difference between using pre-existing “background” IP and “foreground” IP created after the joint-development has taken place, and contractual arrangements can specify who is allowed to use any innovations, which may come out of the joint-development, outside the cooperation.

These designs have an analytical importance which goes beyond the mere idea of contracts and the exploitation of IP. Contractual can be a source of commercial important control. It can be used to establish who can access the technology, where it can be used, who can commercialize the technology, if improvements on the technology can be independently exploited and whether technological access remains after termination or in changed corporate hands.

Corporate Transactions, Foreign Investment, and Technology

The second literature seeks to deal with technological relationships in the context of corporate transactions and foreign investment. The increasing use of technology-intensive businesses to expand across borders is done in a form of mergers, acquisitions, minority investments, joint ventures, subsidiaries and other equity participation. Such constructions can provide both access to the technological capacities as well as non-uniform distribution of business rights and technologies among the participants.

Traditionally the international-business literature has been linked FDI with the transfer of capital, managerial skills, productive capacities and knowledge. FDI can also produce spillovers outside the home firm, which is clearly a case of technology transfer but the extent and effect of which will vary according to the institutional conditions or capabilities of the recipient country (Lowe, 2014). The key is that it doesn't mean technology is effectively under the control of the investor, it is a mechanism through which investment is a potential source of technology transfer.

This distinction becomes especially meaningful in the event the investment does not constitute a complete acquisition. Minority shareholders can have a say in the company by having board seats, access to information, veto power or other ways of influence without holding any intellectual property in an investee company. On the other hand, a strategically important licensee could get huge commercialization rights without owning shares in the technology developer. Joint ventures can also provide further dismemberment of IP, background IP, new IP created in the joint venture, confidential information, and the rights to commercialize the IP.

The distinction between licensing for a corporate transaction and scholarship has taken on an important analytical challenge. For instance, Pandey and Saha (2015) explicitly restrict their analysis of technology transfer to the cases of licensing or assignment



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between unrelated firms and do not consider mergers and acquisitions that involve technology transfer. That is entirely legitimate for such literature on the type of questions it poses, but certain methodological limitations make it clear this is also the space of contemporary hybrid transactions (that is, ones that involve equity investment, licensing, contractual exclusivity, exchange of information, and future technological dependence). These hybrid set-ups are more prominent in the modern international context. Witt (2019) reasons that pressures for delocalization may lead to qualitative changes in the strategies, structures and behaviors of MNE, such as global supply chain organization and cross-border operations. However, more recent empirical studies show that geopolitical fragmentation has now started to impact trade and investment ties, but to varying degrees across sectors and countries (Gopinath et al., 2024). Specifically, Gopinath et al. find measurable decreases in trade and FDI with geopolitically distant blocs compared to trade and FDI with blocks within the geopolitical sphere, in the post-2022 period.

All of these developments make a strong case for an analysis of technology partnerships at transaction level. As the costs associated with the regulatory and geopolitical consequences of acquiring firms outright or investing in any other country is becoming more expensive, corporations may increasingly be tempted to rely on other organizational and contractual mechanisms to access technological competencies.

Trade Secrets, Know-How, and Informational Control

Registered intellectual property only approximate an idea of the technological resources a firm owns. Often, commercial technologies rely on trade secrets, technical know-how, manufacturing methods, engineering practices, confidential data, and experience of implementation, and on organizational know-how. These resources can be a critical factor to whether or not patent or otherwise protected technology can be effectively deployed.

For this reason, technology-transfer scholarship has always seen know-how as part of technology instead of restricting the definition of technology to registered IP. For instance, Pandey and Saha (2015) considered technology for their analysis as patents, know-how or both. This distinction is significant as the legal structure for confidential know-how is different from an exclusive proprietary mechanism arising from a patent. Its commercial value often requires it to be kept secret and have limited access to it.

Information control can therefore be separated from a company's and IP owner's control. An investor could have a big stake in a technology firm without having access to its most sensitive technical data. A patent licensee can have explicit rights to use an invention, but also rely on the licensor to provide tacit knowledge that is essential for effective use of the patent. On the other hand, if confidential engineering information or proprietary know-how is made available, it could give commercially valuable technological capability, although no underlying patent is involved.

In particular, contract is important for a control of the information. Non-disclosure requirements, access restrictions, permitted-use, employee-access, post termination requirements and restriction on dissemination can shape the circle of those who gain technological knowledge and whether the knowledge can be used later on. For cross-border partnerships, these can be as significant to actual technological control as registered intellectual-property ownership.



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From Global Integration to Fragmented Technology Markets

Previous scholarship on technology transfer has evolved in a global economic context that has been marked by growing integration of global production, trade and investment. Today's technology deals take place in a more competitive world. The literature on delocalization, geo-economics fragmentation, supply-chain resilience and technological decoupling shows that cross-border economic interdependence is becoming multifaceted, with considerations not just of traditional commercial efficiency.

The delocalization process could be a real game-changer for the institutional landscape MNCs are facing and entail significant changes in their strategies, organizational designs, global value chains, and political policy (Witt 2019). Technological assets are often not contained within nation-level firms and territories, but within the context of global production and innovation networks, and thus this literature has relevance for technology transactions.

Technological decoupling is the specific issue that Cerdeiro et al., (2021) are interested in addressing this concern. They show that high-tech goods and services can both be sources of technological advance and key players in global value chains, and that if these fail to trade and invest, global value chains may be disrupted. Technological separation therefore does not only impact bilateral trade, but the networks of knowledge, intermediate inputs, investment, and technological capabilities are also impacted (Cerdeiro et al., 2021).

Gopinath et al. (2024) give empirical evidence that the trade and investment styles of today are already changing due to geopolitical tensions. Based on bilateral data, they identify a decrease in economic flows – both trade and FDI – between geopolitically distant blocs, and an increasing number of “connector” economies with neither a strong geopolitical connection to either bloc that act as intermediaries in the negotiations. They have particular implications for global technology partnerships, since their results suggest that in times of fragmentation, trade ties can be reconfigured instead of just broken up (Gopinath et al., 2024).

This is not the trend in the entire world's economy. According to the recent IMF research, FDI fragmentation has been happening especially in key strategic sectors such as computer manufacturing, information and communications technology, transport and professional, scientific and technical services, and is not just an indiscriminate fall in international investment (Norrington, 2024). Important in the present article, contextually, is this sectoral concentration since it indicates that, in a sense, the law of technological investment or technological cooperation is different from that of the regular cross-border investment and therefore the structuring of the legal relationship needs to be addressed separately.

However, fragmentation is not as prevalent as it is sometimes made out to be. Empirical analyses covering the U.S. – China trade-war period have indicated significant impacts on bilateral trade, with more mixed evidence for more widespread trade and investment fragmentation, including technology-intensive manufacturing (Norrington, 2024). Thus, wholesale delocalization is not always the answer but rather a selective restructuring of specific cross-border economic relations.

These new books reveal the changing landscape within which finance of corporate technology transactions needs to be understood. It isn't just a matter of technology traveling from one ever more integrated market to another anymore. It is also a way for companies to maintain access to technological capabilities in the context of an ever-concentrated regulations on investments, trade and technology.



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International Economic Regulation and Strategic Technology

Technology capability is becoming central to international economic regulation, perceived as a strategic object. Foreign-investment screening, export controls, and sanctions, along with competition laws and regulations, industrial policies, research-security measures, and supply-chain interventions, can impact firms' ability to acquire, license, access, or commercialize technology abroad.

The European Union's work towards becoming “strategically autonomous” is one example. Schill (2020) refers to the growing focus of regulators on preserving certain assets and cultivating capabilities in key strategic sectors such as screening of investments and digital infrastructure and enabling technologies. Access to infrastructure, technological capability and reliance on external suppliers can thus have regulatory significance, as may the policy concern be more than a matter of legal title.

Later literature on EU strategic autonomy also sees the development of foreign-investment screening as a tool that is more linked to technological leadership and national and regional security. Investment-screening assessments can be based on the impact of transactions on critical infrastructure and critical technologies as opposed to just the percentage of corporate ownership that is transferring (Schill, 2023).

The regulatory change is noteworthy with regard to the notion of control without acquisition. As public law is increasingly accepting the notion that access, dependence, influence, and technological capability can make a difference without necessarily being the property of individuals or things, private law analysis too must take an interest in the ways private law attributes such capacities through corporate and contractual structures. There is a danger in a 'gold medal' perspective of completed acquisitions that commercially important technological influence can be missed when majorities are not acquired.

This is emphasized by technological decoupling studies. Cerdeiro et al. (2021) demonstrate that measures to limit the trade and investment of high technology have effects across global value and production chains. What is affected by regulation is not just a technology (such as a patent) or a corporation (such as a company), but the network of relationships that constitute how technology is produced, accessed, integrated and commercialized.

Fragmentation across Existing Legal Literatures

As is illustrated by the preceding scholarship, the pertinent problem has been discussed in great length in its respective sub-problems. Scholarship on intellectual property is an analysis of exclusive rights and its exploitation. There is a literature on technology transfer about the transfer and diffusion of knowledge. Licensing scholarship explores licenses and what they allow. Issues of ownership, governance, FDI and organizational structure are discussed in corporate/investment literature. Trade-secrets law is the protection of technological information which is kept secret. International economic law concerns the cross-border flow of goods and services, capital, IP, and more and more key strategic technologies.

Remaining partial in these literatures is the concept of control used throughout.

Table 1. Existing Literatures and the Unresolved Control Problem

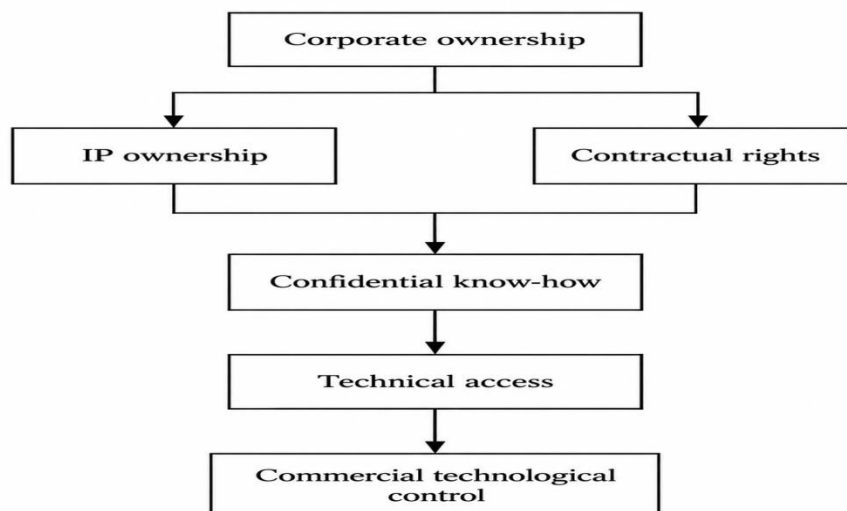
Literature	Principal Object of Analysis	Primary Mechanism of Control	Dimension Requiring Greater Integration
Intellectual	Protected	Exclusive legal	Corporate influence,



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property	technological subject matter	rights	contractual dependence, and technical access
IP licensing	Contractual exploitation of protected technology	License scope and restrictions	Equity relationships and wider transaction architecture
Technology transfer	Movement and diffusion of technological knowledge	Licensing, assignment, FDI, and knowledge flows	Allocation of control within individual hybrid transactions
Corporate law and M&A	Firms, shares, governance, and transactions	Equity, voting, and governance rights	Separate ownership and exploitation of underlying technology
Trade-secret law	Confidential technological knowledge	Secrecy and controlled disclosure	Interaction with corporate, licensing, and infrastructure relationships
FDI literature	International capital and productive investment	Ownership and investment relationships	Firm-level proprietary and contractual allocation of technology
International economic law	Cross-border trade, investment, and IP	International and domestic economic regulation	Private transaction structures creating technological influence
Economic-security literature	Strategic assets and dependencies	Screening, restrictions, and resilience measures	Private-law mechanisms producing control without acquisition

The central analytical difficulty can be represented as follows:





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Each stage of this structure has been explained by the existing literature, but all too often the stages have been discussed in different doctrinal or disciplinary contexts. Thus, a minority investor can be deemed non-controlling under one definition of corporate law, and yet still have under a contract very substantial exclusive commercialization rights. It's possible for the technology developer to be the formal IP owner, but another company may have the infrastructure needed for deployment. Even if one participant has a broad range of licensing rights, confidential know-how may stay with the other one. Thus, the issue is not that control is not a subject of scholarship. Absent integration between the various ways in which control over technology can be constituted.

