Attachment 1

Study Group on Innovation and Competition Policy

Final Report

June 28, 2024

Study Group on Innovation and Competition Policy

List of Study Group Members, etc.

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(In Japanese syllabic order; titles omitted; positions held as of June 10, 2024)

* Study Group member who participated as an observer up to the fifth meeting and as a Study Group member from the sixth meeting onward

**Study Group member who participated up to the fifth meeting

Study Group on Innovation and Competition Policy

Background of the Study

Schedule of Meetings, etc.	Agenda
First meeting (March 9, 2023)	・Prerequisite conditions for study ・Study of impact mechanisms on innovation
Second meeting (April 5, 2023)	・Study of impact mechanisms on innovation
Third meeting (May 22, 2023)	・Study of impact mechanisms on innovation
Fourth meeting (June 7, 2023)	・Research and development when R&D results are uncertain ・Issues concerning the acquisition of startups ・Study of impact mechanisms on innovation
Fifth meeting (June 19, 2023)	・Study of impact mechanisms on innovation
Sixth meeting (October 27, 2023)	・Discussion points after the resumption of the Study Group
Seventh meeting (March 14, 2024)	・Study of specific issues related to basic approaches for the application of the Antimonopoly Act
Eighth meeting (June 10, 2024)	・Review of the Draft Final Report of the Study Group on Innovation and Competition Policy

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Introduction

It is essential to achieve innovation that leads to the creation of innovative products and services and new markets (stimulation of new demand) for Japan's sustained economic growth. Besides, Japan, which is dubbed as a vanguard nation in regard to societal challenges, may potentially view innovation solve a range of issues it faces. On the contrary, in the real world of economic activities, it has been highlighted that with the advancement of the digital economy and the shift to platform- and ecosystem-based businesses, the dynamism of competition may decrease due to the monopolization and oligopolization of markets as well as the further entrenchment and expansion of such oligopoly and monopoly[1]. In light of this economic environment, ensuring a competitive environment that can promote innovation is an important and contemporary policy issue in competition policy, and it is important to properly assess the long-term effects of possible future innovation on the competitive environment[2].

Meanwhile, innovation, which involves a discontinuity from the past, is a phenomenon that often occurs under circumstances of high uncertainty and is acted upon by a range of factors including technologies, markets, corporate strategies, organizations and human resources, capital markets, social systems and regulations, and cultures. Therefore, the whole process of innovation has not yet been well understood. The field of competition policy, i.e., the impacts on innovation that are delivered by various kinds of corporate conduct, appears complex and dynamic. Theoretical and empirical studies on such impacts have been advanced in the relevant research fields such as Economics (industrial organization in particular) and business administration, and a certain amount of knowledge has been accumulated and is being further built up.

Based on this situation, the Study Group on Innovation and Competition Policy[3] (the "Study Group"), consisting of relevant knowledgeable experts, has been convened[4] to obtain deeper understanding and knowledge on the true state of innovation in the context of competition policy. The

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[1] See, e.g., Study Group on Improvement of Trading Environment surrounding Digital Platforms, *Interim Discussion Paper: Improvement of Trading Environment surrounding Digital Platforms* (2018), Crémer et al. (2019), Furman et al. (2019), and Stigler Committee (2019). Moreover, for individual fields in Japan, see, for example, the Japan Fair Trade Commission, *Final Report Regarding Digital Advertising* (2021), *Report Regarding Cloud Services* (2022), and *Market Study Report on Mobile OS and Mobile App Distribution* (2023).

[2] Even in current Antimonopoly Act enforcement practice, it is potentially problematic if motivation to engage in R&D activities that could lead to innovation is inhibited. For example, the Guidelines indicate the following approaches for such cases:

- A restriction, such as calling for the obligation to transfer results of competitive R&D like improvement inventions to other participants weakens the incentive for R&D activities by the participants to improve such results and would be regarded as being highly likely to involve the risk of impeding fair competition (see 2-2(2)(b)(ii) of Joint R&D Guidelines).
- The imposition of obligations of the non-assertion of rights, etc. in licensing may undermine the licensee's motivation for R&D and impede the development of new technologies, which is taken into consideration while determining whether a license involve the risk of impeding fair competition (see 4-5 (6) of Intellectual Property Guidelines).

Additionally, there was an actual case where, although the first enterprise obtained R&D information of the second enterprise, the second enterprise was concerned that the first enterprise would enjoy an unfair advantage for the product in the market by using the information in product development. The judgment gave consideration to the point that the second enterprise's incentive to engage in joint R&D with the first enterprise was impeded (see Lam Research and KLA-Tencor Business Combination Case (2016)).

[3] Japan Fair Trade Commission website, "Guidelines for the Study Group on Innovation and Competition Policy" (March 9, 2023) (https://www.jftc.go.jp/soshiki/kyotsukoukai/kenkyukai/230309kentokai.pdf) (last viewed on: June 28, 2024)

[4] For information on the status of this Study Group, materials, agenda, etc., see (https://www.jftc.go.jp/soshiki/kyotsukoukai/kenkyukai/innovation/index.html). (Last viewed on June 28, 2024)

Study Group has met eight times to date. This Report, compiled as a result of the study, consists of two major parts.

The first half of the Report is a theoretical and systematic review of the mechanisms by which corporate conduct affects innovation, based on the Study Group's expertise in Economics and relevant disciplines. The second half of the Report summarizes the results of a study into an assessing of the impact of innovation under the Act on Prohibition of Private Monopolization and Maintenance of Fair Trade (the "Antimonopoly Act"), based on the theoretical analysis[5].

[5] Part 1.1 through 3 of this Report is essentially identical to the Interim Report of the Study Group on Innovation and Competition Policy (June 30, 2023).

Part1 Theoretical Summary of the Impact Mechanisms of Corporate Conduct on Innovation

1. Study Approach in theoretical analysis and Prerequisite Considerations

1.1 Study approach

The Part1 is aimed at theoretically studying issues including impact mechanisms that corporate conduct and other factors have on innovation. Accordingly, an approach adopted herein is to start with objectively summarize matters that are considered to be merely theoretically and empirically appropriate while setting aside legal and administrative issues—the current legal structure/system and the administrative interpretation of the Antimonopoly Act—and relations to these issues[6]. In the summarization process, attention was paid to rely to the possible extent on theoretical and empirical knowledge that has been discussed in the academic fields such as industrial organization and that is thus adequately robust and versatile. At the same time, the discussions are supplemented by the reasonable inferences and interpretations based on the knowledge of Study Group members.

1.2 Prerequisite considerations for study

This study began with summarization of prerequisite considerations as far as necessary for the purpose of confirmation.

First, discussions on such issues as impact mechanisms on innovation presuppose that the basic structural outline of corporate activities comprises a layer that supplies and trades products[7] and a layer that conducts R&D for such supply and trade. Firms compete with each other in a layer for product supply and trade (a product market) to attain higher profits using their products. They also compete with each other in an R&D layer to achieve innovation that would lead to quality enhancement and cost reduction of their products or launch of new products. Decision making of a firm on one of the layers is affected not only by environments and conditions of that layer but also by environments and conditions of the other layer; therefore, both of the layers affect each other. In the case of horizontal business combination, combined firm are integrated in both of the layers. In contrast, in the case of joint R&D, participants are integrated only in the R&D layer primarily and continue to conduct activities independently of each other in the supply and trade layer. Given the above structural outline, this study has been conducted with a focus on possible changes that would occur in the R&D layer as a result of a certain corporate conduct.

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[6]Accordingly, Part I of this report theoretically and systematically organizes the impact mechanism of corporate conduct on innovation, based on expertise in economics. Therefore, unless otherwise specified, the term "competition" used in Part I is not limited to "competition" (competition in business transactions in which two or more enterprises supply the same or similar goods or services to the same users) as defined in Article 2.4 of the Antimonopoly Act, but is used in a broad sense in which firms compete with each other to obtain more profits. On the other hand, Part 2 of this report summarizes the concepts and points of focus necessary for evaluating the impact on innovation under the Antimonopoly Act, and therefore the term "competition" used in Part 2 is limited to the meaning of "competition" as defined in Article 2.4 of the Antimonopoly Act.

[7]This includes supplying a technology itself, which is a result of R&D, through licensing or other means (technology trading). (The same applies hereinafter.)

Furthermore, as types of innovation to be covered by the study[8], those directly related to competition policy are adopted. Specifically, product innovation and process innovation, which are primarily thought of as means for a firm to compete in a market[9], are considered.

In addition, this Study Group recognizes "impact on innovation" as the state of changes in R&D incentive[10] of each firm caused by various kinds of corporate conduct. Furthermore, it assumes that an impact mechanism is a theoretical path in economics that observes or predicts such change[11]. Accordingly, the competition situation among firms changes in response to such a change in R&D incentive. While the main object explained by the impact mechanism is R&D incentive, an increase in R&D incentive does not necessarily correspond to the ultimate policy target, i.e. achievement of a competition environment that can promote innovation. However, the Study Group adopts an assumption that there is a causal relationship between them in general.

As described above, impact of corporate conduct on innovation is complex and dynamic. It is difficult to observe innovation; there is bidirectionality such that a competition environment and a market structure themselves are also affected by innovation; and different characteristics specific to a relevant industrial structure and a relevant technology result in differences in manner and strength in which impact appears. Therefore, it is difficult to present a standardized tendency by ignoring these differences. Meanwhile, knowledge on the causal relationship between competition and innovation has been accumulated in recent years, for example, through studies conducted using methods such as a structure estimation approach that considers a dynamic model while focusing on characteristics of individual industries. The Study Group has determined it to be fairly valid that, for a range of industries to which the industry-specific characteristics are applicable, a certain causal relationship or tendency based on factors including industry-specific characteristics should be extracted as an adequately general and common move in light of the purpose of this Study Group, i.e. clarification to gain principled and core understanding in the context of competition policy[12].

1.3 Points to note regarding the results of the study in Part1

This Study Group conducted this study in Part1 base on the foregoing presuppositions. Therefore, the positioning of study results is subject to some reservations and notes.

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[8]As categorization of innovation, Schumpeter's categorization into five types—product, process, market, supply chain, and organizational innovation—is well-known. Other examples include four-type categorization into product, process, organizational, and marketing innovation presented in the international standards (Oslo Manual 2018) established jointly by OECD and Eurostat (European Statistical Office).

[9]It not only includes "competition in the market," which is to compete in an existing market, but also includes "competition for the market," which is to compete to create a new market and standard and become a supplier to the new market as a whole.

[10]This includes necessary inputs and capabilities for R&D, which affect R&D incentive. This incentive would be determined based on an expected return of a firm (see descriptions in 2 and thereafter for details).

[11]Examples of quantitative metrics used for observation of innovation include input metrics and output metrics. An example of the input metric is R&D investment spending. Examples of the output metric are the number of patents, the number and quality of new products (including pipelines (R&D projects for specific purposes in the process toward productization or the target of the projects)), and a productivity increase rate. In empirical research, attributes of these metrics need to be meticulously treated. Given the aim of study of this Study Group, however, it is determined that, insofar as consistency is preserved in a basic action mechanism and a basic direction relating to impact on innovation, the essence of suggestion is substantially unaffected by ignoring these differences in assessment.

[12]These factors and tendency at least serve to provide important viewpoints in observing impacts on innovation.

First, Part1 is intended to summarize matters centering on robust and universal impact mechanisms, that is to say, primary ones, and is not intended to encompass almost all possible impact mechanisms[13]. Likewise, while this study has clarified a general tendency of the mutual relationship between impact mechanisms in consideration of the respective basic structures and characteristics of these impact mechanism to the greatest extent possible, it has no intention to indicate, beyond such scope, the time order or the advantage or inferiority of one to another among the impact mechanisms. The summarization is conducted from the perspective of theoretical assumptions. Therefore, it is the matter of course that whether they actually occur, and how and to what extent they occur should be determined depending on specific details of individual cases.

Second, this study attempts to summarize theoretical frameworks as necessary based on economics, etc. independently of the present legal frameworks and application practices of the Antimonopoly Act; hence, the results of the study themselves do not predict how the legal systems and the Japan Fair Trade Commission's application policies should be in the future.

In addition, please refer to Part 2 for the basic concept of the legal framework for applying the Antimonopoly Act to innovation issues based on the current system of Antimonopoly Act and its operational interpretation.

[13]There may possibly be other assumptions as needed, including one that holds true only under limited conditions or specific unique circumstances or one on which consensus cannot be gained from a board range of economic experts.

2. Study on Impact Mechanisms on Innovation in Individual Behavior Types

As a part of the study on impact mechanisms of corporate conduct on innovation and on related matters, this part cites individual behavior types on which economics field have accumulated relatively large amounts of knowledge and are considered useful for incorporating by reference into other behavior types and understanding across types. These individual behavior types specifically are business combinations (horizontal, vertical, and conglomerate) and joint R&D. This part then examines and summarizes impact mechanisms relating to each of these types, and figure out suggestions that would contribute to the understanding across types, including other behavior types, or the principled understanding.

In Japan, transformation of industrial structures, such as green transformation (GX) and digital transformation (DX), is ranked as a societal issue that will potentially serve as an engine for growth[14]. At the same time, promoting the growth of startup businesses, a driving force of innovation, as well as open innovation with large firms, etc. is demanded of the leading-edge science and technology fields in particular[15]. In light of such most recent socioeconomic circumstances and corporate strategies under such circumstances, business combinations and joint R&D are included among the areas that are highly needed to be addressed by policy measures under the mission of competition policy, i.e. ensuring a competition environment conducive to innovation[16]. Therefore, it is beneficial to systematically summarize impact mechanisms on innovation and related matters corresponding to these behavior types.

[14]Council of New Form of Capitalism Realization, *Grand Design and Action Plan for a New Form of Capitalism 2023 revised* (2023).

[15]Council of New Form of Capitalism Realization, *Startup Development Five-year Plan* (2022) envisages the following efforts: 1) as a way to increase fund supply for startups and diversify exit strategy alternatives, increasing the proportion of M&As among ways for startups to exit; and 2) promoting open innovation where existing firms collaborate with startups.

[16]See, e.g., the following: Part I and Part IV of Green Guidelines ; Startup Guidelines; and CPRC (2019).

2.1 Horizontal business combination

2.1.1 Impact mechanisms on innovation

R&D incentive toward innovation stems from the difference between profit expected to gain in the future if R&D is conducted and profit expected to gain if R&D is not conducted. The more the former compared with the latter, the larger R&D incentive is; and the less the former compared with the latter, the smaller R&D incentive is[17].

A business combination affects such differences between these expected returns in participants and non-participants (competitors), thus affecting the R&D incentives of the respective firms. In addition, the occurrence of a horizontal business combination brings about unambiguous situational changes to R&D-related fields (competition environment, market structure, etc. of a product market based on conditions of R&D activities within participants and the results of R&D) that affect how large the expected returns will be. Therefore, the study on impact mechanisms of a horizontal business combination on R&D incentive focuses on these fields and categorizes and summarizes major impact mechanisms that may emerge as ones that work on R&D incentive.

Specifically, these fields are categorized into fields relating to conditions concerning businesses and profits within participants (Groups A to C) and a field relating to competition environment, market structure, etc. (Group D)[18] [19].

Group A	Appropriability (and spillover)
Group B	Necessary inputs and capabilities for R&D
Group C	Profit structure and conditions
Group D	Competition situation in product market

2.1.1.1 Impact mechanisms in fields in which situational changes may occur by horizontal business combination

2.1.1.1.1 Appropriability (and spillover)

Knowledge and information as the result of R&D has non-exclusiveness (non-appropriability), and (without intellectual property rights) it is impossible to eliminate sharing of the knowledge and information by external parties[20]. Therefore, it is not necessarily the case that the R&D conductor can appropriate all of the profits generated by these results. There may be cases where an external party can gain profits by using the results.

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[17]See page 6 of Dow/DuPont EC (2017) Annex 4.

[18]As a result of a horizontal business combination, conditions concerning businesses and earnings may change not only within a combined firm but also within each competitor. However, so that impact mechanisms can be more concisely understood and summarized, this study does not observe the changes of each firm individually but treats as situational changes in a market which comprises these firms (Group D).

[19]Federico et al. (2019) and Shapiro (2012) present similar categorization.

In the analysis of impacts of a horizontal business combination on innovation, Federico et al. (2019) first explains that it focuses on internalization of business-stealing effect and synergistic effect (including internalization of involuntary spillover, voluntary technology transfer within combined firm, and efficiency enhancement due to a combination of complementary assets) from a business combination. It then examines impacts of overwrap of products and pipelines (overwrap between products and pipelines and overwrap among pipelines) and overwrap of R&D capabilities on innovation in the form of case studies to which the analysis is specifically applicable.

Shapiro (2012) cites three perspectives to take into account when assessing impacts of a business combination on innovation: contestability; appropriability; and synergy. It then argues that, while contestability and appropriability relates to R&D incentive, synergy relates to R&D capabilities.

[20]See pages 21-22 of Odagiri (2016).

Such an externality brought to an external party is called "spillover[21]." However, if this spillover is involuntary on the part of the R&D conductor, it means a situation where external parties do "imitation" or enjoy "free riding," and appropriability of profits generated by the results of the R&D is thus insufficient. As a result of such a situation, the expected return of the R&D conductor is unfairly low, whereby sufficient incentive cannot be maintained. It is therefore important to prevent free riding and secure appropriability regarding the results of R&D[22] to increase the R&D incentive of R&D conductors[23]. Meanwhile, the occurrence of spillover benefits an external party, thus having an aspect of increasing the R&D incentive of the external party. Thus, it can be said that appropriability and spillover relate to each other in such a manner that there is a trade-off between R&D incentive of an R&D conductor and R&D incentive of a free rider that would be benefited by spillover.

In the case of horizontal business combination, the following can be presented as impact mechanisms that change R&D incentive of an R&D conductor and its competitor in terms of appropriability and spillover.

2.1.1.1.1.1 Increase in appropriability (positive impact)

In a case where a horizontal business combination eliminates an external party that is a potential imitator, involuntary spillover (an externality) is internalized (incorporated into a combined firm), resulting in higher appropriability of R&D results, which may increase R&D incentive of the combined firm[24].

It should be noted that, in a case where appropriability is sufficiently secured by such means as intellectual property rights from the start, a horizontal business combination may not additionally increase appropriability. In that case, the combination itself is considered not to increase R&D incentive[25].

2.1.1.1.1.2 Decrease in spillover (secondary impact)

Another aspect to be noted is as follows. Increased appropriability by a horizontal business combination may work to suppress R&D incentive to promote innovation for a party that is benefited from spillover through free-riding, considering that the internalization of involuntary spillover within combining firms ends up reducing the number of R&D conductors that utilize spillover and the number of spillover sources[26].

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[21]See page 44 of Odagiri (2016).

[22]The term "appropriability" refers to a state or degree at which a firm can earn a value from innovation and a state or degree at which the competitive advantage relating to the innovation is protected. More specifically, it is a state or degree at which a rival firm is prohibited from copying successful innovation (including generic products) or inventions can be monetized through licensing (see page 225 of Kokkoris, Valletti (2020), page 6 of Dow/DuPont EC (2017) Annex 4, and page 364 of Shapiro (2012)).

[23]One of the solutions to this free-rider problem is to institute a mechanism that adds exclusivity (proprietary nature), that is, an intellectual property rights system. A representative of such systems is patenting. A patent system provides R&D incentive to inventors by enabling them to appropriate their inventions. See page 23 of Odagiri (2016).

[24]See pages 6 and 8-9 of Dow/DuPont EC (2017) Annex 4, page 90 of Gilbert (2020), pages 66-67 of Katz, Shelanski (2007), page 21 of Jullien, Lefouili (2018), page 7 of Federico et al. (2019), and page 255 of Kokkoris, Valletti (2020).

[25]See page 255 of Kokkoris, Valletti (2020), page 25 of Dow/DuPont EC (2017) Annex 4, and page 89 of Gilbert (2020).

[26]See page 90 of Gilbert (2020) and pages 17-18 of Federico et al. (2018).

[27].

Given this aspect, the assessment of impacts of a horizontal business combination in terms of R&D incentive requires holistic consideration to a change in R&D incentive of a combined firm due to increase in appropriability and a change in R&D incentive of a competitor due to decrease in spillover.

It should be noted that a negative impact on R&D incentive of a competitor due to decrease in spillover can be understood as how necessary inputs and capabilities for R&D are affected in the competitor (see 2.1.1.1.2 below)[28].

2.1.1.1.2 Necessary inputs and capabilities for R&D

In general, R&D for new technologies, etc. has an aspect of contributing to more effective R&D by complementarily combine tangible and intangible assets such as human resources, equipment, technologies, data, and knowledge. Meanwhile, R&D involves more or less uncertainty about whether it will be successful and may often require vast implementation costs. For an R&D conductor to allow for such risks and costs, it is important to confirm the following points: whether it can secure operational structure that would enable it to stably generate necessary cash flows; and whether it can efficiently and effectively utilize a range of resources to reduce the implementation costs.

A horizontal business combination brings changes in necessary inputs and capabilities for R&D in such an R&D conductor. These changes bring a change in expected return of the R&D, and thus bring a corresponding change in R&D incentive. In summary, the following impact mechanisms can be suggested.

2.1.1.1.2.1 Synergistic effect (complementary effect) (positive impact)

A horizontal business combination combines complementary assets (such as human resources, equipment, know-how, and knowledge) in R&D that have been owned by each firm. As a result, a synergistic effect (complementary effect) occurs by which R&D capabilities of the combined firm increase; and the chance of success and the quality of R&D results are accordingly expected to be higher, whereby R&D incentive may increase[29] [30].

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[27]As a result of decrease in spillover, a firm (a competitor of a combined firm) that has been conducting R&D by receiving a benefit from spillover can no longer utilize knowledge and information that has been so far available. Therefore, the competitor's inputs or capabilities fall below those that are needed for R&D. This may reduce R&D incentive on the part of the competitor as a R&D conductor.

[28]With this understanding in mind, consideration would be eventually given to such a change in R&D incentive of a competitor as part of the changes in competition situation of a product market (2.1.1.1.4 below).

[29]See pages 65-66 of UK Merger Assessment Guidelines, page 25 of Katz, Shelanski (2007), page 8 of Federico et al. (2019), pages 240-241 of Saito (2022a), page 225 of Kokkoris, Valletti (2020), and pages 177-178 of Odagiri (2016).

[30]An ex-post evaluation of business combinations in the past (CPRC (2011)) points out that R&D intensities and the numbers of published patents both decreased after business combinations in the majority of cases. Apart from this evaluation, the number of published patents may decrease after a business combination because duplicated patents and patents that have been published for the purpose of protection from a combining firm are no longer needed. Therefore, careful consideration is needed on whether a decrease in number of published patents can be directly interpreted as indicating a slowdown of innovation and R&D.

2.1.1.1.2.2 Reponses to R&D investment risks and costs

2.1.1.1.2.2.1 Increases in investment capability and investment capacity of the firm as a whole (positive impact)

A firm's scale expands as a result of horizontal business combination. Fixed-cost reduction and other efficiency improvements may occur as a result, and a combined firm as a whole may have an increased reserve in cash or assets. This may enable the combined firm to have an increased investment capability and investment capacity for R&D, and consequently, higher R&D feasibility, which may increase R&D incentive[31].

2.1.1.1.2.2.2 R&D implementation cost reduction and resource allocation optimization (positive impact)

It can be considered that a horizontal business combination expands the business scale and the business portfolio, thereby bringing about economies of scale and economies of scope[32] and providing room to adjust the details of R&D activities and the allocation of necessary resources for implementing such activities to more efficient ones. Such reduction of R&D implementation costs and optimization of resource allocation may enable the firm to reduce the period required to achieve R&D results or increase the number of R&D projects[33], [34], [35], and may consequently raise R&D incentive.

2.1.1.1.3 Profit structure and conditions

A firm makes decisions on R&D based on an expected return that would be gained by the R&D, and the specifics of R&D are decided in such a manner as to maximize the expected return. This expected return, however, changes depending on profit structure and conditions (such as profit margin, costs, the production scale, and the business portfolio) in individual parts of business activities. Therefore, if the expected return per R&D investment unit increases by changes in such profit structure and conditions, R&D incentive may increase.

A horizontal business combination changes the profits structure and conditions of combining firms following the integration of their business organizations and assets, and may consequently change an expected return that would be gained by R&D. The following can be presented as impact mechanisms that change R&D incentive of combining firms as a result of changes in profit structure and conditions due to a horizontal business combination.

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[31]See page 175 of Odagiri (2016) and page 67 of UK Merger Assessment Guidelines .

[32]For example, in a business combination where process innovation or product innovation developed by a combining firm can be applied to a product of the other combining firm, the combined firm can expand the sales infrastructure where a cost reduction effect and a quality improvement effect can be generated. This may raise R&D incentive of the combined firm (see pages 24-25 of Jullien, Lefouili (2018), page 392 of Shapiro (2012), page 252 of Kokkoris, Valletti (2020), and page 28 of Dow/DuPont EC (2017) Annex 4).

[33]See page 66 of UK Merger Assessment Guidelines, pages 27-28 of Dow/DuPont EC (2017) Annex 4, and page 8 of Dow/DuPont EC (2017) Annex 4 (material provided by a party concerned).

[34]See 1 in "Introduction" of Joint R&D Guidelines and Collection of Counseling Cases (FY2004) Case No. 6.

[35]See page 316 of Ordover, Willig (1985), page 45 of Odagiri (2016), page 8 of UK R&D Block Exemption Regulations (Updated Recommendation), and page 182 of Gandal, Scotchmer (1993).

2.1.1.1.3.1 Demand expansion effect (positive impact)

In a case where the purpose of R&D is product improvement or new product development (product innovation) to create a new demand, profit earned by an increase in demand increases as a margin per product unit increases. Thus, in a situation where an increase in margin per product unit is expected, a firm's expected return from R&D results (increase in demand due to product innovation) increases, and its R&D incentive may increase in its pursuit of the expected return.

Therefore, in a case where a certain level of rent is generated by a horizontal business combination, R&D (product innovation) incentive to expand the demand for a product may increase in a combined firm due to an increase in the rent (margin)[36] [37].

2.1.1.1.3.2 Margin expansion effect (positive impact)

In a case where the purpose of R&D is technology development (process innovation) to increase a margin per production unit, profit earned from a technology increases as the volume of production to which the technology can be applied increases. Thus, in a situation where an increase in production volume is expected, a firm's expected return from R&D results (cost reduction due to process innovation) increases, and its R&D incentive may increase in its pursuit of the expected return[38].

Therefore, in a case where an increase occurs in production volume per firm through a horizontal business combination, this increase in production may result in an increase in R&D (process innovation) incentive for expanding the margin (=reducing costs) per production unit[39].

Between the demand expansion effect and the margin expansion effect, it can be theoretically said that there is the following mutual relationship. When the achievement of product innovation results in an increase in volume of demand (volume of production), it increases incentive for process innovation. Meanwhile, when the achievement of process innovation results in an increase in margin, it increases incentive for product innovation. For such a mutual relationship to actually appear, however, these kinds of innovation need to be continually achieved.

2.1.1.1.4 Competition situation in product market

A firm gains profits in the market of a product (or technology) to which it has applied the results of R&D for the product, a manufacturing method, etc. Therefore, the competition situation of the product market, which determines the expected return level, naturally affects

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[36]See page 3 of Bourreau et al. (2021) and pages 18 and 25 of Jullien, Lefouili (2018).

[37]This situation, however, indicates that the competition in the product market has been weakened. Accordingly, if the combined firm can earn a larger profit by optimizing the price of the product than by achieving product innovation, its R&D incentive is rather more likely to decrease (see page 6 of Dow/DuPont EC (2017) Annex 4 and pages 2-3 of Federico et al. (2018)).

[38]However, if the horizontal business combination does not contribute to improving production efficiency, a margin expansion effect does not work since such a situation leads to price increase and reduction in production volume (see pages 4, 18 and 25 of Jullien, Lefouili (2018)).

[39]See page 44 of Gilbert (2020), page 8 of Dow/DuPont EC (2017) Annex 4 (material provided by a party concerned), page 364 of Shapiro (2012), page 3 of Bourreau et al. (2021), and pages 18 and 25 of Jullien, Lefouili (2018).

the firm's incentive for R&D activities[40]. That is, a firm's decision on whether it will conduct R&D is strategically made depending not only on the size of profits expected from R&D under the firm's individual internal conditions concerning businesses and profits, but also on relative and external elements of the competition environment such as the competition situation with competitors in the product market and the market structure.

The following impact mechanisms can be presented as those that change R&D incentive of a combining firm in a horizontal business combination and of its competitor as a result of change in the competition situation of a product market caused by the horizontal business combination.

2.1.1.1.4.1 Replacement effect (cannibalization effect)

2.1.1.1.4.1.1 Replacement effect (cannibalization effect) (negative impact)

Provided that a certain level of rent already exists because the situation is such that a firm has a high market share in a product market, if a new product to be launched would substitute for (cannibalize) the sales of the firm's own existing product, a substantial increase in margin is limited (because of the existing rent). Therefore, R&D incentive to launch such a new product may be low (replacement effect (cannibalization effect))[41]. Therefore, in a case where a horizontal business combination brings a combined firm an increased market share in a product market and consequently a certain level of rent, the combined firm's R&D incentive for a new product may decrease[42].

Furthermore, combining firms in a horizontal business combination may have overlapping elements (i.e. an existing product and a pipeline (an R&D project for a specified purpose toward productization or the target of such an R&D project); a pipeline of one firm and a pipeline of the other) or may have similar R&D capabilities. In such a case, although these firms' R&D incentive has been driven up (business-stealing effect) by their relationship of being sales competitors until the combination, this relationship is internalized due to the horizontal business combination, whereby a replacement effect occurs. In a combined firm, incentive to continue to maintain (start) R&D of the combining firms may decrease[43].

2.1.1.1.4.1.2 Regarding what is called "killer acquisition"

In recent years, an acquisition that appears to be economically unreasonable (killer

[40]It can be considered that a firm, even in a phase where a product market does not exist yet or where the firm has not yet entered a market while the market already exists, makes a decision on R&D by assuming a potentially created market or a situation after its entry into a market and assessing an expected return in the corresponding product market.

[41]See page 176 of Odagiri (2016) and pages 2693 and 2697 of Igami, Uetake (2020).

[42]See page 176 of Odagiri (2016), pages 2693 and 2697 of Igami, Uetake (2020), and page 36 of Dow/DuPont EC (2017) Annex 4.

[43]See the following: Part IV, 2, (1), F. of Business Combination Guidelines; 4.2.E of U.S. Merger Guidelines; pages 12-15 of Jullien, Lefouili (2018); pages 6, 10, 12, 17, and 41 of Dow/DuPont EC (2017) Annex 4; page 153 of Baker (2019); pages 71-72 of Saito (2022b); pages 233-234, 243-244, and 255 of Kokkoris, Valletti (2020); pages 93-94, 102, and 129 of Gilbert (2020); page 25 of Katz, Shelanski (2007); pages 391-392 of Shapiro (2012); page 3 of Bourreau et al. (2021); page 3 of Federico et al. (2018); page 20 of Novartis/GSK EC (2015); pages 43-44 of UK Merger Assessment Guidelines; and page 16 of TAKEDA/SHIRE EC (2004).

acquisition) where a firm acquires another firm (such as startup) that has been conducting innovative R&D and then terminates the R&D has been pointed out as issue in the field of competition policy[44]. Such a killer acquisition can be understood as a means to eliminate a potential risk to a product of an existing firm in a case where another firm has been conducting R&D for a product that overlaps with (potentially substitutes for) the existing firm's product and the R&D is the potential risk. Under a certain condition[45], a replacement effect (cannibalization effect) works, and the existing firm ends up terminating the acquired R&D[46]. Therefore, it is considered appropriate that an impact mechanism of a killer acquisition on R&D incentive of a combined firm be summarized as a replacement effect (cannibalization effect)[47] [48] [49].

While an acquired firm is assumed to be in an R&D phase before reaching productization, it is considered that this should be understood as an impact mechanism in a horizontal business combination assuming potential competition in light of the above motive and action of a killer acquisition even if there is no apparent competition between the acquired and acquiring firms[50] [51].

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[44]While acquisitions of this type have been traditionally seen in the medical and pharmaceutical field, it is recently concerned that firms such as so-called Big Techs actually conduct similar practices when acquiring startups (see, e.g., page 8 of Sensui (2019), page 6 of Tojo (2021), and pages 62-63 of Wakui (2021)). It should be noted that this Study Group does not cover assessment as to whether there are actually such acquisitions and whether they have actually had negative effects on competition.

[45]A condition such that [1] the existing firm's earnings decreases if it productizes its R&D results without the acquisition of the R&D-conducting firm or [2] it is more beneficial for the existing firm to terminate the R&D after the acquisition than to continue the R&D despite a risk of having its own sales cannibalized after the acquisition.

