The Result of the Review on the Proposed Acquisition of ANSYS, Inc. by SYNOPSYS, INC.

(Overview)

(Tentative Translation)

I.   Parties

SYNOPSYS is a company headquartered in the U.S. that is engaged primarily in providing the Electronic Design Automation (EDA) software used for supporting the design, analysis and manufacture of semiconductor chips[1] and optical design software. ANSYS is a company headquartered in the U.S. that is engaged primarily in providing the Simulation and Analysis (S&A) software[2] used for analyzing engineering issues such as strengthening the structure of products and heat dissipation.

The abbreviations of the Parties, etc. are shown in the Attached Table 1.

II.   Overview of the Case and Relevant Provisions of Law

In this case, SYNOPSYS plans to acquire ANSYS by share acquisition and merger (hereinafter referred to as the "Transaction").

The relevant provisions are Article 10 and 15 of the Antimonopoly Act.

III. Reviewing Process

July 26, 2024:   Commencement of the call for information and comments from third parties concerning the Transaction
(deadline for submitting information and comments: August 30, 2024)

February 12, 2025: Reception of the notifications concerning the Transaction (the commencement of the primary review)

March 13, 2025:   Notification not to issue the cease and desist order

The Transaction was/has been also reviewed by overseas competition authorities and the JFTC conducted the review while exchanging information with the U.K. Competition and Markets Authority and the European Commission.

IV.   Definition of Particular Fields of Trade, etc.

1   Semiconductor Design and Analysis Software Business

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[1] Small electronic components constituted by multiple interconnected elements (transistors, resistors, capacitors, etc.) Semiconductor chips are generally fabricated in large quantities on a single semiconductor wafer (substrate) and are cut into multiple small pieces. Each piece contains a copy of the circuitry, and these pieces are called "dies." Dies are packaged and become in a state where they can be connected to external terminals, and then marketed as semiconductor chips.

[2] In addition to semiconductors, S&A Software is used for analyzing engineering issues in a variety of products, including electrical products, automobiles, and optical products.

(1) Premise

Both EDA Software and semiconductor-related S&A Software are used in semiconductor design and analysis, and for that reason EDA Software and semiconductor-related S&A Software are collectively called "Semiconductor Design and Analysis Software."

(2) Types of Semiconductor Chips

Semiconductor chips can be broadly divided into five types by its function: digital chips, analog chips, mixed-signal chips, multi-die chips, and photonic chips.

(3) Functions of Semiconductor Design and Analysis Software

The process of semiconductor design and analysis is subdivided according to the type of semiconductor chips, and the required functions of Semiconductor Design and Analysis Software differ for each process.

(4) Characteristics of Semiconductor Design and Analysis Software

Generally, when designing semiconductor chips, consumers such as semiconductor manufacturing business operators combine several dozen types of Semiconductor Design and Analysis Software having different functions. In doing so, consumers purchase Semiconductor Design and Analysis Software that they consider to be optimal for their own use, depending on the types and functions of semiconductor chips, regardless of the vendors. It means the Parties Group provides products that are mutually related. Further, consumers repeat the processes in which they incorporate data that are designed and analyzed by using a certain Semiconductor Design and Analysis Software into Semiconductor Design and Analysis Software that is used in the next manufacturing step for further design and analysis, and complete the final design data of semiconductor chips. Therefore, even with products from different companies, it is necessary for Semiconductor Design and Analysis Software to have interoperability.

(5) Scope of Products

In this case, the JFTC defined the scope of the products by dividing Semiconductor Design and Analysis Software according to the types and functions of semiconductor chips (the 10 products[3] of the Semiconductor Design and Analysis Software provided by the Parties Group that compete with each other are listed in the Attached Table 2).

(6) Geographic Scope

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[3] Of the 10 products, regarding functional safety and specification analysis, the JFTC considered all types of semiconductor chip together because the function is used commonly for all types of semiconductor chips and there is little difference in market conditions as the business operators for the function are the same whatever chip the software is for.

Semiconductor Design and Analysis Software is provided globally, and the price is not set depending on regions because the nature of software products and services does not require transport cost, etc. Therefore, even though fluctuations due to exchange rates may occur, there is little difference in price between countries. There are no limitations of the geographic scope because consumers can easily purchase the products regardless of country or region where suppliers are, and suppliers also transact regardless of country or region where consumers are.

For this reason, the geographic scope of the products defined in (5) above is defined as "worldwide."

(7) Types of Business Combination

As both of the Parties Group provide 10 products described in the Attached Table 2, the Transaction falls under horizontal business combination.

Further, as the Semiconductor Design and Analysis Software provided by the Parties Group are products that are mutually related, the Transaction falls under conglomerate business combination (product expansion).