Research Gap

First, ownership and technological control are often analyzed as two separate disciplinary issues. The world of intellectual-property scholarship logically starts with rights in protected subject matter, and company law primarily has concerned itself with control of business entities. However, cross border technology partnerships can intentionally unravel these two forms of ownership. The two frameworks can alone do not fully determine where the more effective practical power to exploit the technology rests.

Second, there is a vast amount of literature on technology-transfers by the mediums of licensing, FDI, sharing and diffusion of knowledge, and restrictive contractual practices, while there are less discussions on hybrid transactions that involve both sides at the same time. This limitation is evident in licensing studies, which often exclude mergers and acquisitions (Pandey & Saha, 2015), and in FDI studies, where investment and technological spills can only be measured at macroeconomic or sectoral levels and not in terms of proprietary and contractual rights that are created within the partnership.

Third, new research on geo-economics fragmentation and technological decoupling has illustrated how increasingly geopolitical and economic-security factors are influencing trade and investment in technology (Cerdeiro et al., 2021; Gopinath et al., 2024; Norring, 2024). However, most of this literature is concerned with trade flows, FDI patterns, global value chains, strategic dependency and regulatory policy. It does not offer as detailed an examination of how technological control is actually achieved in specific firms, where ownership can be of varying percentages, and where IP rights and/or licenses and/or confidentiality and/or technical access serve as alternatives to full ownership.

The research gap thus exists at the intersection of the above literatures and not necessarily in any singularity. Why the importance of IP, how technology can be licensed, how FDI can transfer knowledge, how corporate ownership can result in influence, and why strategic technologies are increasingly regulated by states are all explained in terms of existing scholarship. What is still not well integrated is the legal issue as to how these mechanisms work together within a single cross-border partnership to distribute effective control of technology.

Contribution of the Article

This article aims to fill the gap by moving the focus of the analytical enquiry from the ownership of the technologies per se to the legal structure of technological control. It differentiates five dimensions: Corporate Control, Intellectual-Property Control, Contractual Control, Informational Control, and Technological Access. These dimensions are then explored in conjunction with each other, and not in lieu.

The framework does not presume that all contractual rights are control rights, or that the classic concepts of corporate and IP rights are outmoded. Instead it offers a way of



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discovering situations where the various dimensions are different. A firm can have corporate influence without technological access, the IP without the ability to commercialize the same, the contraction to exploit the IP without ownership of the firm, the confidential know-how without equity control, or the technological infrastructure which can bind the firm to commercial dependence without owning any stake in the company or in the know-how.

The article therefore elaborates on the notion of control without acquisition as a transactional rather than a new category of property. The term has been coined to illustrate situations in which a commercially important set of competencies over technology is acquired by a mix of corporate involvement, IP rights and licenses, contracts, confidential information, and technology access, without the classic full acquisition of the technology-owning company.

It draws on existing literature on technology transfer and IP (Lowe, 2014; Nguyen, 2010), on IP and competition (Anderman, 2007; Drexler, 2008; Pandey & Saha, 2015), the delocalization and the international business literature (Witt, 2019), technological decoupling (Cerdeiro et al., 2021), and the more recent literature on contemporary trade and investment fragmentation (Gopinath et al., 2024; Norring, 2024). The resulting framework serves as a basis for analyzing the sharing of legal and practical capacity to use, exclude, modify, transfer, license and commercialize technology in current cross-border technology partnerships.

Conceptual Framework: From Ownership to Functional Technological Control The Limits of Ownership as a Measure of Control

As can be seen from the literatures examined in the previous section there is no one proprietary relationship that explains technological control. While they may overlap in a traditional acquisition, corporate ownership, IP ownership, contractual rights, know-how and tacit technologies and access to the technology may now be distinct in a technology partnership that crosses borders. The issue of the analytical problem is, however, not so much an issue of who owns a technology-related asset, but an issue of what legal and practical skills, or capacities, exist for each of the parties with regard to the technology asset.

This distinction starts with the extent of control that the business has. The concept of control has historically been linked to features of the corporate law like voting rights, share ownership, or the representation on the board of directors, and the right of influence over the decision making process. These mechanisms are still significant, as a controlling stake in an enterprise might result in indirect power to influence an enterprise's use of technologies. However, a company's control is not a measure of a company's control of all the technologies that the company uses. Critical technologies can include those that are more than just third-party licensed, can be jointly owned, may be territorially limited, can involve confidentiality agreements, or may have contractual terms and conditions that extend beyond corporate firewall transitions.

The opposite condition is also important. A firm can have no stake in a technology developer but have very significant rights in the developer's technology. Having exclusive licenses, commercialization rights, access to confidential know-how, infrastructure or contractual restrictions on competing partnerships can give a significant commercial influence without majority ownership. Thus it becomes necessary to have a multidimensional concept of control in the separation of corporate ownership and technological exploitation.

This difference is in line with the common understanding of technology transfer



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scholarship, which has always considered licensing and assignment as two methods of transferring the technological capability. For instance, Pandey and Saha (2015) differentiate between the technology-transfer agreements based on licensing and assignment and recognize patents and know-how separately. Likewise, Lowe (2014) shows that foreign investment can be a route for technology transfer, yet it does not necessarily lead to successful technology transfer or acquisition of technological capabilities. The differences help to inform a wider analytical claim: Ownership, investment, access and technological capacity are not synonyms.

Corporate Control

Corporate Control" is the first dimension. For this article, corporate control means the ability to shape the technological enterprise's strategic and operational choices, of the enterprise that develops, owns or commercializes the technology in question. This can occur through a majority investment, but can also come from minority investments (which may include governance rights, board representation, veto power, information rights, shareholder agreements, etc.).

The importance of corporate control is that decisions about the amount of research to be done, licensing strategy, commercialization, technological collaboration and entering specific markets are decisions made under an organizational structure. An investor who has a voice in the decisions can thus have indirect control over technology albeit not the legally owned IP.

The concept of corporate control, however, is quite different from technological control. Let's look at an example of a company buying a controlling stake in a technology company whose technology is critical to the business licensed from a third party. If the licensee is controlled by the corporate, it does not make the acquirer the owner of the licensed IP. The license's territorial restrictions, uses, sublicensing rights, term length, termination clauses and change of control restrictions, limits the acquirer.

It is the same for joint ventures. The participants can have corporate control of a joint-venture company, while at the same time using and dedicating different technological resources in accordance with separate contracts. A joint venture can have just a few rights to use a partner's intellectual property, one can hold patents, and the other can offer manufacturing expertise. So it is an incomplete picture of the technology that each participant possesses when the joint venture is held by a corporation.

Corporate control must now be considered as a potential, but not an alternative, source of technological influence; and, in particular, the nature of rights associated with the technology itself must be examined.

Intellectual-Property Control

The second is intellectual-property control. It relates to legally enforceable rights to technological aspects such as patents, copyright protected software, designs, trademarks (as far as they are relevant on a commercial basis) and other intangible assets. Such rights can give rights-holders the legally binding tools to prevent exploitation without permission, and to organize commercialization in the form of assignments and licenses.

The role that IP plays in the control of technology is clear from the international technology transfer system. TRIPS is an attempt to link intellectual-property protection to innovation and the transfer and dissemination of technology, thereby displaying how proprietary rights can help to organize technological exchange (Lowe, 2014). Meanwhile, research on IP and competition shows that exclusive rights can function in a context of various rights and obligations and that exclusive rights may be



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commercialized through contractual arrangements with a significant impact on their economic exploitation (Anderman, 2007; Drexler, 2008; Nguyen, 2010).

It is important for the purposes of this framework to differentiate between intellectual-property control and formal title and unrestricted commercial control. Ownership creates a significant legal status, however, the effective freedom of ownership can be limited by existing licenses, co-ownership, contractual obligations, regulatory rules or reliance on other complementary technologies. However, an exclusive licensee might have very broad exploitation rights, but not be the owner.

The inquiry will not, however, be limited to that of the registered or legal owner. It queries who is doing what with the technology with respect to use, exclusion, modification, licensing, sublicensing, transfer and commercialization. These capabilities can be centralized in the owner, shared between owner and licensee or shared amongst multiple parties.

Contractual Control

Third dimension is contractual control. Contract is especially relevant to the current regime since it enables companies to arrange the transfer of technological capacities without the ownership of the company or IP. The coverage of technological access and exploitation may be more pragmatically limited through licensing agreements or joint-development agreements, strategic-alliance agreements, joint-venture contracts, confidentiality agreements, cloud-service agreements, technology-transfer agreements, or other commercial agreements.

Contractual restrictions are historically important as shown by techniques of technology transfer. Exclusive dealing, grant-back provisions, restrictions on research and adaptation, tying, cross-licensing, export restrictions, and post-expiration obligations are some of the other clauses in the contracts that have been debated internationally (Pandey & Saha, 2015). That such concerns remain is a testament to the fact that the commercial distribution of technology has not only relied upon formal IP ownership.

Contractual control can be both positive in that it provides capabilities, and negative in that it denies capabilities. Positive rights can include rights to manufacture, modify, distribute, sublicense, integrate or commercialize technology. Negative restrictions can include limitations on entering certain markets, cooperation with competitors, reverse engineering, disclosure, assignment, modification and/or use outside of a specific area.

Especially important is the point of the Exclusivity. An exclusive license can formally belong to the licensor and give the valuable exploitation right to the licensee. In a similar vein, a contractual restriction that a technology provider cannot serve certain competitors can enhance the actual negotiating leverage of a different company, without affecting the title of the technology or the providers of the technology.

Contractual control is thus not synonymous with ownership nor only a by-product of it. Contract is often the key way in which new technology is transferred.