[46]Cunningham et al. (2021) clarifies that a killer acquisition could be conducted to eliminate emerging innovation through a combination of traditional mechanisms, a replacement effect and an efficiency effect, (not for the purpose of attaining a synergy or expanding the existing market power) mainly based on a parsimonious theoretical model using together endogenous decision-making on an acquisition, alternatives for innovation, and competition in a product market and empirical analysis for the pharmaceuticals development field.

[47]Other than Cunningham et al. (2021) given in footnote 46, it has been pointed out that there are two aspects as impacts that a killer acquisition has on R&D incentive: a direct loss of an innovative product on the part of an acquired firm; and a decrease in R&D incentive of an existing firm due to reduction in competitive pressure that accompanies the above loss (see page 21 of Federico et al. (2019)).

[48]Additionally, a reverse killer acquisition has been pointed out, which is to terminate R&D of an acquiring firm instead of R&D of an acquired firm in a case where R&D of these firms overlap with each other (see page 17 of Caffarra et al. (2020)). What matters in this case is also a selection of R&D to be terminated as R&D is terminated based on an expected return when that acquisition is conducted. The explanatory mechanisms are therefore the same.

[49]Another aspect pointed out as an impact that a killer acquisition has on R&D incentive is that a startup ceases to conduct R&D for a truly novel product and becomes more likely to select R&D for a product that is similar to an existing one (see page 42 of Cunningham et al. (2021)).

[50]As characteristics of the killer acquisition "theory of harm", OECD (2020) also points out on page 9 that concerns about it are horizontal in essence and that seemingly complementary and irrelevant products may possibly have concerns of horizontal issues.

[51]If a firm could have a vertical relationship with another firm conducting innovative R&D (if it is possible to use the results of the R&D as inputs to an existing product), an acquisition may be made not for the purpose of using these R&D results but to prevent a competitor from using them. A reference has been made to such an acquisition in the context of "killer acquisition" (see pages 16 and 17 of Caffarra et al. (2020)). Such an acquisition is identified as input foreclosure in a vertical business combination and can be explained by the impact mechanism (see 2.2.1.1.5.1 below) thereof insofar as it can be assessed as essentially impeding a competitor from using inputs (instead of whether to continue or discontinue R&D conducted in an acquired firm). However, further consideration is needed on whether any unique impact mechanism is conceivable.

2.1.1.1.4.2 Decrease in or loss of escape competition effect on combined firm (negative impact)

When competition in a product market is intense, the profit of a firm is lower than when competition is scarce or does not exist at all (monopoly). A firm then has high R&D incentive if it sees a chance of using innovation to escape the competition and securing a position where it can earn a high profit. This is called "escape competition effect"[52], and the strength of the effect changes depending on the intensity of competition.

If a horizontal business combination dampens competition in a product market (i.e., if it causes a combined firm to have a certain level of market power in the product market, or if the combined firm's advantage against competitors is fixed or the chance of new entry is reduced), an escape competition effect on the combined firm decreases or disappears, whereby its R&D incentive may decrease[53].

2.1.1.1.4.3 Decrease in or loss of escape competition effect on competitor (negative impact)

A competitor may have a lower expected return in a product market if any of the following occurs through a horizontal business combination: the advantage of a combined firm in terms of R&D increases; the combined firm takes a strategy of aggressively conducting R&D with its increased R&D capabilities (or a competitor expects it); and the combined firm gains market power in the product market. In such a case, an escape competition effect on the competitor decreases or disappears, and may discontinue or slow down R&D activities or reduce R&D investment[54]. This further leads to a decrease in or loss of escape competition effect on the combined firm as a counter effect, whereby the combined firm's R&D incentive may also decrease.

2.1.1.1.4.4 Pre-emption effect (rent-dissipation effect) (positive impact)

A monopolistic firm has a large gross margin (quasi-rent) that corresponds to a demand that would be lost when a competitor enters its market, even larger than an oligopolistic firm. Thus, when there is a threat of entry, the monopolistic firm may have higher R&D incentive so as to prevent new entry by making the entry less attractive or so as to protect its existing profit (rent) (pre-emption effect (rent-dissipation effect))[55]. While this effect is noticeable in the case of monopoly, it is considered that the effect is stronger on a firm that has a higher market share.

In a case where a horizontal business combination creates a monopolistic firm in a product market under such a situation, the monopolistic firm (combined firm) may have higher R&D incentive thanks to a pre-emption effect. However, the following should be

[52]See page 579 of Baker (2019), page 8 of German Innovation Report (2017), and page 22 of Katz, Shelanski (2007).

[53]See page 386 of Shapiro (2012), page 2697 of Igami, Uetake (2020), pages 19-21 of Dow/DuPont EC (2017) Annex 4, and page 6 of Jullien, Lefouili (2018).

[54]See page 165 of Baker (2019), page 6 of Jullien, Lefouili (2018), page 92 of Gilbert (2020), page 23 of Katz, Shelanski (2007), and page 2693 of Igami, Uetake (2020).

[55]See page 46 of Katz, Shelanski (2007), page 45 of UK Merger Assessment Guidelines, and page 5 of Jullien, Lefouili (2018).

noted: when it is uncertain whether innovation can be achieved, the pre-emption effect may not necessarily occur since it is also uncertain whether innovation can prevent entry[56].

2.1.1.1.4.5 Decrease in or loss of pre-emption effect (rent-dissipation effect) (negative impact)

As described in 2.1.1.1.4.4 above, a monopolistic firm (or quasi-monopolistic firm) may conduct aggressive R&D activities to gain future sales and protect profits when there is a threat of entry. Meanwhile, if, as a result of a horizontal business combination, a combined firm will have certain market power in a product market with the chance of new entry reduced, the pre-emption effect on the combined firm rather decreases or disappears, whereby its R&D incentive may decrease[57].

In addition, in a case where combining firms in the horizontal business combination are potential entrants that may turn into potential competitors to compete with an existing monopolistic firm (e.g. a killer acquisition), a threat from the potential entrants directly decreases. Therefore, the R&D incentive of a combined firm may decrease through a decrease in or loss of the pre-emption effect thereon[58].

2.1.1.2 Other impact mechanisms

In addition to the above ones, the following impact mechanisms can be listed as ones that are different in terms of what triggers an impact on a firm's R&D incentive to emerge and how the impact is delivered[59].

2.1.1.2.1 Buyout effect

Because of reasons such as the possibility that an existing firm may raise an acquisition price as it has a motivation to internalize innovation of a competitor, a premium assessment on a buyout at the exit and a sense of anticipation for the assessment help advance the competitor's R&D incentive and innovation, whereby new entry of startups may be encouraged (buyout effect)[60] [61].

A buyout effect is generated from premium assessments as above in past business combinations as well as prediction and anticipation about a future business combination with

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[56]See pages 176-177 of Odagiri (2016) and pages 22-23 of Dow/DuPont EC (2017) Annex 4.

[57]See pages 386-387 of Shapiro (2012) and page 2697 of Igami, Uetake (2020).

[58]See page 45 of UK Merger Assessment Guidelines, page 46 of Katz, Shelanski (2007), and page 21 of Federico et al. (2019).

[59]The other suggestions include, for example, Jullien, Lefouili (2018) (page 23), which indicates the following: while a horizontal business combination results in weaker competition in a product market and thus leads to price increases, the extent of price increase is smaller in a competitor than in a combined firm; this may increase the demand; and then the competitor's R&D incentive toward process innovation may increase. This Study Group, however, determined that it is appropriate to reserve judgment on this suggestion as it can work under specific limited conditions. Another one is Dow/DuPont EC (2017) Annex 4 (material provided by a party concerned) (page 8), which indicates the following: if competition in a product market or R&D is weakened by a business combination, a combined firm is the first among market participants to have an increased chance of becoming successful with R&D and earn an increased return in case of success, and the combined firm's R&D incentive therefore increases. The theoretical rationale for this suggestion, however, is not clear.

[60]See pages 242-243 of Saito (2022a) and page 63 of Gilbert (2020).

[61]The other suggestions include that, as an impact of a buyout, a distortion occurs in R&D incentive as R&D themes of startups center on those that tend to become target of acquisition by existing firms.

these premium assessments taken into consideration, and is not generated as a unique result attributable to a specific horizontal business combination case that is examined. It is thus thought to be an impact mechanism in which a trigger for an emergence of impact on a firm's R&D incentive is different[62].

2.1.1.2.2 Coordinated effect (negative impact)

All of the impact mechanism mentioned in 2.1.1.1 above explain how R&D incentive for firms to compete for customers is affected in the competition. However, impact mechanisms include one that can change the behavioral psychological aspect itself of a firm from competition for customers to avoidance of competition and coordination. It would be appropriate to address this mechanism separately, given its nature. If a horizontal business combination increases the degree of market concentration, it may facilitate coordinated conduct or increase incentive to perform coordinated conduct between a combined firm and a competitor, whereby R&D incentive both in a combined firm and a competitor may remarkably decrease (coordinated effect)[63].

Besides, there is a suggestion that coordinated conduct is unlikely to occur in R&D activities because of characteristics of such activities—low predictability, high likelihood of having the results externally confidential, long periods required to achieve the results, etc.—and also because of possible changes in the market structure itself, such as changes in market share, occurrence of new entry and market expansion that may be caused by the results[64].

[62]It should be noted that further consideration is needed on how competition policy should address such a buyout effect, which is not a unique effect attributable to a specific business combination case.

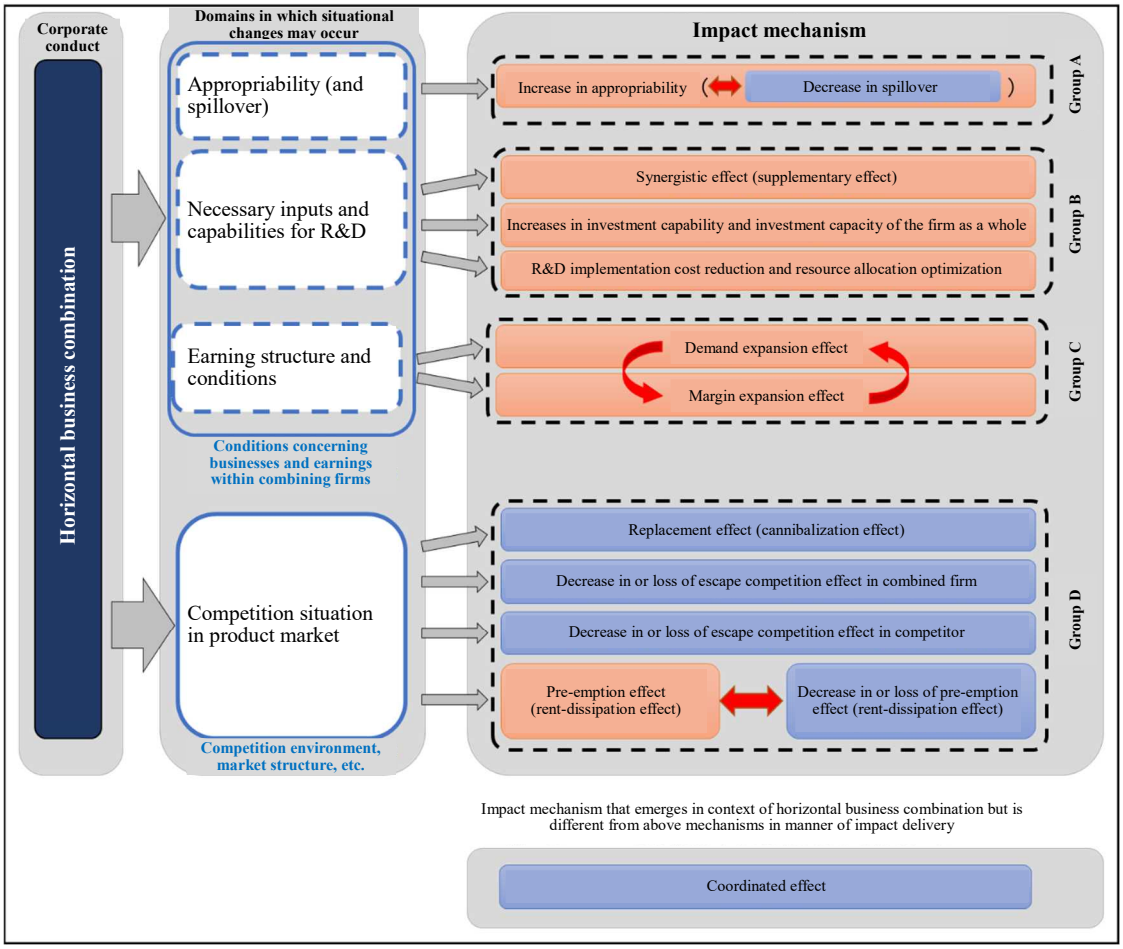
[63]See page 15 of Dow/DuPont EC (2017) Annex 4, pages 47-48 of Katz, Shelanski (2007), and page 87 of Gilbert (2020).

[64]See page 21 of German Innovation Report (2017), pages 47-48 of Katz, Shelanski (2007), and page 87 of Gilbert (2020).

2.1.2 Overall summarization of impact mechanisms on innovation

A comprehensive picture of the main impact mechanisms categorized and summarized in 2.1.1 is illustrated below.

[FIG. 1: Impact Mechanisms for Horizontal Business Combination]



Among these individual impact mechanisms, those described in 2.1.1.1 above are complex and dynamic in the real world in the following manner: while they individually affect R&D incentive depending on changes brought by a horizontal business combination in the situations in the respective R&D-related fields (such as internal conditions on R&D activities, the competition environment of a product market, and market structures), the manner and the strength of their actual emergence affect each other, and both positive and negative impact occur on R&D incentive at the same time.

Meanwhile, even though they have such a dynamic relationship, it is considered possible that, when they are observed based on particular situations and conditions (elements) related to R&D activities, the competition environment, market structures, etc. that may affect manners in which specific impact emerge, general tendencies can be extracted to some extent for a mutual relationship between some of the impact mechanisms and for an overall manner in which impacts emerge. Examples of such tendencies are presented below.

In some cases, the level of strength of each impact mechanism may need to be specifically compared[65] under a situation where a general tendency is observed for how impacts emerge in a relative manner among relevant impact mechanisms. However, it is difficult to quantitatively make this comparison, and there may additionally be impacts attributable to other impact mechanisms. Accordingly, impacts attributable to each of impact mechanisms, etc. need to be comprehensively considered for overall impacts on R&D incentive.

2.1.2.1 Trade-off associated with appropriability and spillover

As described in 2.1.1.1.1 above, in terms of R&D incentive, there is a trade-off relationship between enhanced appropriability in a combined firm and decreased spillover that is enjoyed by competitors. Given this trade-off, competition policy needs to work to appropriately secure aggregate R&D incentive of a combined firm and competitors that would benefit from spillover by free riding. To do so, it needs to appropriately balance between R&D incentive in a combined firm, which increases through the securing of appropriability, and R&D incentive in competitors, which increases through spillover.

In this context, the requirement for the combined firm's R&D incentive to emerge beyond a necessary threshold is that the invention value exceeds the costs for R&D. It is not necessarily required to secure the appropriability of 100%. Therefore, assessment as to the extent to which the appropriability should be raised beyond the necessary threshold depends on the extent to which incentive in competitors decreases due to a decrease in spillover as a counter effect. Accordingly, such assessment is made with consideration given mainly to the following points: how much R&D incentive in the competitors increases due to spillover; and to what extent the competitors can meaningfully utilize knowledge and other information that have been spilled over. In this assessment, for example, the following points may be considered.

2.1.2.1.1 Technological characteristics

In a case where there is a technological characteristic such that a technology involved potentially serves as a base from which a number of firms cumulatively develop new technologies in such a manner as to develop improved technologies and related or adjacent technologies, spillover results in a high rate of increase in R&D incentive and therefore should be regarded as having relatively high importance. Therefore, in such a case, the level of appropriability that should be secured beyond the above mentioned threshold tends to be relatively low.

Otherwise, in a case where a technology involved is expected to be of high versatility but firms capable of developing it are limited to a small number of specific firms, it is effective to raise R&D incentive of these specific firms. At the same time, the other firms cannot benefit from spillover before the development of the technology is finished; so it is also required to give priority to the development of the technology. Therefore, the level of appropriability that should be secured tends to be relatively high.

[65]For example, suppose there are an impact mechanism X that has a positive impact and another impact mechanism Y that has a negative impact. Even if it can be suggested that X tends to emerge relatively strong and Y tends to be relatively weak under a certain condition, quantitative comparison between X and Y is needed in determining whether the impact of X is dominant holistically.

In other cases where spillover is unlikely to contribute to R&D in competitors, for example, where utilization of knowledge and other information that are spilled over would require a complementary technology and know-how, and where the competitors have a low technological level and thus have low receptive skills, the appropriability has been secured practically in the first place, and it is considered that a horizontal business combination may result in no additional increase in appropriability (and in no decrease in spillover in competitors).

2.1.2.1.2 Level of technological opportunity

In a case where there is a high technological opportunity[66] thanks to spillover, it can be considered that an R&D implementation cost for innovation is low, and that there are a large number of potential innovators. Therefore, it can be considered that, while the above mentioned threshold is low, and the level of appropriability that should be secured beyond the threshold also tends to be relatively low, spillover brings a large benefit to competitors. Accordingly, in such a case, a decrease in spillover may have a relatively large impact after involuntary spillover is internalized through a horizontal business combination.

2.1.2.1.3 Closeness of technologies

In a case where, as the closeness of technologies among firms including combining firms is high, they can share and utilize knowledge, information, etc. and thus are receiving large benefits from mutual spillover[67], [68], the internalization of involuntary spillover between the combining firms due to a horizontal business combination decreases the number of firms that utilizes spillover and the number of spillover sources. However, profit that a combined firm can earn through appropriability may not be large in the first place. Consequently, a decrease in spillover may have a relatively large impact due to decreases in number of conductors of R&D that would lead to innovation by benefitting from spillover and number of sources of spillover to be received by the R&D conductors (competitors in particular).

2.1.2.2 Necessary inputs and capabilities for R&D (optimization of resource allocation in particular)

As described in 2.1.1.1.2.2.2 above, expansions in business scale and business portfolio due to a horizontal business combination provide room to adjust the details of R&D activities and the allocation of necessary resources for implementing such activities to more efficient ones. When there are several overlapping R&D themes, such overlapping R&D may be an overinvestment from the viewpoint of the society as a whole, whereas such a situation may

[66]A technological opportunity means a degree of potential applicability of a technology in a business or an industry (page 25 of Okada (2019)).

[67]A "technological distance" plays an important role in emergence of effects of spillover. This notion includes not only the distance of technologies themselves but also a geographical distance and a social and cultural distance. Consideration can be given to impacts in these aspects as necessary. In some cases, it is also appropriate to give consideration to technologies themselves in combination with the following: actions that are exerted by these distances of non-technological aspects; and how these actions may change through a horizontal business combination.

[68]When technologies are almost the same, there may be rather no benefits from spillover as there is no need of imitating those of other firms.

enable the following: having at least one of the projects to be successful by adopting different approaches; or developing differentiated products by having several alternative outcomes[69]. In such a situation, a firm makes decisions considering what is the optimal resource allocation that it should choose in order to maximize the expected return from R&D. Specifically, while the chance of success of R&D and specific functions and utility value that would be produced by the results of the R&D are innately uncertain (information incompleteness), the firm's choice would be as follows. If such uncertainty is expected to be low, the firm would choose to efficiently utilize its R&D resources by streamlining and integrating the overlapping R&D themes into one. In contrast, if such uncertainty is expected to be high, the firm would choose to maintain the overlapping R&D activities with a focus on risk diversification, diversity, an option value, etc.

2.1.2.2.1 Level of technological opportunity

If relevant R&D offers a low technological opportunity and has a low chance of success in technology development, a firm may choose to maintain the overlapping R&D themes from a view that relatively high importance are put on risk diversification, diversity, etc. within the scope of R&D because streamlining and integrating overlapping R&D themes into one may lead to a risk of a complete failure as the one remaining R&D theme fails. In contrast, if relevant R&D has a fairly high chance of success in technology development, the firm may concentrate its R&D resources by streamlining and integrating overlapping R&D themes into one.

2.1.2.2.2 Uncertainty of functions and utility value from R&D results

In the R&D stage, it is often unclear what functions R&D results (technology) will actually have and what utility value they will bring to the society. When such uncertainty is high, pursuing several R&D themes in parallel can maximize the aggregate expected return in some cases, and overlapping R&D themes may be maintained. In contrast, when the functions and the utility value can be fairly foreseen, streamlining and integrating the R&D themes into one may be chosen for efficient utilization of R&D resources.

2.1.2.3 Profit structure and conditions

A demand expansion effect and a margin expansion effect may mutually and cumulatively increase R&D incentive through the occurrence of a rent and an increase in production, which are changes in profit structure and conditions due to a horizontal business combination. For such effects to occur and sustain, however, necessary innovation needs to be continually achieved.

2.1.2.3.1 Level of technological opportunity

The chances of achieving process innovation and achieving product innovation also depend on the level of a technological opportunity. When the technological opportunity is low, it is difficult to continually achieve innovation, and it is therefore difficult to expect the above mutually cumulative effects, positive impacts on R&D incentive in a combined firm

[69]See page 45 of Odagiri (2016).

through a demand expansion effect and a margin expansion effect may be relatively limited.

2.1.2.3.2 Price controlling power in product market

In terms of demand expansion effect, the occurrence of a rent means decreased competitive pressure (the occurrence of price controlling power of a combined firm) in a product market. Accordingly, if a combined firm can gain higher profit by adjusting the price of a product than by achieving product innovation, R&D incentive therein is likely to decrease[70], and it is therefore difficult to expect the mutually cumulative effect.

2.1.2.4 Competition situation in product market

A firm strategically decides whether to conduct R&D or not, depending on relative and external elements of the competition environment such as the competition situation with competitors in a product market and market structures. Accordingly, it is considered that, under specific competition and market conditions as described below, either of positive and negative impacts tends to prevail against the other on R&D incentive in a combined firm and competitors.

2.1.2.4.1 Stable market

When a product market is stable, more specifically, for example, firms in the market are fixed, there are little changes in the market share, the potential for market entry is low, or the market is matured, there is less room to steal customers from competitors and less room to expand the market itself than in an unstable market (2.1.2.4.2 below), and therefore products of the same firm are more likely to cannibalize each other. Thus, the market is considered to be under a relatively strong replacement effect, have low competitive pressure making it less likely for an escape competition effect to occur, and be under a pre-emption effect that is small or unlikely to occur because of a low risk of having a rent stolen (even if a monopolistic rent occurs as a result of a horizontal business combination). Overall, a negative impact may prevail.

2.1.2.4.2 Unstable market

When a product market is unstable, more specifically, for example, competition among existing firms in the market is intense or new entry is easy (there are quite a few potential entrants), a relatively strong pre-emption effect works as a result of a horizontal business combination (if a monopolistic rent occurs), whereas a negative impact due to a decrease in escape competition effect and the presence of a replacement effect can be relatively weak. Overall, a positive impact may prevail in contrast to a stable market (2.1.2.4.1 above).

2.1.2.4.3 Growth potential of market

In addition to 2.1.2.4.2 above, when a firm can expect a future market expansion and a future increase in its sales with certainty in a situation where a product market is in a growing phase, products of the same firm are less likely to cannibalize each other's sales. Therefore, after the combination, a replacement effect may not appear so strongly despite its large

[70]Page 6 of Dow/Dupont EC (2017) Annex 4, and pages 2-3 of Federico et al. (2018).

market share. Overall, a positive impact may prevail to an even larger extent.

2.1.2.4.4 Degree of market concentration (market share[71] of combining firms in particular)

As the market share of a combined firm in a product market is higher, a certain level of rent is more likely to occur or the scope of cannibalization is larger at that time. This may result in a stronger replacement effect, a decrease in competitive pressure results in a decrease in escape competition effect on the combined firm, and an increase in advantage of the combined firm makes it difficult for an escape competition effect to occur in competitors.

Besides, as the combined firm has a higher market share, it would lose a larger portion of its rent due to new entry or innovation of a competitor, whereby a pre-emption effect may be larger. However, depending on a certain competition condition that can be generated in accordance with the size of the market share of combining firms[72], the risk of having its rent stolen is small, and in such case, the pre-emption effect would be small despite its large market share or unlikely to occur. Overall, a negative impact may prevail.

It should be noted that this condition may change depending on the level of product substitutability and the level of differentiation between firms. If the level of product differentiation are considerably high, the situation is considered to be the one described in 2.1.2.4.6 below.

2.1.2.4.5 Closeness/divergence of technological level

When there is a gap in technological level between combining firms and competitors, that is, leading innovators competing directly with each other are combined in a situation where there are no other leading innovators, the leading innovators have relatively large market share or are highly likely going to have such market share by launching a new product. There is considered to be a relatively large replacement effect.

Besides, decreases in escape competition effect on the combined firm and in competitors tend to intensify because technological competitive pressure from competitors is weak. At the same time, if a technological gap with competitors and potential entrants is large, the risk of losing the existing rent is small, whereby a pre-emption effect on the combined firm is less likely to occur.

Therefore, overall, a negative impact may prevail.

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[71]For impacts on R&D incentive in individual firms, it may be needed to consider not only how high the current market share of combining firms are but also the possibility of future changes in market share. Therefore, the points 2.1.2.4.1 to 2.1.2.4.3 given above should also be noted.

[72]Examples of the possible condition are as follows:

- A condition such that competitive actions of competitors and entry of potential entrants are more likely to be abandoned because, in light of market characteristics and other related matters (such as economies of scale, economies of scope, network effect, economies of agglomeration on essential inputs, and large costs and risks associated with R&D), expansions in business scale and business portfolio due to a horizontal business combination work to reinforce the advantage of a combined firm in terms of elements that are important for competition;
- A condition such that, while a horizontal business combination makes it likely for a combined firm to have higher market power and gain capabilities to prevent new entry or eliminate a competitor through market foreclosure conduct (such as input foreclosure or customer foreclosure), the combined firm has high incentive to maintain its rent through such market foreclosure conduct, not by pre-empting innovation, in light of past conduct, market conditions, etc.

2.1.2.4.6 Level of product differentiation and switching costs

In a case where a product market has traditionally been horizontally differentiated (segmentalized) because of a condition such as a high level of product differentiation in the market or high switching costs between products, and products therein are characterized by low product substitutability, a combining firm would not steal customers from either the other combining firm's products or from competitors' products. Thus, all of the pre-emption effect, the replacement effect, and the escape competition effect are likely to be relatively small. Therefore, even if the competition situation of the product market changes following a horizontal business combination, a strategic effect on R&D incentive may not occur strongly as a whole.

Under these conditions, impacts on R&D for a new product conducted by the combined firm depend on the level of differentiation between the new product and an existing product of the combined firm. If the differentiation between the existing product and the new product or a similar or derivative product to be newly launched is weak (e.g. a minor change product, update of software, or another product that is functionally overlapping to a certain extent), a replacement effect may occur between the new product and the own existing product. On the other hand, if the new product delivers strong product differentiation, such a replacement effect may be weak.

2.1.2.5 Overall impact reflecting mutual relationships between above fields 2.1.2.1 to 2.1.2.4

A horizontal business combination can primarily have impacts on R&D incentive through changes in the respective fields—the trade-off associated with appropriability and spillover (Group A), necessary inputs and capabilities for R&D (Group B), profit structure and conditions (Group C), and the competition situation of a product market (Group D). Meanwhile, the final level of R&D incentive is holistically determined through the collective action of situations in the respective fields. In particular, the state of changes in R&D incentive that occur in the fields (Groups A to C) relating to individual conditions concerning businesses and profits within a combining firm is also largely affected by strategic decision making that reflects relative and external elements of the competition environment of a product market.

The following considers mutual relationships between these fields and summarizes several cases where certain tendencies can be identified regarding how the overall impact emerge on R&D incentive.

2.1.2.5.1 Stable monopolistic situation in product market

As the competition situation of a product market (Group D), there is a case where a combined firm gains an extremely high market share (monopolistic market share) under a stable market environment where new entry seems impossible. A particularly strong negative impact emerges on R&D incentive because of strategic effects corresponding to this competition situation, which are the presence of a replacement effect and the loss of an escape competition effect and a pre-emption effect. Even though there are positive impacts such as an increase in appropriability (Group A) and a synergistic effect (Group B), such a

negative impact can prevail overall[73].

2.1.2.5.2 Low product substitutability in product market

When a product market has a feature of low product substitutability with a high level of product differentiation, an impact that changes in the competition situation of the product market have on R&D incentive (Group D) tends to be neutral even if a horizontal business combination is conducted (see 2.1.2.4.6 above). It is also considered that, in a product market having product substitutability, impacts through impact mechanisms tend to be suppressed in the aspect of changes in individual conditions within a combined firm (Groups A to C)[74]. However, if an increase in expected return does not necessarily need to come from customer stealing between products (between firms) and can be expected to come from production cost reduction within the firm, creation of new demand, and creation of a high-value-added product, R&D incentive may change within that scope.

Let us specifically suppose, for example, a case where, even though the features of products provided to users are differentiated, the production processes are fairly the same. Insofar as this case is concerned, a horizontal business combination results in an increase in production to which process innovation can be applied. Therefore, it can be considered that a margin expansion effect occurs. Furthermore, if improvements are expected with respect to the necessary inputs and capabilities for R&D (Group B), the chances of cost reduction, new product development, etc. may increase, and R&D incentive may change in this context. Therefore, these positive impacts may occur on the overall R&D incentive.

2.1.2.5.3 Importance of spillover

When spillover of knowledge and other information from another firm serves as an important element in R&D (for example, when there is a technological characteristic such that one technology potentially serves as a base from which a number of firms cumulatively develop new technologies, when there is a high technological opportunity thanks to the spillover, or when the knowledge, information, etc. are interchangeably utilized because the technologies of firms are close to each other), if appropriability increases through a horizontal business combination, a negative impact on R&D incentive in a competitor due to a decrease in spillover tends to be relatively large (see 2.1.2.1 above). Furthermore, such a situation may lead to reduction in future competitiveness of a product of the competitor in a product market. This results in a decrease in or loss of the escape competition effect (and decreases in or loss of the escape competition effect and the pre-emption effect on a combined firm) in the competitor, whereby a negative impact that changes in the competition situation (Group D) of the product market have on R&D incentive may be stronger.

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[73]See pages 2693 and 2697 of Igami, Uetake (2020).

[74]For example, in terms of appropriability, while spillover occurs and would be utilized in product development by another firm, profit to be earned from R&D results itself is not leaked and shifted into that firm because of the low product substitutability. Therefore, in this situation, sufficient appropriability has been secured before the horizontal business combination. As to the demand expansion effect, a high level of product differentiation means that the combined firm already possesses price controlling power over its own product, an incremental rent (price controlling power) generated by a horizontal business combination is limited.

2.1.2.5.4 Low technological opportunity and uncertainty of functions and utility value from R&D results

When a market share increases in a product market as a result of a horizontal business combination, a stronger replacement effect is likely to occur on R&D themes that have been found overlapping. Meanwhile, if there is any specific situation regarding these R&D themes such that the level of technological opportunity is low (R&D has a low chance of success) or that the uncertainty regarding specific functions and utility value of R&D results is high, this situation may be addressed through determination on resource allocation optimization in anticipation of expansions in business scale and business portfolio through a horizontal business combination. Therefore, the overlapping R&D themes may be maintained (Group B). As the risk of complete failure after streamlining and integrating the overlapping R&D themes into one increases, or as the uncertainty of the functions and the utility value is higher (possibility of the results of both sides evoking mutually complementary or differentiated demand is high, in particular), such decision makes the expectation for cannibalization to occur in the future smaller, and therefore, the replacement effect is less likely to increase despite a large market share (at least for the time being until the situation becomes clearer).

In this context, a state where an opportunity cost for the complete failure is fully considered means a state where, even after a horizontal business combination takes place, a combined firm keeps facing the high likelihood of having its customers stolen by a competitors once R&D fails[75]. Therefore, if the combined firm actually resorts to such decision-making, an escape competition effect and a pre-emption effect correspondingly occur in the combined firm, and a decrease in escape competition effect on the competitor is considered to be limited. Thus, the overall negative impact that changes in the competition situation (Group D) in the product market have on R&D incentive is likely to be relatively low.

[75]Conversely, a state where such a cost is not considered (the complete failure poses no problem in terms of profit even if it actually occurs) means that the combined firm is in a stable monopolistic state. In this state, a negative impact attributable to the competition situation of the product market including a replacement effect may appear rather strongly (see 2.1.2.5.1 above).