2   Optical Design Software Business
(1) Scope of Products

Optical design software is software used for designing and simulating light-related products such as camera lenses and automobile headlights, and can be divided into the two types: optics software[4] and photonics software[5].

As optics software and photonics software involve different technologies and are used for different applications and business types, in this case, the JFTC defined the scope of the products considering "optics software" and "photonics software" to be different products.

(2) Geographic Scope

Optics software and photonics software are provided globally, and the price is not set depending on regions because the nature of software products and services does not require transport cost, etc. Therefore, even though fluctuations due to exchange rates may occur, there is little difference in price between countries. There are no limitations of the geographic scope because consumers can easily purchase the products regardless of country or region where suppliers are, and suppliers also transact regardless of country or region where consumers are.

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[4] Software for design and simulation of systems that manipulate light on a macro scale (large fields such as lenses and cameras) using ray tracing technology (a method for creating realistic images in computer graphics).
[5] Software for design and simulation of optical systems and devices on a nanoscale (small fields such as lasers) smaller than light waves using electromagnetic solvers (tools for calculating how electricity and magnetic forces function in a space).

For this reason, the geographic scope of the products defined in (1) above is defined as "worldwide."

(3) Types of Business Combination

As both of the Parties Group provide optics software and photonics software, the Transaction falls under horizontal business combination.

V. Assessment of Substantial Restraints on Competition
1 Semiconductor Design and Analysis Software Business
(1) Horizontal Business Combination

Of the 10 products listed in the Attached Table 2, the Transaction in the markets for two products (parasitic capacitance analysis (analog chips) and transistor-level power integrity analysis (multi-die chips)) fall under the safe harbor standards for horizontal business combination. Regarding the markets for seven products (excluding the markets for the above two products and RTL power consumption analysis (digital chips) explained below), although there is limited competitive pressure from new entrants and there is no competitive pressure from adjacent markets, the JFTC did not found that competition in these markets for the seven products would be substantially restrained, considering that (i) competitive constraints from multiple competitors were found, (ii) the degree of competitiveness between the Parties Group was considered to be weak, and (iii) there might be competitive pressure from consumers.

Meanwhile, the JFTC recognized that the Transaction would substantially restrain competition in the market for RTL power consumption analysis[6] (digital chips), considering that (i) the market shares of the Parties Group after the Transaction would be high (approximately 70%), which would place the Parties Group in the first position in terms of market share, and the gap between the Parties Group and the second and lower ranks would be large; (ii) taking competitors' and consumers' opinions into account, the Parties Group's products were found to be similar to a certain degree and the competitive relationship between the Parties Group could not be described as weak; (iii) new market entry would not be easy due to the issues regarding development period, human resources, budget, etc., and thus the competitive pressure from new entrants would be limited; (iv) there were no products with a similar effect to that of a certain Semiconductor Design and Analysis Software, and thus no competitive pressure from the adjacent markets was found; and (v) unlike other Semiconductor Design and Analysis Software, there would be only three suppliers in the market for RTL power consumption analysis (digital chips) after the Transaction, which would make it difficult for consumers to switch suppliers, and thus

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[6] A tool for evaluating the quantity of electric power required for a semiconductor chip to function.

competitive pressure from consumers would be limited.

(2) Conglomerate Business Combination

  A   Foreclosure and Exclusivity of the Market

   (a) Blocking/Degradation of Interoperability

       Consumers choose the Semiconductor Design and Analysis Software that they consider to be optimal for their own product design, depending on design process and function, regardless of vendors, and which means, they value the ability of Semiconductor Design and Analysis Software to smoothly transfer design data among products, i.e., interoperability. In this regard, the JFTC examined the possibility of foreclosure or exclusivity of the market due to the blocking/degradation of interoperability between the Parties Group's and competitors' Semiconductor Design and Analysis Software by the Parties Group occupying a powerful position in each market for the Semiconductor Design and Analysis Software after the Transaction.

       Although the Parties Group occupies a powerful position in each market for the Semiconductor Design and Analysis Software, the JFTC found that the Parties Group would not have the ability to cause foreclosure of the market by the blocking/degradation of interoperability, considering that (i) in many markets, there were powerful competitors having a market share of no less than 10%, or competitors having a larger market share than that of the Parties Group; (ii) competitive constraints from competitors (regardless of the size of their market share) were found even in the market where the Parties Group had a large market share; (iii) although it could not generally be said that it was easy for consumers to switch to other Semiconductor Design and Analysis Software, there were some consumers purchasing multiple Semiconductor Design and Analysis Software for the same function and it was relatively easy for such consumers to switch; and (iv) even if the blocking/degradation of the interoperability by the Parties Group had occurred, consumers would have multiple countermeasures such as approaching directly to the Parties Group, switching to other Semiconductor Design and Analysis Software provided by competitors, and creating their own data converting tools and using them to maintain interoperability.