Informational Control: Trade Secrets and Know-How

The 4th dimension is informational control. Frequently, technological resources encompass knowledge which is not adequately captured by patents, copyright rights and other procedural IP rights. Know-how, whether or explicit (such as technical specifications, manufacturing know-how, confidential datasets, algorithms and processes) or tacit (such as engineering expertise, testing information and know-how), and, trade secrets and services, can be crucial for the commercialization success.

Pandey and Saha's (2015) treatment of technology as a whole, including patents and



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know-how is a reflection of the importance of this distinction. The formal authorization to use an IPR may thus prove to be commercially inadequate if the licensee is not knowledgeable enough to use the technology effectively.

Access is a vital part of the informational control. The confidential technological knowledge holder can decide to whom, why and for how long to pass on the information and under what conditions. Control can be maintained even after some technology rights are licensed through non-disclosure agreements, permitted-purpose clauses, information-security clauses, access restrictions or post termination confidentiality clauses.

Asymmetrical dependence can thus result from informational control. A partner can have formal commercialization rights, and also be relying on another partner for ongoing technical services or private expertise. On the other hand, if that participant has a lot of technical expertise, own a small stake in the company, but has a lot of influence in the development and implementation of technology, then that person is technically the true owner of that company.

This aspect is particularly relevant in cross-border collaborations with complicated technology, where the transfer of technology may not be enough to have a successful exchange of information. It could involve the ongoing collaboration, training, technical support, access to data or organizational expertise. So who has control over these informational resources becomes pivotal to effective technological control.

Technological Access and Capability

Technological access is the fifth dimension. It relates to the hands-on ability to implement, connect, manage, customize, replicate, increase or otherwise leverage technology. This dimension is intentionally separated from legal entitlement as there is no automatic guarantee that possessing legal entitlement gives rise to the technical capacity to exercise that entitlement.

Infrastructure, computing resources, manufacturing facilities, specialized equipment or facilities, data, interoperability, technical personnel, software interfaces, supply chains, or complementary technologies may be required to access technology. In complicated technological ecosystems, control of such resources may have impact on commercialization even if another party owns the underlying IP.

This distinction is more relevant as more and more technologies are provided in the form of service or infrastructure. One company can contractually have the authorization to use the technology but may still not be able to use it on their own due to the fact that the technology is only accessible by means of infrastructure controlled by the other party. On the other hand, access to key infrastructure can result in significant commercial leverage without being a transfer of underlying technology.

Technological capability thus is an operational aspect of control. The legal positions are set through corporate, proprietary, contractual and informational rights, but ultimately the legal positions are of commercial significance since they govern the susceptibility of technology to use and commercialization.

Functional Technological Control

Now the five dimensions can be combined based on the concept of functional technological control. This article uses the term functional technological control to refer to the capacity of an actor, either alone or through linkages that is legally and practically relevant to the use, exclusion, modification, transfer, licensing or commercialization of a technology.

Functional technological control is not recommended as some separate property right or



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a substitute for existing theories of corporate control, intellectual-property, contract or trade-secret protection. It is an analytical tool to analyze the ongoing interaction of these legally independent mechanisms in the context of one commercial role.

The framework can be expressed as:

$$FTC = f(C, IP, K, I, T)$$

Where:

C = corporate control;

IP = intellectual-property control;

K = contractual control;

I = informational control; and

T = technological access and capability

Table 2. Dimensions of Functional Technological Control

Dimension	Principal Legal or Practical Source	Central Question	Indicative Capabilities
Corporate control	Equity, voting rights, governance arrangements	Who can influence the technology-owning enterprise?	Governance, strategic decision-making, investment decisions
Intellectual-property control	Patents, copyright, designs, and related rights	Who possesses legally enforceable rights over the technology?	Use, exclusion, assignment, licensing
Contractual control	Licenses, joint-venture agreements, strategic-partnership agreements	What technological capabilities have been granted or restricted by agreement?	Exclusivity, commercialization, sublicensing, territorial and field-of-use control
Informational control	Trade secrets, confidentiality, and know-how	Who controls access to commercially necessary technological knowledge?	Disclosure, technical knowledge, confidential information, continuing assistance
Technological access	Infrastructure, systems, data, and technical capability	Who can practically deploy and exploit the technology?	Deployment, integration, modification, scaling, and operation.

The expression is nonmathematical. This does not mean that each variable has a universal numerical weight and these five dimensions are interchangeable. Rather, it suggests that functional technological control is the result of a configuration and interplay of several legal forms of influence.

Control without Acquisition

Control without acquisition refers to this particular configuration, the one this article is mostly about. It can spring up when a firm has acquired commercially important technological skills without actually buying the company that owns or develops the technology.



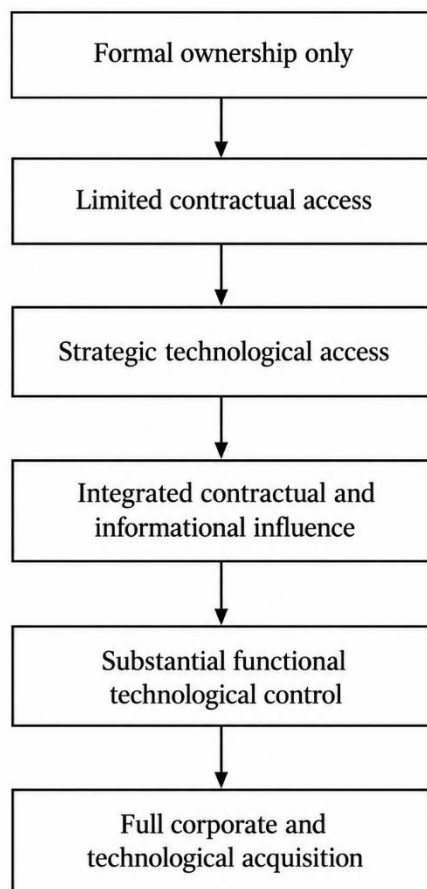
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This control can be established by minority interests, by rights of control in the governing body or board of directors, by exclusive licenses, preferential commercialization rights, access to confidential information, supply of infrastructure, long-term contract rights or technological dependence. None of the separate components must guarantee functional technological control. The key point is whether in combination they give a party significant ability to control access to, or development, use, transfer or commercialization of, technology.

This strategy does not necessarily consider a minority investment or licensing or contractual dependence to be equivalent to corporate control. Rather, it needs an analysis on a case-by-case basis. There is a possibility that a small equity investment with ordinary non-exclusive licensing can result in a low level of technological influence. A greater degree of equity and having exclusive access to information and facilities, along with an absence of competing capabilities, could result in a materially different allocation of capabilities.

So control without acquisition can be considered as a continuum as opposed to a binary state:

Figure 2. Continuum of Technological Control in Cross-Border Technology Partnerships



The analytical significance of this continuum is that intermediate forms that are not necessarily captured in conventional categories based on 'ownership' can be identified. It provides a foundation for analysis of the allocation of technological capabilities through cross-border technology partnerships and the point at which the functional effects of cross-border technology partnerships are in the direction of the functional consequences



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found in the context of acquisitions.

The next step in the analysis is thus to shift from the conceptual categories to the transactional structures. It explores the various ways in which minority investment, joint venture, strategic alliance, licensing agreement, technology-transfer agreement and other cross-border partnerships mix these five dimensions of control.

Transactional Structures of Control in Cross-Border Technology Partnerships

Translating Technological Control into Transactional Structure

The conceptual separation of the control over a firm's technology, its contract, its knowledge base, its information, and its ownership as a corporation is only relevant for the law when analyzed through the organization of technological collaboration that firms undertake. There is no standard organization model for cross border technology partnerships. They can take the form of minority equity investments, joint ventures, strategic alliances, technology licenses, joint-development contracts, technology-transfers, infrastructure agreements or any mix of these structures. But the technological control that is assigned rests not so much on the formative designation given to a transaction as on the bundle of rights, restrictions, information, and capabilities that are generated by this designation.

This is especially significant, as many partnerships today involve a combination of corporate and contractual approaches. An investor might receive a minority stake and also get various other benefits such as a license, access to confidential information, preferred commercialization rights or infrastructure commitments. A joint venture can be a joint entity, but rely on the other party's technology which is not a joint technology. A strategic alliance can be a no equity-sharing agreement, but can still give one partner access to a lot of technology and markets.

Showcasing the real-life impact of these partnerships, regulatory scrutiny of key tech relationships reveals the increasing relevance of these partnerships. The U.S. Federal Trade Commission (FTC) report on the partnerships between major cloud-service providers and generative-AI developers included equity and revenue-sharing models, consultation and control rights, exclusivity clauses, cloud-computing agreements, sharing of technical and business information, and technological integration (Federal Trade Commission, 2025). These arrangements occur in the AI industry, but they are a form of a broader type of transactional occurrence, large technological influence can be built by several layers of legal relationships without a traditional full acquisition.

Thus, the transaction itself is the unit of analysis that should be used. All the elements of equity, IP, contract, information and technological infrastructure need to be analyzed in concert to assess the actual distribution of commercially important capabilities.

Minority Equity Investments

Minority investment falls somewhere between arm's-length commercial contract and a complete acquisition of the company. In general, a minority shareholder has limited rights of ownership based on his or her minority interest. Typically, the rights of a shareholder having a minority interest are limited in scope. However, the importance of minority ownership will depend on the governance and contractual rights which come with the investment.

These rights can be represented on the board, access to corporate information, consultation rights, consent rights regarding specific decisions, protection against specific corporate actions, participation in future financing or other negotiated avenues of influence. The equity stake thus only gives a first glimpse of the investor's stake.



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The difference is more pronounced where the investor at the same time holds a technological or commercial relationship with the investee, as this relationship can be interpreted as a control. A single company can be a shareholder, a licensee, an infrastructure provider, customer, a distributor, a research collaborator, or commercialization partner. Every relationship establishes a possible unique source of influence. These two roles can yield a commercial role much more powerful than what equity alone would indicate.

This is what the FTC's look at key AI partnerships shows. In its study, it found associations between various types of financial involvement and consultation rights, exclusivity agreements, cloud agreements, information sharing, and access to technological resources (Federal Trade Commission, 2025). The reason these arrangements are important is not that the investment of the minority shareholders is necessarily deemed to be a control, but that the equity relationship must be considered in the context of the arrangements.

The status of minority ownership is thus not a criterion but one variable in the functional technological control. The value grows in cases of rights or protection, which are based on proprietary, contract, information or infrastructure rights.

Joint Ventures and the Division of Technological Rights

One of the best examples of this separation of corporate and technological ownership is the joint venture. Two or more enterprises can together form or operate a business, but each own the technologies that are necessary for the business. This can create a legal structure that assigns rights of corporate governance, IP ownership, use of technology and commercialization to multiple players.

One of the key issues in technology partnerships that involve joint ventures is the difference between background and foreground IP. Background IP typically refers to technological assets which participants bring into the collaboration prior to its inception, and share for specific purposes. Technology made by the collaborative activity is a foreground imp. Different ownership and licensing arrangements may be made in each category.