2.2 Vertical business combination and conglomerate business combination

2.2.1 Impact mechanisms on innovation

Vertical business combinations and conglomerate business combinations are not a type of combination that itself works to reduce the number of competition units in a product market. Therefore, typically, such a combination does not impede the market efficiency as long as there is no concern about closure or coordinated conduct. Meanwhile, in the context of R&D incentive, it can be considered possible that situational changes such as integrations of complementary products and assets and expansion of firm's scale due to such a business combination can have different impacts than the above described ones.

Accordingly, the following considers impact mechanisms that may emerge on R&D incentive by a vertical business combination or a conglomerate business combination. As with a horizontal business combination as described in 2.1.1 above, with the focus on R&D-related fields (conditions concerning R&D activities within combining firms, the competition environment and the market structure of a product market that are based on R&D results, etc.) in which unambiguous situational changes can occur through a business combination, the following categorizes and summarizes major impact mechanisms that may emerge in relation to each of the fields[76].

Specifically, in the first place, these fields are categorized into fields relating to conditions concerning businesses and profits within a combining firm (Groups A to C) and a field relating to the competition environment, market structure, etc. (Group D).

Group A	Appropriability (and spillover)
Group B	Necessary inputs and capabilities for R&D
Group C	Profit structure and conditions
Group D	Competition situation in product market

In addition, the following points out certain actions that a combined firm can take (and that are economically rational to take) after a vertical business combination or a conglomerate business combination occurs. Such actions may consequently affect R&D incentive in firms concerned. Specifically, there are those that affect inputs and capabilities for R&D and expected returns through input foreclosure or customer foreclosure (Group E) and those that affect the expected return of a competitor through, for example, acquisition of confidential information of the competitor (Group F).

Group E	Market foreclosure against business counterparty (competitor)
Group F	Acquisition of confidential information of competitor

[76]For a business combination of another type, for example, one having both an aspect corresponding to a horizontal business combination and an aspect corresponding to a vertical business combination, the individual aspects need to be considered. Suppose the following relationship in a current product market: combining firms in a combination assessed as a vertical business combination or conglomerate business combination is potentially in competition with each other (e.g., R&D in one of the combining firms potentially leads to development of a product that would compete with a product of the other combining firm, or R&D of the combining firms overlap). Impact mechanisms on R&D incentive that are generated based on this relationship can be seen as having horizontal nature in this domain. Thus, impact mechanisms summarized as horizontal business combination apply thereto. When impacts on R&D incentive are assessed with a focus on a potential competitive relationship from the aspect corresponding to a horizontal business combination, however, further consideration may also be needed on how the impacts from the aspect corresponding to a vertical business combination or a conglomerate business combination are related.

2.2.1.1 Impact mechanisms in fields in which situational changes may occur by vertical business combination or conglomerate business combination

2.2.1.1.1 Appropriability (and spillover) [positive impact]

Let us assume a situation involving free-riding where involuntary spillover benefits a competitor, whereby the competitor has deprived a R&D conductor firm of a part of profit that it would have gained from the R&D results. If the R&D conductor firm combines with the competitor, resulting appropriability enhancement can increase R&D incentive in a combined firm. In a vertical business combination or a conglomerate business combination, however, the issue of appropriability basically does not arise even though involuntary spillover itself may occur. This is because, unlike a horizontal business combination, combining firms in such a case are not competing with each other and are not in a situation where one of them takes a free ride on profit gained by the other from its R&D results[77].

However, appropriability may possibly be enhanced by a vertical business combination in some cases, including a case involving an R&D conductor firm who gains profit from licensing of the R&D results and a licensee firm. In this case, the need for the licensee firm to have a relevant license would be reduced if it can apply spillover to R&D for a technology relating to the license. Insofar as such cases are concerned, the issue of appropriability may arise as what affects R&D incentive, as in the case with impact mechanisms in a horizontal business combination (increase in appropriability of a combining firm and consequent decrease in involuntary spillover to a competitor).

2.2.1.1.2 Necessary inputs and capabilities for R&D (positive impact)

A synergistic effect (complementary effect), R&D implementation cost reduction, and resource allocation optimization—impact mechanisms through which a vertical business combination or a conglomerate business combination can bring about positive effects on R&D incentive in a combining firm by changing necessary inputs and capabilities for R&D— are basically the same as those as the impact mechanism of a horizontal business combination[78], [79]. In addition, increases in investment capability and investment capacity may occur likewise in a vertical or conglomerate business combination because the expansion of firm's scale and the complementarity among businesses may enhance efficiency in expense and product quality and may leave more cash and assets to spare.

2.2.1.1.3 Profit structure and conditions

Impact mechanisms that affect R&D incentive in a combining firm due to changes in profit structures and conditions can be considered to be also present in a vertical or conglomerate business combination. A demand expansion effect and a margin expansion effect can be cited as those that are the same as in a horizontal business combination. Additionally, there are "total optimization" and "resolution of a hold-up problem."

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[77]For example, in a case where R&D in a downstream firm is spilled over to an upstream firm, such spillover may be rather beneficial to the downstream firm if the upstream firm applies this spillover to its R&D for a product that would be traded between these firm.

[78]For synergistic effects (complementary effects), see page 71 of Nagaoka, Hirao (2013).

[79]See page 64 of Asker, Nocke (2021) for expansion of remaining capacity in the form of implementation cost reduction through business tool integration, economies of scale, or economies of scope.

2.2.1.1.3.1 Demand expansion effect (positive impact)

In a horizontal business combination, an increase in share (market power) in a product market occurs, and thus generates a certain level of rent, whereas, in a vertical or conglomerate business combination, an increase in share in a product market does not occur immediately after the combination. However, a certain level of rent may be generated in some cases. For example, such an effect as quality enhancement occurs through complementary combination of products that combining firms have in their respective markets, and results in a product with higher advantage, whereby a certain level of rent can be generated. Such cases are considered to be basically the same as a horizontal business combination in that a demand expansion effect increases R&D (product innovation) incentive for product demand expansion.

2.2.1.1.3.2 Margin expansion effect (positive impact)

In a horizontal business combination, an increase occurs in production volume per firm by the combination of businesses, whereas, in a vertical or conglomerate business combination, production volume does not increase immediately due to the combination of businesses. However, for example, there may be a case where upstream and downstream firms have elements in common in terms of necessary equipment and assets for production, technology, production process, etc. In such a case, the number of products to which process innovation relating to the elements they have in common can be applied increases, and the scope of areas where cost reduction can be achieved can be expanded[80]. Such a case can be considered to be basically the same as a horizontal business combination in that a margin expansion effect may lead to an increase in R&D (process innovation) incentive[81].

2.2.1.1.3.3 Total optimization (positive impact)

For example, when the firm in the downstream market supplies a product that includes a component procured from a firm in an upstream market while these firms both have market power in the respective markets, their production volumes are determined so that their demand and supply reach equilibrium where the respective firms make the maximum profits, and this situation may lead to underinvestment (double marginalization problem). When there has been such a situation, a combined firm would aim to maximize its profit in total from the upstream market and the downstream market through a vertical business combination. Consequently, it internalizes vertical externalities between products (resolution of double marginalization) and moves toward an increase in production volume, whereby R&D incentive may increase[82].

Likewise, for example, in a situation where an increase in supply volume of products in one market results in an increase in supply volume of products in the other market because two markets offer products that are functionally complementary to each other,

[80]See pages 251-252 of Kokkoris, Valletti (2020).

[81]A demand expansion effect and a margin expansion effect are considered to be basically the same as those in a horizontal business combination in that these effects may mutually increase incentive for product innovation and incentive for process innovation and in that these kinds of innovation need to be continually achieved for such effects to occur.

[82]See pages 74 and 81 of Nagaoka, Hirao (2013).

firms supplying these products may independently take individual profit maximization actions. Such actions may lead to underinvestment. In such a case, as a result of a conglomerate business combination, a combined firm maximizes profit by comprehensively viewing products of these two markets. Consequently, vertical externalities between products are internalized, whereby R&D incentive for quality improvement and lower prices for the respective products may increase[83].

2.2.1.1.3.4 Resolution of hold-up problem (positive impact)

For example, in a case where a manufacturer of a component develops production equipment conforming to specification of a manufacturer of a final product (equipment that cannot be diverted to other production), if trading with the final product manufacturer is terminated, the component manufacturer cannot shift to sales to other customers, and the R&D costs for the production equipment turn into a sunk cost. Such a specific asset based on customer relationship (relationship-specific asset) provides a final product manufacturer with strong negotiation power against a component manufacturer after the start of R&D (after the incurrence of costs), whereby the component manufacturer may be forced to accept unfavorable requests such as price reduction. When predicting that the final product manufacturer would conduct such opportunistic behavior, the component manufacturer avoids making an investment (R&D investment) in such a relationship-specific asset (hold-up problem)[84].

With the presence of such a hold-up problem, a vertical business combination serves to integrate decision-making and resolve a business relationship that causes a hold-up problem, whereby R&D incentive for the relationship-specific asset may increase in a combined firm[85].

In should be noted that such a hold-up problem may occur in a case where, while quality can be improved through technological coordination between products of two or more firms, a specific investment is needed for the technological coordination. Thus, it can be considered that the same resolution of such a problem can be expected in a conglomerate business combination[86].

2.2.1.1.4 Competition situation in product market

In a vertical or conglomerate business combination, combining firms conduct business in different markets. Therefore, the combination does not result in cannibalization between them and, naturally, changes neither a market share nor potential for market entry in the respective markets. It is considered that a replacement effect (cannibalization effect) and a pre-emption effect (rent-dissipation effect) occur neither in a vertical business combination nor in a conglomerate business combination.

Depending on the situation, however, a vertical or conglomerate business combination may change the competition situation with a competitor in a product market. To the extent

[83]See page 74 of Nagaoka, Hirao (2013).
[84]See pages 33-36 of Odagiri (2016).
[85]See pages 71-74 of Nagaoka, Hirao (2013).
[86]See page 19 of German Conglomerate Mergers Control Discussion Paper (2006).

that such a case applies, a decrease in or loss of escape competition effect on a combined firm and the competitor and a decrease in or loss of a pre-emption effect (if it has already been present) in a combined firm may occur.

2.2.1.1.4.1 Decrease in or loss of escape competition effect and decrease in or loss of pre-emption effect on combined firm (negative impacts)

Unlike a horizontal business combination, a vertical or conglomerate business combination is considered not to immediately result in changes in the competition situation, such as increases in share of a combined firm in product markets where combining firms conduct business, only by means of the combination. In that regard, neither a decrease in or loss of escape competition effect nor decrease in or loss of a pre-emption effect (if it has already been present) would occur in principle.

Meanwhile, for example, as a business activity after vertical business combination between a component manufacturer (a combining firm in an upstream market) and a final product manufacturer (a combining firm in a downstream market), it can be assumed that profit would expand if the combining firm in the downstream market increases a purchase volume from the combining firm in the upstream market. In such a case, the combining firm in the upstream market increases supply to the combining firm in the downstream market increases, and has less need to supply its component to those other than the combining firms, whereby a competition of the component manufacturer with competitors over component sales in the upstream market disappears. Consequently, an escape competition effect and a pre-emption effect (if it has already been present) on the combining firm in the upstream market decrease, whereby R&D incentive regarding component production may decrease[87].

In addition to such situation, in a case where the profit is still larger with the combining firm in the downstream market not purchasing components from firms other than the combining firm in the upstream market, the issue of customer foreclosure may arise (see 2.2.1.1.5.2 below)[88].

Such a decrease in escape competition effect and a decrease in pre-emption effect presuppose that business is conducted between combining firms of a business combination, and therefore, are considered not to occur in a conglomerate business combination in principle. However, for example, a combined firm has market power with respect to a product of a combining firm in a conglomerate business combination, and can supply a combination of the product and a product of the other combining firm using the market power, R&D incentive for products in the other combining firm may decrease as in a vertical business combination. Furthermore, the issue of market foreclosure may arise in some cases.

[87]See page 75 of Nagaoka, Hirao (2013).

[88]Conversely, there may be a case where profit is larger with the combining firm in the upstream market not supplying its inputs such as a component to those other than the combining firm in the downstream market, the issue of input foreclosure may arise (see 2.2.1.1.5.1 below).

2.2.1.1.4.2 Decrease in or loss of escape competition effect on competitor (negative impact)

Unlike a horizontal business combination, a vertical or conglomerate business combination is considered not to immediately result in changes in the competition situation, such as increases in share of a combined firm in product markets where combining firms conduct business, only by means of the combination. In that regard, a decrease in or loss of escape competition effect on a competitor would not occur in principle.

Meanwhile, it is also considered that a vertical or conglomerate business combination results in higher R&D advantage in a combined firm. If a competitor has a lower expected return in a product market as a result of the combined firm's taking a strategy of aggressively conducting R&D with its increased R&D capabilities (or a competitor expects it), an escape competition effect on the competitor decreases or is lost, whereby R&D incentive may decrease[89]. This further leads to a decrease in or loss of escape competition effect on the combined firm as a counter effect, whereby the combined firm's R&D incentive may also decrease.

2.2.1.1.5 Market foreclosure against business counterparty (competitor) (negative impact)

R&D requires a range of inputs such as technologies, information, data, materials, equipment, etc. They are vital in R&D because the chance of success of R&D depends on whether these inputs are available. R&D incentive is also affected by whether a firm is in circumstances that allow it to gain sufficient profit from the R&D results, more specifically, for example, by factors such as a reasonable expectation about acquisition of the sufficient customer size (demand), as they relate to an expected return.

A vertical business combination may generate a state where, as a result of integration (as a group) of combining firms that are present in an upstream market and a downstream market (and conduct business between them), another firm in a competition with one of the combining firms in either the upstream market or the downstream market has a business relationship with the other combining firm in the other market. Assuming that this relationship is present, the business combination can change inputs and capabilities for R&D and monetization activities in the competitor and thus affect its R&D incentive. Specifically, the impact mechanisms described in 2.2.1.1.5.1 and 2.2.1.1.5.2 below can be presented.

The following should be noted: While a conglomerate business combination does not involve a business relationship with a competitor but may affect monetization activities of the competitor in a case where complementary products of the combining firms can be supplied in combination, the same impact mechanism as in the case of a vertical business combination is considered to occur (see 2.2.1.1.5.2 below).

[89]See page 248 of Buehler, Schmutzler (2008).

2.2.1.1.5.1 Decreases in inputs and capabilities in competitor due to input foreclosure

Let us assume the following case: after a vertical business combination, a combining firm in an upstream market refuses to supply a technology which serves as an input to its R&D to a competitor in a downstream market or conducts business under an unfavorable condition with it (forecloses R&D inputs); and additionally, the competitor in the downstream market cannot find any alternative supplier. In such a case, the competitor becomes unable to acquire necessary inputs for its R&D[90], whereby its R&D incentive may decrease[91] [92].

It should be noted that this impact mechanism is not considered to occur in a conglomerate business combination because conducting such input foreclosure requires that combined firm have a business deal with the competitor through the business combination.

2.2.1.1.5.2 Decrease in profitability in competitor due to customer foreclosure

Let us assume the following case: After a vertical business combination, a combining firm in a downstream market refuses to buy a product from a competitor in an upstream market or conducts a business deal with an unfavorable condition with it (forecloses a user of a product to which R&D results have been applied); and additionally, the competitor in the upstream market cannot find any alternative purchaser. In such a case, even if the competitor conducts R&D, it cannot secure purchasers for the product based on R&D results and the sales volume thereof decreases[93]. Consequently, the expected return from R&D decrease, whereby its R&D incentive may decrease[94].

Let us further suppose a case where a combined firm in a conglomerate business combination can supply a combination of complementary products of respective combining firms while the product of one of the combining firms has market power. In such a case, if a competitor in the market of the other combining firm is left with a decreased number of trading opportunities[95] and with a decreased expected return from R&D, the competitor's R&D incentive decreases as in the case of customer foreclosure in a vertical business combination.

2.2.1.1.6 Acquisition of confidential information of competitor (negative impact)

In a vertical or conglomerate business combination, combining firms may share confidential information (e.g., plans and details of R&D) on R&D within a competitor, which is obtained through the position as a business counterparty to the competitor and

[90]See Part V, 2, (1), A. of Business Combination Guidelines and pages 56-57 of UK Merger Assessment Guidelines.

[91]See page 166 of Baker (2019).

[92]This negative impact on R&D incentive can be understood as a question of what changes occur in necessary inputs and capabilities for R&D in the competitor (see 2.2.1.1.3 above). With this understanding in mind, such a change in R&D incentive of the competitor is analyzed as an element that constitutes changes in the competition situation of a product market (see 2.2.1.1.4 above).

[93]See Part V, 2, (2), A. of Business Combination Guidelines and page 60 of UK Merger Assessment Guidelines.

[94]Such a change in R&D incentive of the competitor is analyzed as an element that constitutes changes in the competition situation of a product market (see 2.2.1.1.4 above).

[95]See Part VI, 2, (1), A. in Business Combination Guidelines and page 62 of UK Merger Assessment Guidelines.

through a venture investment, among others. In such a case, the competitor may have a decreased chance of success prior to the success of the combined firm's success even if it conducts R&D[96] (or if the competitor expects so), the competitor's R&D incentive may decrease[97] [98].

2.2.1.1.7 Coordinated effect (negative impact)

It is considered appropriate that a coordinated effect be treated separately from the other impact mechanisms as in the case of a horizontal business combination, given its nature.

Unlike a horizontal business combination, a vertical or conglomerate business combination does not immediately result in a decrease in number of competition units in a market, whereas, as described in 2.2.1.1.6 above, it may facilitate coordinated conduct or increase incentive to perform coordinated conduct between a combined firm and a competitor as a result of the combined firm's acquisition of confidential information of the competitor[99]. In such a case, as in a horizontal business combination, R&D incentive both in the combined firm and the competitor may remarkably decrease. Besides, there is a suggestion that coordinated conduct is unlikely to occur in R&D activities because of characteristics of such activities—low predictability, high likelihood of having the results externally confidential, long periods required to achieve the results, etc.—and also because of possible changes in the market structure itself, such as changes in market share, occurrence of new entry and market expansion that may be caused by the results. This suggestion is basically same as in horizontal business combination.

[96]See Part V, 2, (1), B., Part V, 2, (2), B., and Part VI, 2, (1), B. of Business Combination Guidelines, and page 53 of UK Merger Assessment Guidelines, and Part III, 2, (1), (i) of the Startup Guidelines.

[97]See Lam Research and KLA-Tencor Business Combination Case (2016).

[98]Such a change in R&D incentive of the competitor is analyzed as an element that constitutes changes in the competition situation of a product market (see 2.2.1.1.4 above).

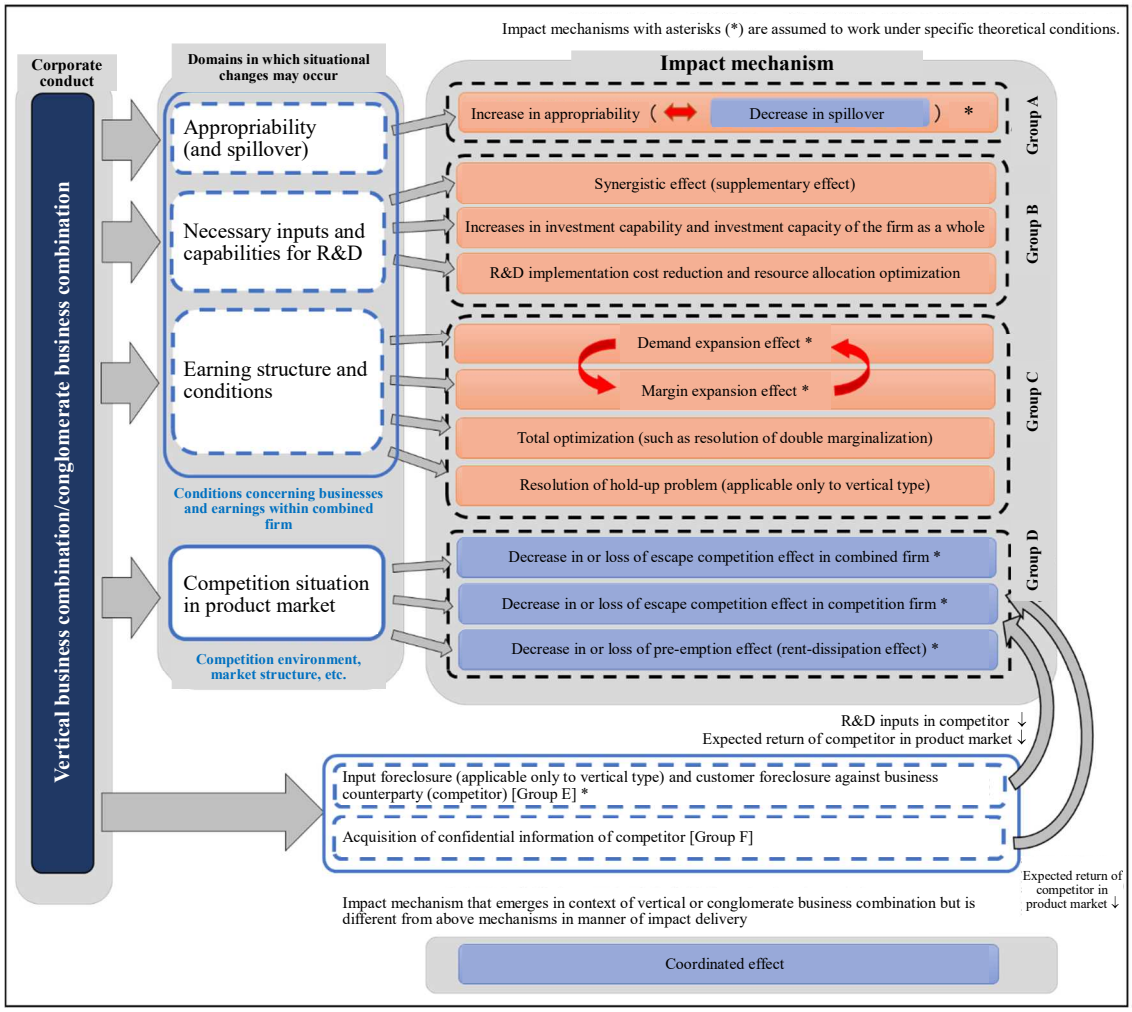
[99]See Part V, 3 of and Part VI, 3 of Business Combination Guidelines.

2.2.2 Overall summarization of impact mechanisms on innovation

2.2.2.1 Basic perspectives

A comprehensive picture of the main impact mechanisms categorized and summarized in 2.2.1 above is illustrated below[100].

[FIG. 2: Impact mechanisms for Vertical Business Combination or Conglomerate Business Combination]



These individual impact mechanisms are considered to be basically the same as those presented for a horizontal business combination in the following points: they are complex and dynamic in the real world as the manner and the strength of their actual emergence affect each other; and when they are observed based on particular situations and conditions (elements) related to R&D activities, the competition environment, market structures, etc. that may affect manners in which specific impact emerge, general tendencies can be extracted to some extent for a mutual relationship between the impact mechanisms and for an overall manner in which impacts emerge.

[100]In a business combination that involves a so-called conglomerate (eco-system firm) represented by a Big Tech, the impact mechanisms in the case of a vertical or conglomerate business combination are applicable in principle except for the domains where combining firms are (or are potentially) in a horizontal relationship (see footnote 76).

2.2.2.2 Mutual relationships among impact mechanisms

As described in 2.2.2.1 above, general tendencies can be extracted to some extent for a mutual relationship between some of the impact mechanisms and for an overall manner in which impacts emerge. Examples of such tendencies are presented below;

provided, however, the following points should be noted:

- As described in 2.2.1.1 above, combining firms in a vertical or conglomerate business combination are not competing with each other. This means that, even when the impact mechanisms that are basically same as in the case of a horizontal business combination work, there are differences in how strongly each of them emerges, and some of them do not even appear, compared with the case of a horizontal business combination. These differences need to be taken into consideration when the mutual relationships among the impact mechanisms are assessed.
- As described in 2.2.1.1.5 and 2.2.1.1.6 above, market foreclosure against a business counterparty (competitor) and acquisition of confidential information of a competitor that are possibly conducted by a combined firm are to be taken into consideration as elements that constitute the competition situation in product market (Group D) field. Therefore, these are to be assessed by being added to impacts in the competition situation in product market (Group D) field.

2.2.2.2.1 Trade-off associated with appropriability and spillover

While it is considered that appropriability can increase only in limited cases in a vertical or conglomerate business combination as described in 2.2.1.1.1 above, the following considerations on a horizontal business combination would also apply to a vertical or conglomerate business combination in principle: there is a trade-off between increase in appropriability in combining firms and decrease in spillover that is enjoyed by competitors by free-riding; and it is necessary to have an appropriate balance so as to appropriately secure aggregate R&D incentive of a combined firm and competitors that would benefit from spillover by free riding.

2.2.2.2.1.1 Technological characteristics

In principle, our considerations on the relationships of technological characteristics with increase in appropriability in a combined firm and decrease in spillover in competitors in a horizontal business combination are considered to also apply to the relationships thereof with increase in appropriability in a combined firm and decrease in spillover in competitors in a vertical or conglomerate business combination.

2.2.2.2.1.2 Level of technological opportunity

In principle, our considerations on the relationships of the level of technological opportunity with increase in appropriability in a combined firm and decrease in spillover in competitors in a horizontal business combination are considered to also apply to the relationships thereof with increase in appropriability in a combined firm and decrease in spillover in competitors in a vertical or conglomerate business combination.

2.2.2.2.1.3 Closeness of technologies

In principle, our considerations on the relationships of the closeness of technologies with increase in appropriability in a combined firm and decrease in spillover in competitors in a horizontal business combination are considered to also apply to the relationships thereof with increase in appropriability in a combined firm and decrease in spillover in competitors in a vertical or conglomerate business combination.

2.2.2.2.2 Necessary inputs and capabilities for R&D

It is considered that expansions in business scale and business portfolio due to a vertical or conglomerate business combination provide room to adjust the details of R&D activities and the allocation of necessary resources for implementing such activities to more efficient ones, which is basically the same as in the case of a horizontal business combination. However, in a vertical or business combination, unless there is overlapping R&D[101], the issue of which option to take (i.e. streamlining and integrating overlapping R&D themes into one for resource allocation optimization or maintaining overlapping R&D activities with a focus on diversity, etc.) does not arise.

2.2.2.2.3 Profit structure and conditions

It is considered that, in a vertical or a conglomerate business combination, if a demand expansion effect and a margin expansion effect occurs under a certain condition, they may mutually and cumulatively increase R&D incentive and that necessary innovation needs to be continually achieved for such increase to occur, which is basically the same as in the case of a horizontal business combination.

2.2.2.2.4 Competition situation in product market

It is considered that R&D incentive is strategically decided depending on relative and external elements of the competition environment such as the competition situation with competitors in a product market and market structures if a vertical or conglomerate business combination changes the competition situation of the product market, which is basically the same as in the case of a horizontal business combination. In such a mechanism, under specific competition and market conditions, how negative impacts emerge may be different in terms of R&D incentive in combining firms and competitors as described in 2.2.2.2.4.1 to 2.2.2.2.4.6 below[102].

It should be noted that customer foreclosure (Group E) against a business counterparty (competitor) and acquisition of confidential information of a competitor (Group F) affect inputs and capabilities, as well as the expected return, of the competitor through these kinds of conduct enabled as a result of a vertical or conglomerate business combination, thereby ultimately affecting the competition situation (Group D) in the relevant product market.

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[101] See footnote 76 for cases where there is overlapping R&D.

[102] As described in 2.2.1.1.4 above, a vertical or conglomerate business combination does not result in cannibalization between products or R&D of combining firms, and does not naturally change the market share or potential for market entry in the respective markets. Therefore, a pre-emption effect (or a replacement effect (cannibalization effect)), which is a positive effect, is not involved.

2.2.2.2.4.1 Stable market

It is considered that an escape competition effect is less likely to occur when a product market is stable than when it is unstable, which is basically the same as in the case of a horizontal business combination.

2.2.2.2.4.2 Unstable market

It is considered that, when a product market is unstable, contrary to when it is stable, a negative impact due to a decrease in escape competition effect can be relatively weak. However, as described in 2.2.1.1.4 above, a decrease in escape competition effect is caused by an increase in business transactions between combining firms (in the case of a vertical business combination) or by supplying a combination of products of combining firms (in the case of conglomerate business combination). Because these kinds of conduct may be performed regardless of market stability, it is considered that the degree to which the decrease in escape competition effect is reduced may be smaller (the escape competition effect is more likely to continue to decrease) than in a horizontal business combination.

2.2.2.2.4.3 Growth potential of market

Even in the case of 2.2.2.2.4.2 above, when a firm can expect a future market expansion in a situation where the product market is in a growing phase, new demand is expected to be created, whereby an additional expected return can be expected. Therefore, the degree to which the escape competition effect decreases may be relatively small.

2.2.2.2.4.4 Degree of market concentration

2.2.2.2.4.4.1 High degree of concentration in upstream market (market share of combining firm in particular)

The larger the market share of a combining firm in an upstream market, the more difficult it is for a competitor in a downstream market to find an alternative supplier when the combining firm refuses to supply. Therefore, the competitor cannot acquire necessary inputs and thus decreases in R&D capabilities if the business combination (not only increases the ability of the combining firm to implement input foreclosure but also) results in implementation of input foreclosure. Consequently, the expected return of the competitor decreases to a larger degree, and an escape competition effect is therefore considered to decrease to a larger degree.

2.2.2.2.4.4.2 High degree of concentration in downstream market (market share of combining firm in particular)

The larger the market share of a combining firm in a downstream market, the more difficult it is for a competitor in an upstream market to find an alternative purchaser when the combining firm refuses to purchase. Therefore, the competitor is left with no customers for monetization if the business combination (not only increases the ability of the combining firm to implement customer foreclosure but also) results in implementation of customer foreclosure. Consequently, the expected return of the competitor decreases to a larger degree, and an escape competition effect is therefore

considered to decrease to a larger degree.

It should be noted that, similarly, in the case of a conglomerate business combination, if products of respective combining firms are supplied in combination in a situation where either of the products has a large market share, the impact of market foreclosure and a consequent decrease in escape competition effect are considered to be large.

2.2.2.2.4.4.3 High degree of market concentration in both upstream and downstream markets (market share of combining firms in particular)

In a case where combining firms in an upstream market and a downstream market undergo a vertical business combination with both of the combining firms having a large market share, if both input foreclosure in the downstream market (in 2.2.2.2.4.4.1 above) and customer foreclosure in the upstream market (in 2.2.2.2.4.4.2 above) are implemented, escape competition effects in competitors in the respective markets decrease to a large degree at the same time. Additionally, in both of the markets, escape competition effects and pre-emption effects (rent-dissipation effects) (particularly in a case where combined firm has rents generated) on the combined firm decrease particularly to a large degree. It is therefore considered that negative impacts in Group D need to be taken into consideration with certain weights thereon.

2.2.2.2.4.5 Closeness/divergence of technological level

Let us assume a case where there is a large gap in technological level between combining firms and competitors, that is, when the combining firms are competent innovators while there is no competent innovator among the competitors. In such a case, if there is a circumstance that makes complementary actions between R&D in different fields meaningful, the advantage of R&D in the combining firms who are both competent innovators may increase. It is therefore considered that escape competition effects and pre-emption effects (if it has already been present) in the combining firms and the competitors tend to decrease to a larger degree, which is basically the same as in the case of a horizontal business combination.

2.2.2.2.4.6 Level of product differentiation and switching costs

Let us assume a case where, while the level of product substitutability in the respective markets of combining firms in a vertical or conglomerate business combination are low, segregation of business relationship between products of the combining firms and products of the competitors is advanced in both an upstream market and a downstream market (product markets of the respective combining firms in the case of a conglomerate business combination). In such a case, the competitors are in low need to conduct business with the combined firm, and the impact of input foreclosure or customer foreclosure (market foreclosure) (or the chance of implementation of such conduct) is not large. Therefore, changes in the competition situations of the respective product markets due to the vertical or conglomerate business combination and consequent decreases in escape competition effect would be limited. Thus, a strategic effect on R&D incentive as a whole may not work strongly.

Let us assume another case where, while the level of product substitutability in the respective markets of combining firms in a vertical or conglomerate business combination are low, there is no segregation of business relationship between products of the combining firms and products of the competitors in both an upstream market and a downstream market (product markets of the respective combining firms in the case of a conglomerate business combination). In such a case, the competitors may have business relationship with the combined firm. In that situation, if the combining firm in the upstream market refuses to supply products, the competitor in the downstream market, a business counterparty, is considered to have rather more difficulty finding an alternative business counterparty (supplier), and there may be a larger impact of input foreclosure on the expected return of the competitor. Similarly, if the combining firm in the downstream market refuses to purchase products, the competitor in the upstream market, a business counterparty, is considered to have rather more difficulty finding an alternative business counterparty (user), and there may be a larger impact of customer foreclosure on the expected return of the competitor. Consequently, respective decreases in escape competition effect are considered to be large both in the downstream market and in the upstream market.