   (b) Combined Supply

       Because consumers purchase multiple Semiconductor Design and Analysis Software at once to design semiconductor chips, the JFTC examined the possibility of foreclosure or exclusivity of the market due to the conditional provision by the Parties Group in which consumers purchase a product occupying substantially powerful position in the market combining with another product.

       It is difficult to consider that consumers would switch their Semiconductor Design

and Analysis Software by the combined supply, given that (i) there are powerful competitors in the market for Semiconductor Design and Analysis Software as explained in (a) above; and (ii) although the possibility of combined supply by the Parties Group to some companies cannot be denied, consumers of Semiconductor Design and Analysis Software generally prefer to choose Semiconductor Design and Analysis Software that is most optimal to their companies regardless of the vendors, and thus it cannot be said that the combined supply would attract the deal if the combination does not match the needs of consumers. Therefore, it can be considered that the Parties Group does not have the ability to cause foreclosure of the market by the combined supply.

B   Elimination of Potential Competition

SYNOPSYS has been proceeding with its research and development towards the entry to the market for thermal analysis[7] (multi-die chips), but has not reached the stage to have a specific plan for commercialization, and in addition to ANSYS having an overwhelming market share (approximately 70%), there are other powerful competitors as well in the market for thermal analysis (multi-die chips). Given the above, even if SYNOPSYS enters the market, it cannot be said that SYNOPSYS is highly likely to become a powerful competitor. Further, it cannot be concluded that the degree of competitiveness between the product SYNOPSYS has been developing and ANSYS' thermal analysis (multi-die chips) software is strong. Therefore, the impact of the elimination of the potential competition caused by the Transaction on competition is insignificant.

2   Optical Design Software Business

Regarding the market for optics software, as the market shares of the Parties Group after the Transaction will be 100% and thus the possibility of continuation of effective competition after the Transaction is extremely low, the JFTC found that the Transaction would substantially restrain competition in the market for optics software.

Regarding the market for photonics software, although the market share of the Parties Group will be approximately 65% after the Transaction, the JFTC found that the Transaction would substantially restrain competition in the market for photonics software, considering that there were no powerful competitors other than the Parties Group; the Parties Group had been competing with each other actively; competitive pressure from new entrants was limited; and no competitive pressure from the adjacent markets was found.

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[7] A tool for analyzing temperature management and thermal effect in circuit design.

VI. Remedies

1 Overview of Remedies

The Parties Group offered the following remedies, provided that the closing of the Transaction shall be completed.

(1) ANSYS' RTL power consumption analysis software business will be sold to Keysight, a company headquartered in the U.S. that provides electronic design and testing solutions including Semiconductor Design and Analysis Software.

(2) SYNOPSYS' optics software business and photonics software business will be sold to Keysight.

2 Assessment

It can be assessed that the remedies can restore the competition that would be lost due to the Transaction, as they create an independent and powerful competitor by divesting the business of either of the Parties Group as it is to a business operator outside the Parties Group, so that the Parties Group will not be able to freely influence prices, etc. to a certain degree after the Transaction.

VII. Conclusion

Based on the premise that the remedies would be implemented, the JFTC concluded that it could not establish that the Transaction would substantially restrain competition in any particular fields of trade.

Attached Table 1 - The Abbreviations of the Parties, etc.

SYNOPSYS, INC.	SYNOPSYS
ANSYS, Inc.	ANSYS
A group of companies comprised of SYNOPSYS and ANSYS	Parties
A group of companies comprised of a group of companies already linked together with SYNOPSYS as the ultimate parent company and a group of companies already linked together with ANSYS as the ultimate parent company	Parties Group
Keysight Technologies, Inc.	Keysight

Attached Table 2 - Semiconductor Design and Analysis Software provided by both of the Parties Group

	Products
1	RTL (Register Transfer Level) power consumption analysis (digital chips)
2	ESD (Electrostatic Discharge) analysis (digital chips)
3	Parasitic analysis (analog chips)
4	ESD analysis (analog chips)
5	Power device analysis (analog chips)
6	Transistor-level power integrity analysis (analog chips)
7	ESD analysis (multi-die chips)
8	Transistor-level power integrity analysis (multi-die chips)
9	Photonic chip simulation (photonic chips)
10	Functional safety and specification analysis (digital chips, analog chips, mixed- signal chips, multi-die chips, and photonic chips)