For instance, one of the parties can own patents and license them to the joint venture. One may bring a manufacturing knowledge or technical information that is confidential. Technologies that were further developed by the venture could be the property of the venture, one of the participants or jointly with several participants, depending on the contractual rights and obligations for use and commercialization. Hence, shared control over a joint-venture company does not imply shared control over the technological resources of a company.

It becomes increasingly critical that the contractual structure of the joint venture is in place. The rights of use, territorial markets, licensing rights, improvements, access to background technology, ownership of new inventions, confidentiality, sublicensing, and post termination exploitation may be covered in agreements. These provisions can then affect the technological standing of each of the participants, apart from the shareholding interests.

Joint ventures across the borders complicate geography. Patents and other IP rights can vary from country to country and commercialization rights can be geographically allocated by licensing agreements. The project might consequently rely on the availability of national IP rights and private agreements, rather than on a single worldwide right.



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Strategic Alliances and Non-Equity Partnerships

Strategic alliance reveal that technology can be influential without any equity acquisition. Firms can still work together, either under contractual agreements, involving R&D, manufacturing, product integration, distribution, data, infrastructure, technical services or commercialization, and legally continue to be independent companies.

Mechanisms capable of shaping technological behavior do not go away when they are missing because of the lack of equity. To prevent a technology developer from entering similar relationships with competitors, exclusivity can be an important consideration when negotiating the sale of a technology. Selected access terms can be beneficial to one partner when accessing new technology. There is potential for economic dependence in long-term purchasing and/or capacity agreements. The technical integration may make the switch more difficult, and information sharing agreements could result in access to commercially sensitive knowledge.

These mechanisms can be especially important in cases of multiple mechanisms. A commercial partner can have no interest in the technology developer but receive an exclusive license, important access to future developments, confidential technical information and a central position in the distribution or hosting of the technology. It is therefore possible to have a formal corporate independence, but have high levels of contractual and technological interdependence.

A modern example of this type of relationship is the FTC's study of relationships between cloud providers and AI developers. The agency identified contractual deals involving an agency's cloud spend, limitations on relationships with other providers, limitations on access to technical and business data, and the potential to incorporate artificial intelligence (AI) tools into current products and services (Federal Trade Commission, 2025). The features mentioned above show the dependency that can be created through strategic partnerships that is not necessarily of corporate ownership.

So a strategic alliance is a key element of the idea of control without acquiring. They show how private ordering can be important for a large technological influence, by means of contract, information, infrastructure, and commercial dependence without having a single touch or a formal merger on the corporate level.

Technology Licensing as an Allocation of Commercial Power

The main legal means to differentiate exploitation rights from ownership is technology licensing. Not only is the importance of a license dependent on whether a license has been granted, but also on the specific rights and restrictions that are included in the license agreement.

Contractual provisions on exclusive dealing, grant-backs, research restrictions, adaptation, tying, exports, cross-licensing, and continuing obligations are important issues that have been addressed by technology-transfer scholarship (Pandey & Saha, 2015). The restrictions illustrate that the commercial implications of licensing are not just a function of the underlying intellectual property right.

There are some variables which are especially significant in deciding on allocation of control. Only if the exploitation is exclusive will the licensor be able to give permission for other competing exploitation. The licensee is restricted on where they can operate as outlined in the territorial provisions. Technological exploitation is divided between industries or applications, due to the field-of-use restrictions. Whether the licensee has the ability to license to third parties is governed by the provisions of the sublicense. The clauses relating to assignments have an impact on the transferability of the technology, the modification and improvement clauses have an impact on whether or not the licensee



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can modify and improve the technology themselves.

An exclusive license can then give the licensor the formal ownership of the work whilst enabling the licensee to enjoy a wide commercial influence. However, a wide license can also generate some degree of autonomy in the licensee where the licensor needs to keep providing updates, confidential know-how, technical assistance, data or infrastructure to the licensee.

Licensing should thus be measured as per the abilities it provides. Who can use the technology, exclude competing exploitation, modify, authorize third parties, transfer rights and commercialize the resulting products or services are legally relevant questions that are not excluded. These questions relate directly to the functional technological control framework, and relate to licensing.

Trade Secrets, Know-How, and Continuing Informational Dependence

Formal IP rights are just one of the technological resources needed for a successful commercialization. Confidential information such as technical information, manufacturing expertise, internal processes, datasets, engineering knowledge, experience of implementation and source materials, and other types of know-how are often crucial to complex technologies.

The distinction is important in the context of technology-transfer scholarship that has considered technology to be both know-how and patents (Pandey & Saha, 2015). The difference has a large impact on the transactions. A firm may have a license to use a patented technology, but not have the confidential knowledge necessary to efficiently use the technology.

Confidentiality agreements, technical-assistance agreements, information-access provisions and limitations on use are often used as technology partnerships. These agreements provide for the sharing of confidential knowledge, who has access to confidential knowledge, whether the confidential knowledge can be used outside the partnership and what obligations remain after termination.

This sort of contracting can result in ongoing informational dependence. A recipient may gain a significant amount of exploitation rights, but still require reliance on the tech provider for updates, maintenance, troubleshooting, enhancements and/or specific expertise. There can thus be formal legal authorization without limited technological autonomy.

The level of technology transfer, therefore, needs to be assessed not only as an indication of whether the IP rights have been granted for license or assignment, but also as an indication of whether the knowledge necessary should be made available for independent exploitation.

Infrastructure as a Source of Technological Dependence

Technological control can also be achieved by other resources that are not in the form of corporate ownership nor IP. Many modern technologies rely on a specialized infrastructure such as computing power, manufacturing plants, telecommunication networks, distribution networks, technical platforms, specialized equipment, data resources and related technologies.

When infrastructure is dependent, it generates a unique type of commercial influence. A company can have the technology either owned or licensed but may not be able to use the technology at scale without infrastructure controlled by another company. On the other hand, an infrastructure provider could have no ownership stake in the technology, but could be a strong player as the technology's commercialization would rely on the



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provider's resources.

This is especially apparent in technological markets with cloud based products. The FTC reviewed key AI relationships, and found that the contracts included significant commitments to cloud computing, access to computing resources, data sharing provisions and technical aspects could make it more difficult to switch providers (Federal Trade Commission, 2025). These arrangements are not only important for AI, but for other factors as well. Similar dependencies can also be found in any commercialization environment that needs specific facilities and/or supporting technological tools.

What is also clear is that there is a difference between legal freedom and practical freedom, as is illustrated by the infrastructure dependence. A contract might allow a firm to use alternative suppliers when it is impractical or costly to switch suppliers for migration, interoperability, retraining, technical redesign, or long-term financial obligations. However, the basis of assessing technological control goes beyond a contractual prohibition. The dynamics of the practical architecture, in which contractual rights are exercised, should also be taken into account.

Exclusivity and Contractual Dependence

The technological capabilities can be significantly redistributed if there is no change in ownership, which can be done in the context of exclusivity. An exclusive license could be used to prevent other parties from exploiting the work in a specific market. There may be restrictions on working with the other technology providers in a strategic-partnership agreement. A distribution agreement can provide for one company to use the commercialization rights first. There can be infrastructure agreements that make it impractical to have alternatives.

Not everything that is exclusive is necessarily under control. It is significant based on the terms of the agreement, the scope of the agreement, the subject matter of the agreement, territorial scope, termination rights and interaction with other terms of the agreement. An exclusive license with a limited scope of protection could perhaps only offer the commercial certainty that has to be had to warrant investment. The same can have a significantly different impact in the case of long duration, confidential information access, large levels of infrastructure dependence, preferential rights and high switching costs.

It is the combination of these elements that is more important than each provision taken separately. Legal restrictions and practical dependencies interact the strongest and strengthen contractual dependence. A tech developer can keep corporate and IP ownership and remain commercially reliant on another company for funding, infrastructure, distribution and/or market access. This form of control without acquisition is especially significant as it involves a formal relationship without transfer of ownership but with practical control potentially limited.

Hybrid Transactions and the Aggregation of Control

Hybrid transactions are the most analytically relevant technology partnerships. These arrangements are a mix of legal arrangements and no one element on its own captures the emerging mix of technological capabilities.

Discuss a cross-border collaboration where an investor makes a minority investment and is provided with a seat on the Board of Directors as an observer. The investor is given exclusive commercialization rights in specific markets in a separate agreement. The investor provides the technology developer with infrastructure, provides the technology developer with confidential technical information with an eye to integration, and gives



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preferential access to technology developments that may occur in the future. None of these arrangements alone is indicative of comprehensive control. However, when these two work together, they can have a significant impact on the development of the technology and its commercialization.

This collection issue is the reason why it is important to go beyond formal classification when using transaction analysis. Licensing and infrastructure are not described, and so are not included in the relationship being a minority investment. It is incorrect to say that it's a licensing agreement, since it's a matter of governance influence. The association of it as a business arrangement ignores confidential information and technological reliance.

Cumulative is the correct procedure, but not mechanical. Several rights do not necessarily imply the presence of functional technological control. Their legal scope and the practical interaction should be explored. Little influence may be gained from a small investment and ordinary non-exclusive license; but a different influence may be achieved if the information is invested in a minority, and given with privilege of access, dependence on infrastructure, and commercialization rights.

The key issue is, do the different arrangements have a meaningful impact on the ability of the other participant to decide about how the technology is utilized, developed, licensed, transferred, or commercialized?

Transactional Assessment of Functional Technological Control

Conceptual framework can then be implemented by making a structured analysis of each transaction. The first inquiry is about the corporate relationship—stock ownership, participation in governance, voting rights, information rights, and other ways of exercising influence. The second is intellectual property issues - ownership, licensing, exclusivity, territory, field of use, sublicensing, modification and transferability. The third is about contractual rights and restrictions which are not part of the formal IP license.

Thereafter, the analysis should be highlighting the distribution of confidential information and know-how. This encompasses the extent of disclosure, ongoing technical support, access to enhancements, confidentiality requirements and the post-closure management of knowledge. Last but not least, technological access to the technology, such as infrastructure, data, manufacturing capability, computing resources, interoperability and other complementary technologies that are needed for commercialization.

These should not be made the basis of a general numerical test. The meaning of each dimension is technology and transaction dependent. The significance of infrastructure may be the key in one industry, whereas it could be a trade secret or patent in another. The aim of the framework is then to ensure that the various technological influences coming from legally separate sources are taken together.

This is also a transactional approach that maintains the separation between influence and acquisition. Having technological control does not automatically imply that a partnership should be deemed to be a merger nor do it convey ownership of technology. Instead, it sets out the circumstances that, with the use of corporate, proprietary, contractual, informational and technical arrangements, can give rise to commercially significant control in the absence of an obvious “full acquisition”.

The analysis carried out in this section is consequently the link between the conceptual framework and the comparative analysis of real-life cross-border technology partnerships. The next section applies these rules to some transactions or legal systems to see how control without acquisition works in reality.



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Comparative Application: Control without Acquisition in Cross-Border Technology Partnerships

Microsoft–OpenAI: Separating Corporate Ownership from Technological Rights

In the previous sections, it was demonstrated that technological control can be dispersed among corporate rights, IP rights, contract, confidential knowledge and technical infrastructure. This section takes that approach to publicly known technology partnerships across borders. The goal is not to decide for all corporate, merger, competition or investment law purposes whether any specific relationship is a legal “control”. Instead, the analysis focuses on the question of whether or not the transactions represent the broader phenomenon discussed in this article: firms can acquire a substantial amount of knowledge about technology without buying the technology developer.