2.2.2.2.5 Overall impact reflecting mutual relationships between above fields 2.2.2.2.1 to 2.2.2.2.4

A vertical or conglomerate business combination can primarily have impacts on R&D incentive through changes in the respective fields—the trade-off associated with appropriability and spillover (Group A), necessary inputs and capabilities for R&D (Group B), profit structures and conditions (Group C), and the competition situation of a product market (Group D). Meanwhile, the final level of R&D incentive is holistically determined through the collective action of situations in the respective fields. In particular, the state of changes in R&D incentive that occur in the fields (Groups A to C) relating to individual conditions concerning businesses and profits within a combining firm is also largely affected by strategic decision making that reflects relative and external elements of the competition environment of a product market.

The following considers mutual relationships between these fields and summarizes several cases where certain tendencies can be identified regarding how the overall impact emerge on R&D incentive.

2.2.2.2.5.1 Low product substitutability in product market

As described in 2.2.2.2.4.6 above, the impact of input foreclosure or customer foreclosure tends to be larger, and a negative impact of the competition situation of a product market (Group D) may be larger in a case where the product market is with a high level of product differentiation, a low level of product substitutability, and no segregation of business relationship between products of combining firms and competitors. Besides, as in the case of a horizontal business combination, when the level of product substitutability is low, the impact mechanisms of changes in conditions within the

combined firm (Groups A to C) tend to deliver limited impacts in principle[103].

Therefore, overall, a negative impact from Group D may prevail.

2.2.2.2.5.2 Importance of spillover

When spillover from another firm serves as an important element in R&D, if the appropriability of a combined firm increases through a vertical or conglomerate business combination, it is considered that a negative impact on R&D incentive in a competitor due to a decrease in spillover tends to be relatively large, and that an impact that a change in Group D has on R&D incentive may be stronger with the above situation affecting a product market. These are basically the same as in the case of a horizontal business combination. It should be noted, however, that appropriability can increase only in limited cases as described in 2.2.1.1.1 above.

2.2.2.2.5.3 Strength of complementarity between products or technologies

In a vertical or conglomerate business combination, when there is strong complementarity between products of respective combining firms or technologies possessed thereby, a combination of these products or technologies can increase the chance of having a product improved in quality or function or conducting novel technology development that has a high value. Therefore, the stronger this complementarity, the improvement in product competitiveness or R&D advantage of a combined firm is further enhanced, whereby the gap thereof with competitors may be further enlarged in the product market (Group D). In such a case, decreases in R&D incentive in the combined firm and the competitors may be more remarkable through decreases in or the losses of an escape competition effect and a pre-emption effect (if it has already been present).

Meanwhile, this complementarity may work to enhance positive impacts, such as a synergistic effect (complementary effect), mainly from the necessary inputs and capabilities for R&D (Group C). It is accordingly considered that it may increase R&D incentive in the combined firm in some cases.

However, when this complementarity is considerably strong (typical examples of which include a strong positive network effect), the competition situation of a product market changes in such a manner that, while the position of the combined firm is cumulatively and irreversibly strengthened, competitors (including potential competitors) are deprived of resisting power. In the situation where such a market controlling position is entrenched, the negative impact on R&D incentive in the combined firm and the competitors may

[103]However, double marginalization problem may be present in a case where the level of product substitutability is low both in an upstream market and in a downstream market. This is because combining firms can be considered to virtually have market power within their respective scope of business as the intensities of competition are relatively low in the respective markets. It should be noted here that, if the respective combining firms in the upstream market and the downstream market undergo a vertical business combination in such a situation, a positive impact may arise thanks to resolution of double marginalization (Group C) between their products.

prevail overall even with the above positive impact taken into consideration[104] [105] [106] [107].

It should be noted that such a relationship between a positive impact and a negative impact on R&D incentive may be applicable to the following case for example. While inputs are extremely vital in terms of business operation, economies of agglomeration strongly work in a manner that application of these inputs enhances attributes such as product quality and results in a feedback loop where this enhancement attract further inputs (e.g., data in a data-driven type business). It may also be applicable to a case where economies of scope or economies of scale strongly work between products of combining firms (e.g., a large reduction in marginal costs).

[104]See page 2697 of Igami, Uetake (2020).

[105]See page 28 of Chen et al. (2022).

[106]Crémer et al. (2019) also suggests as follows regarding the theory of harm on an acquisition of a startup by a conglomerate (eco-system firm). As a result of an acquisition of a startup in a market where there are highly intense concentration and an entry barrier that have been brought about by a strong positive network effect and a data-driven feedback loop, the value of service is enhanced through a complementary relationship. In addition, the entrance barrier is raised by having customers of partially substitutable services internally maintained, whereby a strong eco-system controlled by an acquiring firm is further expanded and stabilized. Furthermore, the prospects of independent and decentralized innovation may be lower.

[107]Besides, through the consolidation of necessary inputs for R&D, a combined firm may be put in a higher bargaining position for R&D inputs, thus may be able to refuse licensing to a competitors or impose an unfavorable business condition thereto, whereby input foreclosure may be easier to conduct (see page 166 of Baker (2019)). In such a case, the escape competition effect on competitors decreases to a larger extent.

2.3 Joint R&D

2.3.1 Impact mechanisms on innovation

Joint R&D can make R&D activities active and efficient and promote innovation, and is considered to have pro-competitive effects in many cases[108].

Meanwhile, joint R&D may have negative impacts on R&D incentive because of the following points: its characteristic similar to a business combination that decision-making and consequent behavior are integrated to a certain extent through collaboration among two or more firms[109]; and agreements that are enforced for implementation of joint R&D and unilaterally or bilaterally restrict or control business activities of participants[110].

2.3.1.1 The necessity of joint R&D (presuppositional discussions)

Joint R&D is conduct where two or more firms jointly conduct R&D for a specific theme, and may lead to questions from the perspectives of the Antimonopoly Act due to its nature of being collective conduct. In judgement as to whether the conduct is questionable or not, the need for joint undertaking is assessed in terms of, for example, whether it is difficult for a single firm to bear associated R&D risks and costs, whether there is a substantial need for conducting R&D jointly based on technological accumulations, technology development capabilities, etc.[111] Points to consider for this need for joint undertaking include whether the joint conduct would ensure the effectiveness of R&D, and whether it would facilitate the smooth implementation of R&D. In a case where the need for joint conduct is denied, R&D activities are restricted, the numbers of mutually alternative technologies and products are reduced, or R&D is delayed[112], for example.

Thus, the first question about joint R&D is whether it needs to be undertaken jointly. However, even if the need has been recognized, it may affect R&D incentive for firms when it is implemented. The following examines and summarizes a range of impact mechanisms through which joint R&D affect R&D incentive.

2.3.1.2 Impact mechanisms of joint R&D on R&D incentive

As in the case of a business combination, joint R&D affects R&D incentive in participants and in non-participants (refer to firms that are in competitive relationship, unless otherwise specified) by affecting the difference between expected returns of each firm when R&D is conducted and when it is not, respectively. Accordingly, the following considers impact mechanisms that may work on R&D incentive by joint R&D. As in the above discussions, with the focus on R&D-related fields (conditions concerning R&D activities within joint R&D participants, the competition environment and the market structure of a product market that are based on R&D results, etc.) in which unambiguous situational changes can occur through joint R&D, the following categorizes and summarizes major impact mechanisms that may emerge in relation to each of the fields.

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[108]See 1 in "Introduction" of Joint R&D Guidelines.

[109]See page 9 of CPRC (2019)

[110]See page 12 of CPRC (2019)

[111]See Part I, 2, {3} of Joint R&D Guidelines.

[112]See paragraph 139 of EU Horizontal Co-Operation Agreements GLs, Part I, 1 of Joint R&D Guidelines, and page 182 of Scotchmer (2008).

Specifically, in the first place, as those generated from a joint undertaking of R&D (joint R&D itself), these fields are categorized into fields relating to conditions concerning businesses and profits within a joint R&D participant (Groups A to C) and a field relating to the competition environment, market structure, etc. (Group D).

Group A	Appropriability (and spillover)
Group B	Necessary inputs and capabilities for R&D
Group C	Profit structure and conditions
Group D	Competition situation in product market

In addition to these fields, as those generated from an agreement for implementation of joint R&D, there are following fields: a field that affects inputs and capabilities of participants and their expected returns in a product market through agreements between participants that restrict their own business activities (Group E-1); and a field that includes implementation of input foreclosure or customer foreclosure against a business counterparty (non-participant) based on an agreement that assumes that there is business relationship between any of the participants or between any of the participants and any of the non-participants (Group E-2)[113].

Group E-1	Restrictions on business activities (that affect inputs and capabilities of a participant and expected return thereof in product market)
Group E-2	Market foreclosure against business counterparty (non-participant)

2.3.1.3 Impact mechanisms in fields in which situational changes may occur by joint R&D

2.3.1.3.1 Appropriability (and spillover)

In joint R&D, impact mechanisms (an increase in appropriability in participants and a consequent decrease in involuntary spillover in non-participants) that change R&D incentive in participants and non-participants in terms of appropriability and spillover are basically the same as those in the case of a horizontal business combination. As described below, however, it is considered that the appropriability is affected to a different degree, and that there is a spillover effect among participants as a mechanism unique to joint R&D.

2.3.1.3.1.1 Increase in appropriability (positive impact)

The same impact mechanism as one that applies to a horizontal business combination works, which is as follows: involuntary spillover is internalized within joint R&D participants as a result of having joint R&D conducted within firms among which the involuntary spillover has been present, resulting in an increase in appropriability and consequent increases in R&D incentive among the participants, whereas a decrease in involuntary spillover to non-participants may occur as a secondary impact[114].

In joint R&D, however, unlike in a business combination where involuntary spillover that has been present between combining firms is completely internalized by their integration into one (as a group), participants can independently conduct business

[113]While these domains include a change that affects R&D in the same field as the joint R&D (R&D competing with or alternative thereto), and a change that affects R&D in different fields, the same impact mechanisms apply to both types.
[114]See pages 44-45 of Odagiri (2016), page 197 of Odagiri (2001), and page 249 of Hanazono (2018).

activities (R&D) other than the joint R&D, and involuntary spillover cannot be completely prevented by a contract, etc. Thus, involuntary spillover present among participants may not be completely internalized. It is therefore considered that appropriability increases to a smaller extent than in a horizontal business combination and that a positive impact on R&D incentive in the participants is relatively small.

Besides, while spillover to non-participants may decrease as a result of joint R&D, a negative impact on R&D incentive in non-participants is relatively small considering that participants can continue to independently conduct R&D that is not covered by the joint R&D, and that the number of such mutually independent R&D conductors is maintained. It is considered that a negative impact on R&D incentive in non-participants due to decrease in spillover can be understood as how necessary inputs and capabilities for R&D are affected in the non-participants (see 2.3.1.3.2 below)[115], which is the same as in the case of a horizontal business combination.

2.3.1.3.1.2 Spillover effects among participants (positive impact)

Joint R&D can result in new (voluntary) spillover among participants on technology information possessed by these firms by facilitating information exchange among them during the course of the joint R&D. That is, in joint R&D, unlike a horizontal business combination where combining firms are completely integrated into one, participants are allowed to continue to independently conduct R&D, utilizing the knowledge acquired through the joint R&D, whereby R&D incentive may be increased (spillover effect)[116].

It should be noted that spillover enjoyed by each participant from the other participants through joint R&D can be understood as serving to enhance necessary inputs or capabilities for R&D[117] in that participant (see 2.3.1.3.2 below)[118].

2.3.1.3.2 Necessary inputs and capabilities for R&D

In joint R&D, impact mechanisms (a synergistic effect (supplementary effect), increases in investment capability and investment capacity, R&D implementation cost reduction, and resource allocation optimization) through which the implementation of the joint R&D changes necessary inputs and capabilities for R&D and consequently can bring about positive effects on R&D incentive are basically the same as those in the case of a horizontal

[115]It is considered that this negative impact is to be analyzed as an element that constitutes changes in the competition situation of a product market (see 2.3.1.3.4 below), which is the same as in the case of a horizontal business combination.

[116]See page 197 of Odagiri (2001).

[117]It is considered appropriate that a mechanism through which information exchange between participating firms results in the enhancement of necessary inputs for joint R&D be described as a synergistic effect (supplementary effect) in 2.3.1.3.2 below. A spillover effect (supplementary effect) here can be described as what affects R&D in a field other than that of joint R&D.

[118]It is considered that this negative impact is to be analyzed as an element that constitutes changes in the competition situation of a product market (see 2.3.1.3.4 below), which is the same as in the case of a horizontal business combination.

business combination[119] [120] [121].

Among these effects, however, a synergistic effect (supplementary effect) is considered to have a relatively small positive impact on R&D capabilities compared with a horizontal business combination. This is because joint R&D merely virtually integrate R&D through a contract among participants that individually conduct business, and supplementary assets may be combined insufficiently, as compared with a horizontal business combination where combining firms are organizationally integrated (as a group) into one and perform unified decision-making[122] [123].

2.3.1.3.3 Profit structures and conditions (positive impact)

In joint R&D, positive impact mechanisms (demand expansion effect and margin expansion effect) that change R&D incentive in participants due to changes in profit structure and conditions, that is, the occurrence of a certain rent and an increase in product volume, in the participants are basically the same as those in the case of a horizontal business combination[124] [125]. However, while a horizontal business combination itself changes the profit structure and conditions of a combining firm, joint R&D does not change the corresponding profit structure and conditions naturally at the time when the joint R&D is implemented but only when R&D has been successful and when the competition environment in a product market has changed following the launch of a product to which participants apply the results of the R&D. It is considered that such prerequisites need to be taken into consideration.

It is also considered that a demand expansion effect itself may never even appear (unless a participant can add a substantially high value to a product in the productization stage) with the following reason. While a demand expansion effect occurs when a rent occurs from sales of a product to which the results of joint R&D are applied (when price controlling power is

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[119]For more on a synergistic effect (supplementary effect), see 1 in "Introduction" of Joint R&D Guidelines, Collection of Counseling Cases (FY2000) Case No. 8, pages 45-46 of Odagiri (2016), pages 5 and 8 of UK R&D Block Exemption Regulations (Updated Recommendation), and page 316 of Ordover, Willig (1985).

[120]For more on the enhancement of investment capacity, see 1 in "Introduction" of Joint R&D Guidelines and Collection of Counseling Cases (FY2004) Case No. 6.

[121]For more on R&D implementation cost reduction, see page 316 of Ordover, Willig (1985), page 45 of Odagiri (2016), pages 197-198 of Odagiri (2001), page 8 of UK R&D Block Exemption Regulations (Updated Recommendation), and pages 173-175 of Gandal, Scotchmer (1993). It should be noted that resource allocation optimization can also occur through resolution of information asymmetry. Such resolution is achieved by, for example, a contract among participating firms or by having information on the R&D capabilities of the participating firms shared among them through joint R&D.

[122]Odagiri (2016) (page 46) mentions that the combination of supplementary capabilities can be attained only insufficiently depending on the form and the manner of operation of joint research. Meanwhile, Joint R&D Guidelines mentions as follows: calling for the obligation to disclose information necessary for joint R&D on technologies, etc. does not fall under unfair trade practices, in principle (Part II, 2, (1), (a), {2} of Joint R&D Guidelines); and restricting the diversion of the technologies, etc. disclosed by other participants in connection with the joint R&D project regarding themes other than that of the joint R&D project beyond a reasonable extent necessary for the prevention of the diversion of the technologies, etc. may fall under unfair trade practices (Part II, 2, (1), (b), {1} of Joint R&D Guidelines).

[123]As described in 2.3.1.3.3 below, it is considered that a joint R&D contract can secure a certain level of synergistic effect (supplementary effect) by calling for the obligations to disclose information on relevant technologies and to keep information confidential among participating firms.

[124]See page 384 of Hagedoorn (1993) and page 415 of Belderbos et al. (2006).

[125]As impact mechanisms on R&D incentive that are attributable to changes in earning structure in joint R&D, there are mentions that "total optimization" and "resolution of a hold-up problem" occur under specific conditions, as in the case of a vertical or conglomerate business combination (page 457 of Brocas (2003) and page 288 of Banerjee, Lin (2001)).

present), a firm needs to excel in a product market so as to gain a rent. However, in joint R&D, products of participants are based on the results of the joint R&D, so each participant is unlikely to naturally secure a superior position in the product market (among competitors including the other participants).

2.3.1.3.4 Competition situation in product market

In joint R&D, an impact mechanism (strategic effect) that affects R&D incentive in participants and non-participants through changes that the joint R&D has brought in the competition situation of a product market is basically the same as the impact mechanism in the case of a horizontal business combination.

Unlike a horizontal business combination, however, joint R&D leaves participants with room to individually act and assumes that they continue to compete with each other in a market of products based on results of the joint R&D. Competition among participants that has been present in the product market does not disappear by the start of joint R&D. Thus, unlike a horizontal business combination where competition between combining firms in the current and future product market disappears, joint R&D does not naturally change the situation of competition with competitors, the market structure, etc. in a product market. Therefore, as described below, the impact mechanisms are considered to partially occur or occur only under specific conditions.

2.3.1.3.4.1 Replacement effect (cannibalization effect) (negative impact)

Unlike a business combination, joint R&D does not affect the market share of participants in a product market. Therefore, joint R&D is considered to create no replacement effect (cannibalization effect) in each of the participants with its own existing product because such an effect would occur when the market share of a firm increases to the extent that a certain rent occurs.

Meanwhile, when participants are conducting or potentially conducts R&D with the same theme as that of joint R&D, a cannibalization relationship occurs in each participant between its own R&D and R&D covered by the joint R&D as a result of conducting the joint R&D, whereby a replacement effect occurs. It is therefore considered that the participant's incentive to maintain (start) R&D with the same theme as the joint R&D decreases.

This impact mechanism in the form of a replacement effect is basically the same as the impact mechanism in a business combination.

2.3.1.3.4.2 Decrease in escape competition effect in participants (negative impact)

A decrease in or loss of escape competition effect is attributable to the weakening of competition in a product market, and therefore is considered not to immediately occur in joint R&D.

Meanwhile, let us assume a case where, while quality competition is focused in a product market, the results of joint R&D would equalize the quality of products of participants, and another case where, while price competition is focused, the results of joint R&D would make the cost structures of participants similar to each other. In either

of these cases, a participant has a shorter period for which it can pre-empt profit by successfully achieving R&D before all the other participants by joint undertaking of R&D. In such a case, when competitive pressure from non-participants is small and competition in the product market is dominated by competition among the participants, escape competition effects in the respective participants may decrease insofar as these conditions apply[126].

Furthermore, when joint R&D affects the competition situation in a product market between a product employing the results of joint R&D and a competing product, for example, when the results of joint R&D directly affect the quality or costs of products, escape competition effects in the respective participants may decrease in the following case: the advantage of participants over non-participants considerably increases by the joint R&D, making their competition with non-participants in the product market unchangeable, or resulting in the lower chance of new entry.

2.3.1.3.4.3 Decrease in or loss of escape competition effect in non-participants (negative impact)

As in the case of a horizontal business combination, the following impact mechanism may occur: when joint R&D affects the competition situation in a product market between a product employing the results of joint R&D and a competing product, for example, when the results of joint R&D directly affect the quality or costs of products, the advantage of participants over non-participants considerably increases by the joint R&D, whereby the escape competition effects in non-participants decrease or is lost. This further leads to decreases in or loss of escape competition effects in the participants as counter effects, whereby the participants' R&D incentive may also decrease. This is also the same as in the case of a horizontal business combination.

Furthermore, such a decrease in or loss of escape competition effect in the non-participants occurs, for example, in the following case: when a specific firm is restricted from participation in joint R&D aimed at developing a technology essential for a business while the total market share of the participants is considerably high, this restricted frim (non-participant) gives up R&D for this essential technology[127].

2.3.1.3.4.4 Decrease in or loss of pre-emption effect (rent-dissipation effect) (negative impact)

Joint R&D does not immediately result in an increase in share in a market product. Therefore, a monopolistic firm (or quasi-monopolistic firm) does not emerge, and a pre-emption effect (rent-dissipation effect) is considered basically irrelevant to joint R&D.

However, in a situation where an existing monopolistic firm (or quasi-monopolistic firm) is present with an pre-emption effect already (potentially) present, such a firm and a competitor (which includes a potential entrant that may become a competitor in the future) participate in joint R&D, and there are no other leading competitors and no other potential entrants, the risk of the existing monopolistic firm's losing a rent decreases,

[126]See page 183 of Nagaoka (2022).

[127]See Part I, 2, (2) of Joint R&D Guidelines.

resulting in a mechanism where R&D incentive to impede entry of the competitor decreases. This mechanism may appear in the same manner as the impact mechanism in a horizontal business combination.

2.3.1.3.5 Impact mechanisms generated by agreements for implementation of joint R&D

While joint R&D is intended to achieve a common target with two or more firms participating therein, participants may set up a range of agreements between them in a case where simply agreeing to jointly conduct R&D is not enough to achieve the common target or it is necessary to more smoothly achieve the common target. Such agreements have effects that contribute to achieving a target of the joint R&D, for example, enabling the participants to concentrate on the joint R&D or forcing them to keep know-how, i.e. the results of the joint R&D, confidential. At the same time, such agreements may have a negative impact on R&D incentive in participants and non-participants (including firms that are not in competitive relationship)[128]. Such agreements are therefore considered in terms of whether they ensure the effectiveness of R&D and whether they facilitate smooth implementation of R&D[129].

It is considered that certain differences between impact mechanisms arise due to a range of agreements for the implementation of joint R&D depending on which corporate R&D incentive or inputs and capabilities they affect. As described below, agreements can be broken down into those that affect participants in joint R&D, "restrictions on business activities of participants (those relating to inputs and capabilities or expected returns in a product market of participants)," and those that affect non-participants, "market foreclosure against a business counterparty (non-participant)."

2.3.1.3.5.1 Restrictions on business activities of participants (affecting inputs and capabilities or expected returns in a product market of participants)

2.3.1.3.5.1.1 Agreements relating to use of technologies and R&D activities of participants in joint R&D (necessary inputs and capabilities for R&D)

The agreements may possibly restrict, beyond the necessary extent, each participant from any of the following: conducting R&D whose theme is the same as that of the joint R&D even after the completion of the joint R&D; conducting R&D whose theme is different from that of the joint R&D; conducting R&D using the results of the joint R&D; using technology, etc. disclosed by another participant for themes other than that of the joint R&D; and using for oneself or licensing a third party to use technology, etc. owned by a participant[130]. Such restrictions would constrain technology trading and R&D activities of participants and deteriorate inputs and capabilities for R&D in fields that are same as or different from the field covered by the joint R&D, and may

[128]See 1 in "Introduction" and Part II, 1 of Joint R&D Guidelines. It should be noted that, as described in 2.1.1.2 above, some agreements affect the same domains as the joint R&D affects, and some affect domains that the joint R&D does not affect. However, it is considered that impact mechanisms on R&D incentive themselves are common to both types.

[129]See Part II, 2 of Joint R&D Guidelines.

[130]See Part II, 2, (1), (c), {1}, {2} and {3}, Part II, 2, (1), (b), {1}, and Part II, 2, (2), (b), {1} of Joint R&D Guidelines and page 54 of Odagiri (2016).

consequently decrease R&D incentive. This negative impact can be understood as how necessary inputs and capabilities for R&D are affected in these participants (see 2.3.1.3.2 above)[131].

2.3.1.3.5.1.2 Agreements relating to use of technologies and business activities other than R&D activities of participants in joint R&D (decreases in escape competition effect in participants)

The agreements may possibly require each participant, beyond the necessary extent, any of the followings: to allow only some of participants to own intellectual property rights based on results; to impose the obligation to transfer exclusively to the participants the ownership of, or permit them to exclusively use, intellectual property rights based on improvements of results; to be restricted about the prices, production volumes, users, sales regions, etc. of a product based on the results of the joint R&D; and to be restricted from producing or selling the competing products other than those based on the results of the joint R&D. In such a case, the expected return to be gained by the participants from the joint R&D and their own R&D in a product market may decrease[132]. This negative impact is to be analyzed as an element that constitutes changes in the competition situation of a product market (see 2.3.1.3.4 above).

2.3.1.3.5.2 Market foreclosure against business counterparty (non-participant) (negative impact)

While joint R&D is intended to create a new technology with firms jointly conducting R&D, technology, etc. produced as the results of joint R&D can be used by each participant for its own competition in a product market, and the technology itself can be traded (technology market). On the premise that such a technology market is present, a non-participant with competitive relationship in the product market can be potential users of technology, etc. produced as the results of joint R&D, the non-participant and the participants that owns the technology may establish a business relationship (for example, a licensor-licensee relationship). Furthermore, a non-participant with a competitive relationship in the technology market (a firm that has or aims to develop a technology (substitutable technology) that is similar to the technology aimed by the joint R&D) and a participant in the joint R&D that is a user of the technology can enter into a business relationship.

In joint R&D, on the premise that such business relationships may be present, mechanisms through which agreements between participants affect inputs and capabilities for R&D and monetization activities in a business counterparty (non-participant) and consequently affect R&D incentive are basically the same as the impact mechanisms in a

[131] Such a change in R&D incentive in participating firms is analyzed as an element that constitutes changes in the competition situation of a product market (see 2.3.1.3.4 above).

[132] See Part II, 3, (2), (a) of Startup Guidelines, Part II, 2, (1), (c), {4}, Part II, 2, (2), (b), {2} and Part II, 2, (3), (b), {1}-{3} and {5} of Joint R&D Guidelines and page 54 of Odagiri (2016). It may be summarized that, while unilaterally imposing an unfavorable restriction on a specific participating firm in joint R&D is understood as constituting abuse of a superior bargaining position, a mechanism through which joint R&D affects incentive of the participating firm is similar to this.

vertical business combination. Specifically, impact mechanisms due to agreements as described in 2.3.1.3.5.2.1 and 2.3.1.3.5.2.2 below can be presented.

2.3.1.3.5.2.1 Input foreclosure against business counterparty (non-participant)

Let us assume a case where, while the total market share of firms participating in joint R&D aimed at developing a technology essential for a business (R&D) is considerably high, a specific firm is foreclosed from the technology by being restricted from participating in the joint R&D or from conducting a joint R&D whose theme is the same as that of the joint R&D with some of the participants. This foreclosed firm (non-participant) becomes unable to conduct R&D that needs this essential technology as an input[133]. In this case, however, if a license is given to the non-participant under an appropriate condition so that it can conduct the R&D, foreclosure from this technology does not occur[134].

Besides, there may be a case where the participants agree to restrict licensing of the joint R&D results to a third party, whereby the non-participant is foreclosed from the technology resulting from the joint R&D. Also in this case, the non-participant becomes unable to conduct R&D using this technology as an input thereto[135].

Also in a case where the participants have an agreement to restrict licensing of technologies owned by them to a third party, the third party (non-participant) becomes unable to conduct R&D using any of these technologies as an input thereto.

Thus, a mechanism through which R&D incentive in a non-participant decreases, where the non-participant becomes unable to acquire necessary inputs for R&D, by being restricted from participating in the joint R&D, being restricted from being licensed to use the results, or being restricted from being licensed (restriction of licensing to a third party) to use any technology owned by the participants, is the same as the impact mechanism in a vertical business combination.

2.3.1.3.5.2.2 Customer foreclosure, etc. against business counterparty (non-participants)

Let us assume a case where firms participating in joint R&D agree to restrict themselves, beyond the extent that is necessary for implementation of joint R&D, from introducing a technology that is similar to a technology aimed to achieve by joint R&D, whereby a non-participant is unable to license the foregoing similar technology to any of the participants and thus is deprived of business opportunities (foreclosed from customers in licensing business). A mechanism through which R&D incentive for that similar technology decreases in the non-participant following a decrease in its expected return[136] is the same as the impact mechanism in a vertical business combination.

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[133]See Part I, 2, (2) of Joint R&D Guidelines, Collection of Counseling Cases (FY2016) Case No. 2, and paragraph 138 of EU Horizontal Co-Operation Agreements GLs.

[134]See Part I, 2, (2) of Joint R&D Guidelines and paragraph 138 of EU Horizontal Co-Operation Agreements GLs.

[135]See Part I, 2, (2) and Part II, 2, (2), (a), {2} of Joint R&D Guidelines.

[136]See Part II, 2, (1), (b), {2} of Joint R&D Guidelines.

2.3.1.3.6 Coordinated effect due to information sharing among participants (negative impact)

It is considered appropriate that a coordinated effect be treated separately from the foregoing impact mechanisms as in the case of a horizontal business combination, in view of the nature of this impact mechanism.

Regarding a horizontal business combination, it has been suggested that coordinated conduct is unlikely to occur in R&D activities[137] because of characteristics of such activities—low predictability, high likelihood of having the results externally confidential, long periods required to achieve the results, etc.—and also because of possible changes in the market structure itself, such as changes in market share, occurrences of new entry, market expansion, etc. that may be caused by the results (See 2.1.1.2.2 above). In contrast, in the case of joint R&D, firms participating therein share information on technologies and the progress of R&D of the individual firms, and converge and commonalize results and the consequences of the results—demand and profit—though joint undertaking of R&D. Therefore, if the above mentioned condition changes and the mutual predictability between participants increases, it becomes easier for the participants to take coordinated conduct, whereby coordinated conduct is more likely to be facilitated[138]. Under such circumstances, when the expected return is higher if the degree (such as the level of results and the development pace) of the R&D are held down than if the R&D is conducted aggressively to the extent technologically possible[139], the participants choose to take coordinated conduct. Thus, it is considered that their R&D incentive may remarkably decrease.

[137]With respect to coordinated conduct on prices in a product market, the following characteristics are generally cited as a market structure where coordinated conduct tends to be facilitated: high transparency in pricing behavior; high degree of market concentration (oligopolistic); high stability (small changes in supply and demand); and high symmetry (homogeneous in terms of cost structure, market share, manufactured product, etc.) (see paragraphs starting from 77 of EU Horizontal Cooperation Agreement Guidelines). Such consideration to characteristics of a market focuses on the following functions thereof: enabling firms to have common awareness about conditions that enable coordinated conduct to be taken when the ability of a firm to predict other firms' actions has increased due to increased predictability on pricing; and facilitating monitoring and retaliation over a breach of coordinated conduct. Similar perspectives may be equally applicable to R&D based on the understanding that firms can develop common awareness about expected returns through coordinated conduct when each firm has higher predictability about R&D activities of other firms. For the likelihood of facilitation of coordinated conduct among firms participating in joint R&D, it is thus beneficial to verify whether these circumstances may arise in R&D activities through joint undertaking of R&D.

[138]See pages 17-18 CPRC (2019)

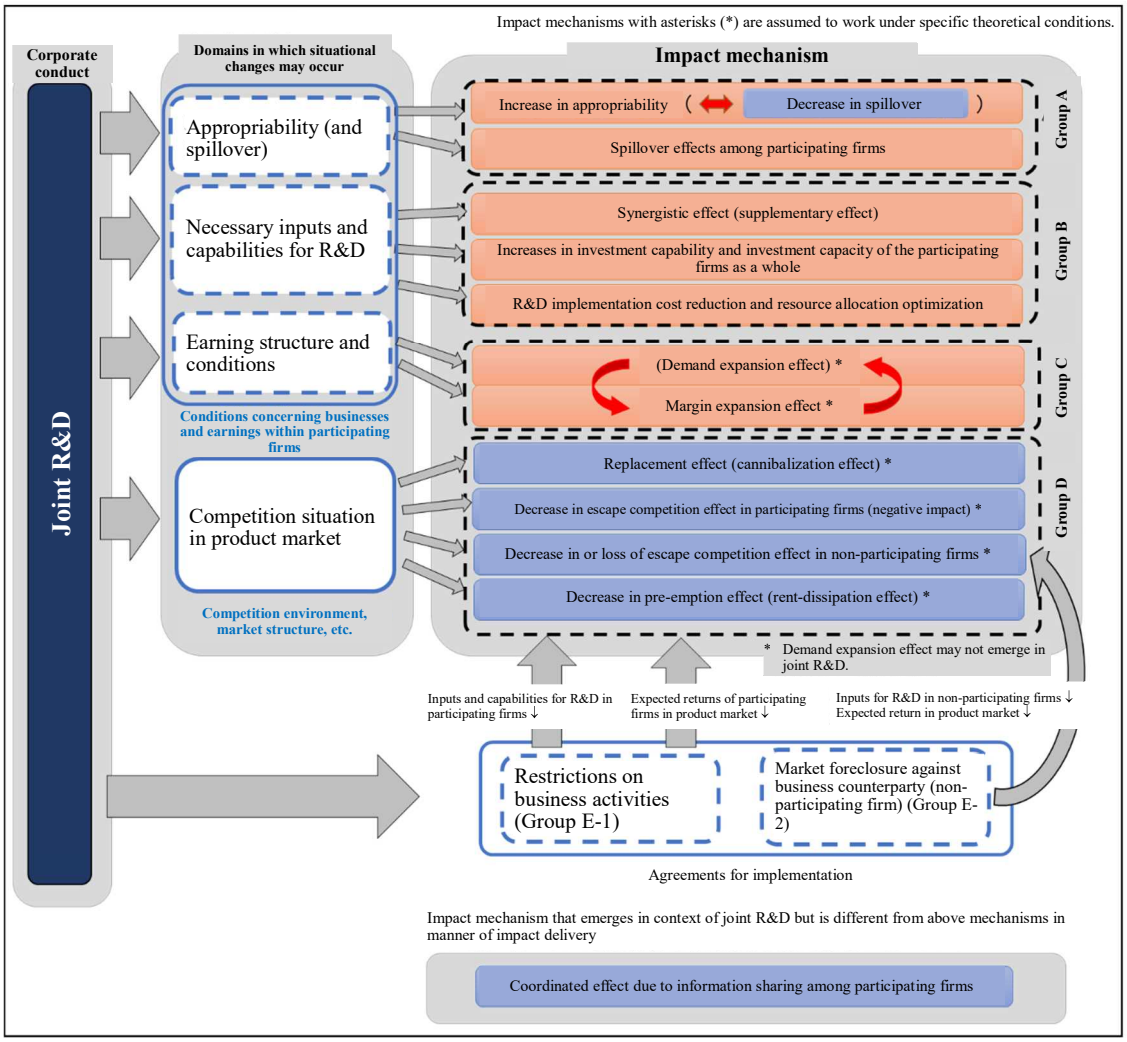
[139]Possible example is a case where R&D results deviated from reasonable expected returns of firms participating in joint R&D have been set in compliance with government regulations.

2.3.2 Overall summarization of impact mechanisms on innovation

2.3.2.1 Basic perspectives

A comprehensive picture of the main impact mechanisms categorized and summarized in 2.3.1 is illustrated below.

[FIG. 3: Impact mechanisms for Joint R&D]



These individual impact mechanisms are considered to be basically the same as those presented for a horizontal business combination in the following points: they are complex and dynamic in the real world as the manner and the strength of their actual emergence affect each other; and when they are observed based on particular situations and conditions (elements) related to R&D activities, the competition environment, market structures, etc. that may affect manners in which specific impact emerge, general tendencies can be extracted to some extent for a mutual relationship between the impact mechanisms and for an overall manner in which impacts emerge.

2.3.2.2 Mutual relationships among impact mechanisms

As described in 2.3.2.1 above, general tendencies can be extracted to some extent for a mutual relationship between some of the impact mechanisms and for an overall manner in

which impacts emerge. Examples of such tendencies are presented below;

provided, however, the following points should be noted:

- As described in 2.3.1.3, participants in joint R&D continue to conduct business activities outside of the joint R&D. This means that, even when the impact mechanisms that are basically the same as in the case of a horizontal business combination work, there are differences in how strongly each of them emerges, and some of them do not even appear, compared with the case of a horizontal business combination. These differences need to be also taken into consideration when the mutual relationships among the impact mechanisms are assessed.
- As described in 2.3.1.3.5 above, impacts that occur due to agreements for implementation of joint R&D (Group E-1, E-2) are to be examined as elements that constitute the competition situation in product market (Group D). Therefore, these are to be assessed by taking into account impacts in the competition situation in product market (Group D).

2.3.2.2.1 Trade-off associated with appropriability and spillover

The following considerations on a horizontal business combination would also apply to joint R&D in principle: there is a trade-off between increase in appropriability in participants in joint R&D and decrease in spillover that is enjoyed by non-participants by free riding; and it is necessary to have an appropriate balance so as to appropriately secure the aggregate R&D incentive of participants and non-participants that would benefit from spillover by free riding. In addition to the above trade off, however, a positive impact on R&D incentive in participants due to an increase in newly generated spillover among participants due to the implementation of joint R&D need to be reflected in R&D incentive in joint R&D.

2.3.2.2.1.1 Technological characteristics

In principle, our considerations on the relationships of technological characteristics with increase in appropriability in a combined firm and decrease in spillover in competitors in a horizontal business combination are considered to also apply to the relationships thereof with increase in appropriability in participants and decrease in spillover in non-participants in joint R&D.

2.3.2.2.1.2 Level of technological opportunity

In principle, our considerations on the relationships of the level of technological opportunity with increase in appropriability in a combined firm and decrease in spillover in competitors in a horizontal business combination are considered to also apply to the relationships thereof with increase in appropriability in participants and decrease in spillover in non-participants in joint R&D.

2.3.2.2.1.3 Closeness of technologies

In principle, our considerations on the relationships of the closeness of technologies with increase in appropriability in a combined firm and decrease in spillover in competitors in a horizontal business combination are considered to also apply to the relationships thereof with increase in appropriability in participants and decrease in

spillover in non-participants in joint R&D.

2.3.2.2.2 Necessary inputs and capabilities for R&D (optimization of resource allocation in particular)

Joint R&D allows each participant to have R&D costs shared by the other participants, thereby providing more room in adjusting its resource allocation to more efficient one. Consideration on which option to take from the perspective of resource allocation optimization (i.e. to streamline and integrate its own R&D that overlaps with joint R&D or to maintain its own R&D activities) is basically the same as in the case of a horizontal business combination.

2.3.2.2.2.1 Level of technological opportunity

If the technological opportunity is low (the chance of success of R&D is low), relatively high importance is put on risk diversification, diversity, etc. in technology development, and a participant is likely to choose to maintain its own R&D activities that overlap with joint R&D. If the opportunity is high, a firm is likely to choose to concentrate its R&D resources by streamlining and integrating (discontinuing) its own R&D. This consideration is basically the same as in the case of a horizontal business combination.

2.3.2.2.2.2 Uncertainty of functions and utility value from R&D results

When the uncertainty about functions and utility value from R&D results (technology) is high, pursuing several R&D themes in parallel can maximize the aggregate expected return in some cases, so the R&D themes that overlap with joint R&D are likely to be maintained. In contrast, when the functions and the utility value are fairly predictable, a firm is likely to streamline and integrate (discontinue) its own R&D. This consideration is basically the same as in the case of a horizontal business combination.

2.3.2.2.3 Profit structure and conditions

A demand expansion effect and a margin expansion effect in joint R&D may mutually and cumulatively increase R&D incentive, and necessary innovation needs to be continually achieved for such cumulative increase to occur. While this is basically the same as in the case of a horizontal business combination, it is considered that no demand expansion effect may emerge as described in 2.3.1.3.3 above. Furthermore, a mutually cumulative relationship of R&D incentive may not exist in the first place.

2.3.2.2.4 Competition situation in product market

It is considered that R&D incentive is strategically decided depending on relative and external elements of the competition environment such as the competition situation with competitors in a product market and market structures (if joint R&D changes the competition situation of the product market), which is basically the same as in the case of a horizontal business combination. In such a mechanism, under specific competition and market conditions, negative impacts are likely to emerge more strongly in terms of R&D incentive

in participants and non-participants[140].

It should be noted that restrictions on business activities of participants due to agreements for implementation of joint R&D (Group E-1) and market foreclosure against a business counterparty (non-participant) (Group E-2) affect inputs and capabilities or expected returns of participants or non-participants through such conduct, and eventually affect the competition situation of a product market (Group D)[141].

2.3.2.2.4.1 Stable market

It is considered that an escape competition effect is less likely to occur when a product market is stable than when it is unstable, which is basically the same as in the case of a horizontal business combination.

2.3.2.2.4.2 Unstable market

It is considered that the negative impact of a decrease in escape competition effect is less likely to occur when a product market is unstable than when it is stable, which is basically the same as in the case of a horizontal business combination.

2.3.2.2.4.3 High degree of market concentration (market share of participants in particular)

It is considered that the larger the share of participants in joint R&D in a product market, the smaller the escape competition effect would be in participants and the less likely the escape competition effect emerges in non-participants. This is basically the same as in the case of a horizontal business combination.

These consequences may be different depending on the level of product substitutability and the level of differentiation between participants and non-participants. If the level of product differentiation is considerably high, the situation is considered to be the one described 2.3.2.2.4.5 below.

2.3.2.2.4.4 Closeness/divergence of technological level

Let us assume a case where there is a large gap in technological level between participants and non-participants, that is, a case where, while leading innovators that directly compete with each other participate in joint R&D, there is no leading innovator among the non-participants. In such a case, it is considered that decreases in escape competition effects tend to intensify, which is basically the same as in the case of a horizontal business combination.

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[140] As described in 2.3.1.3.4 above, joint R&D does not immediately result in an increase in share in a market product, and therefore, a monopolistic firm (or quasi-monopolistic firm) does not emerge. Therefore, unlike in a horizontal business combination, a pre-emption effect (rent-dissipation effect), which is a positive impact, is irrelevant to joint R&D. Furthermore, as described in 2.3.1.3.4.1 above, the replacement effect in joint R&D decreases incentive to maintain (start) R&D that overlaps with joint R&D, and is irrelevant to certain situations and conditions mentioned in 2.3.1.3.4.1 and thereafter.

[141] To the latter (Group E-2), the same considerations as in the case of market foreclosure against a competitor in a vertical or conglomerate business combination apply (see 2.2.1.1.5 above).

2.3.2.2.4.5 Level of product differentiation and switching costs

When the product substitutability is low, it is considered that a decrease in escape competition effect can be relatively small, even if the competition situation in product market changes due to joint R&D, a strategic effect on R&D incentive itself may not work strongly as a whole, which is basically the same as in the case of a horizontal business combination.

2.3.2.2.5 Overall impact reflecting mutual relationships between above fields 2.3.2.2.1 to 2.3.2.2.4

Joint R&D can primarily have impacts on R&D incentive through changes in the respective fields—the trade-off associated with appropriability and spillover (Group A), necessary inputs and capabilities for R&D (Group B), profit structure and conditions (Group C), and the competition situation of a product market (Group D)[142]. Meanwhile, the final level of R&D incentive is holistically settled through the collective action of situations in the respective fields. In particular, the state of changes in R&D incentive that occur in the fields (Groups A to C) relating to individual conditions concerning businesses and profits within participants in joint R&D is also affected by strategic decision making that reflects relative and external circumstances in the competition environment of a product market (provided that the joint R&D changes the competition condition in the product market). The following considers mutual relationships between these fields and summarizes several cases where certain tendencies can be identified regarding how the overall impact emerge on R&D incentive.

2.3.2.2.5.1 Low technological opportunity, and uncertainty of functions and utility value from R&D results

As 2.3.1.3.4.1, joint R&D is considered basically the same as a horizontal business combination in the following points: in a case where a technology to be covered by joint R&D has a low level of technological opportunity (low chance of success) although a replacement effect is likely to emerge between that technology and individually conducted R&D, or in a case where there is high uncertainty regarding functions and utility value from results of joint R&D, the individually conducted R&D is likely to be maintained; and the higher the risk of a complete failure after streamlining and integrating (discontinuing) the individually conducted R&D or the higher the above uncertainty, the less likely the replacement effect increases. Furthermore, the relationship with an opportunity cost in case of the complete failure is considered to be basically the same as in the case of a horizontal business combination.

2.3.2.2.5.2 Low product substitutability in product market

Joint R&D is also considered basically the same as a horizontal business combination in the following points: effects from Group D tend to be neutral in a case where a product

[142]As described in 2.3.2.2.4 above, impacts due to agreements for implementation of joint R&D (Groups E-1 and E-2) that need to be considered as those that constitute changes in the competition situation of a product market (Group D) are included.

market has low product substitutability because of strong differentiation among products therein; and, in a case where, while how impacts from the Groups A to C emerge tend to be suppressed, R&D incentive may change insofar as expected return can be increased by production cost reduction within the firm, creation of new demand, and creation of a high-value-added product without necessarily needing customer stealing between firms, and these positive impacts may collectively work on R&D incentive.

2.3.2.2.5.3 Importance of spillover

When spillover from another firm serves as an important element in R&D, if the appropriability of participants increases through joint R&D, it is considered that a negative impact on R&D incentive in non-participants due to a decrease in spillover tends to be relatively large[143], and that an impact that a change in the competition situation (Group D) has on R&D incentive may be stronger with the above situation affecting a product market, which is basically the same as in the case of a horizontal business combination.

2.4 Elements that affect how specific impacts emerge through impact mechanisms

The sections 2.1 to 2.3 above summarizes impact mechanisms on R&D incentive with respect to three types of corporate conduct: a horizontal business combination; a vertical business or conglomerate business combination; and Joint R&D. Each of the specific impacts based on the respective impact mechanisms does not always occur with the same strength. Instead, it occurs in a different manner depending on a range of elements such as the situation of a market, the relationships between combining firms and between combining and competitors, and the relationships between participants and between participating and non-participating.

As described above in the sections 2.1 to 2.3, there are impact mechanisms common to these corporate conduct types. It is considered that elements that affect R&D incentive through such common impact mechanisms basically have same tendencies. However, the specific manners in which such elements affect it are not necessarily the same. There are cases where the same elements are different in how strongly they emerge and what paths to take when emerging, and where the element exhibits the same tendency only under a specific condition.

Such elements that affect how specifically R&D incentive is affected can be summarized as follows with respect to each impact mechanism (including those common to several corporate conduct types and those unique to a specific corporate conduct type).

[143]There is the need to give consideration also to spillover effects that newly emerge among participating firms due to joint R&D. (A relatively strong positive effect may occur given that spillover is important in this particular industry.)

2.4.1 Elements relating to appropriability (and spillover) (Group A)

2.4.1.1 Elements relating to increase in appropriability (secondary decrease in spillover)

2.4.1.1.1 Market characteristics

2.4.1.1.1.1 Degree of involuntary spillover [applicable to all corporate conduct types]

When involuntary spillover between combining companies and participants increases, the spillover is internalized through a business combination or joint R&D and results in higher degree of appropriability, whereby R&D incentive in the combining companies or participants may increase[144].

2.4.1.1.1.2 Level of protection by intellectual property rights [applicable to all corporate conduct types]

In an environment where the protection of intellectual property rights is strong, involuntary spillover and imitation that accompany the occurrence of innovation occur only to a limited extent. Thus, appropriability is ensured, and R&D incentive is consequently high[145]. That is, in such an environment, participation in a business combination or joint R&D does not result in higher appropriability or higher R&D incentive of combining firms or participants[146].

In an environment where the protection of intellectual property rights is weak, involuntary spillover and imitation are more likely to occur. Thus, a firm aiming to create innovation has low R&D incentive, whereas other firms such as competitors tend to have higher R&D incentive. In such an environment, however, internalization of spillover through a business combination or joint R&D with a competitor can ensure the appropriability of the firm aiming to create innovation, whereby R&D incentive therein tends to increase[147].

2.4.1.1.1.3 R&D units, etc. in market

When there are at least a certain number of R&D units in a market, a large number of entities including competitors would be affected by spillover when the spillover occurs, overall R&D incentive in these competitors tends to increase[148]. [Applicable to horizontal business combinations and joint R&D]

There is a case where, even if a horizontal business combination or joint R&D is implemented, spillover to other competitors still occurs because of the presence of a large number of firms. In such a case, a benefit from the horizontal business combination and joint R&D such as impeding new entry or preventing free riding cannot be sufficiently internalized. Therefore, the increase in appropriability is limited, whereby R&D incentive in combining firms in the horizontal business combination or in participants in the joint

[144]See page 249 of Hanazono (2018) and see page 2394 of Lo'pez, Vives (2019).

[145]However, even with intellectual property rights strongly protected, spillover to a competitor may occur by certain other means that do not violate the intellectual property rights (see page 21 of Jullien, Lefouili (2018) and page 240 of Saito (2022a)).

[146]See page 25 of Dow/DuPont EC (2017) Annex 4 and pages 225 and 255 of Kokkoris, Valletti (2020).

[147]See page 66 of Katz, Shelanski (2007) and page 21 of Jullien, Lefouili (2018).

[148]See page 160 of Baker (2019).

R&D is less likely to increase[149]. [Applicable to horizontal business combinations and joint R&D]

Likewise, in a case where spillover to other licensees (or potential licensees) still occurs even if a vertical business combination between a licensor firm and a licensee firm is implemented[150], the increase in appropriability is limited to a larger extent, whereby the business combination is less likely to increase R&D incentive in combining firms. [Applicable only to vertical business combinations]

2.4.1.1.1.4 Significance as innovator [applicable to horizontal business combinations and joint R&D]

When two among a limited number of competent innovators are combined in a horizontal business combination or conduct joint R&D, spillover is internalized; accordingly, the degree of decrease in R&D incentive in competitors, etc. is likely to be relatively large[151].

2.4.1.1.1.5 Number of participants [applicable only to joint R&D]

In a case where there are a large number of participants in joint R&D, each participant has a higher chance of free riding on the R&D results and expenditures of the other participants.

Therefore, the larger the number of participants in joint R&D, the higher its chance of free riding on the R&D results, etc. of the other participants, resulting in insufficient internalization of involuntary spillover. Therefore, the appropriability of the R&D results decreases (or an increase in appropriability is limited), whereby the positive impact on R&D incentive in the participants decreases[152].

2.4.1.1.2 Technological characteristics

2.4.1.1.2.1 Technological features [applicable to all corporate conduct types]

A business combination or joint R&D may result in no decrease in spillover in competitor or other firms in a case where utilization of knowledge and other information that are spilled over would require a supplementary technology and know-how, or where the competitors have a low technological level and thus have low receptive skills.

Otherwise, in a case where spillover and imitation from innovation are limited, the level of appropriability ensured is high in the first place. Thus, a business combination and joint R&D are unlikely to increase R&D incentive in combining firms and participants[153].

[149]See page 22 of Dow/DuPont EC (2017) Annex 4.

[150]While arguments about appropriability are considered basically irrelevant in a vertical business combination, there is a case where combining firms in a vertical business combination have a relationship with each other as an R&D firm that gains profit from licensing a R&D result and a licensee firm for the R&D result, as described in 2.2.1.1.1 above.

[151]See page 17 of Federico et al. (2018).

[152]See page 217 of Nagaoka, Hirao (2013).

[153]See page 25 of Dow/DuPont EC (2017) Annex 4.

2.4.1.1.2.2 Level of technological opportunity [applicable to all corporate conduct types]

In a case where there is a high technological opportunity, it can be considered that R&D implementation costs for innovation is low, and that there are a large number of potential innovators. Therefore, there are a large number of firms that would receive spillover. Accordingly, when involuntary spillover is internalized through a business combination or joint R&D in a case where there is a high technological opportunity, a decrease in spillover may have a relatively large impact. Consequently, the degree of decrease in R&D incentive in competitors, etc. are likely to be relatively large.

2.4.1.1.2.3 Closeness of technologies [applicable to horizontal business combinations and joint R&D]

When firms including combining firms or participants have been strongly benefitted by spillover from each other because of the high closeness of technologies between the firms, the combining firms or the participants are less likely to gain large profit from appropriability in the first place even if involuntary spillover between combining firms or among participants through a horizontal business combination or joint R&D is internalized. Therefore, an increase in appropriability due to a horizontal business combination or joint R&D is small, whereby R&D incentive is less likely to increase.

2.4.1.1.3 Conduct characteristics (manners of implementation and responsibility sharing for joint R&D) [applicable only to joint R&D]

Joint R&D internalizes spillover effects among participants, and the internalization of spillover does not change depending on the form of joint R&D. The issue of free riding may separately arise among participants if different responsibilities of R&D activities are assigned to different participants or one of the participants mainly conduct R&D activities. In such a situation, a positive impact due to an increase in appropriability is relatively small[154].

2.4.1.2 Elements relating to spillover effects among participants in joint R&D [applicable only to joint R&D]

2.4.1.2.1 Number of participants (market characteristics)

In a case where there are a large number of participants in joint R&D, the number of (involuntary) spillover sources and the number of spillover receivers are also large. Thus, the spillover effects among participants are likely to be large.

2.4.1.2.2 Technological characteristics

2.4.1.2.2.1 Technological features [applicable only to joint R&D]

Spillover effects among participants may not appear in a case where spillover does not lead to R&D in participants, for example, when utilization of knowledge and other information that are spilled over would require a supplementary technology and know-how, or when the firms that receive spillover have a low technological level and thus have

[154]See page 46 of Odagiri (2016).

low receptive skills.

2.4.1.2.2.2 Level of technological opportunity [applicable only to joint R&D]

In a case where there is a high technological opportunity (for R&D in a field different from that of joint R&D), it can be considered that R&D implementation costs for innovation is low, and that there are a large number of potential innovators. Therefore, there are a large number of firms that would receive spillover. Accordingly, when there is a high technological opportunity, a positive impact due to increases in spillover among participants is likely to increase.

2.4.1.2.2.3 Closeness between technologies [applicable only to joint R&D]

In a case where participants have already been strongly benefitted by spillover from each other because of the high closeness between the technologies of the firms, an increment in (voluntary) spillover due to joint R&D and an associated positive impact on R&D incentive in the participants are likely to be small.

2.4.2 Elements relating to necessary inputs and capabilities for R&D (Group B)

2.4.2.1 Elements relating to synergetic effect (supplementary effect)

2.4.2.1.1 Technological characteristics (technological supplementarity and supplementary increase in technological opportunity) [applicable to all corporate conduct types]

When combining firms or participants have technology, know-how, human resources, knowledge, etc. that supplement each other, a synergetic effect may be facilitated by the integration of such resources, etc. in the combining firms or the participants through a business combination or joint R&D[155].

It should be noted that, if there is supplementarity between their technologies even when there are overlapping businesses, a synergetic effect may be facilitated by the integration of resources, etc. in the combining firms through a horizontal business combination[156].

However, a synergetic effect is not very likely to emerge in some cases such as when there are corporate culture differences among the combining firms or the participants. Besides, the priority on technologies to be used in the combining firms and the participants may prevent the use of effective (highly supplementary) technologies.

Meanwhile, when the technological opportunity is supplemented by the presence of an outside research body or collaboration partner such as a university, the synergetic effect may increase as a result of an increase in number of available technologies.

2.4.2.1.2 Conduct characteristics (manners of implementation and responsibility sharing for joint R&D) [applicable only to joint R&D]

Joint R&D conducted in a newly created cooperative organization or in a trade association tend to facilitate a synergetic effect (supplementary effect). In a case where different responsibilities of R&D activities are assigned to different participants or where one of the

[155]See page 25 of Katz, Shelanski (2007) and page 8 of Federico et al. (2019).
[156]See pages 177-178 of Odagiri (2016).

participants mainly conduct R&D activities, however, the synergetic effect (supplementary effect) may be insufficient unless the information sharing among the members is properly planned and carried out[157].

2.4.2.2 Increases in investment capability and investment capacity

2.4.2.2.1 Market characteristics (capital cost reduction by subsidies, etc.) [applicable to all corporate conduct types]

When more cash can be secured by use of subsidies, etc., the funding capacities of firms are supplemented and their capital costs are reduced, whereby R&D incentive increases.

2.4.2.2.2 Technological characteristics (magnitude of risk or cost of R&D) [applicable only to joint R&D]

When the magnitude of risk or cost of R&D is too large for a single firm to bear and, additionally, the necessity of conducing R&D jointly with other firms is large based on the technological accumulation, technological development capabilities, etc. of the firm, joint R&D would diversify the risk among participants and enhance their investment capabilities, thereby delivering a positive impact on the R&D capabilities[158].

2.4.2.3 R&D implementation cost reduction and resource allocation optimization

2.4.2.3.1 Market characteristics (transparency of R&D capabilities) [applicable to horizontal business combinations and joint R&D]

When a firm decides whether to make an investment in R&D, it cannot correctly predict the chance of success when its R&D capabilities cannot be determined from outside. Such incorrect prediction may lead to underinvestment by a firm that can efficiently conduct R&D or overinvestment by an inefficient firm.

In such situations, joint R&D enables participants to adjust their investment through a contract in such a manner that more efficient firms bear larger parts of investment activities. Consequently, optimization (resource allocation optimization among participants) of the R&D investment level of the participants in the joint R&D may be achieved. Such optimization may be achieved by sharing of information on the R&D capabilities of the participants.

Such optimization may also occur by elimination of information asymmetry as a result of sharing of information within a combined firm through a horizontal business combination.

Therefore, the less transparent the R&D capabilities of firms are, the larger the positive impact that would be delivered on resource allocation optimization among participants or within a combined firm by securing transparency through joint R&D or a horizontal business combination[159].

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[157]See page 46 of Odagiri (2016).

[158]See Part I, 2, (1), {3} of Joint R&D Guidelines.

[159]See pages 173-175 of Gandal, Scotchmer (1993).

2.4.3 Elements relating to profit structure and conditions (Group C)

2.4.3.1 Elements relating to total optimization

2.4.3.1.1 Product characteristics (Level of supplementarity between products) [only applicable to conglomerate business combinations]

The higher the supplementarity between the products of combining firms, the larger the possibility and the degree of increase in the supply volume of the product in one market when the supply volume of the product in the other market increases. Therefore, in a conglomerate business combination, R&D incentive may increase to accomplish quality improvement or lowering of the price of one of the products.

2.4.3.2 Elements relating to resolution of hold-up problem

2.4.3.2.1 Market characteristics (bargaining positions of upstream firm and downstream firm) [applicable only to vertical business combinations]

When a firm in a downstream market is in a higher bargaining position than a firm in an upstream market before investment in a relationship-specific asset, the firm in the upstream market may have no other choice but to invest in a relationship-specific asset even if it expects a hold-up. Therefore, a hold-up problem (underinvestment) that can be resolved by a vertical business combination may not occur in the first place.

2.4.3.2.2 Product characteristics (magnitude of R&D costs) [applicable to vertical business combinations and conglomerate business combinations]

If a relationship-specific asset requires large R&D costs, a large sunk cost would be incurred when trading between firms is discontinued, leading to a hold-up problem. Therefore, a positive impact is more likely to occur due to the resolution of a hold-up problem following a vertical or conglomerate business combination.

2.4.4 Elements relating to competition situation in product market (Group D)

2.4.4.1 Elements relating to replacement effect (cannibalization effect)

2.4.4.1.1 Market characteristics

2.4.4.1.1.1 Degree of market concentration (market share of combining firm in particular) [applicable only to horizontal business combination]

The higher the market share and the degree of market concentration, the more strongly a replacement effect (cannibalization effect) with the existing product of a combining firm would occur and the more likely R&D incentive is to decrease[160].

In the case of monopoly, a negative impact of a replacement effect prevails against a positive impact of appropriability, a synergetic effect (supplementary effect), and a pre-emption effect (rent-dissipation effect), and R&D incentive is unlikely to arise[161].

In the case of duopoly, the replacement effect is still likely to occur, and it is considered that a negative impact prevails. As the degree of market concentration decreases further, the replacement effect is increasingly less likely to occur. However, when the number of firms has increased to reach a certain number, the increase in R&D incentive stagnates[162].

2.4.4.1.1.2 Stability, instability, and growth potential of market [applicable only to horizontal business combination]

In a case where a product market is stable, e.g., firms in the market are fixed, there are little changes in the market share, the potential for market entry is low, or the market is matured, there is little room to steal customers from competitors and little room to expand the market itself. Therefore, products of the same firm are more likely to cannibalize each other, and a replacement effect may occur more strongly. In contrast, when a product market is unstable, a replacement effect may occur more weakly.

It should be noted that the potential for market entry can be considered as follows. In a horizontal business combination between an existing firm and a potential entrant, the existing firm has incentive to discontinue R&D in the entrant after business combination because the potential entrant has higher competitiveness in R&D than other existing firms. Therefore, a replacement effect tends to occur more strongly[163].

Furthermore, when a firm competes in a product market in the growing phase, and predicts a future market expansion and its future sales increase with a high degree of certainty, its existing sales is less likely to be cannibalized, whereby a replacement effect may occur relatively weakly.

2.4.4.1.1.3 R&D units, etc. in market [applicable to horizontal business combinations and joint R&D]

In a case where a limited number of R&D units (such as firms) are conducting R&D for new products, a replacement effect (cannibalization effect) tends to be larger if a horizontal business combination and joint R&D between these firms is conducted. In

[160]See page 36 of Dow/Dupont EC (2017) Annex 4 and pages 2693 and 2697 of Igami, Uetake (2020).
[161]See pages 2693 and 2697 of Igami, Uetake (2020).
[162]Same as above.
[163]See page 157 of Baker (2019).

contrast, an impact of a replacement effect (cannibalization effect) is limited in a case where there are at least a certain number of independent R&D units other than a combined firm and firms participating in joint R&D[164].

2.4.4.1.1.4 Significance as innovator [applicable to horizontal business combinations and joint R&D]

In a horizontal business combination or joint R&D conducted between leading innovators directly competing with each other, an impact delivered by a replacement effect tends to be large if there is no other leading innovator[165].

2.4.4.1.2 Product characteristics

2.4.4.1.2.1 Level of product differentiation and switching costs (innovation conversion ratio) [applicable only to horizontal business combination]

In a case where products have low substitutability in a product market horizontally differentiated because of a condition such as a high level of product differentiation in the market or high switching costs between products, customers of an existing product are not stolen. Therefore, a replacement effect (cannibalization effect) is not likely to occur.

Suppose that a combining firm has a new product based on its innovation and launches it at the same time as a horizontal business combination and that the other firm has an existing product or a future product. An innovation conversion ratio is calculated as the ratio of a decremental gross margin for the existing product or the potential product as a result of the new product's substitution (cannibalization) thereof to an incremental gross margin gained by the launch of the new product. In particular, when this ratio is larger (i.e., the substitutability between the existing products or R&D (future products) of the respective combining firms), a replacement effect (cannibalization effect) tends to occur more strongly, and R&D incentive may decrease to a larger extent[166].

When there is overlapping in R&D, however, even if R&D investment in one of the combining firms is reduced due to the replacement effect, a decrease in expected return due to the reduction in R&D investment may be smaller. If so, a combined company may focus more on (increase an investment in) R&D of the other combining firm[167].

2.4.4.1.2.2 Direction of product differentiation [applicable only to horizontal business combination]

If innovation expected to be brought about by R&D leads to quality improvement (vertical differentiation) of an existing product, a replacement effect with the existing product tends to occur more strongly, whereby incentive for (such) R&D in a combined firm decreases to a large extent.

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[164]See paragraph 138 of EU Horizontal Cooperation Agreement Guidelines, page 13 of US IP Guidelines.

[165]See pages 12, 17, and 40 of Dow/Dupont EC (2017) Annex 4, page 3 of Federico et al. (2018), and page 255 of Kokkoris, Valletti (2020).

[166]See pages 12 and 40 of Dow/Dupont EC (2017) Annex 4, page 3 of Federico et al. (2018), and pages 93 and 102 of Gilbert (2020).

[167]See page 12 of Jullien, Lefouili (2018).

In contrast, if such innovation leads to product differentiation (horizontal differentiation), it is also beneficial to the other combining firm (it brings down the innovation conversion ratio). Thus, a replacement effect is not likely to occur, and accordingly, a decrease in (such) R&D incentive in the combined firm is small[168].

2.4.4.2 Elements relating to decrease in or loss of escape competition effect

2.4.4.2.1 Market characteristics

2.4.4.2.1.1 Degree of market concentration (market share of combining firms or participants in particular) [applicable to horizontal business combinations and joint R&D]

If a combined firm has a large market share in a horizontal business combination, competitive pressure decreases, whereby an escape competition effect decreases in a combined firm. At the same time, the advantage of the combined firm is enhanced, whereby an escape competition effect is less likely to occur in competitors. [applicable only to horizontal business combinations]

In joint R&D, if participants collectively have a large market share, competitive pressure from non-participants decreases. Particularly when competitive pressure from non-participants is small and competition in the product market is dominated by competition among the participants, escape competition effects in participants may be more likely to decrease in a case where the results of the joint R&D work to equalize quality and cost structures. Furthermore, due to the increased advantage of the participants in joint R&D, escape competition effects in non-participants are less likely to occur. [applicable only to joint R&D]

2.4.4.2.1.2 Stability and instability of market [applicable to all corporate conduct types]

In a case where a product market is stable, e.g., firms in the market are fixed, there are little changes in the market share, the potential for market entry is low, or the market is matured, an escape competition effect is unlikely to occur in the first place as competitive pressure is low. Therefore, a decrease in or loss of escape competition effect due to a business combination or joint R&D may be unlikely to occur. When the product market is unstable, an impact from a decrease in or loss of an escape competition effect due to a business combination or joint R&D may weaken.