The collaborative ventures of Microsoft with OpenAI, Amazon with Anthropic, and Google with Anthropic offer valuable case studies as they represent investments, tech access, infrastructure, commercialization, and information relationships. They have also been studied under the Federal Trade Commission's Section 6(b) and so offer a highly detailed public record. The three models are partnerships between “prominent” generative-AI developers and “major” cloud-service providers, and the FTC analyzed their equity and revenue stake, their consultation and control, exclusivity, computing arrangements, information access, and switching costs (Federal Trade Commission, 2025).

These cases are not meant to be indicative of all technology partnerships. The agreements surrounding the development of AI are rather different than in other fields and have been changing over the years, and AI development is particularly reliant on computing infrastructure. They are more useful, however, in illustrating the possibility of distributing various types of control amongst legally independent firms.

Microsoft–OpenAI: Separating Corporate Ownership from Technological Rights

The example of the Microsoft–OpenAI partnership is one of the best examples of the necessity of separating out the ownership and control aspects of technology. In January 2023, Microsoft revealed plans for the next phase of a multi-year, multibillion-dollar investment in a relationship which began with investments in 2019 and 2021. The deal included an investment, supercomputing facilities, rolling out OpenAI models into Microsoft's products, commercialization via Azure OpenAI Service, and at that time, Azure being OpenAI's only partner in the cloud space (Microsoft, 2023).

So, with the framework developed in Section 3, there were therefore multiple dimensions of the situation. There was a relationship between the financial investment and the corporate and economic relationship. This gave rise to an intellectual property/commercialization relationship regarding rights to OpenAI technology. In the technical aspect, Azure resources established a technical relationship. Another path was opened for commercializing the technology when the product was integrated.

The construction also illustrates that the law in the matter can only be considered in dynamic terms and not be surmised from the original deal. In January 2025, Microsoft made it public that it still had the rights to OpenAI intellectual property for use in its products, was also an exclusive provider of the OpenAI API on Azure, had reciprocity agreements to share revenues with OpenAI, and was a big investor in the company. Meanwhile, plans for new computing capacity had become more flexible: Microsoft announced a right-of-first-refusal mechanism, while OpenAI, which is also building out more capacity, reported that it was primarily using this for research and model training



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(Microsoft, 2025).

This relationship then came to a further stage. In October 2025, Microsoft announced that it would own a 32.5 per cent stake in the OpenAI for-profit, excluding the impact of recent funding rounds, and that it would also have ongoing IP rights, API agreements, revenue-sharing agreements and greater freedom to engage in specific activities with third parties (Microsoft, 2025). In April 2026, the companies announced another amendment, whereby Microsoft's licensing rights to the OpenAI models and products would extend to 2032, but will be non-exclusive; Microsoft will continue to be OpenAI's primary cloud partner; and OpenAI will have more flexibility to license products to other cloud providers (Microsoft, 2026).

Analytical significance of evolution of the relationship. Technological control was not determined at the time of investment. It was constantly created or recreated by amendments to the IP access, commercialization, infrastructure and revenue aspects as well as those relating to third parties.

Therefore, there are two proposals to advance in the case of Microsoft and OpenAI. First, while often a significant technological right is transferable without the acquisition of the technology developer, the opposite is also true. Second, it is possible for the level of functional technological control to vary even when the underlying corporate relationship is large. A transaction based approach needs to be able to consider the contractual and technological setting in existence at the moment, and not the one established at the time of the initial investment.

Amazon–Anthropic: Minority Ownership Combined with Infrastructure and Commercialization

Here's a configuration of the Amazon–Anthropic partnership. Amazon said it would invest up to \$4 billion in Anthropic and hold a minority stake in the firm when the two announced their strategic partnership in September 2023. The deal was much more than an equity deal. Anthropic made AWS its main cloud partner for mission-critical workloads, agreed to use AWS Trainium and Inferentia chips to build, train and deploy future versions of its foundation models, and committed to ensuring AWS customers have access to future models via Amazon Bedrock. AWS customers also were to get an early look at certain customization and tuning capabilities (Amazon, 2023).

This structure is important for just this reason: Amazon's corporate control was clearly defined as minority control. The equity relationship by itself, therefore, is not sufficient to account for the commercial value of the partnership. In addition to the investment, infrastructure, distribution of models, collaboration with technology and commercialization take place.

This agreement has later been strengthened. In November 2024, Amazon announced that it would spend an additional \$4 billion and will use its own main cloud provider, AWS, as its primary training partner, besides its primary cloud partner Anthropic. For the “largest future foundation models,” (Amazon, 2024) anthropic would rely on AWS Trainium and Inferentia technologies to train and deploy its artificial intelligence models. The functional-control framework makes us aware of the difference between the various types of influence that can be shown in a transaction. Amazon's minority investment is a corporate relationship not corporate acquisition, in the sense that it is not enough to create such a relationship for it to be considered acquisition. The setup of the infrastructure puts AWS in a crucial place in the technical context where Anthropic creates and releases models. Cooperation in computing technologies thus links the firms' techno liter activities and distribution via Amazon Bedrock establishes a



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commercialization relationship.

The conclusion then is not as sweeping as saying Amazon “controls” Anthropic.” The relationship itself is not sufficiently indicated in the publicly available materials to allow that to be collapsed. Instead, it is a transaction that exemplifies the possibility of a significant level of technological interdependence and a minority investment. The partnership is relevant to control – not through the minority equity interest alone, but through investment, infrastructure, distribution and technical collaboration.

Google–Anthropic and the Possibility of Overlapping Technological Relationships

The Google – Anthropic dynamic is another significant one for technology providers: being able to have multiple strong ties to a major technology company. In the context of the FTC's Section 6(b) study, Google–Anthropic was contrasted with the Microsoft–OpenAI and Amazon–Anthropic relationships and the larger class of arrangements was characterized as those with financial investment and non-monetary transactions between dominant cloud technology service providers and AI developers (Federal Trade Commission, 2025).

What overlaps in the partnerships of this case tell us about technological control is the analytical importance of this case. But if control were defined only in terms of corporate ownership, the control relationship between more than one investor might be studied in terms of the investors' own shareholdings. However, functional technological control needs to be analyzed separately with regard to the rights held by each partner for infrastructure, information, commercialization, governance and technology.

A technology developer can thus reside in multiple overlapping ecosystems without giving up any control at all to any one ecosystem partner. There might be a company that has the computing resources, another that has the commercialization rights, and more than a few that have financial interests. Rights can also be subject to movement with time.

This is another reason why binary classification is to be avoided. A significant strategic partnership need not mean that the technology developer will have lost independent control, nor the absence of majority ownership indicate that the technology developer will not exert meaningful influence. It is the setting of specific rights and dependencies that is important.

The FTC Findings and the Aggregation Problem

The 2025 study by the FTC is especially useful in studying the three partnerships as a group, and examining the commonalities of transactions. The agency disclosed equity and revenue-sharing interests, consultation and control rights, exclusivity clauses, significant cloud-computing obligations, access to confidential technical and business information, and possible impacts from being able to switch between cloud vendors. It also noted that the cloud providers are creating AI models and products themselves (Federal Trade Commission, 2025).

These results reveal an apparent “aggregation problem.” Each element can be reviewed in a traditional legal manner using a different legal perspective. The analysis of equity rights is part of the corporate and investment analysis. When you're using a model or model rights, you're dealing with intellectual property and licensing issues. Exclusivity is at first contractual, and can also have competition-law implications. Questions of trade-secret and/or confidentiality arise from confidential information. Commitments which are related to computing involve infrastructure and commercial contracting. Barrier switching includes not just the architectural design of tech, but also the contractual



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design of tech.

But the commercial relationship that the parties are in is a result of the working of these arrangements.

This analytical contribution of functional technological control is not in the establishment of a legal category for every contractual right. It's the understanding that a technology partnership can be evaluated on a horizontal basis through the legal doctrines. It may be that the practical power one firm has to shape technological commercialization comes as a result of the synergy of rights which seem individually inadequate to create the sense of conventional control or ownership.

Meanwhile, aggregation shouldn't be a rule that all complex partnerships yield control. The FTC itself gave rise to several implications of the partnerships as competition concerns to the extent that it didn't consider the partnerships as acquisitions and didn't assume that each cloud provider controlled its partner. The functional framework also needs to demonstrate content and interaction of rights and not transaction size or commercial importance.

Intellectual-Property Rights within Hybrid Partnerships

The case studies also show the reasons why transaction structure must not be divorced from the consideration of intellectual property. The ability to make use of technology may be more a question of license and contractual access than IP ownership. The value of such rights will vary in terms of their breadth, exclusivity, length, allowed uses, transferability, and connection to other resources.

The partnership between Microsoft and OpenAI is particularly prominent. Microsoft officially disclosed that they still have rights to OpenAI IP and intend to commercialize OpenAI models in their products. Amendments subsequently made changed parts of those rights with a certain amount of technological cooperation remaining. The case illustrates how IP rights can be meaningful for a strategic partnership and also how IP relationships can be flexible and contractual.

This is consistent with the separation made in previous techno-transfer literature. Exploitation can be kept apart from formal ownership through licensing and the actual extent of the transferred technological ability is defined by contractual limitations. The history of the restrictions in terms of exclusivity, research, adaptation, export and other related activities shows that the allocation of technology is always dependent on the contractual architecture of the proprietary rights (Pandey & Saha, 2015).

That's the problem with hybrid technology partnerships: The license is part of a larger corporate partnership. The IP license can include the rights to invest, infrastructure, revenue sharing, product integration, information sharing and governance rights with it. The unit then is not the license itself, but the actual transactional context of the license.

Confidential Information as a Separate Source of Influence

The FTC findings also lend weight to the idea of analytically separating informational control from formal intellectual property rights ownership. The agency noted that cloud-provider partners might be able to get hold on sensitive, technical, and business data that may be unavailable to market participants (Federal Trade Commission, 2025).

This is relevant because technology partnerships may involve more than just the subject matter of a standard IP license, where the technology involves information sharing. Technical integration could involve revealing details of the system architecture, development data, performance data, implementation needs or other confidential information. Commercial coordination may also relate to information on strategy,



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customers, pricing, product development, or expected technological capabilities.

Having access to such information does not create control. However, other ways of influencing can be supplemented with information. A shareholder who participates in the governance of the company, who incorporates technology and who is given sensitive information is different and more than the typical passive investor. Likewise, a technical supplier that receives information to integrate into the infrastructure provider's system is in a different position than the latter.

Therefore, the process of assessing informational control needs to be based on the nature of the information, the contractual reason for access, restrictions on access, access length and the relationship between the information and other rights of the partnership.

Infrastructure and the Difference between Legal and Practical Autonomy

The three partnerships also illustrate how formal legal rights are not necessarily a reliable indicator of the actual technological capacity. Cloud infrastructure is a commercially important piece of the FTC's relationships that relies on the significant computing power needed for advanced development of AI. The agency identified switching costs that could be higher due to large cloud contracts and contractual and technical factors (Federal Trade Commission, 2025).