2.4.4.2.2 Product characteristics (level of product differentiation and switching costs) [applicable to all corporate conduct types]

In a case where products have low substitutability in a product market horizontally differentiated because of a condition such as a high level of product differentiation in the market or high switching costs between products, competitive pressure is low. An escape competition effect is thus unlikely to occur in the first place. Accordingly a decrease in or loss of an escape competition effect due to a business combination or joint R&D may be unlikely to occur.

[168]See page 13 of Jullien, Lefouili (2018).

2.4.4.2.3 Technological characteristics (closeness and divergence between technological level) [applicable to all corporate conduct types]

In a more competitive market, R&D incentive in firms that have the same technological level tend to be higher due to an escape competition effect. In firms that have low technological level (that are behind from other firms), however, an escape competition effect occurs only in a limited manner, and a decrease in or loss of escape competition effect is likely to occur, whereby R&D incentive tends to be lower[169].

In a case where there is a gap in technological level between combining firms and competitors in a business combination or between participants and non-participants in joint R&D, or where a large gap in technological level arises due to business combination or joint R&D (e.g., leading innovators directly competing with each other are combined in a horizontal business combination without any other leading innovators), technological competitive pressure from competitors or non-participants is weak. Thus, decreases in or loss of escape competition effect in combining firms and competitors or in participants and non-participants tend to intensify. Accordingly, R&D incentive in any of these firms is considered to decrease.

2.4.4.3 Elements relating to pre-emption effect (rent-dissipation effect)

2.4.4.3.1 Market characteristics

2.4.4.3.1.1 Degree of market concentration [applicable to horizontal business combinations and joint R&D]

In a monopolistic market where there is a potential for market entry, a monopolistic firm's incentive to discourage a potential competitor and to acquire intellectual property rights by making innovation arises. Therefore, a pre-emption effect (rent-dissipation effect) tends to occur more strongly. However, a replacement effect also occurs, and consequently, a product employing the intellectual property may not be launched into the market[170].

If the market becomes a duopoly after there is entry, the replacement effect is still likely to occur, and a negative impact prevails. As the degree of market concentration decreases further, the replacement effect is increasingly less likely to occur, and a pre-emption effect is increasingly more likely to occur. However, when the number of firms has increased to reach a certain number, the increase in R&D incentive stagnates[171].

2.4.4.3.1.2 Stability and instability of market [applicable to horizontal business combinations and joint R&D]

In a case where a product market is stable, e.g., firms in the market are fixed, there are little changes in the market share, the potential for market entry is low, or the market is matured, (even if a monopolistic rent is earned as a result of a horizontal business combination), the risk of the rent being stolen is low, whereby a pre-emption effect may be

[169]See pages 5-6 of Jullien, Lefouili (2018), page 92 of Gilbert (2020), page 23 of Katz, Shelanski (2007), and page 2693 of Igami, Uetake (2020).

[170]See page 29 of Katz, Shelanski (2007).

[171]See page 2693 of Igami, Uetake (2020).

small or unlikely to occur. In contrast, in a case where a product market is unstable, a pre-emption effect tends to occur more strongly through a horizontal business combination (if a monopolistic rent is earned). [applicable to horizontal business combinations]

In addition, in a stable product market, a horizontal business combination and joint R&D may not result in a decrease in pre-emption effect. In an unstable product market, a pre-emption effect of a firm (a combining firm or a participant) that earns a monopolistic rent as a result of a horizontal business combination or joint R&D may decrease or be lost in its relationships with the other combining firm and the other participants, and may continue to be present in its relationships with competitors or non-participants. Therefore, the overall decrease in or loss of the pre-emption effect may be smaller. [Applicable to horizontal business combinations and joint R&D]

2.4.4.3.2 Product characteristics (level of product differentiation and switching costs) [applicable to horizontal business combinations and joint R&D]

In a case where products have low substitutability in a product market horizontally differentiated because of a condition such as a high level of product differentiation in the market or high switching costs between products, customers of a combining firm would not be stolen by a product of the other combining firm and products of competitors. Therefore, a pre-emption effect due to a horizontal business combination can be relatively small.

In such a case, a decrease in or loss of pre-emption effect due to a horizontal business combination or joint R&D may become less likely.

2.4.4.3.3 Technological characteristics (closeness and divergence between technological level) [applicable to horizontal business combinations and joint R&D]

If a combined firm has large technology gaps with competitors and potential entrants, it has a low risk of losing its existing rent. Thus, a pre-emption effect due to a horizontal business combination may tend to work more weakly in a combined firm.

In such a case, a decrease in or loss of pre-emption effect due to a horizontal business combination or joint R&D may become less likely.

2.4.4.3.4 Nature and characteristics of innovation [applicable to horizontal business combinations and joint R&D]

If the success of the innovation is uncertain, prevention of entry by the innovation is also uncertain. Thus, a pre-emption effect is unlikely to work and a horizontal business combination may not increase R&D incentive[172].

If it is likely that the innovation is disruptive innovation that would replace an existing technology or product and create a new market[173], a pre-emption effect tends not to work. Thus, a combined firm (existing firm) of a horizontal business combination may have lower R&D incentive than a potential entrant[174].

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[172]See page 23 of Dow/DuPont EC (2017) Annex 4.

[173]While disruptive innovation is categorized into a new-market creation type and a low-end type, this discussion does not apply to the low-end type.

[174]See page 23 of Dow/DuPont EC (2017) Annex 4.

In such a case, a decrease in or loss of pre-emption effect due to a horizontal business combination or joint R&D may not occur.

2.4.5 Elements relating to market foreclosure (Group E) against business counterparty (competitor) in vertical business combination or conglomerate business combination

2.4.5.1 Elements relating to input foreclosure

2.4.5.1.1 Market characteristics

2.4.5.1.1.1 Profitability in upstream market, profitability in downstream market, and degree of market concentration [applicable only to vertical business combinations]

When a combining firm in an upstream market has low profitability with the other combining firm in a downstream market having high profitability and a large market share, the combining firm in the upstream market has higher incentive to conduct input foreclosure[175], and it is more likely that this decreases the R&D incentive of competitors.

2.4.5.1.1.2 Excess supply capacity in downstream market [applicable only to vertical business combinations]

When a combining firm in a downstream market has a large excess supply capacity, the other combining firm in an upstream market has higher incentive to conduct input foreclosure[176], and it is more likely that this decreases the R&D incentive of competitors.

2.4.5.1.2 Product characteristics

2.4.5.1.2.1 Level of product differentiation and switching costs in downstream market [applicable only to vertical business combinations]

If product substitutability between competitors in a downstream market and a combining firm in the downstream market is high, the other combining firm in an upstream market has higher incentive to conduct input foreclosure[177], and it is more likely that this decreases the R&D incentive of the competitors.

2.4.5.1.2.2 Importance of inputs [applicable only to vertical business combinations]

In a case where an input that is supplied by a combining firm in an upstream market serves as determinants of product quality and innovation speed in a downstream market, a negative impact on R&D incentive in competitors due to input foreclosure may be more likely to occur[178].

[175]See Part V, 2, (1), A, (b) of Business Combination Guidelines.
[176]Same as above.
[177]Same as above.
[178]See pages 56-57 of UK Merger Assessment Guidelines.

2.4.5.2 Elements relating to customer foreclosure, etc.

2.4.5.2.1 Market characteristics

2.4.5.2.1.1 Excess supply capacity in upstream market [applicable only to vertical business combinations]

When a combining firm in an upstream market has a large excess supply capacity, the other combining firm in a downstream market has higher incentive to conduct customer foreclosure because a profit as a group of combining firms may increase if it switches suppliers from competitors in the upstream market to the combining firm in the upstream market for a portion of its purchase that has been made from the competitors and thereby improves the operating rate of the combining firm in the upstream market[179]. It is more likely that this decreases the R&D incentive of the competitors.

2.4.5.2.1.2 Importance of assortment of goods and services in downstream market and network effects [applicable only to vertical business combinations]

In a case where the assortment of goods and services is important in a downstream market, a combining firm in the downstream market has lower incentive to conduct customer foreclosure if refusing to purchase from competitors in an upstream market would result in a narrower assortment of the combining firm in the downstream market[180], and it is less likely that this decreases R&D incentive of the competitors. In particular, if the downstream market is a multilateral platform on which indirect network effects work, the combining firm in the downstream market has further lower incentive to conduct customer foreclosure[181], and it is further less likely that this decreases the R&D incentive of the competitors.

2.4.5.2.1.3 Importance of economies of scale, network effects, data, etc. in upstream market [applicable only to vertical business combinations]

In a case where economies of scale, network effects, data, etc. are important in an upstream market, a competitor in the upstream market would receive a larger impact from customer foreclosure conducted by a combining firm in a downstream market, and the degree of decrease in R&D incentive in the competitor would be larger[182].

2.4.5.2.1.4 Position of a combining firm in market and level of supplementarity between markets [only applicable to conglomerate business combinations]

In a case where the position of a combining firm in a market is considerably high and a product thereof has high supplementarity with products in the market of the other combining firm, the likelihood that customer foreclosure can be conducted against competitors in the market of the other combining firm increases through supplying products of the respective markets in combination[183]. The likelihood that this decreases the R&D incentive of the competitors also increases.

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[179]See Part V, 2, (2), A., (b) of Business Combination Guidelines.

[180]Same as above.

[181]Same as above.

[182]See page 60 of UK Merger Assessment Guidelines.

[183]See Part VI, 2, (1), A. of Business Combination Guidelines.

2.4.5.2.1.5 Market size of market of other combining firm and profitability thereof [only applicable to conglomerate business combinations]

In a case where (while the position of a combining firm in a market is high) the market size of the market of the other combining firm (market of supplementary products) is large and the profitability of a product of the other combining firm in this market is high, a profit would increase from an increase in sales volume of the product of the other combining firm if their products are supplied in combination. Therefore, incentive to conduct customer foreclosure against competitors by supplying products in combination may be higher[184], and it is more likely that this decreases the R&D incentive of the competitors.

2.4.5.2.1.6 Importance of economies of scale, network effects, data, etc. in market of other combining firm [only applicable to conglomerate business combinations]

In a case where (while the position of a combining firm in a market is high) economies of scale, network effects, data, etc. are important in the market of the other combining firm (market of supplementary products), competitors in the market of the other combining firm would receive a larger impact from customer foreclosure through supplying products in combination, and the R&D incentive of the competitors may decrease to a larger extent[185].

2.4.6 Agreements for implementation of joint R&D (Groups E-1 and E-2) [applicable only to joint R&D]

2.4.6.1 Elements relating to market foreclosure against business counterparty (non-participant)

2.4.6.1.1 Market characteristics (degree of market concentration (market share of participants in particular))

When participants have a large market share, input foreclosure or customer foreclosure against non-participants based on an agreement among participants is more likely to be conducted, and an impact on the R&D incentive of the non-participants may be larger.

2.4.6.1.2 Product characteristics

2.4.6.1.2.1 Importance of inputs

In a case where a technology that is a result of joint R&D and technologies owned by individual participants serve as determinants of the speeds of R&D and the chances of success of non-participants, a negative impact on the R&D incentive of the non-participants may be more likely to occur by input foreclosure based on an agreement among the participants.

2.4.6.1.2.2 Supplementarity between owned assets

[184]Same as above.

[185]See page 62 of UK Merger Assessment Guidelines.

When assets owned by participants (that serve as inputs for R&D) have high supplementarity, input foreclosure against non-participants based on an agreement among participants is likely to be conducted, and an impact thereof on the R&D incentive of the non-participants may be larger.

2.4.7 Elements relating to coordinated effect

2.4.7.1 Nature and characteristics of innovation [applicable to all corporate conduct types]

Coordinated conduct associated with innovation is less likely to occur when the innovation has high uncertainty, the results are highly likely to be kept confidential, or it requires a long period to achieve the results[186].

In the case of disruptive innovation, coordinated conduct associated with innovation is less likely to occur because it potentially changes a market structure itself[187].

2.4.7.2 Industrial characteristics (growth potential of market)

In a growth market (market growing phase), coordinated conduct is less likely to come about because of the high likelihoods of entry and market share change[188].

[186]See pages 47-48 of Katz, Shelanski (2007) and page 87 of Gilbert (2020).

[187]See page 87 of Gilbert (2020).

[188]See page 21 of German Innovation Report (2017).

3. Basic Perspectives to Assessment of Impacts on Innovation (Using the Summarization by Individual Conduct Type as Clue)

In order to provide systematic understanding and knowledge on impacts of corporate conduct on innovation, 2 above summarizes and analyzes impact mechanisms of corporate conduct on innovation focusing on business combinations and joint R&D, which are types of corporate conduct on which relatively large amounts of knowledge in economics have accumulated, and are considered useful to be incorporated into examination of other conduct types and for understanding across types.

There are conduct types other than these conduct types that may have some impacts on innovation as well, for example, individual conduct that may produce a market foreclosure effect and vertical restriction conduct that imposes a certain restriction or obligation on a business counterparty. However, specific forms of these conduct types and their theories of harm are varied, and knowledge in economics specific to each of the conduct types is not considered to have been sufficiently accumulated. Thus, the continuing issues include summarization of impact mechanisms, etc. on innovation with respect to each of these conduct types[189].

Besides, the summarization and understanding gained on business combinations and joint R&D include underlining knowledge and viewpoints that are more or less common to corporate conduct in general when observing and assessing impacts on innovation. The perspectives summarized below are considered to be useful as basic and common viewpoints in studying impact of various types of corporate conduct on innovation.

3.1 Focus on R&D competition

For assessment of impacts on innovation, naturally, it is necessary to appropriately observe a "field" where each impact may appear. Conventionally, in assessment of impacts on competition, the competition (short-term competition) between products (including potential products expected to be productized in the future with reasonable certainty) of firms in a product market has been mainly examined. In the relation with impacts with innovation, however, the competition in a product market itself is primarily positioned as an event after the issue of R&D is already reflected in a product as the results[190], so it is impossible to sufficiently understand impacts on innovation only by observing the product market competition[191]. Therefore, in order to appropriately assess impacts of corporate conduct on innovation, it is necessary to directly focus on R&D competition[192]

[189] A mechanism that may work on future R&D incentive through a change in expected return in the market can be considered common to conduct types that have, for example, an effect of excluding a competitor from a product market even if these conduct types take varied forms.

[190] There is an aspect in which the competition situation in a product market affects the size of an expected return, which leads to a strategic effect on the R&D incentive of each firm, as summarized mainly in 2.1.1.1.4 above.

[191] Also in the application practice of the Antimonopoly Act, there have been cases where competition restrictions in a product market can have adverse impacts on innovation or R&D incentive (e.g., Lam Research and KLA-Tencor Business Combination Case (2016), Amazon Japan G.K. Case (2017), and Apple Inc. Case (2021)). However, these cases are limited to those that arose from the competition situations in product markets, so the issue of impacts on innovation was not directly argued in these cases. Meanwhile, in the first place, the current interpretation for application is as follows: "Restrictions pertaining to the use of technology can affect competition in developing technologies. No market or trade, however, can be defined for research and development activities by themselves. Therefore the effect on competition in developing technologies should be evaluated by the effect on competition in the trade of future technologies resulting from such activities or products incorporating the technology." (Part 2, (2), (iii) of Intellectual Property Guidelines).

[192] "Competition" in this "competition in developing technologies (R&D competition)" is not necessarily limited to "competition" as defined in Article 2, Paragraph 4 of the Antimonopoly Act (competition in which multiple enterprise, within their business activities, supply the same or similar goods or services to the same user), but has a broader meaning

and then understand what actions the firms take and what impacts these actions have on the R&D incentive of the respective firms.

Actually, the summarization on the impact mechanisms (see 2 above) of business combinations and joint R&D on innovation suggests that focuses be put on impacts on conditions concerning R&D activities within a firm and impacts on strategic decision-making on R&D based on the competition situation in a product market.

In addition, the specific fields to be noted in which R&D competition takes place may be broadly categorized as: (i) R&D competition of a new product against existing products[193] (existing products versus a pipeline product); (ii) R&D competition potentially present between new products (a pipeline product versus a pipeline product); (iii) competition between R&D capabilities[194].

It should be noted that, when impacts on innovation are assessed, it is appropriate to use the R&D incentive of firms and the changes therein as substitute because assessment of innovation and R&D activities inevitably involves a number of predictions due to the futuristic nature of these types of corporate conduct and involves high uncertainty.

3.2 Perception of competitive relationships in R&D competition

As described in 3.1 above, a focus is directly put on R&D competition in assessment of impacts on innovation. In that case, unlike a product market competition where assets subject to competition and competitors are considerably apparent, R&D competition is not necessarily clear at present in terms of what relationships competitors are in and what they are competing for. Therefore, it is necessary to summarize the perception of "competition."

Regarding this issue, as long as an event is a competition, it is an event between parties having some competitive relationship. In the context of competition policy, however, this competitive relationship may not be understood from the pure type, the similarity and the overlap of technologies that are targets of R&D. Considering that firms conduct R&D activities as part of their profit gaining activities, it is appropriate to focus on the point that there occurs a relationship where entities compete for profit gained from the technology, that is, to understand it as a competition for utility value and functions of a technology in a potential product. Thus, the extension of competition is also defined based on whether this competitive relationship is present or not[195].

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where firms compete with each other to gain as much profit as possible.

[193]This includes improvement of an existing product and R&D for reduction of production costs, etc.

[194]Federico et al. (2019), when analyzing impacts of a horizontal business combination on innovation, puts focuses on internalization of a customer stealing effect and internalization of a synergetic effect (including internalization of involuntary spillover, voluntary technology transfer within a combined firm, and efficiency enhancement by combination of supplementary assets) in a business combination, and cites these domains (i) to (iii) as case studies to which these are specifically applied. Furthermore, Dow/DuPont EC (2017) covers, in addition to the domains (i) and (ii), the domain (iii) (the fields in which combining firms have overlapping R&D capabilities) in examining R&D competition regarding the agrochemical industry.

[195]Manners in which the competitive relationship and the degree of competition in R&D competition should be specifically determined have not yet been established. "Innovation diversion ratio" (the ratio of a portion that a new product launched by a combining firm in a business combination steals from the sales of an existing product of the other combining firm because of overlapping between the new product and the existing product or between R&D. A positive innovation conversion ratio means that the new product has substitutability with an R&D technology or the existing product, whereas a negative innovation conversion ratio means that it has supplementarity therewith (a characteristic that increase sales of the counterparty)) has been proposed (see pages 391-392 of Shapiro (2012)). However, the use of this ratio involves some practical problems such as data available for actually obtaining the ratio. Another problem is that, when R&D is in its early stage, it is difficult to specifically know the characteristics of a technology and the utility value and functions of a product produced by the technology.

In this connection, the above perception of a competitive relationship focuses on a competitive relationship in a future product market and assumes a competitive relationship currently present in R&D activities relating to technologies of products that would be in the future product market. In other words, in a phase where competition in a product market is defined, firms that have competitive relationships in the R&D competition (or, of the firms, ones whose connection with a product market is reasonably recognizable) can be treated as potential competitors in the product market, and the extension of these potential competitors can also be examined with a focus on competitive relationships in the R&D competition.

3.3 Importance of considering quality aspect in R&D competition

Unlike product market competition basically assuming already existing assets, R&D competition, where the details of a technology, which is the target of competition, and the utility value thereof have not been established yet, is activities between firms intended to raise the level of them as much as possible. In addition, while the situation and the degree of this R&D competition depend on the R&D capabilities of respective competitors, it is considered that the axes for assessment of the competition situation from the perspective of competition policy may change depending on the forms, the phase, etc. of R&D. Furthermore, in terms of relationship with a product market, the scope of impacts of R&D on the product market differs depending on the nature of the R&D and the degree of impact of a technology to be developed, and it even may change the competition environment or the market structure of the product market.

Given such characteristics of R&D competition, for appropriate assessment of impacts on innovation, it is increasingly more important to take into consideration the quality aspects of respective factors constituting R&D competition, for example, in the following points[196].

First, the level of innovation expectable in R&D competition is not only affected by the number of competition units that conduct R&D but also affected to a certain extent by the degree of their R&D capabilities (whether each competition unit is a leading and competent innovator or not). Moreover, the degree of the dynamism of R&D competition, which may be weakened by some corporate conduct, also changes depending on whether a firm to be affected is capable of leading innovation or not[197]. Thus, only quantitative variables, such as the number of competitors and market share, may be insufficient for adequately measuring substantial impacts on innovation. Therefore, it is necessary to focus on the quality of R&D capabilities of the competitors[198].

In addition, for example, it also refers to a case where it is appropriate to maintain a competition

[196]Separately, there is a practical challenge of appropriately observing and assessing such quality aspects.

[197]For example, when leading and competent innovators conduct a horizontal business combination or joint R&D, if there are no other (or only a limited number of) leading and competent innovators, negative impacts such as a decrease in R&D incentive and decreases in or loss of replacement effect and escape competition effect in the competitors due to internalization of spillover tend to be stronger (see the following in 2.4.1.1.1.4; 2.4.4.1.1.4; and 2.4.4.2.3 above).

[198]Also in the current interpretation for application, for example, Business Combination Guidelines (Part IV, 2, (1), B.) is considered to assess the quality aspect of the competitive relationship between combining firms. It includes "competition among the parties, etc. in the past" among "determining factors in deciding substantial restraint of competition through unilateral conduct," and mentions that "There are cases in which vigorous competition among companies or actions by companies that increase market competition lead to a reduction in market prices or an improvement in the quality or variety of goods. In these cases, even though the combined market share of the parties or their combined rank is not high, a business combination would have a substantial impact on competition as it eliminates the possibility of the price reduction or quality improvement described above."

environment with which a certain degree of diversity, etc. is secured for R&D in a phase where R&D results are uncertain. It means that the desirable state of R&D competition from the perspective of competition policy R&D may change depending on the form of R&D (see 3.5 below for details).

Furthermore, R&D for a basic but highly general-purpose technology, as compared with R&D for a technology that is closer to a particular product, is considered to have a small impact on competition in the market of this particular product[199], whereas the range of product markets to which it relates can be widely spread across industries, and, if the technology constitutes an element in each of the product markets that is important in terms of competition, a firm that owns the technology may gain extensive market power across the product market[200]. Thus, such R&D potentially changes assumptions for assessing competition in a product market. Moreover, if such a situation is assumed, it is also important to monitor whether appropriate R&D competition has been secured in the R&D field in advance.

3.4 Fields and viewpoints that should be noted in assessment of impacts on innovation

R&D incentive toward innovation stems from the difference between profit expected to gain if R&D is conducted and profit expected to gain if R&D is not conducted. The above summarization on business combinations and joint R&D in 2 above first assumes that the differences between such expected returns are affected, whereby the R&D incentive of firms is changed. It then identifies the following four fields in which unambiguous situational changes in the level of expected return may occur as a result of respective types of corporate conduct, and summarizes impact mechanisms on R&D incentive that may emerge in each of the four fields.

From the viewpoints of economics, the above relationship between corporate conduct and changes in expected return or R&D incentive is common to corporate conduct in general; accordingly, considerations on these four fields[201] would generally apply to all types of corporate conduct in common. Therefore, when examining what impacts each type of corporate conduct has on innovation, the following perspectives and focuses are considered to be usable.

3.4.1 Field relating to conditions concerning businesses and profits within corporate conduct actors

As the fields where unambiguous situational changes occur due to corporate conduct, the following three fields are conceivable as those relating to conditions in R&D activities within a corporate conduct actor. It is considered that observation and analysis on situational changes generated as a result of corporate conduct in these fields can lead to certain suggestions on what impacts are brought to the R&D incentive of a firm.

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[199]Joint R&D Guidelines (Part I, 2, (1), {2}) mentions that "if a joint R&D project is made for basic research, which is not intended to develop a specific product, it usually would have little effect on competition in the product market, and is less likely to present a problem under the Antimonopoly Act."

[200]If supplementarity in terms of functions and quality occurs between products of these product markets through this technology, effects of the market power are further stronger.

[201]Some of the respective conduct types may be theoretically irrelevant depending on the characteristics of conduct. In addition, since these domains are merely recursively estimated from business combinations and joint R&D, this report does not rule out the possibility that still other domains are present in association with the other conduct types.

3.4.1.1 Appropriability (whether profit appropriate for investment is secured through internalization of externalities due to spillover)

A profit to be gained based on R&D results may not necessarily be appropriated by an R&D conductor, and free riding by others using knowledge and information (spillover) on these results may occur. If it occurs, the expected return of the R&D conductor is smaller than it should be, and the R&D incentive of this the R&D conductor may not work sufficiently.

In a situation where such externalities (free riding by others) have occurred, if appropriability has increased as a result of internalization of externalities through specific corporate conduct, this increase may serve to increase R&D incentive of the actor of such conduct. Accordingly, it is necessary to focus on this field with respect to a change in R&D incentive of the corporate conduct actor. However, in a case where appropriability is sufficiently secured, for example, by means of intellectual property rights, an incremental increase in appropriability does not occur through corporate conduct.

In contrast, an increase in appropriability decreases spillover that is enjoyed by competitors, and may work to suppress the R&D incentive of the competitors. Therefore, in order to secure a competition environment that would facilitate innovation, it is necessary to take appropriate balance between R&D incentive in a corporate conduct actor, which increases through the securing of appropriability, and R&D incentive in competitors, which increases through spillover.

It should be noted that, although various cases where the scope of profits expands as a result of corporate conduct can be considered, this field represents actions that lead to resolving the problem of underinvestment through internalization of externalities (free riding by others) relating to R&D results. Naturally, securing monopolistic profit by excluding competitors from the market by means of certain exclusionary conduct is irrelevant.

3.4.1.2 Necessary inputs and capabilities for R&D (whether combination of assets, etc. generates supplementarity, and contributes to cost reduction, resource allocation optimization, and R&D investment capacity)

In R&D, supplementary combination of tangible and intangible assets has an aspect of contributing to effective R&D. Meanwhile, R&D involves uncertainty and requires huge costs for implementation. To accommodate such risks and costs, it is important to secure a business structure that enables stable supply of necessary cash flow, etc., and to efficiently and effectively utilize a range of resources to reduce the implementation costs.

If a certain type of corporate conduct can reinforce and enhance necessary inputs and capabilities for R&D, such a change may push up an expected return from R&D, whereby a positive effect may work on the R&D incentive of the actor. Examples of the forms through which the expected return from R&D increases can be categorized broadly as follows: (i) a decrease in implementation costs[202]; (ii) an increase in profit expected to gain from results[203];

[202]For example, the following cases can be considered: joint undertaking of R&D that requires huge development expenses, whereby implementation costs are shared among participating firms, thus enabling reduction of cost per participating firm; and economies of scale occur due to the expansion of the scope of R&D, thus reducing a fixed cost per unit.

[203]For example, the following case can be considered: combining supplementary assets owned by combining firms for R&D through a business combination, thereby enhancing the R&D capabilities of a combined firm and consequently

(iii) an increase in chance of success of R&D[204]; and (iv) an increase in risk allowance or risk diversion[205].

At the same time, it is necessary to focus on the aspect that inputs and capabilities for R&D in competitors may also be affected by such corporate conduct. For example, let us assume a case where it becomes more difficult for competitors to acquire necessary inputs for R&D as a result of input foreclosure by a combined firm in a vertical business combination or as a result of a firm in a leading position in a market causing its business counterparty to conduct exclusive trading for inputs. The competitors are restricted from inputs for R&D and may suffer an increase in R&D implementation costs or a decrease in chance of R&D success.

It should be noted that, while the enhancement of R&D capabilities, etc. may occur directly or indirectly through various aspects of corporate activities, the target of consideration in the context of this field may be understood as an action that is intended as a direct effect of specific corporate conduct and that may be reasonably expected (in a business combination, those that occur in a realizable manner as an effect unique to the business combination[206]).

3.4.1.3 Profit structure and conditions (whether expected return per R&D investment unit increases)

An expected return expected to be gained from R&D results is determined on the premise of an profit structure and conditions (profitability, costs, and the production scale) in individual parts of business activities. A change in such profit structure and conditions changes the expected return. Specific corporate conduct of a certain actor may change the profit structure and conditions thereof. If this change can increase the expected return per R&D investment unit, the R&D incentive of the actor may increase. Therefore, it is necessary to also focus on this field.

However, corporate conduct types that can naturally change such profit structure and conditions are considered to be limited. A horizontal business combination itself changes the profit structure and conditions through integration of business organizations. In contrast, in joint R&D, the profit structure and conditions of each participant change only after the R&D is successful and after the competition environment of a product market changes as a result of the firm's launch of a product employing the results of the R&D. Also in the case of individual conduct, for example, an increase in sales of assets tied in[207] cannot be seen as inevitable. Thus, when assessing whether R&D incentive actually increases, it is necessary to take into consideration reasonable inevitability from corporate conduct.

As described in 3.4.1.2 above, the target of consideration in the context of this field is an

enabling the company to expect achievement of R&D results that would produce more profit.

[204]For example, the following cases can be considered: new availability of necessary inputs for R&D; and expansion of the scope of business, whereby resource injection to R&D can be bolstered or intensified.

[205]For example, the following cases can be considered: expansion of the scope of business or of the portfolio, whereby extra cash is generated, leading to higher risk allowance; and maintaining overlapping R&D, thereby enabling risk diversification and, consequently, aggressive R&D initiatives.

[206]See Part IV, 2, (7) of Business Combination Guidelines. It should be noted that, while it refers to an increase in benefits of users, this issue is excluded in terms of relevance with changes in R&D incentive.

[207]See page 93 of Choi (2004) as a reference that points out the possibility of an increase in R&D incentive through a change in earning structure and conditions due to tie-in sales. It should be noted that it also refers to a strategic effect whereby tie-in sales decrease the R&D incentive of competitors.

action that is intended as a direct effect of specific corporate conduct and that is reasonably expected. When the market share of the actor increases or the actor can gain and exercise price controlling power as a result of certain exclusionary conduct, such cases would not be the target of consideration.

3.4.2 Fields relating to competition situation of product market

Each firm conduct monetization activities in a market of a product (or technology) employing R&D results. The situation of its expected return depends on the competition situation and the market structure of the product market and changes therein. Therefore, the situation in this field affects the R&D incentive of the firm. That is, the firm strategically decides whether to implement R&D or not, depending on relative and external circumstances of the competition environment, such as the competition situation with competitors in the product market and the market structure.

In most cases, corporate conduct affects the competition situation of a product market, the market structure, etc. Therefore, it is important to have the following viewpoints when carrying out observation and analysis on changes in the competition situation in the product market due to the corporate conduct and what impacts occur on the R&D incentive of the actor and competitors as a result of the above changes.

It should be noted that, even if a positive impact on R&D incentive arises in the corporate conduct actor in the field described 3.4.1 above, it is considered that strategic decision-making reflecting the competition situation of the product market strongly affects whether the R&D incentive of the firm increases eventually.

3.4.2.1 Basic points to be noted

3.4.2.1.1 Decreases in or loss of escape competition effect and pre-emption effect (rent-dissipation effect)

If corporate conduct dampens competition in a product market (i.e., if it causes an actor of the corporate conduct to have a certain level of market power in the product market, or if the actor's advantage against competitors is fixed or the chance of new entry is reduced), the incentive (escape competition effect) of the actor to conduct R&D to gain a highly profitable position by escaping from competition through innovation may decrease or disappear. In this case, if a competitor has a lower expected return in the product market, an escape competition effect in the competitor decreases or disappears, whereby R&D incentive may decrease.

Besides, in a case where corporate conduct produces a monopolistic firm in a product market, which can enjoy a monopolistic rent, this monopolistic firm may have larger R&D incentive to prevent new entry or to protect its existing profit (pre-emption effect). Meanwhile, when a corporate conduct actor is a monopolistic firm (or quasi-monopolistic firm) and its corporate conduct dampens competition in a product market, a threat from existing competitors and new entry decreases. Thus, the pre-emption effect in this firm decreases or disappears, whereby R&D incentive may decrease or disappear.

3.4.2.1.2 Replacement effect (cannibalization effect)

Provided that a certain level of rent already exists because an actor has an increased market share in a product market as a result of corporate conduct thereof, if a new product to be launched would substitute for (cannibalize) the sales of the firm's own existing product, a substantial increase in margin is limited (because of the existing rent). Therefore, R&D incentive to launch such a new product may decrease. In addition, when there is a relationship between firms in which customers are stolen between the existing products and the pipelines of the firms, if corporate conduct by an actor internalizes the relationship, a replacement effect emerges, whereby R&D incentive decreases.

It should be noted that corporate conduct other than a horizontal business combination and some cases of joint R&D basically does not naturally change the market share of a product market. Therefore, such corporate conduct is considered to create no replacement effect.

3.4.2.2 More practical viewpoints

Given the basic understanding described in 3.4.2.1 above and to provide more practical viewpoints, we have focused on the forms of specific events that can occur through corporate conduct in the competition situation of a product market and summarized the points to be noted as follows:

3.4.2.2.1 Enlargement of gap in competitiveness

Let us assume a case where, as a result of corporate conduct, for example, the advantage and the R&D capabilities of an actor in a product market[208] increases, the gap thereof with each competitor in a product market enlarges, and the contestability of the competitor decreases. In such a case, the competitor cannot expect a sufficient expected return, and may have lower R&D incentive. Also in the case of a potential competitor, such an increase in the gap in terms of competition condition may decrease its R&D incentive toward new entry. Furthermore, as a counter effect, the R&D incentive of the actor may decrease.

As a result of the corporate conduct, if the actor can get strong supplementarity in product or in technology or if business activities of competitor are restricted and/or limited as described in 3.4.2.2.2 below, the above tendencies may become stronger.

3.4.2.2.2 Restrictions and limitations on business activities of competitor

In a product market, various types of corporate conduct that directly or indirectly, for example, via a business counterparty, impose restrictions and/or limitations on diverse aspects of the business activities of a competitor may be performed. While some of these restrictions and/or limitations have rationality and necessity and contribute to market efficiency enhancement, some of them have adverse impacts on the R&D incentive of the competitor and may further lead to a decrease in R&D incentive of the actor of the corporate conduct.

A case where input foreclosure (market foreclosure) is conducted on necessary inputs for R&D (such as human resources, raw materials, data, cash, technologies, patents) in a vertical

[208] An increase in R&D capabilities may increase the R&D incentive of the actor, separately (see 3.4.1.2 above).

or conglomerate business combination is typical. Other possible cases include, for example, a case where a firm in a leading position in a market causes a business counterparty to conduct exclusive trading for relevant inputs[209], and this makes it difficult for a competitor to acquire or appropriately use the inputs.

Besides, R&D incentive is affected by the level of expected return to be brought by a product employing R&D results, so whether a firm has appropriate access to customers (including future potential customers) may be an issue. For example, there is a case where customer foreclosure is conducted in a vertical or conglomerate business combination. Other possible cases include the following: a case where a firm in a leading position in a market causes its customer to refuse to conduct business with its competitor, or encloses customers by carrying out predatory pricing or predatory innovation; and a case where a firm raises switching costs among its customers by lowering the mutual compatibility between its service and those of its competitors.

There are still other cases: a case where participants in joint R&D are restricted in the use of joint R&D results or in other R&D activities beyond the necessary extent; and a case where a vertically combined firm, who conducts business in one market with a firm that is its competitor in another market, imposes a condition that restricts and/or limits methods of the firm‘s business activities. Thus, there are a range of possible cases where a competitor is restricted and/or limited in various aspects of its business activities. It is important to observe and analyze such restrictive and limiting events that occur by corporate conduct or in a product market, also from the perspective of the R&D incentive of each firm.

3.4.2.2.3 Exclusion of competitor

As described in 3.4.2.2.2 above, when restrictions and/or limitations are imposed on the competitor in business activities, the R&D incentive of the competitor may decrease, and the R&D incentive of the actor of the corporate conduct may also decrease. When the competitor is excluded from the product market by the corporate conduct, it means that important countervailing power in R&D ceases to exist, whereby decreases in R&D incentive of the respective firms may be further notable[210].

[209]Among other cases, there may be a restrictive business deal where, when supplying the inputs to the competitor, the business counterparty imposes some restriction and/or limitation on the use of these inputs.

[210]A case where the competitor is being controlled by the actor of the corporate conduct is equivalent to the case where it is excluded.

3.5 R&D in stage where R&D results, etc. are uncertain

How R&D is conducted and what form it takes for appropriately achieving R&D results and the resulting innovation are broadly categorized as follows: a direction where the emphasis is put on efficiency in achieving the results, that is, avoiding overlapping investment by streamlining and integrating two or more R&D conductors or overlapping R&D themes into one (through a business combination or joint undertaking of R&D); and a direction where the emphasis is put on diversity, an option value, risk diversification, etc., that is, maintaining two or more R&D conductors and overlapping R&D themes. Basically, there is a trade-off between these efficiency-focused and diversity-focused alternatives. In terms of R&D characteristics, when R&D is still in a phase where the chance of success, specific functions and a utility value to be brought by its results are uncertain, it is difficult to determine which of the alternatives is more appropriate to select.

In such an uncertain phase, it is considered desirable to ensure an opportunity for innovation by maintaining overlapping R&D until its results, etc. become clear to some extent, so that either of them may be then selected, and making a decision between the efficiency and the diversity later based on the outcome[211].

Furthermore, the distance of the R&D phase from a product can be considered as a point to be noted in making a decision as to whether the above approach should be adopted or not under the current situation[212]. That is: if the R&D theme, such as product development, is close to an embodiment of the utility value, etc. (product) of the specific results thereof, it is possible to estimate the efficiency preference and the profitability with a certain level of reasonableness; and if the R&D theme, such as development of technology elements, is in a phase distant from a product, it may be more necessary to leave the range of selectable alternatives as wide as possible.

3.5.1 Relationship of impact mechanisms, etc. on innovation

Given the above discussions, in a situation where the diversity and a wide range of alternatives should be maintained for the time being, the following are examples of points to be considered when impacts on R&D incentive are assessed based on the summarized impact mechanisms, etc. on innovation.

3.5.1.1 Trade-off associated with appropriability and spillover

For a technology that would contribute to increasing appropriability of a corporate conduct actor and provide a large benefit from spillover to its competitors, the aspect of spillover should be appropriately considered from the perspective of maintaining the number of R&D conductors (competitors) and their R&D capabilities which may lead to the diversity and a wide range of alternatives.

3.5.1.2 Resource allocation optimization

In a case where conduct such as a business combination makes more room to adjust how

[211] See page 38 of Kerr et al. (2014).

[212] However, the more distant the R&D phase from a product is (the more uncertain the functions and the utility value of R&D results are), the more difficult it is to have a clear view of the competitiveness (and the substitutability in some cases), which is a premise when the diversity issue is considered. In addition, there is room to expand political arguments to questions such as whether R&D competition regarding a technology element, whose stage is too early to identify connection with a product, should fall in the scope of competition policy.

R&D resources are allocated, a combined firm should make its own determination as to which direction to take, i.e. streamlining and integrating overlapping R&D themes into one or maintaining the overlap.

3.5.1.3 Replacement effect (cannibalization effect)

When R&D conductors having overlapping R&D themes conduct a horizontal business combination, the following matter should be deeply discussed: whether R&D themes of a combining company are likely be discontinued in a combined firm due to the presence of a replacement effect (cannibalization effect) in addition to a decrease in number of R&D conductors.

3.5.1.4 Escape competition effect and pre-emption effect (rent-dissipation effect)

Deep discussions should be made as to whether the number of R&D conductors may decrease and whether their quality aspect deteriorates, due to decreases in and loss of escape competition effects and pre-emption effects (rent-dissipation effects) in a corporate conduct actor and its competitor through changes in the competition situation in product market as a result of corporate conduct.

3.5.2 Methods for observing likelihood of decreases in diversity and number of alternatives

In terms of R&D characteristics, when it is considered appropriate to maintain diversity and a wide range of alternatives for the time being, or when the value of diversity, etc. is important, it is difficult to directly observe whether the diversity, etc. is appropriately maintained and it is also difficult to predict the future development. In such a case, the following elements may be used as surrogate metrics and noted as to whether these metrics are lost by corporate conduct or are subject to limitation or foreclosure, resulting in adverse impact on competition environment. In such a way, it may be possible to indirectly observe and predict an adverse impact on the diversity, etc.

- The number of R&D conductors and their level of R&D capabilities
- Necessary inputs for R&D (such as human resources, data, cash, technologies and patents, and equipment)
- Accessibility to potential customers[213]

[213]However, at the time when a product employing R&D results is not yet present, there are problems such as the practical difficulty of identifying the extension of customers of the product, and the tendency of having a wide range of potential customers. It is necessary to continue to consider whether there may be more appropriate metrics on the output (changes expected return) side.

4. Summary of Situations that may Cause Issues in Competition

◇Points of this paragraph

In this section, based on the theoretical and systematic discussion up to Part 1.3, we summarize the situations in which R&D incentives are likely to be reduced due to corporate conduct.

1 Summary of market structures that tend to lead to reduced R&D incentives

Stable monopoly or oligopoly with no new entrants expected
= When contestability is lost going into the future
Note: It is also important to focus on qualitative aspects such as the number of leading innovators and changes in their composition in terms of future loss of contestability.

→ Negative effects may occur.

2 Summary of product and technology characteristics that tend to lead to reduced R&D incentives

・Aspects with characteristics that tend to promote the acquisition or expansion of market power

For instance, the characteristics include the following cases:

- ・Concentration of demand on a specific company arising due to network effects
- ・Combination of multiple products and technologies strongly complementary to each other
- ・The lock-in effect increases switching costs for particular consumers

→ Negative effects may occur.

Up to Part 1.3 of this Report, we have theoretically and systematically organized the mechanisms by which corporate conduct affects innovation, based on the Study Group's expertise in Economics and other disciplines. In this Report, we examined the effects of corporate conduct on R&D incentives that lead to innovation by an actor (offending party) and its competitors, etc., and found that, theoretically, both positive and negative effects on R&D incentives can occur simultaneously. In the light of the finding, the actual mechanism and strength of the impact and whether the positive or negative impact is stronger as a result should be determined on a case-by-case basis, based on the specific form of corporate conduct, market structure, product and technology characteristics, and other factors.

On the contrary, it is also assumed that it is difficult to make quick decisions and exclude problems under competition while making specific judgments about the impact on R&D incentives under the Antimonopoly Act. Thus, it is also important to ensure flexibility of law enforcement to secure a competitive environment that promotes innovation. Therefore, articulating in advance the circumstances under which R&D incentives are likely to be reduced will contribute to the prompt implementation of the Antimonopoly Act.

In doing so, the following opinion was expressed at the Study Group.

- The problem of market structure in securing R&D incentives is that a monopoly or oligopoly of an important technology creates a long-term problem of a loss of diversity of enterprises engaging in innovation, which will narrow innovation in the future.
- In relation to product and technology characteristics from the perspective of securing R&D incentives, it may be appropriate to particularly focus on the digital industry. The digital industry is a driver of innovation; however, at the same time, its products and services are often established on the basis of an ecosystem of digital platform providers, meaning that the impact is significant, considering the issue of what will happen to innovation undertaken by the digital platform providers themselves, as well as innovation undertaken by the businesses participating in the digital platform providers' ecosystem.

Based on the above opinions and on the theoretical and systematic discussion up to Part 1.3, we have articulated the situations in which R&D incentives are likely to be reduced in terms of (1) market structure and (2) product and technology characteristics (including the digital field)[214].

4.1. Summary of market structures that tend to lead to reduced R&D incentives

4.1.1. Loss of contestability

In this Report's discussion up to Part 1.3, we have articulated that the negative effects on the R&D incentives of each enterprise are related to the impact mechanisms (replacement effect, escape competition effect, and pre-emption effect) on the competitive situation in the product market.

In this context, with regard to the characteristics of market structure, Part 1.2.1 of this Report (see page 23) states that "As the competition situation of a product market, there is a case where a combined firm gains an extremely high market share (monopolistic market share) under a stable market environment where new entry seems impossible. A particularly strong negative impact emerges on R&D incentive because of strategic effects corresponding to this competition situation, which are the presence of a replacement effect and the loss of an escape competition effect and a pre-emption effect. Even though there are positive impacts such as an increase in appropriability and a synergistic effect, such a negative impact can prevail overall." The same point applies not only for horizontal business combinations but also for vertical and conglomerate business combinations (see page 36 and joint R&D (see page 54).

If a certain corporate conduct results in a stable monopoly (or oligopoly) with no prospect of new entrants, i.e., contestability is lost in the future, the actor (offender) itself will not be able to expect a positive impact on R&D incentives, or even if such impact occurs, the negative impact (loss of escape competition effect and pre-emption effect) will be strong, and R&D incentives are likely to decrease overall.

Based on the above, it is considered that the competitive situation in a product market is likely to have a negative impact on R&D incentives if the market structure is characterized by a stable monopoly (or oligopoly) in which no new entrants are expected to enter the market.

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[214] The following discussion up to Part 1.3 of this Report is based on the Study Group's expertise in Economics and is intended to articulate situations in which R&D incentives are likely to be reduced. However, the fact that a situation falls under any of the following points does not necessarily render it immediately problematic under the Antimonopoly Act. It should also be noted that the circumstances under which R&D incentives are reduced are not limited to the following points:

4.1.2 Changes in the number and composition of leading innovators

Even if the market structure of a product market has not reached a stable monopoly (or oligopoly), it is important to focus on changes in the number and composition of "leading innovators (those with superior R&D capabilities)" in terms of future loss of contestability in the product market[215].

In this regard, Part 1.3.3 of this Report (see page 75) states, "the level of innovation expectable in R&D competition is not only affected by the number of competition units that conduct R&D but also affected to a certain extent by the degree of their R&D capabilities (whether each competition unit is a leading and competent innovator or not). Moreover, the degree of the dynamism of R&D competition, which may be weakened by some corporate conduct, also changes depending on whether a firm to be affected is capable of leading innovation or not. Thus, only quantitative variables, such as the number of competitors and market share, may be insufficient for adequately measuring substantial impacts on innovation. Therefore, it is necessary to focus on the quality of R&D capabilities of the competitors."

When product markets become competitive, R&D incentives increase for firms with comparable technology levels due to the escape competition effect, but for enterprises that are not operating at a high level of technology (lagging behind other firms), the escape competition effect is limited and is likely to decrease or be lost, resulting in lower R&D incentives. As a result, contestability in the product market is lost, and even if the market structure does not transition to a stable monopoly (or oligopoly), it can transition to a state similar to a stable monopoly (or oligopoly) where new entrants cannot be expected in real terms. Therefore, the absence or limited number of leading innovators as a result of a given corporate conduct is likely to be an issue in terms of competition.

In determining whether an enterprise is a leading innovator, we consider not only its market share of the product market but also the quality and quantity of its R&D assets (human resources, equipment, technology, etc.) and patents, the amount and objectives of its R&D investment, and its achievements and track record in R&D, along with other R&D activity indicators. Moreover, it is appropriate to consider the extent to which the above factors and the objectives and content of the R&D activities currently being conducted (or about to be conducted) overlap or align with each other, from the perspective of evaluating the extent to which the competitor can directly function as a check on the market-dominant firm[216] [217].

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[215] Although R&D involves a variety of enterprises, including those primarily engaged in R&D and investment activities such as corporate VC, we assume here that these enterprises will participate in competition in the future product market.

[216] In this regard, in the EU, for example in the Dow/DuPont case, when assessing the importance of the two parties as innovators, factors such as the expertise and assets possessed by each party, R&D expenditure targets, and the quality and quantity of patents were taken into consideration. The proximity of the competitive relationship between the two parties was also assessed by looking at overlapping goals and lines of research at the discovery stage as well as overlapping pipelines at the development stage.

[217] The EU Market Definition Notice also states that the nature and scope of innovation efforts, the purpose of the line of research, the expertise of the teams involved, and the results of past innovation efforts may be relevant for defining the boundaries where innovation competition takes place (see para. 92).

4.2 Summary of product and technology characteristics that tend to lead to reduced R&D incentives

4.2.1 Basic points

Some product and technology characteristics and other characteristics tend to encourage the acquisition or expansion of market power, and when such characteristics are present, product and service markets tend to be prone to loss of contestability. In markets with such characteristics, it is more difficult to gain market share through R&D than in markets without such characteristics, and for competitors, the expected return from products using R&D results are reduced, which in turn reduces R&D incentives.

An example in which this characteristic is pronounced is the network effect. The network effect can easily concentrate demand on specific firms and encourage them to acquire and expand market power, in that securing a certain number of consumers increases the value of goods or services and makes it more likely that they will be used. As a result, the competitive disparity between competing firms will widen, and R&D incentives for competitors will also decrease.

Additionally, when multiple products or technologies that are highly complementary to each other are combined, or when switching costs due to the lock-in effect for particular consumers are increased, these tend to encourage the acquisition and expansion of market power, which is likely to reduce R&D incentives for competitors. Regarding the complementarity between the products and technologies involved, Part 1.2.2 of this Report (see page 40 mentions, “In a vertical or conglomerate business combination, when there is strong complementarity between products of respective combining firms or technologies possessed thereby, a combination of these products or technologies can increase the chance of having a product improved in quality or function or conducting novel technology development that has a high value. Therefore, the stronger this complementarity, the improvement in product competitiveness or R&D advantage of a combined firm is further enhanced, whereby the gap thereof with competitors may be further enlarged in the product market. In such a case, decreases in R&D incentive in the combined firm and the competitors may be more remarkable through decreases in or the losses of an escape competition effect and a pre-emption effect (if it has already been present).”In addition, if the complementarity between products and technologies becomes stronger, “the competition situation of a product market changes in such a manner that, while the position of the combined firm is cumulatively and irreversibly strengthened, competitors (including potential competitors) are deprived of resisting power. In the situation where such a market controlling position is entrenched, the negative impact on R&D incentive in the combined firm and the competitors may prevail overall”.

Regarding the increase in switching costs due to the lock-in effect on users, Part 1.3.4 (see page. 81 of this Report states that actions that reduce R&D incentives may include cases “where a firm in a leading position in a market …(omitted)… raises switching costs among its customers by lowering the mutual compatibility between its service and those of its competitors.”

4.2.2 Product and technology characteristics in business areas utilizing digital platforms

Particularly, product and service fields with the product and technology characteristics noted in 4.2.1 above include business fields that utilize digital platforms. Digital platforms tend to select business strategies that maximize revenue and competitiveness across the ecosystem[218] rather than by individual business layer[219]. The products and services offered by digital platforms are characterized by strong network effects, economies of aggregation and positive feedback loops in terms of data and user bases, economies of scale and scope, and near-zero marginal cost. In some cases, they combine multiple characteristics such as strong complementarity among products and services (and the technologies used in them), free markets, and high switching costs due to the lock-in effect for users. Therefore, the degree to which digital platforms reduce R&D incentives of competing companies is greater than in other fields. In addition, in a winner-take-all situation, which is a characteristic of digital platforms, certain enterprises are more likely to become entrenched in a dominant market position[220], and the R&D incentives of such enterprises are also reduced due to the reduction of their own escape-competition and pre-emption effects.

In a market with these characteristics, corporate conduct[221] that results in the entrenchment or

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[218] This refers to a network in which digital platform providers use their primary business activities as a starting point to expand into other markets/fields that are complementary to their main business, thereby expanding their business by leveraging network effects resulting from the complementarity between markets, and by utilizing various services in the business fields they have expanded into to complement their primary business and create further synergistic effects (CPRC (2022) page 2).

[219] The Headquarters for Digital Market Competition, *Competition Assessment of the Mobile Ecosystem Final Report* (2023) states that "The combined and synergistic effects of the cross-layer actions of a small number of platform providers have further strengthened their dominant position in each layer, and together these actions have strengthened and entrenched their impact in the ecosystem as a whole. This cycle of strengthening and consolidating impact in the ecosystem as a whole is a characteristic of the current mobile ecosystem from a broad perspective" (page 24). It adds, "Typically, this is thought to be caused by multiple, amorphous and simultaneous behaviors (usually) taken at any layer where platform providers can leverage their influence. Even if the negative effect on competition caused by such behavior alone is relatively minor, the combined and synergistic effects of a number of such behaviors can manifest negative effect (harm) on competition" (page 28).

[220] The following examples have been highlighted as leading to a decline in innovation in this situation.

- The theory of harm in regard to the acquisition of startups by conglomerate (ecosystem) companies in the digital field states that in a market environment where there is a high degree of concentration and entry barriers brought about by strong positive network effects and data-driven feedback loops, an acquiring firm may increase the value of its services through complementary relationships and retain customers of partially substitutable services within the ecosystem, thereby raising the entry barriers and further expanding and stabilizing a fixed ecosystem dominated by the acquiring firm, while at the same time reducing the prospects for independent and decentralized innovation. (Cremer et al. (2019) pages 112-113 and 121-122).
- "The company is able to secure or strengthen its position in layers in which it has strengths, while taking advantage of other layers to strengthen the competitiveness of its services at the same time. The combined and synergistic effects of these cross-layer actions by a small number of platform providers have further strengthened their dominant position in each layer, which in turn has strengthened and entrenched their impact in the ecosystem as a whole. This cycle of influencing and consolidating impact in the ecosystem as a whole is a characteristic of the current mobile ecosystem from a broad perspective." "With high barriers to entry and little competitive pressure at each layer, ... there is little prospect of a correction, at least in the short term, and a strong likelihood that this will continue in the medium to long term." (Headquarters for Digital Market Competition, *Competition Assessment of the Mobile Ecosystem Final Report* (2023) pages 24-25.)
- "These characteristics (citation needed: network effects, multifaceted markets, the role of data, and digital ecosystems) tend to lead to the creation of firms with durable and entrenched positions of economic power, providing these firms with the ability to engage in exploitative and exclusionary conduct. Such conduct can lead to higher prices, reduced choice, quality, and innovation; limit access to markets for competitors; and impede effective consumer decision making." (See G7 Joint Competition Enforcers and Policy Makers Summit, *Summary of Efforts to Improve Competition in Digital Markets* (2023), tentative translation, para. 29.)

[221] Because digital platforms tend to select business strategies that maximize revenue and competitiveness across the

expansion of that position by an enterprise with market power will tend to lead to a reduction in R&D incentives in particular.

ecosystem as a whole, rather than by individual business layer, multiple corporate conducts (regardless of the type of behavior such as independent actions or business combinations), can compound and synergistically enhance the market closure effect across the ecosystem as a whole and create entrenched and extended market power.

Part 2: Assessing the Impact on Innovation under the Antimonopoly Act

In Part 1 of this Report, based mainly on our expertise in Economics, we have theoretically discussed the mechanisms by which corporate conduct affects innovation.

In Part 2, based on these theoretical discussions, we summarize and discuss the issues of innovation[222] as well as our approach and points of focus, etc. in applying the Antimonopoly Act.

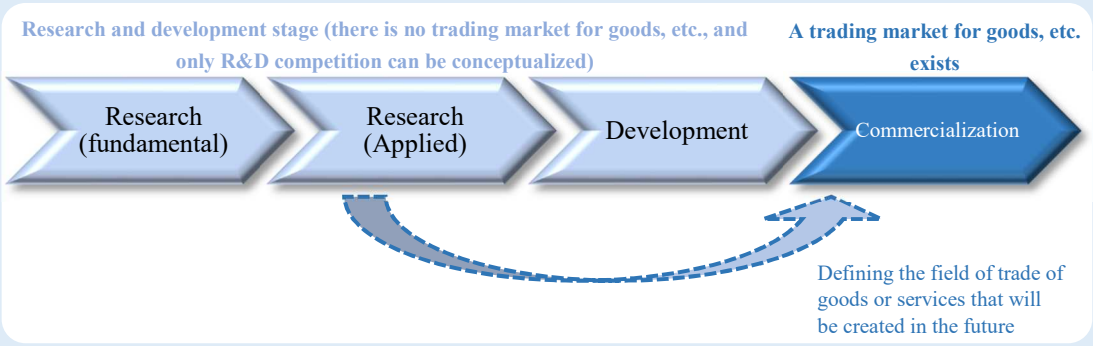
Specifically, in Part 1.3.1 states that, to properly evaluate the impact of corporate conduct on innovation, it is necessary to focus directly on R&D competition. Based on this point, in Part 2.1, we examined the approach to understanding corporate conduct during the R&D stage in applying the Antimonopoly Act, and in Part 2.2, we examined the perspectives to be taken in assessing the impact on innovation in applying the Antimonopoly Act. In addition, in Part 2.3, we examined the challenges that competition authorities face in properly assessing the impact of innovation on competition.

1. Positioning of R&D Competition in the Application of the Antimonopoly Act

◇Points of this paragraph

This paragraph summarizes methods for assessing the impact of R&D on innovation at research and development stage, as follows:

- R&D activities by enterprises are usually conducted with the objective to earn revenue by linking them to the supply of some goods or services in the future.
- Therefore, even **if specific goods or services do not yet exist, it is possible to envision goods or services that will be created in the future in light of the purposes for which research and development is conducted, and to define the business field in which they will be traded.** It is thus appropriate to evaluate the impact of corporate conduct at the R&D stage on R&D incentives as the impact on competition in the market defined in this manner.



[222]There are a variety of innovation issues that can raise antitrust concerns. Examples include killer acquisitions (Part 1.2.1(1)a(d)a(b)), in which an acquisition terminates research and development that could be a potential threat to the company's products in the future, and technology hoarding that leads to market power in a particular market.

1.1. Need to focus on R&D competition

Since the source of innovation lies in new technologies that are the result of research and development, it is vital that R&D incentives be secured to promote innovation, and any circumstance that reduces R&D competition in which all enterprises are competing will have a direct, negative impact on innovation. Therefore, to properly assess impacts on innovation in the application of the Antimonopoly Act, it is necessary to focus on R&D competition and analyze and evaluate its true state[223].

Usually, the evaluation of the impact on competition in the application of the Antimonopoly Act is made with respect to competition in the trading market for specific goods or services (after the results of research and development have been reflected). However, with respect to innovation, it takes a long period of time until the results of research and development are reflected in goods or services, and the competitive situation may change significantly during this period. Therefore, it may be too late to evaluate their impact on competition only at the stage when the results of R&D are reflected in specific goods or services.

For example, let us consider a case in which a good is still far from being commercialized but is expected to create a new, large-scale market in the future, and many enterprises are competing in research and development of new technologies essential for the development of that good. If an enterprise interferes with competition in research and development of such technology and obstructs other enterprises from conducting R&D activities freely, a situation may arise in which only that offender's technology is commercialized and the offender monopolizes the market for that good. In such a case, even if the competitive situation is evaluated at the stage when the technology is commercialized, the offender already has a monopoly in the market, and there is little prospect that enterprises eliminated from the R&D competition will reenter the market, making it difficult to retroactively restore the competition that existed at the R&D stage.

Thus, to properly assess impacts on innovation, it is necessary to do so at the initial stage during the time of research and development, rather than later when the technology, etc. is materialized as a good or service.

1.2 Treatment of R&D Competition under the Antimonopoly Act

1.2.1 Discussion at this Study Group

Based on the aforementioned point, the Study Group discussed methods to assess impacts on innovation at the time of research and development, etc., and the following opinions were expressed by the Study Group members:

- Conceptualizing the innovation market would require legal reform, but it is not necessary to go that far, and a legal interpretation of defining future product market is sufficient. However, there is a concern that if future product markets are too abstract and forecast-based, it will be difficult for enterprises to engage in counter-arguments.
- It is easier to evaluate the R&D markets by linking them to the product market rather than directly looking at such markets. For example, we believe that the current framework can be adequately interpreted by interpreting "any particular field of trade" in the current law to include dynamic competition, as in the EU's concept of dynamic competition.

[223] See Part 1.3.1.

- In Article 2.4 of the Antimonopoly Act, "competition" is defined as supplying or receiving the supply of goods or services, and the place where this is done is understood to be the market; however, this also includes potential competition, and the question would be to what extent such potential competition can be recognized.
- Even under the current legal framework of looking at product markets, it would appear possible to essentially achieve what amounts to evaluating of the R&D market by abstracting the product market. For example, if it is possible to define an abstract market of a few products that utilize AI technology, an R&D market can be evaluated at an early stage. Furthermore, even if such an abstract market is defined, there is no issue in terms of the application of the law, and if a market that is slightly different from the one envisaged is realized after measures have been taken, this is a judgment call made at a given time, and therefore not problematic.
- In cases where the technology itself is the subject of a transaction, as in licensing transactions, the technology market can be defined directly, and the impact on R&D competition can also be understood through the evaluation of this market.

1.2.2 Discussion and Conclusion

When applying the Antimonopoly Act, it is necessary to evaluate the impact of the conduct at stake on "competition" in "any particular field of trade" (Articles 2.5 and 2.6, etc. of the Antimonopoly Act)[224] [225]. The "competition" subject to evaluation under the Antimonopoly Act is assumed to be the one in which some form of transactions in goods or services can be conceptualized[226].Therefore, it is difficult to view competition in R&D itself, which cannot be conceptualized as a transaction, as a market (any particular field of trade)[227].

On the contrary, because R&D activities conducted by enterprises are usually aimed at earning profits by supplying some goods or services in the future[228], it is considered unlikely that a situation would arise in which it is impossible to predict what kind of good or service the results of any given research and development will be used for in the future, and what kind of market will be created. Additionally, "competition" under the Antimonopoly Act (Article 2.4)

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[224] Generally, the definition of the scope of competition in "any particular field of trade," i.e., the scope in which the competition to be evaluated is taking place, is called "market definition."

[225] To be precise, unlike private monopolization and unreasonable restraint of trade (Article 3 of the Antimonopoly Act), unfair trade practices (Article 19 of the Antimonopoly Act) do not necessarily have to be in "any particular field of trade" as a legal requirement. However, there is a judicial precedent (WINS Shiodome case (Tokyo High Court judgment of January 31, 2007)) that determined whether or not unfair trade practices exists on the basis that "the Antimonopoly Act is a law that regulates certain acts and conditions that restrict or hinder competition to promote fair and free competition, and it is impossible to determine the existence of the risk of impeding fair competition n unless the market in which competition takes place is defined." In addition, considering that unfair trade practices are continuously dealt with under preventive measures against private monopolization, etc., it is believed that unfair trade practices (especially those that reduce free competition) are also undertaken with an awareness of the scope of the trading market.

[226] "Competition" under the Antimonopoly Act (Article 2.4) refers to a situation in which two or more enterprises supply or are able to supply the same or similar goods or services to the same consumer or receive such goods or services from the same supplier, and is interpreted to include potential competition.

[227] In addition, it is possible to value the inputs required for R&D (e.g., human resources, licenses, etc.) by understanding the trading market for the inputs (i.e., labor market, technology market), if such a trading market exists.

[228] In the interviews conducted by the secretariat of the Study Group with enterprises (in the IT, energy, and biotech/pharmaceutical fields), all interviewees stated that they always make decisions regarding research and development after considering the kinds of goods or services that the results will lead to.

includes not only existing competition but also potential competition, and there have been past cases in Japan that have conceptualized potential markets[229].

Therefore, even if specific goods or services do not exist yet, it is possible to envision goods or services that will be created in the future in light of the purposes for which research and development is conducted, and to define the business field in which they will be traded. It thus seems appropriate to evaluate the impact of corporate conduct at the R&D stage on R&D incentives as the impact on competition in the market defined in this manner[230].

The above approach is also based on what has already been presented in several Japan Fair Trade Commission Guidelines. For example, the Intellectual Property Guidelines state that "No market or trade, however, can be defined for research and development activities by themselves. Therefore the effect on competition in developing technologies should be evaluated by the effect on competition in the trade of future technologies resulting from such activities or products incorporating the technology."[231].The Startup Guidelines, published in March 2022, state that "There is a risk that restrictions on the free R&D activities of start-ups may generally reduce competition in future technology markets or good markets through their impact on R&D competition," thus rendering future trading markets for goods or services potentially problematic under antitrust law.

Moreover, in the guidelines of competition authorities in other countries/jurisdictions, for example, the U.S. Merger Guidelines, published by the U.S. Department of Justice and the Federal Trade Commission in December 2023, also mention the possibility that competition authorities may define markets related to goods resulting from innovation, even if such goods do not yet exist, if a merger is likely to reduce incentives for innovation and substantially lessen competition[232].

In this way, even at a point in time when the goods or services do not yet exist, by assuming goods or services that will be created in the future and defining the market for them in consideration of the purpose of R&D, etc., and conducting competition assessment, it will be possible to assess the impact of corporate conduct taken at the R&D stage on competition more directly and at an earlier point in time, which will contribute to ensuring a competitive environment encouraging innovation.

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[229] For example, in the Asahi Kohmatsu Case (Tokyo High Court judgment of June 13, 1986), a cement manufacturing and sales company and a limestone powder manufacturing and sales company entered into an agreement to not supply limestone mined by them to new entrants in the market to hinder new entrants. The court found that this was a restriction on trade in the market (competition for procurement) for limestone, an as-yet non-existing raw material at the time of the agreement, and identified possible adverse effects on the market that could occur in the future.