Anthropic and their partnership with Amazon is a great example of this. AWS was then Anthropic's main cloud provider, and eventually its main training partner, tying the development and deployment of Anthropic's models to AWS services and dedicated chips. Microsoft and OpenAI built a similar partnership, in which computing resources, model access, and commercialization were all entangled and where the specifics of these partnerships have since shifted.

Not having an infrastructure provider does not mean that you are not dependent on infrastructure, or that you are not the owner of the technology. Nor does it mean that using a specific provider automatically means that a legal control is established. It does, however, imply the existence of the practical aspect of technological autonomy. One enterprise might have a strong dependence on the other enterprise's resources to develop or commercialize technology, while at the same time retaining the technology developer's formal IP and corporate independence.

This separation of legal and practical autonomy is thus crucial for the notion of a functional technological control.

Dynamic Control and Contractual Reconfiguration

Another lesson learned from the case studies is that technological control is a dynamic and temporal phenomenon. The rights afforded by a strategic partnership can be renegotiated over time to allow for changing financing requirements, technological strengths, infrastructure markets, corporate configurations and regulatory environments.

It is notable how Microsoft and OpenAI have evolved. In 2023, the relationship highlighted Azure's dominance as an exclusive cloud-provider. By January 2025, the terms of provision of further computing power were becoming more flexible. Subsequent deals changed the IP and cloud rights further; in April 2026, Microsoft announced that its model-and-product IP license would be non-exclusive while OpenAI would get more freedom to provide products via other cloud companies (Microsoft, 2023; Microsoft, 2025; Microsoft, 2026).

This change is an illustration of the reasons why technological control cannot be considered a constant feature of an investment. A minority investor could be given or taken contractual rights. If there is no exclusivity, it can be revoked or renegotiated. The



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dependency of infrastructure can be greater or less. New investors are welcome. Technologies can be made compatible with other systems. IP licenses can be made wide, narrow, exclusive or non-exclusive.

Technological control should thus be assessed within a given period of time. The distribution of technological capability at the time of the transaction may not accurately reflect the distribution of technological capability at the present time.

Comparative Findings

The case studies lead to three general statements.

First, the ownership of a company is not the same as having control over the technology. Minority investments can coexist with large commercial, informational and infrastructural relationships, as well as large corporate ownership without necessarily involving the transfer of full ownership or exploitation of all technological assets.

Next, technological control is cumulative, but differentiated. All the above factors can feed into each other without being legally dependent on each other. The combination of these two must be considered on a case by case basis, not automatically presumed to be a control.

Thirdly, technology control is not static. There can be significant changes in rights without a traditional acquisition or divest. Redistribution of functional technological control can happen while the participating enterprises still have their legal separation, through the amendment of licenses, infrastructure commitments, exclusivity provisions, commercialization rights, and information arrangements.

The results support the main argument of this article. In today's cross-border technology marketplace, the economic issue isn't just one of ownership of the company or of the formal IP rights and ownership. It's also who has access to the technology, who can decide on how it can be used, commercialize it, incorporate it into products, obtain confidential information about it, provide the essential infrastructure, authorize additional exploitation, and limit other technological relationships.

Control without acquisition is then in what is effectively a space between arm's length contracting and traditional corporate control. The cases that are explored in this instance show that this space is significant to commerce and legally is a fractured one. The following section examines the added-layer of complexity when such privately negotiated arrangements cross borders and relate to international trade, investment, technology-transfer and economic-security regulation.

International Economic Regulation of Cross-Border Technological Control From Private Transaction Design to International Economic Regulation

The foregoing analysis shows that technological control can be created by a variety of methods, including participation in the equity, intellectual property rights, contractual limitations, confidential know-how and technological infrastructure. If these arrangements are trans-border, however, their legal meaning can only be grasped in a private law context. The same transaction can involve international IP rules, trade disciplines, investment regulation, foreign-investment screening, export controls, and new economic-security rules and measures at the same time.

This interaction has taken on heightened significance owing to the two roles played by technology in the international economy. It can be a business asset that might be licensed or invested, sold, or exploited, or a strategic capability that can be moved whenever and wherever the government desires, or limited, monitored, or even prohibited. The law, therefore, regulating cross-border technology partnership presents a tension underneath



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it, between technological exchange and technological security.

The international intellectual-property system acknowledges the connection between intellectual property protection and dissemination of technology. Article 7 of the TRIPS Agreement states that IP protection and enforcement should be conducive to technological innovation and technological transfer and diffusion and that Article 8 acknowledges that measures may be taken against practices which unreasonably restrict trade or have an adverse effect on international technological transfer. 7–8).

The 21st century economic-security regulation adds another worry. Governments are more interested in who is getting access to critical technologies, sensitive information, technological capabilities, and strategic infrastructure rather than mostly interested in the transfer of technology. The regulatory framework thus directly affects the functional technological control concept presented in this article.

Intellectual Property and the International Organization of Technology Markets

IP rights are territorially established and enforced to the extent that technology commercialization often involves transnational networks. A technology partnership could consist of: patents granted in various countries, copyright protection of software created in one country, confidential information delivered in a second country, manufacturing in a third country, and market entry in different countries.

The TRIPS Agreement sets a multilateral floor for the protection and enforcement of IP rights and explicitly links the protection to technology transfer and dissemination. The relationship between this is expressed in Article 7 of the international IP system as an objective of the IP system, and Article 66.2 of the TRIPS Agreement requires developed-country Members to provide incentives for enterprises and institutions to promote technology transfer to least-developed countries (LMDCs). 7, 66.2).

This is in line with the longstanding notion that IP rights, trade, investment and technology transfer are intertwined in international economic development. While looking at the extent to which the international legal architecture facilitates technological acquisition and diffusion, Lowe (2014) focuses on developing countries and how they saw technology transfer as an important part of the TRIPS bargain.

If cross-border technology partnerships are the case, however, the question goes beyond just the existence of IP protection. Internationally protected technology might be commercialized via private agreements which impose various exploitation rights other than formal ownership. Patent holders can choose to give territorial licenses; confidential know-how can be licensed separately for each region; commercialization rights can be split between corporate affiliates or separate partners.

The international IP system, therefore, creates important legal parameters for technological transfer but has no direct influence on the functional technological control of a transaction. Such distribution is still highly influenced by the private contractual architecture.

Technology Transfer and the Limits of the Multilateral Trade Framework

Trade-investment-technology transfer nexus is not sufficiently embedded in WTO law. This is illustrated in the Agreement on Trade-Related Investment Measures. TRIMs covers investment measures in relation to goods trade and any measure which is inconsistent with the GATT requirements on national treatment and quantitative restrictions. Does not create a global multilateral framework for foreign investment or technology transfer.

WTO's self-explanatory negotiating history is especially enlightening. During the



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Uruguay Round, technology-transfer requirements were discussed, although the TRIMs Agreement that was eventually agreed upon is much more limited and deals mainly with technology-transfers in trade in goods.

With technology partnerships, this is limited coverage is important. A transaction that crosses over borders may be related to foreign investment, licensing, services, confidential information, data, infrastructure, and technology transfer. None of the WTO texts covers that whole chain of transactions.

Fragmentation that occurs as a result of this is similar to the fragmentation of private law identified above in this article. Technology control at the transactional level is shared within corporate, proprietary, contractual, informational and infrastructural relationships. Those relationships at the international regulatory level are met with various elements of trade, investment, IP, services, and domestic regulatory law.

This means that some technology transfers can be legally allowed to be invested, but other technology transfers cannot. Or, investment might be subject to screening even if the same commercial licensing would still be feasible. International economic regulation, therefore, does not only play a role in the mobility of capital across borders, but also in the mobility of the accompanying technological capabilities.

Foreign-Investment Screening and Critical Technology

Foreign-investment screening offers perhaps the most direct recognition of the regulatory authorities of the interdependence of corporate acquisition and access to technology, but also highlights their analytically separateness. New screening tools are increasingly used to value foreign investment-related technologies, sensitive information, IP and technological capabilities.

A case in point is the European Union. According to the EU framework of 2019, sensitive information and critical technologies, including artificial intelligence, robotics, semiconductors, cyber security, aerospace, quantum technologies, biotechnology, were included in the screening factors.

The regulatory approach has evolved over time. The new regulation, adopted in June 2026, and to be enforced from 1 January 2027, is to be based on a common minimum scope of screening, including some specified semiconductor, quantum and AI technologies. The Regulation also acknowledges that foreign access to critical technologies, know-how, sensitive information, infrastructure and intangible assets are important for security reasons.

It is a very pertinent development to the present argument. A typical investment screening seems to be in the corporate transactions, especially foreign investments or acquisitions. However, the regulatory issue could be more than just a business one. The key is not just that a foreign investor acquires shares, but whether access to “sensitive” information, knowledge, infrastructure, strategic capabilities or critical technology is acquired.

A distinction can be made by using the functional technological control framework. One way to technological influence is via the corporation, but the economic and strategic implications of the transaction may hinge upon the information, technology, commercialization and infrastructure rights that go along with the corporation.

Non-Controlling Investments and the Regulatory Problem of Access

The link between investment screening and technological control can be problematic if an investor does not obtain the classic form of control. Although minority investments may not include information rights, participation in governance, licensing, technical



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cooperation, or privileged access to technology, these other rights can be included.

The problem raised here is a regulatory one which is very similar to the private-law problem discussed above. Where technological influence can exist without a majority stake, a regime based on corporate ownership changes could miss some of those transactions where significant technological access is provided.

This question is not as important as it may seem. No single piece of minority investment is enough to constitute technological control and overall regulatory expectations could unwisely undermine necessary investment and international cooperation. The question which is actually relevant is thus: What rights and what capabilities go hand in hand with the investment?

Investment that does not involve the sharing of sensitive technology is a different profile than investment that includes the right to board or confidential technology information, exclusive licensing, joint development or access to strategically significant infrastructure. The functional-control framework provides for differentiation of these arrangements without making any assumption regarding the equivalence of all minority investments and acquisition.

The same logic applies to other than investment screening. Financial ownership is becoming a growing problem for regulators focused on technological security and on distinguishing it from the transmission of technological capabilities.

Outbound Investment and the Movement of Technological Capability

The change from an ownership-based to a capability-based approach to regulation is even more clearly visible in the new outbound-investment policy. Unfortunately, traditional investment regulation has focused on capital coming into a jurisdiction. The question of whether domestic companies can export strategically important technology or know-how by investing overseas is an important topic in economic-security policy.

In January 2025, the European Commission proposed rearranging investments in semiconductors, artificial intelligence and quantum technologies, arguing that this is a key priority in terms of investments. The purpose was to evaluate the risks of economic-security arising from outbound investment that might lead towards the transfer of key technologies and know-how to third countries.

This is a key idea of this article which the regulation is helping to support, that capital and technological control are not one and the same. The technology, expertise, IP or knowhow transferred along with the financial investment can be a reason why an outbound investment is important. On the other hand, a large capital investment with little or no technological transfer can present other concerns.