[230] As demonstrated here, when defining a market based on the goods or services that will be produced through research and development, it is difficult to precisely define the market because it involves future predictions by its very nature. However, it is considered sufficient if the scope of competition is specified to the extent necessary to determine that there is an effect of restricting competition for future products or services resulting from the R&D competition.

[231] See Intellectual Property Guidelines 2.2(3).

[232] See U.S. Merger Guidelines 4.3.D.7.

2. Points of Focus for Evaluating the Impact on Innovation

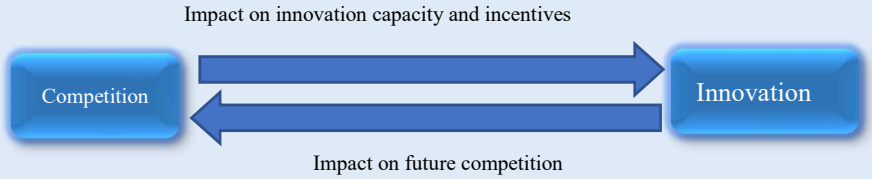
◇Points of this paragraph

In this paragraph, we summarize points of focus, etc. for assessing impacts on innovation from a long-term perspective, as follows.

● Points of focus of long-term evaluation of impact on innovation

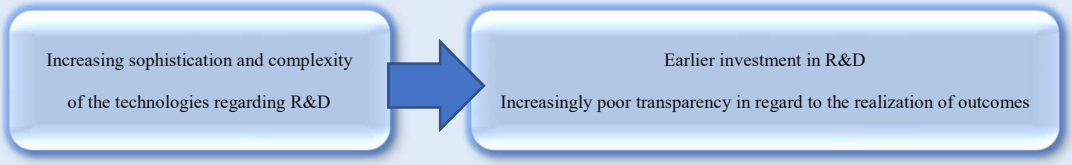
a. The need for a dynamic perspective in assessing impacts on innovation

- Just as competition impacts innovation, innovation may bring about changes in market structure, such as the creation of innovative goods and services through research and development, which may impact future competition.



- Given the increasing role of innovation in the marketplace, **competition authorities need to keep a close watch on corporate conduct, especially those that adversely affect innovation, which can lead to significant changes in market structure and restrict future competition.**

b. The need to take into account recent changes in the R&D environment



- Given that innovations that will give rise to new technologies in the future will emerge from R&D competition, **competition authorities should not be precluded from determining that an anti-competitive effect for future products or services is being generated, even at a stage when it is unclear whether the R&D results in question will be realized.**

●When short-term anti-competitive effects and long-term pro-competitive effects of innovation are expected to occur simultaneously

- While taking into consideration the rationality of the objective and the appropriateness of the means, it is appropriate to consider, for example, the following points (a) through (e).

(a) Whether the innovation can be sufficiently expected to realize long-term pro-competitive effects based on objective circumstances and facts

(b) Whether the results of the innovation will contribute to increased consumer welfare in the long term

(c) The extent to which the long-term pro-competitive effects of the innovation will have an impact in markets where short-term anti-competitive effects will occur

(d) Whether the anti-competitive effects of corporate conduct are short-term and minor, or whether they will excessively restrict market competition

(e) Whether the occurrence of short-term anti-competitive effects is unavoidable in order to realize the long-term pro-competitive effects of the innovation

2.1 Need for a long-term perspective in assessing impacts on innovation

Ensuring a competitive environment conducive to innovation requires that competition authorities properly assess impacts on innovation. It has been highlighted that under-intervention by competition authorities can lead to increased market power by certain enterprises, and thus a decrease in the willingness of other enterprises to innovate, whereas over-intervention can eliminate opportunities for innovation by the enterprises themselves[233].

Where the effects on competition resulting from a given corporate conduct can be both short and long term, short-term effects are often easier to assess in the form of changes in price or volume. However, when considering the impact that promoting an innovation will have on future competition, since there are currently no goods or services that use the relevant technology, the impact cannot be appropriately assessed from a short-term perspective and must be evaluated from a long-term perspective[234]. Additionally, since it is not possible to obtain data at this time regarding the timing, price, and quantity of specific new goods and services resulting from an innovation, evaluation of innovations is often qualitative, except in limited cases.

In this Study Group, we discussed points of focus, etc. when assessing impacts on innovation from a long-term perspective.

2.2 Points of focus of long-term evaluation of impact on innovation

2.2.1 Discussion at this Study Group

The noteworthy comments made at this Study Group were as follows:

- When we consider a future market, if we consider R&D investment as a means of competition, we must naturally consider the fact that the market will undergo drastic changes. The time span will change with the accumulation of data and the emergence of general-purpose technologies such as AI. Furthermore, the scope of the market will change. We consider determining the appropriate time frame to take such circumstances into account essential, and indeed the significance of this Study Group lies in its demonstration that evaluation should not be undertaken from a short-term perspective but from a long-term perspective, and that long-term adverse effects should be considered and evaluated in alignment with competition authorities in other countries/jurisdictions.
- To keep pace with competition authorities in other countries/jurisdictions, Japan needs to be more explicitly aware of future markets and pipeline product development.
- From the perspective of ensuring a competitive environment that can promote innovation, it is highly detrimental to not assess the impact of innovation on competition as we do not know much about it. From a societal perspective, there are surely R&D projects that will

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[233] Regarding under-intervention, the Organization for Economic Co-operation and Development (OECD) (2023) notes that "under-enforcement could result in more concentrated markets, which, in turn, negatively impact consumer welfare and the potential to decrease incentives to innovate in the long run. " (see page 5). Conversely, Argentesi et al. (2019) pointed out that over-intervention could prohibit mergers that did not actually have an anti-competitive effect, and that it could also make the outcome of merger regulation less predictable, which could negatively affect enterprises' willingness to invest (para. I.162). In addition, according to the OECD (2023), "Over-enforcement could decrease incentives to innovate, as companies would consider the intense scrutiny of competition authorities as part of their risk-assessment for investment decisions, preventing innovations which could have positively impacted consumer welfare." (see page 5).

[234] Conversely, adverse effects on innovation at a stage where the distance between a certain innovation and the stage of commercialization is so huge that it is impossible to envision future goods and services. They are basically not considered to be problematic under the Antimonopoly Act; this also relates to Part 2.1 above.

succeed in only one out of ten attempts, and if we do not take these into account due to uncertainty as to whether they will be successful, then we will be missing out on opportunities for socially necessary innovation. All things considered, without any doubt, it is necessary to assess competitive innovation from a long-term perspective, even if the assessment is qualitative.

2.2.2 Discussion and Conclusion

In the application of the Antimonopoly Act, the following two points of focus should be kept in mind when looking at impacts on innovation.

2.2.2.1 Dynamic perspectives in assessing impacts on innovation

While assessing impacts on innovation, it is necessary to take a dynamic perspective that considers the impact of innovation on future competition.

Regarding the relationship between innovation and competition, it has been pointed out that the main approach taken by competition authorities till date has been to evaluate innovation on the premise that competition affects innovation. In this approach, innovation is understood as one of the factors relevant to the competition, but it is not seen as a driver of competition[235]. Under this approach, the focus of the analysis is on whether corporate conduct reduces competition in the market and whether reduced competition reduces the ability or incentive to innovate.

Conversely, innovation may bring about changes in market structure, such as the creation of innovative goods and services through R&D, which may affect future competition. Thus, some approaches to assessing the impact of competition on innovation are based on the premise that innovation affects competition (just as competition affects innovation)[236]. Under this approach, the analysis focuses on whether corporate conduct diminishes innovation, given that protecting innovation can have a positive effect on competition.

Given the increasing role of innovation in the marketplace, competition authorities will need to closely monitor corporate conduct producing adverse effects on innovation, especially those that can cause significant changes in market structure and limit future competition.

The competition authorities in other countries/jurisdictions, for example, the U.S. Merger Guidelines mention " A merger can result in durable market power and long-term harm to competition even when it initially provides short-term benefits to some market participants. Thus, the Agencies will consider not just the impact of the merger holding fixed factors like product quality and the behavior of other industry participants, but they may also consider the (often longer term) impact of the merger on market power and industry dynamics[237]."

2.2.2.2 Changes in the R&D environment in recent years

There are ongoing rapid changes in the environment, such as the shift in industrial structure due to digitalization. Major social issues, such as environmental problems and the falling

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235 OECD (2023), p. 12.

236 See ibid., p. 22.

237 See U.S. Merger Guidelines (2023) 2.6.

birthrate and aging population, are also arising. The importance of innovation in response is increasing, and it has been highlighted that, against the backdrop of the fragmentation and complication of science and technology, it is now necessary to respond to R&D activities, which are the source of innovation, through long-term investment, joint research, and open innovation, etc.

With respect to the R&D environment, our hearings with enterprises produced the following responses, for example.

- Although it is currently possible to predict the results of R&D investments across an industry to some extent, it is becoming increasingly difficult to foresee with certainty whether such results will be achieved. Additionally, due to the increasing sophistication and complexity of technology, there is an increasing lack of technological transparency each year regarding what technologies can be used in the development of new technologies and whether they will be accepted in the marketplace. (Energy)
- It is said that the probability of success in R&D is decreasing year by year worldwide. Moreover, as new technologies become more sophisticated and complex, it is becoming progressively more difficult to foresee sufficient results from R&D. In addition, while in the past we have invested in goods with a high probability of success that we could foresee being commercialized to some extent, increasing R&D competition with competitors is compelling us to invest despite lower probability of success than that in the past, i.e., to invest in R&D that is ahead of the R&D stage in which we have mainly invested in the past. As a result, the timeframe for R&D is becoming longer, making it difficult to fully foresee the realization of R&D results at this point in time. (Biotechnology and Pharmaceuticals)

Furthermore, academic papers also indicate similar findings to those from the interviews mentioned above, pointing out that changes are occurring, such as the increasing complexity of technology making it difficult to adequately predict the R&D results[238], the difficulty in accurately grasping changes in the market environment making it difficult to predict the profits from R&D[239], and the existence of factors known as macro shocks[240] making it even more difficult to adequately forecast the results of R&D.

In light of the above, it can be said that the R&D situation is in fact changing, with the increasing sophistication and complexity of technologies in R&D leading to earlier investments in R&D and increasing lack of transparency in the realization of R&D results.

With R&D now taking place at an earlier stage than in the past, there will be more competition for technologies with fundamental and general-purpose characteristics. In cases where technologies created through R&D have fundamental and general-purpose characteristics, the range of goods or services that are expected to be created by utilizing such technologies in the

[238] Several studies have shown that increasing complexity due to technological deepening and the scale of R&D may lead to poorer prospects for R&D results. For example, Nagaoka et al. (2023, page 17 and 23), using U.S. patent data aggregated to the firm level, confirm that the use of science and the expansion of research teams leads to poorer R&D outcome prospects. Others have shown that lack of technological transparency has a negative impact on firms' incentives to invest in R&D (Coad et al. 2016; Bolli et al. 2020).

[239] Czarnitzki and Toole (2007) and Guiso and Parigi (1999) show that less information about changes in market conditions can have a negative impact on R&D incentives because it is more difficult to predict profits from R&D.

[240] As specific examples, WIPO (2023) cites the pandemic, the Ukrainian conflict, the volatility of macro indicators, and rapid technological developments, such as AI, as examples of how the difficulty of forecasting in a changing macro environment is negatively affecting R&D and innovation.

future will also be broad. It is thus highly necessary, in terms of competition policy, to closely monitor corporate conduct that restricts competition related to such technologies.

Given that enterprises engage in R&D competition with competitors even when it is unclear whether the R&D results will be realized, and that such R&D competition gives rise to innovations that will have an impact on future markets, competition authorities should not be precluded from determining that an anti-competitive effect for future goods or services is occurring, even at a stage when it is unclear whether the results of the R&D in question will be realized.

Furthermore, outside Japan, the UK Merger Assessment Guidelines explicitly state that the Competition and Markets Authority will consider the impact on competition from a long-term perspective, stating that uncertainty in the market several years later itself does not preclude an assessment of the impact of anti-competitive effects[241].

2.3 When short-term anti-competitive effects and long-term pro-competitive effects are expected at the same time

For example, in a business combination in a capital-intensive industry, etc., where the number of competitive units will decrease, but where quality improvements and creation of new technologies are expected through larger-scale R&D activities resulting from joint R&D, an anti-competitive effect such as price increases due to a decrease in competitive units may occur in the short term, whereas a pro-competitive effect such as price decreases and quality improvements may occur in the long term through more efficient R&D activities resulting from joint R&D.

Our basic approach in applying the Antimonopoly Act when assessing impacts is that if corporate conduct has only an anti-competitive effect, it is naturally problematic under the Antimonopoly Act. Conversely, if a certain corporate conduct has an anti-competitive as well as pro-competitive effect, the rationality of the objective and the appropriateness of the means (such as whether there are other alternative means that are less restrictive) will be considered, and both the effects will be taken into consideration to comprehensively determine whether the behavior is problematic under the Antimonopoly Act.

2.3.1 Discussion at this Study Group

At the Study Group, the following comments were made on the framework for judging the pro-competitive effects of innovation in cases where short-term anti-competitive effects are expected.

- A short-term detriment to competition would be, for example, a short-term increase in prices, but there is a concern that if the competition authorities over-intervene with respect to such price increase, it will cause enterprises to lose incentives to innovate to improve quality over the long term. Conversely, there is a possibility that the short-term adverse effects of market power will reduce the number of new entrants into the market in the future, which will have a negative impact on long-term competition. Therefore, the extent to which short-term adverse effects are likely to remain in the long term should be carefully evaluated.

241 See UK Merger Assessment Guidelines 2.6, 2.10, and 2.27 (2021).

- While there may be a tradeoff as to whether to focus on short-term or long-term impacts, the issue of how far the relevance of the current market to the future market can be clearly defined may also be involved in this decision. For example, if the goods market is similar in the short and long term, such as in the development race in the pharmaceutical industry, it is easy to compare the short-term and long-term impacts. However, when results obtained in the short term, such as the results of basic research and development, are used over the long term to develop new goods, the correlation between the short and long terms is not necessarily visible, and there is the problem that it may be necessary to prove the correlation.
- In cases where there are short-term adverse effects, to evaluate the overall impact on the market as positive, taking into account the long-term positive effects of innovation (emphasis on the long-term effects), there must be sufficient justification for overlooking such current adverse effects on competition. For example, it may be necessary to consider whether long-term positive effects are something that should be achieved even if it means causing short-term adverse effects, such as whether the long-term positive effects are in the public interest, or whether short-term adverse effects are unavoidable to achieve long-term positive effects.

2.3.2 Discussion and Conclusion

From the perspective of ensuring a competitive environment conducive to innovation, the long-term pro-competitive effects of innovation must also be appropriately evaluated. On the contrary, if at the same time a short-term anti-competitive effect is considered to occur, the innovation must be something that ought to be realized even if it causes short-term adverse effects on competition to approve a given corporate conduct based on the positive long-term effect of the innovation on competition. If competition is restricted in the short term and market power is formed, competition will also be restricted in the long term when new entrants to the market are not expected in the future, which may also lead to reduced R&D incentives.

In light of the above, in considering the long-term positive impact of innovation on competition when the short-term impact on competition is negative, it is appropriate to consider, for example, points (a) through (e) below, while considering the rationality of the objective and the reasonableness of the means[242].

2.3.2.1 Whether the innovation can be sufficiently expected to realize long-term pro-competitive effects based on objective circumstances and facts

In considering the long-term pro-competitive effects of innovation outcomes, it is also necessary to consider the likelihood that these effects will actually be realized. In situations where an anti-competitive effect is expected in the short term, if the feasibility of a pro-competitive effect stemming from the innovation is extremely low, it is unlikely that attention will be focused on such pro-competitive effect, and the realization of the effect must be sufficiently expected based on fairly objective circumstances and facts (e.g., individual progress reports on R&D, and materials disclosed to shareholders and financial markets, etc.).

As described in 2.2.2 above, the situation of R&D is changing, and as R&D technologies become more advanced and complex, investment in R&D is being made at an earlier stage. In

[242] Even when a situation is one where the positive long-term impact of an innovation on competition should be considered, it may be necessary to adopt measures to address the short-term negative impact of the innovation on competition, for example, in a limited time frame, while taking into account the positive impact of the innovation.

light of this, it is possible that the period required to ensure the achievement of improved efficiencies through the results of R&D may also become longer. Therefore, it is necessary to determine the feasibility of R&D results with an appropriate time frame in mind, taking into account the circumstances of each case, when the feasibility of the results is low in the short term, but the results are fully expected to be realized in the long term[243].

2.3.2.2 Whether the results of the innovation can contribute to increased consumer welfare in the long term

The results from innovation need to be returned to the consumer. On this point, with regard to innovation, the results of innovation can be returned to the consumer in a wide variety of forms, and an increase in consumer welfare as a result of innovation through R&D does not necessarily immediately manifest itself in the form of lower goods prices or an increase supply volume. It may also manifest itself in the form of improved quality, availability of new goods through the development of new technologies, and an expanded range of choices[244]. In addition, even if new goods and technologies do not exist in the market at the R&D stage and the results of R&D do not immediately lead to price reductions in products, etc., the results of R&D may contribute to increased consumer welfare in the form of improved quality and increased variety of goods after multiple stages from technological development to the introduction of new products.

2.3.2.3 The extent of impact that the long-term pro-competitive effects of the innovation will have in markets where short-term anti-competitive effects will occur

Although it is difficult to measure with quantitative specificity the magnitude of the future pro-competitive effect of innovation, it is necessary to consider the extent to which innovation will promote competition among enterprises in markets where anti-competitive effects are occurring. For example, if such pro-competitive effect affects a wide area within the market where the anti-competitive effect occurs, it may be focused on as having a greater pro-competitive effect than if it does not. Some innovations may have broad market impact, such as innovative updates to the underlying technology supporting a product that has been widely used in a given market, or the creation of inputs that are essential to the process of producing the product in question. The results may have a broad impact on the market.

2.3.2.4 Whether the anti-competitive effects of corporate conduct are short-term and minor or whether they will excessively restrict market competition

If an intervention excessively restricts market competition in the short term, it will have a significant adverse effect on competition, such as reducing the number of competitors and

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[243] The Business Combination Guidelines state that "Improvements in efficiency should be materialized." (4-2(7)), and this "feasibility" is based on the idea that since efficiency is considered when a business combination has some impact on competition, the achievement of efficiency gains must be certain (see Fukamachi (2021), page. 214). Under this approach, for example, the greater the likelihood of a reliable outcome of R&D after a corporate merger, the more likely it is that the authorities will find the efficiency gains to be feasible.

[244] One study that shows that consumer welfare has increased due to the availability of new goods is Brynjolfsson et al. (2003), which shows that the emergence of online bookstores has increased the variety of books available to consumers for purchasing.

increasing prices, and may not have a pro-competitive effect in the long term as a result of its significant impact on competing enterprises. Therefore, an intervention's short-term impact on competition should be limited.

2.3.2.5 Whether the occurrence of short-term anti-competitive effects is unavoidable to realize the long-term pro-competitive effects of the innovation

The long-term pro-competitive effects of innovation must be specific to the corporate conduct in question. In other words, there must be a causal relationship such that the long-term pro-competitive effects cannot be achieved by other means that are less anti-competitive in the short term, and that the long-term pro-competitive effects can be achieved only by the corporate conduct in question.

3. Issues Related to the Evaluation of the Impact of Innovation

◇Points of this paragraph

In this paragraph, the information to be provided by the enterprise and the manner of establishing proofs are summarized as follows.

1 Provision of appropriate information by enterprises

- "Provision of appropriate information by enterprises" refers to the compilation of information for the Japan Fair Trade Commission to properly understand the impact of innovation on competition.
  Examples: Content and results of R&D, probability of success, magnitude of results, lead time, required costs and investment capability, R&D structure, comparison with existing situation in R&D of similar technologies, incentives to engage in R&D, etc.

2 Manner of establishing proofs

If evidence of a positive impact on innovation is submitted, the Japan Fair Trade Commission will take this into account when determining the impact on competition. Therefore, **enterprises that claim to promote innovation are encouraged to proactively submit objective evidence supporting their claims.**

In order to ensure a competitive environment that promotes innovation, competition authorities are required to properly evaluate the impact of innovation on competition. However, as described above in 2.2.2.2, as R&D activities become longer and more complex, it is becoming more difficult for the Japan Fair Trade Commission to understand the details of innovations and their feasibility. In addition, when the Japan Fair Trade Commission evaluates the impact of corporate conduct on competition, including impacts on innovation, by corporate conduct from a long-term perspective, it necessarily includes future projections, which adds a further complicating factor.

Therefore, the Study Group discussed the information needed to properly assess the impact of innovation on competition.

3.1 Need for provision of appropriate information by enterprises

To understand the impact of innovation on competition, it is necessary to understand the content and progress of R&D, the prospects for results to be obtained from it, and its feasibility, etc. Much of the information related to these issues is held by enterprises. For example, if the Japan Fair Trade Commission is examining the synergistic effects[245] that will arise from a horizontal business combination between two companies to determine whether or not the parties will be motivated to engage in R&D, it will want to ascertain the existence of complementary assets (human resources, equipment, know-how, etc.) that each party possesses, how these can be combined, and the possibility of the expected results in R&D. However, the relevant information is held by the parties involved, and unless this information is provided by the enterprises, it will be difficult to properly assess impacts on innovation.

The current guidelines, etc. of the Japan Fair Trade Commission do not specify the details of information required to evaluate the impact of innovation on competition; for example, the Appendix to the Policies Concerning Procedures of Review of Business Combination and the Business Combination Guidelines provide the following information as reference materials for defining "any particular field of trade": materials on overviews of goods, raw materials, manufacturing methods, and manufacturing process diagrams; reference materials for understanding the position of the relevant company group and the situation of their competitors, such as materials on trends in market size (quantity and value) and demand forecasts; and reference materials for demonstrating efficiencies, such as explanatory materials regarding efficiency addressed to shareholders and financial markets[246]. With regard to the examination of alleged violation cases, for example, in the Guidelines for Exclusionary Private Monopolization[247], the overall market conditions pertaining to the good are listed as one of the factors for determining unjust low price sales, and the characteristics of the good, economies of scale, degree of product differentiation, etc. are listed as factors for determining this.

3.1.1 Discussion at this Study Group

Given the above, the Study Group discussed the information that the Japan Fair Trade Commission should receive from enterprises in order to evaluate the impact of innovation on competition, including the details of innovation and its feasibility, and the following opinions were expressed by the members.

- In the case of acquisitions of startups, it is comparatively difficult to evaluate the results of R&D, and it is important to collect information on how the startup was evaluated and funded by venture capitalists and financial institutions.
- One of the gaps we feel between Japan and other countries/jurisdictions in the examination of business combinations is that competition authorities in other countries require enterprises to submit data and materials that objectively prove that there have been improvements in efficiency, such as materials on the results of economic analyses or materials related to

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245 See page 9 of this Report.

246 See the Attachment to the Policies Concerning Procedures of Review of Business Combination, and the Business Combination Guidelines 2-2, 4-2(1) and (7).

247 See the Guidelines for Exclusionary Private Monopolization, 2-2(2).

technology, the Japan Fair Trade Commission does not seem to require such materials to be submitted.

- In evaluating future R&D results (e.g., new technologies), which are difficult to fully grasp, it would be helpful to refer to objective external data. For example, by using patent data for all industries, including analysis of technology proximity, it may be easier to assess more appropriately how much efficiency gains or competitive losses may result from the combination of technologies that are in close proximity after a business combination.
- When requiring enterprises to provide materials on their R&D, there is an incentive for them to make their R&D look better, so the challenge is to ensure the objectivity of the contents of such materials. It is also possible that a high level of technical understanding may be required to fully comprehend the submitted materials. Therefore, it is necessary to collaborate with experts to ensure the validity and objectivity of the materials submitted by enterprises.

3.1.2 Discussion and Conclusion

For the Japan Fair Trade Commission to properly ascertain the impact of innovation on competition, it is important for the Commission to receive materials from enterprises on, for example, the content and results of the R&D, the probability of success, the magnitude of the results (including profitable value, substitutability with and superiority over competing technologies, etc.), lead time, required costs and investment capability, R&D structure (human resources, equipment, internal and external complementary technology stock, etc.), comparison with the situation in R&D of existing similar technologies, and incentives to engage in R&D. Specific materials could include research plans related to these points, materials based on economic analyses, materials based on objective external data, and materials based on the company's own past data. When the Japan Fair Trade Commission assesses the impact of an innovation on competition based on materials provided by an enterprise, it is necessary to ensure the objectivity and validity of the materials provided by the enterprise, and the Commission may be required to collaborate with experts in related fields, depending on the case.

3.2 Manner of establishing proofs

As mentioned above, much of the information necessary to understand the impact of innovation on competition is in the possession of enterprises, and it is difficult for the Japan Fair Trade Commission to grasp the full scope of such information. Also, the content of such information is highly technical. Given these points, the Japan Fair Trade Commission faces limitations in specifying all of the information that it can use as proof and order enterprises to submit. Even if enterprises were to provide more information, it would be difficult for the Japan Fair Trade Commission to determine whether all necessary information has been submitted, and it would be easier for the parties involved, who have specialized knowledge, to explain the prospects for the R&D in question.

Therefore, this Study Group examined issues regarding proof in assessing the impact of innovation on competition.

3.2.1 Discussion at this Study Group

The following comments were made on this issue at the Study Group.

- Positive and negative effects on innovation should be discussed separately, and negative effects should be proven by the Japan Fair Trade Commission, but we could think about the possibility of different treatment for information regarding positive effects (information regarding justification)?
- If there is a long-term positive impact from a horizontal merger, I think that should be proven by the companies involved. Also, the criteria for admitting the claim should indeed be strict, especially in the case of a merger involving a company with a high degree of market power. In addition, since the companies concerned are the most knowledgeable about the technology, such treatment would be appropriate from the perspective of operational burden.
- Enterprises have an incentive to submit evidence in regard to information that is advantageous to them, such as the occurrence of innovations that would be beneficial to consumers in the future, so in practice there may be no issue with the status quo. However, as the manner of establishing proof has not been sufficiently explained up to now, it would be meaningful to clarify this point in guidelines, etc.
- The U.S. Merger Guidelines enacted in December 2023 lowered the Herfindahl-Hershman index standards for presuming illegality in business combinations, etc. This is apparently intended to shift the burden of proof to the enterprise in cases where a business combination by Big Tech firms meets the above standards, etc. Thus, it is necessary to keep a close eye on movements in regard to requiring explanations on the part of the enterprises for the negative impact on innovation.

3.2.2 Discussion and Conclusion

Regarding the concept of the burden of proof under current law, there are few cases in which a judgment has been made as to where the burden of proof lies. However, the Osaka Bus Association Case (Japan Fair Trade Commission decision of July 10, 1995), a case under the trial system before the 2013 amendment, determined that the burden of proof regarding the grounds for precluding illegality lay with the Japan Fair Trade Commission[248]. Referring to the classification theory of legal requirements regarding the burden of proof under the Civil

[248] The Osaka Bus Association case (Japan Fair Trade Commission decision of July 10, 1995) was a case in which a cartel behavior (hereinafter referred to as "the behavior in question" in this commentary), whereby the Osaka Bus Association decided that chartered bus operators who were members of the Association should raise fares, etc., was at issue. The background to the behavior in question was that under the Road Transport Act, fares for chartered buses could be set within a range of 15% above or below the approved fare, but in the chartered bus market in Osaka Prefecture, transactions at fares significantly below the approved fare were being conducted on a large scale and on a regular basis, and the case concerning the behavior in question was intended to correct these illegal fares. In this case, the court held that if the competition being restricted by the price agreement is related to illegal transactions subject to criminal penalties etc., the price agreement does not meet the element of "substantially restricting competition" unless there are special circumstances. The court thus ruled that of the fares raised by the behavior in question, those that were within a range of 15% above or below the approved fares violated Article 8.4 of the Antimonopoly Act, while illegal fares that were below the minimum fares set by the Road Transport Act did not violate the Antimonopoly Act. Regarding the burden of proof, the court ruled that unless the respondent (the enterprise) points out the fact that the competition sought to be restricted by the behavior in question involves illegal transactions, etc. that are prohibited by other laws and involve criminal penalties, there is no need to take this point into consideration in the hearing; however, once the fact is pointed out by the respondent, the investigators will bear the burden of proof that such facts do not exist.

Procedure Code[249] and the concept of the burden of proof regarding normative requirements where abstract concepts regarding normative evaluation (negligence, legitimate reason, etc.) are legal requirements[250], it is considered that the positive impact on innovation, which is particularly favorable to enterprises, acted as a countervailing fact vis-à-vis the grounds for the Commission's evaluation supporting the anti-competitive effect established by the Japan Fair Trade Commission, and will be asserted by the enterprise. In practice, enterprises will have an incentive to submit evidence regarding positive impacts on innovation that are favorable to them, and so it is expected that enterprises will proactively submit evidence. For example, if there is a concern that a certain merger plan may have the effect of halting innovation of one of the parties, as in the case of a so-called "killer acquisition," and if the Japan Fair Trade Commission can prove the effect of the merger based on facts such as the amount of the acquisition and the corporate strategy based on internal documents, it would be necessary for the parties to submit evidence and explanations of the merger's promoting innovation and benefitting the consumer if the parties would like to make such claim. Also, the Japan Fair Trade Commission will evaluate effects on competition taking into account evidence submitted by an enterprise regarding a positive impact on innovation, and it is therefore recommended that an enterprise that claims to promote innovation proactively submit objective evidence pertaining to such claim, which will enable the Japan Fair Trade Commission to ascertain the details of the innovation and evaluate the impact on competition promptly and appropriately.

Given the uneven distribution of the documentation on innovation, it will be worthwhile going forward to continue discussions on issues such as shifting the burden of proof. However, the burden of proof should be discussed and organized within the overall system of the Antimonopoly Act, and we look forward to further discussion in this area as an issue for future consideration.

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[249] The burden of proof is broadly divided into three legal effects: creation of a right, impairment of a right, and extinguishment of a right. The party in whose favor each legal effect works has the burden of proving the essential facts that support such legal effect (referred to as facts that are the basis of a right, facts that impair a right, and facts that extinguish a right, respectively). The burden of proof is basically allocated between the plaintiff and the defendant based on the wording of the relevant provisions etc., but if this is inexpedient from the perspective of fairness for the parties, the allocation will also take into consideration substantial factors such as the distance from the evidence, the difficulty of proof, and the likelihood of the existence or non-existence of facts. In academic theory, this concept is known as the "modified classification theory of legal requirements."

[250] The burden of proof is on the party asserting the effect stipulated in a legal provision to prove the essential facts of such provision. Regarding normative requirements that take abstract concepts related to normative evaluation as essential facts rather than facts themselves, the Antimonopoly Act includes "a substantial restraint of competition," "the risk of impeding fair competition," and "without justifiable grounds," etc., and the party asserting an effect has the burden of proving specific facts that provide grounds for the evaluation, while the party denying the effect has the burden of proving specific countervailing facts that obstruct the evaluation.

Conclusion

The dynamism of competition may decline due to the monopolization and oligopolization of markets resulting from the development of the digital economy and the shift to business platforms and ecosystems. In this context, competition policy is required to ensure a competitive environment that can promote innovation, based on expertise regarding the actual state of innovation. Based on this awareness, the Study Group has theoretically and systematically summarized the mechanisms by which corporate conduct affects innovation based on its expertise in Economics and relevant disciplines, and based on this theoretical summary, has examined the evaluation of the impact of corporate activities, etc. on innovation in the Antimonopoly Act.

This Report has several distinctive features. First, this Report is based on our expertise in Economics and presents our approach and points of focus on the application of the Antimonopoly Act by combining expertise in Economics and Jurisprudence. In the future, assessment the impacts of innovation are expected to become more complex with the advancement of the digital age, etc., and the fusion of both forms of expertise will thus become even more necessary.

Second, in addition to clarifying the need for a long-term perspective in assessing the impact of innovation, the Report also provides factors to consider when short-term anti-competitive and long-term pro-competitive effects are expected to occur simultaneously.

Additionally, the Report also refers to issues that can be expected in assessing the impact of innovation on competition, such as the need for provision of appropriate information by enterprises and the manner of establishing proofs, given the reality that enterprises possess much of the information needed to more appropriately assess the impact of innovation.

As mentioned above, this Report summarizes the Japan Fair Trade Commission’s approach to assessing the impact of innovation, and is expected to provide certain suggestions not only to the Japan Fair Trade Commission but also to related enterprises and other parties. On the contrary, the ideas summarized in this Report are also general in nature, as there are few cases where innovation has become a central issue in regard to competition at this point in time. The Study Group hopes that, based on this Report, the Japan Fair Trade Commission will proactively deal with cases related to innovation in the future, and through the accumulation of relevant cases, more specific issues and approaches will be clarified.

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