Functional technological control is thus an analytical connection between private transaction design and outbound-investment regulation. The pertinent question is: Does the transaction provide an opportunity for another party to gain knowledge of, or skills in, strategic technologies in use, development, reproduction, scaling, and/or commercialization?

Export Controls and the Separation of Ownership from Technological Access

Ownership is not the only legally relevant way in which technology transfers across borders that is allowed by export-control regimes. Controls can be applied to technology, software, technical information, equipment or other items, regardless of whether or not the recipient acquires the company that owns them.

The difference has implications for cross-border technology partnerships. It is possible for a foreign investor to obtain an economic interest in a technology enterprise without



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having, in law, the right to particular controlled technology. But a non-investor can get access to technological knowledge through a licensing agreement, through technical assistance, or by collaborating in research projects, and find that he faces restrictions on exports.

The regulatory object is thus often access to technology, not corporate ownership.

This results in a key qualification to private contractual freedom. Parties are allowed to negotiate wide rights on technology but contractual authorization does not automatically mean there are legal rights to cross-border transfer. If a license is issued for access to the technology, it is subject to any public law restrictions. Likewise, there are no restrictions on transferring controlled technology to foreign owners, employees, affiliates or locations as a result of the acquisition.

There is thus a gap between contractual capability and legally permissible capability in functional technological control. A party can have contractual rights to a technology or information that it cannot enjoy in full due to the public regulation of the technology or information.

Economic Security and the Reorientation of Technology Regulation

New regulatory trends in international economic relations are becoming more prominent in the semiconductor industry, artificial intelligence, quantum technologies, digital infrastructure and other strategic industries. Technology is not just considered a focus of innovation policy, IP protection, or commercialization. It is being increasingly assessed by the notion of resilience, strategic dependence, supply security, national security and economic security.

The EU foreign investment framework 2026 is a good example of this trend. It has a clear focus on strategically important technologies and includes the possibility of impacting the access and security of such technologies, intellectual property and other intangible assets. It also covers digital infrastructure, such as specific cloud-computing activities.

This regulatory twist shifts the focus of private transaction design. However, not only in the context of contractual relationships, but also as a source of strategic dependency, the question of exclusivity, infrastructure dependency, access to confidential know-how and rights to technology commercialization can come up.

Ownership and dependence are particularly significant differences. It is possible for a jurisdiction to be the owner of a technology enterprise, but the enterprise is highly reliant on infrastructure, components, data, or complementary technology located in another jurisdiction. On the other hand, a foreign investor can invest in shares with no freedom of access to the technology. Relationships, which conventional ownership categories cannot fully describe, therefore, need to be analyzed in the context of economic-security analysis.

The Territoriality Paradox

Cross-border technology partnerships also bring to the fore what is referred to as a territoriality paradox? Intellectual-property rights and investment screening mechanisms are still largely territorial, as are export-control laws and a host of contractual enforcement provisions, while the technology relationships they govern increasingly are transnational.

Technological assets may thus have varying legal relationships in various jurisdictions. There are markets in which there are patent rights and others where there aren't. Territories might be divided in terms of licensing. Technological access may be limited



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based on destination and/or recipient due to export control. Investment screening could include the nature and the rights of foreign investors. Requirements for data and infrastructure might also influence the place and means for the deployment of technology.

The outcome of this is that technological control that functions effectively can be territorially differentiated too. A firm may have broad commercialization rights in one market, limited rights in another and have no lawful technological access in a third market. Simply stating that he had or lacked control would mask a key aspect of the transaction.

The subject matter and jurisdiction, therefore, must be analyzed with respect to functional technological control. Questions of ownership of the technology, and the legal means by which it is to be exercised are not only who, but also where, of particular capabilities can lawfully be exercised.

Private Ordering and Public Regulation

The central legal issue looked at in this section derives from the interplay of private ordering and international economic regulation. Technological relationships are managed by entering into corporate transactions, IP licenses, confidentiality agreements, exclusivity, infrastructure agreements and so on. A few of the same relationships are regulated by governments in the areas of investment screening, trade rules, export controls, competition rules, and economic-security policies.

Not all such systems have the same notion of control.

Corporate law can be specialized on the subject of voting or influence in the governance. Intellectual-property law concerns itself with subject matter that is legally protected, as well as exclusive rights. Negotiated allocations of technological capability are enforced by the law of contracts. Investment screening can be done based on access to sensitive technology or information. Particular transfers could be subject to export controls, in addition to corporate ownership. Technological dependence and strategic capability can be considered in the economic-security policy.

A technology partnership for two companies on different sides of the border may thus have different legal statuses. A transaction can be a failure in the company's acquisition process, and yet offer a substantial level of technological access. A license could be valid according to private law, and the performance would need regulatory authorization. A minority investment can have a negligible impact on corporate control but can bring the regulatory scrutiny due to the access to the sensitive information or critical technology.

These doctrinal tests are not abated by the principle of functional technological control. The importance of this is that it highlights key similarities in the economic object which each regime tries to tackle from a different legal perspective: meaningful technological capacities.

Implications for Cross-Border Transaction Design

The foregoing analysis immediately has consequences for transactions structuring. There are only two questions in the minds of most people when considering technology transactions – which is the owner and what is the scope of the license? As lawyers increasingly face the question of whether combinations of corporate, contractual, informational and technical rights have regulatory implications in multiple jurisdictions, they must also take into account whether any such consequences would arise.

There should therefore be four or more questions of doing due diligence. First, what is the technology and other "intangible assets" that it involves? Second, who will have what



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rights and be able to do what? Third, what jurisdictions control the relevant investment, transfer, information access or technological activity? Fourth, if the rights to be transferred under the proposed contract are intended to be contingent upon completion, can they be exercised after completion?

This is especially applicable to hybrid transactions. There may be different issues involved with a minority investment when compared to a passive investment, due to their technical nature. There are several potential regulatory differences between the two forms of the IP license, with the latter being supported with confidential know-how. The integration of infrastructure can make the relationship between infrastructure and its underlying IP appear to be dependent.

As a result, along with the traditional ownership analysis, a capability-based analysis is becoming increasingly vital in cross-border transaction design. It isn't just what assets are legally transferred, it's what technological skills the transaction affords each player to gain, retain, limit or use.

Regulatory Fragmentation and the Case for an Integrated Control Analysis

The fragmentation found within private law is repeated at the international level. Various regimes operate over various aspects of the same technological relationship. The TRIPs take a global approach to setting minimum standards for IP protection and explicitly mention technology transfer as an objective. Only certain measures related to trade in goods are regulated by TRIMs. Foreign investment in critical technologies is considered by domestic and regional investment-screening mechanisms. Specific technological transfers are controlled by export controls. Inbound/investment measures are increasingly about the international flow of strategic technological capability.

Instead, no single regime, therefore, offers a complete explanation of the distribution of control over technology in a cross-border commercial collaboration.

This regulatory disintegration further underscores the importance of the use of a functional technological control as an analytical frame. A concept that allows for the starting point to be the transaction itself – the identification of corporate influence, proprietary rights, contractual powers, informational access, and technological capabilities – and then the identification of regulatory regimes for each of these components.

This is also a way to prevent the assumption that economic security translates to limitations on technology transfer with the outside world. World trade law still values tech innovation, tech dissemination, tech investment and tech development. The regulatory hurdle is thus not just to stop technology from crossing borders. It is to differentiate between common, beneficial technology transfer and transactions that create legally relevant kinds of access, dependence and strategic control.

The technological control is thus a private ordering and a public economic control which works in parallel. It is possible to build large technological relationships without traditional acquisition, but that is subject to rules and concerns about the identity of the investor, the sensitivity of the technology, transfer of know-how, location of the infrastructure, and the implications of the relationship for strategy, among other issues. This interaction can serve as an indicator of the potential of the framework of control without acquisition in corporate transactions, commercialization of intellectual property and the future regulation of international technology markets.



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Implications for Corporate Transactions, Intellectual-Property Commercialization, and Cross-Border Commercial Practice

Reconsidering the Relationship between Ownership and Control

In this article, analysis has been developed to disagree with the proposition that technological control is something that can be identified by the mere existence of a corporate ownership or merely used to show intellectual property titles. Commercially important technologic skills can be spread out among multiple legally-discrete relationships, as illustrated by the cross border technology partnerships. For example, a firm can keep ownership of the enterprise and of its IP while transferring to another firm significant rights related to technological access, commercialization, confidential information and/or infrastructure and/or market deployment. On the other hand, when acquiring an equity position, an acquirer does not necessarily have unrestricted access to the technologies that are used or, developed, by the target enterprise.

This separation has real-world implications since that is how many legal inquiries are naturally ordered when using conventional knowledge of transactional analysis. Corporate attorneys review equity, governance, voting rights and transaction structure. IP attorneys look at the issues of ownership, validity, licensing and infringement. Contractual rights and obligations are the domain of commercial lawyers. Trade-secret analysis involves confidential information and regulatory experts deal with investment screening, export controls and other public-law restrictions. These are all perspectives that are important, but any one of these on its own only provides a part of the picture of the technological capabilities allocated.

Functional technological control is a way of achieving such integration without surrendering their respective doctrinal differences. It brings the focus on the ability to use, exclude, modify, transfer, license, access and commercialize technology, which is a cumulative legal and practical one. The resulting inquiry is thus, capability based, not title based.

This difference applies especially to transactions which lie somewhere between ordinary licensing and a full acquisition. Strategic alliances, joint ventures, long-term technology partnerships and infrastructure partnerships fall in between. Their meaning is not necessarily discernable from the type of transaction.

Implications for Corporate Transactions

The approach indicates that when evaluating technological assets in a corporate transaction, it will be appropriate to consider not only legal title to specific intellectual-property rights, but also the factors that make it appropriate to use such assets. A technology business could have rights split between owners, licensors, infrastructure providers, joint-venture partners, employees, and contractors and other commercial actors, which constitutes the commercial value of the enterprise.

This is directly relevant to structuring of transactions. Share purchase can result in changes in control of the company but still have important technological limitations in place. Possibly restrictions on fields of use or territories exist under existing IP licenses. Access to third party technology could be impacted by change of control. Joint-development arrangements might entail that ownership of improvements be vested elsewhere. There may be restrictions on confidential know-how which remain in effect after the legal sale of the know-how. Important technological infrastructure can continue to be in the custody of a different company.

The other way round also must be taken care of. A transaction may not involve transfer of majority ownership but the investor may be provided with the necessary technological



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capabilities through an accompanying agreement. The involvement of the Board of Directors, rights to information, licensing, exclusivity, technical integration, infrastructure provision or preferential commercialization rights can, in combination, increase the importance of the relationship beyond the equity stake.

The question of transaction should, therefore, not simply be limited to the question of corporate control. It should also put the question if the distribution of technological capabilities changes with the transaction. This distinction is particularly important when the business that investment serves is not a controlling interest in the enterprise qua enterprise, but commercial interest in technology acquisition.

Implications for Technology Due Diligence

The framework also impacts due diligence. Ownership, registration and validity, infringement risk, licenses and assignments, encumbrances, employee-created IP and related issues are the typical areas of conventional IP due diligence in a conventional sense. While these inquiries will never be irrelevant, in technology-intensive transactions there is a need for a more general evaluation of the relationships, which ultimately help to identify whether the technology can be exploited.

It's important, then, that a purchaser or investor should differentiate legal ownership from operational independence. The target might have patents and software, or rely on third party know-how, data, infrastructure, technical services, manufacturing capacity and/or complementary IP. While formal ownership does not change, the end of any one of these relationships can have important repercussions on commercialization.

Similarly, a due diligence investigation should assess the apparent "wide" rights to technology if such rights are limited by contractual restrictions. Exclusivity, territorial, field-of-use, sublicensing prohibitions, assignment restrictions, confidentiality and change-of-control clauses can impact the commercial value of technological assets. Contractual restrictions have always shown the importance in technology-transfer scholarship in relation to how IP could be exploited commercially (Pandey and Saha, 2015).

The capability-based due-diligence inquiry would thus be more than simply "Who owns the technology?" but would also be "What is the company able to do with the technology?". It involves identification of the legal and practical capacity to employ, adjust, combine, license, sublicense, transfer, scale and commercialize the technology, in relevant areas, between legal jurisdictions.

Implications for Intellectual-Property Commercialization

This analysis further underscores the need to integrate IP into a commercialization architecture. While owning IP gives legally important exclusive rights, in practice, commercial technological control often requires a combination of the ownership of IP with complementary assets, infrastructure, confidential information and contract.

This is in line with the difference between the protection of IP rights and the transfer of technology. The process of technology transfer from one enterprise to another can take multiple forms such as licensing, assignment, investment, and knowledge transfer and technological innovation and dissemination are linked objectives in the international IP framework. Lowe (2014) shows that having IP protection and foreign investment does not in itself guarantee effective technological diffusion or capacity building.

In practice, for a commercialization, it is therefore not always the patent, copyright, or other formal right that is the relevant unit; it is a package of technology. This could include a bundle of patents, software, confidential knowhow, technical documents, data,



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training, support, interoperability rights, infrastructure access and ongoing development requirements.

Commercial value of a license thus hinges on whether the licensee also receives any complementary capabilities to exploit the technology. A wide patent license with insufficient know-how can also yield less control than a more limited license with lots of technical assistance and infrastructure. Likewise, exclusive commercialization rights could be a significant economic force, even with the same formal property rights granted to the owner of the object.

This distinction is certainly relevant to emerging technologies where commercialization is dependent upon technological resources interrelated to one another and not the existence of any one IP right.

Implications for Contract Drafting

The notion of contract is particularly significant once the concept of technological control has been developed as divisible. In this sense, transactional agreements are not just instruments that would help to exploit existing property rights, but also instruments which would actually define which technological capabilities each of these parties has.

Drafting in principle should therefore make more precise identification of the object of the transaction. The terms “technology,” “intellectual property” and “proprietary information” may refer to legally separable assets and capabilities. Agreements should differentiate, if applicable, patents, software, source code, technical documentation, datasets, trade secrets, manufacturing know-how, improvements, derivative technologies, technical assistance and the access to infrastructure.

The contract is then to be used to specify rights associated with each part. The terms “ownership” and “access” are different. Access and modification should not be confused. Changes and ownership of improvements should not be confused. The commercialization rights are distinct from sublicensing and/or transferring technology rights. Confidential-information rights should include the names of those who are allowed to receive the information and the purposes for which it is allowed to be received. Continuation should be included in the termination provisions, with regard to the use or return of technological materials.

Preciseness should occur with exclusivity as well. The scope, geographic area and timeframe of the exclusivity provision and how the provision is applied in practice, the other parties to the contract and the connection between the provision and the other obligations in the contract should be taken into account when evaluating the scope of an exclusivity provision. The combination of a number of narrowly drafted provisions can sometimes have a more commercial impact than a single broad restriction.

The drafting of contracts thus becomes one of the main means for establishing, dividing, maintaining and dissolving the functional technological control.

Implications for Technology Valuation

Ownership vs functional control also has implications on the valuation of technology businesses. Compared to formal ownership, the value of a technology asset can sometimes not be determined due to the fact that commercialization can be dependent on rights or resources outside of the enterprise.

If a company owns valuable IP and has no ability to operate the businesses without relying on other companies' infrastructure or know-how, this can have an impact on the maximum value of the IP it owns. On the other hand, a company with a long and effective exclusive commercialization right can reap significant economic benefits from a



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technology on which it does not have the rights.

Thus it is necessary to capture in transaction valuation the durability of technological capabilities. The risks may not be reflected on the balance sheet or IP register, but can be a license shortly about to expire, revocable infrastructure arrangement or dependency on confidential knowledge held by another enterprise. In a similar way, contractual claims by negotiating partners to future improvements or to preferential access to technological developments can create value that cannot be evaluated in an ownership-based approach. This is how functional-control framework relates to the reality of technology commercialization economics and legal analysis. It focuses people on rights and dependencies which have a direct impact on the continuing commercial value of technological assets.

Implications for Regulatory Classification

Counting technological control in the event of acquisition is also not straightforward and poses difficulties for public regulations. Ownership, influence, access and control of a transaction could be defined in different ways in investment-screening, competition, export-control and economic-security regimes.

As shown in Section 6, modern regulatory practice has evolved to look at access to sensitive information, know-how, critical technologies, and infrastructure as well as mostly to majority corporate acquisitions. This is as much an acknowledgement of the reality that strategically critical capabilities can be transferred via license, minority investment, research collaboration, technical assistance and various other methods.

These regimes have statutory tests which should not be replaced by the functional-control framework. Determination of functional technological control under the analytical framework set forth in this paper does not constitute legal control for the purposes of mergers, expansion screening, corporate law and competition law. The jurisdictions and substantive requirements of each regime remain the same.

The framework can still serve as a diagnostic function, however. It can detect technology capacity built through a transaction without having to be registered in the applicable regulatory regime. This can help identify the rationale for a corporate perspective of no control that still results in transactions being subject to review due to the impact on the technology.

The Risk of Over-Regulating Technological Collaboration

But caution is needed when it comes to recognition of control without acquisition, as well. Important commercial and innovative role of international technology partnerships. A means of technology transfer is licensing. Complementary skills can be used with a joint venture. Strategic alliances can allow companies to share the development costs and infrastructure. With minority investment, financing innovation without losing independence of the technology developer can be done.

Interdependence need not therefore be considered as inherently problematic. Nor should all exclusive licenses or infrastructure arrangements or information sharing arrangements or minority investments be regarded as functional control.

A better way is to differentiate the ordinary commercial coordination from that which is a material redistribution of technological capabilities. This involves consideration to be given on the scope, length of time, exclusiveness, substitutability and cumulative working of the concerned rights. It also needs to be understood that technological dependency can be due to the technical features or to the economies of scale.

The analytical frame thus created here is therefore meant to help to better characterize



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and not to establish a presumption against cross-border technology partnerships.

Toward Capability-Based Transaction Analysis

The most important practical consequence of the article is that a capability approach is needed when it comes to technology transactions. This approach starts with the technology asset (or system) and determines the commercialization skills needed.

The analysis identifies then whether each participant has each capability and how that capability is acquired as law. There may be corporate rights determining strategic decision making. Exclusion or licensing rights may be by IP rights. Commercialization and modification rights can be designated in the contract. Access to knowledge can be decided by an arrangement of a trade secret. Relationships with infrastructure may be the deciding factor on if a technology can be deployed at commercial scale or not.

This is a different way of doing the sequence of legal analysis. The question is not started with a label of a transaction and its commercial implications but started with the distribution of capabilities and subsequently, the legal structures involved in such distribution.

This analysis is especially appropriate for the kind of technology markets because there are increasingly many valuable technology systems that rely on a number of complementary assets. Control may be less a question of having one exclusive right to block someone than having to 'co-ordinate' a number of rights and resources required for commercialization.

Broader Implications for International Technology Markets

The international level adds to the complications facing the traditional definition of "domestic ownership" versus "foreign control," namely the issue of "control without acquisition. For a domestically owned technology enterprise the reliance might be on foreign infrastructure and/or financing or licensing or commercialization networks. An investor can have a "significant financial interest" while providing limited access to sensitive technology. A multinational partnership can allocate various technological abilities to various parties in a few jurisdictions.

The nationality of the official owner is thus not the only policy question at hand. It is related to the international transfer of technological capacities.

This observation also calls into question simplistic notions of technology transfer. Not all movement of a license/investment is necessarily accompanied by technological capability transfer. Effective capability might be on the basis of know-how, technical manpower, infrastructure, data, complementary IP or on-going cooperation. On the other hand, significant technological effect can emerge via continuous access even in the absence of any change of ownership.

The notion of functional technological control then offers a common analytical language to examine transactions which fall between technology transfer, corporate investment, IP commercialization and international economic regulation.

Conclusion

A growing number of cross-border technology partnerships call into question the presumption that corporate ownership, IP ownership and technological control go hand-in-hand. The article has shown that these relations can be split up by means of minority investment, joint venture, strategic alliance, license agreement, confidentiality agreement, infrastructure partnership and by other means of private ordering.

The phenomenon which has arisen has been termed control without acquisition. It is not



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a lack of ownership per se, but the potential of commercially relevant technological competencies that can be achieved without traditional “full” acquisition of the technology holding company.

The article introduced the ‘functional technological control’ concept along five analytically separable dimensions: corporate control, intellectual-property control, contractual control, informational control and technological access to explain this phenomenon. The framework reveals that technological context can be divided between various actors and legislation. Whilst important, ownership is just part of a bigger picture in terms of developing and commercializing technology.

Implementation of the framework in the current technology partnerships further illustrated that investment, licensing, information exchange, commercialization and infrastructure can all work simultaneously. Equity percentages, or the formal labels given to transactions, are therefore not a sole indication of the significance of the relationships. They constitute a structure which must be analyzed in a cumulative way, without losing sight of the different individual rights included.

International dimension exacerbates this fragmentation. Various aspects of the technology relationship are governed by intellectual-property rules, technology-transfer principles, investment screening, export controls and economic-security measures. Private agreements can grant a broad spectrum of technology rights but public regulation can limit the rights to specific capabilities for cross-border movement.

The article thus asserts that an orientation from an ownership-based analysis to a capability-based analysis is needed. In the case of companies, the question should be asked in addition to the owner of the enterprise. In the case of commercializing your ideas and intellectual property, it shouldn't stop with just the legal owner. For contract law, it should look to how negotiated provisions are shared as regards the technological capacities. It should differentiate the transfer of capital from the transfer of technology, for requirements for international economic regulation.

There is a danger in taking the word control without acquisition to mean a new legal test that replaces existing doctrines. It has an analytical value. It refers to an increasingly significant class of commerce that is based on a separation between the ownership or proprietary rights on the one hand and the technical capability or contractual power on the other.

Cross-border technological cooperation is becoming increasingly complex, and the principal legal question is thus no longer only who owns the technology, but who can use it, how it is limited, how it can be developed, who can take it over, how it can be integrated and how it can be commercialized – and based on what package of legal rights and technological dependencies.

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