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Chinese Government's Response to US-China Semiconductor Friction and Distortion of China's Semiconductor Industry Development Policy

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The Chinese government has invested a large amount of policy resources in the semiconductor industry, positioning it as an industry that supports socioeconomic development and national security. As a result, China's semiconductor industry has surely developed rapidly, but it now faces an increasing need for self-reliance due to the intensifying U.S.-China conflict. Also, in recent years, China's semiconductor industry development policy has been found distorted. In response, how is the Chinese government working to coordinate its semiconductor industry development policy? This essay will clarify that move and discuss its implications on Japan.

1. China's semiconductor industry faces a need for self-reliance due to the U.S.-China conflict

China's semiconductor industry development policy is facing a major challenge because of a series of sanction measures taken by the U.S. Trump administration against the industry. They include enhancing the review of foreign investment in the U.S. and restricting visa issuance, but what has been especially damaging to China is export regulations targeting specific companies.

Fujian Jinhua Integrated Circuit Company (JHICC), China's major DRAM manufacturer, was added in the entity list by the U.S. Department of Commerce in October 2018 and was charged with spying by the U.S. Department of Justice in November 2018, resulting in the halt of the DRAM joint production project between JHICC and United Microelectronics Corporation, a major semiconductor foundry in Taiwan.

Huawei Technologies Group was also added in the entity list in May 2019 and became a target of expansion (in May 2020) and re-expansion (in August 2020) of direct product regulation. It thus has trouble procuring semiconductors, semiconductor production facilities,



etc. that use equipment based on U.S. technologies.

Semiconductor Manufacturing International Corporation (SMIC), China's leading foundry, also became a target of U.S. sanctions. It is said that the U.S. government asked the Netherlands government to prevent ASML from exporting state-of-the-art extreme ultraviolet (EUV) exposure equipment to SMIC. In addition, due to SMIC's inclusion in the entity list, it is in principle not permitted to export or re-export to SMIC, or domestically transport, U.S. products necessary for the production of semiconductors with a circuit line width of 10 nm or less. Regarding other U.S. products, the U.S. Department of Commerce is supposed to determine whether they may be exported to SMIC on a case-by-case basis.

U.S. companies have a large market share of advanced semiconductor production equipment and electronic design automation (EDA) tools. Huawei is reportedly building its own plant to manufacture semiconductors with a circuit line width of 45 nm without depending on U.S. technologies. However, this 45 nm semiconductor chip is the one that was used for iPad and iPhone 4 launched in 2010, which means it is far from being advanced and only equivalent to the Apple 4 microprocessor. As often expressed in China, the U.S. government is grabbing the Chinese semiconductor industry by the throat.

2. Semiconductor industry development policy has been found distorted

The Chinese government has been concerned for some time about the semiconductor industry's overdependence on external sources and has invested a large amount of policy resources to accelerate domestic production of semiconductors since the announcement of the National Guideline for the Development and Promotion of the IC Industry in 2014. This has led to some achievements, including a 20.2% increase on average in China's semiconductor sales between 2015 and 2019, mass production of semiconductors with a circuit line width of 14 nm (by SMIC), three Chinese companies joining the world's top ten Outsourced Semiconductor Assembly and Test (OSAT) providers, and the ability to design 5 nm semiconductors (HiSilicon under the control of Huawei).

But China's self-sufficiency rate of semiconductors has not reached the expected target. Although the Made in China 2025 plan announced in 2015 set the goal of increasing the self-sufficiency rate of core basic parts to 40% by 2020, China's self-sufficiency rate of semiconductors is just around 30% in 2019, according to data from the State Council of China.¹ According to IC Insights (2021), China's IC self-sufficiency rate is 15.9% in 2020, and that for Chinese local semiconductor manufacturers is only 5.9%.

¹ "China's IC self-sufficiency rate is just 30% in 2019 but is expected to increase to 70% in 2025," j.people.cn, August 20, 2020. (<http://j.people.com.cn/n3/2020/0820/c94476-9736795.html>, accessed on January 30, 2021.)



Besides, distortion of China's semiconductor industry development policy is obvious in recent years. There are many overlapping investments: As of August 2019, for plants for 12-inch wafer semiconductors alone, there are 18 in operation, 15 under construction, and 23 awaiting construction.² Not a few plants have failed or ceased operations. From 2014 to 2017, Tsinghua Unigroup is said to have received policy support (financial support and profit transfer through preferential lending and investment) equivalent to about 30% of its revenue (OECD, 2019). Backed by this large-scale support, it actively acquired companies at high prices only to end up defaulting in 2020. There are also some suspensions of local projects that arise from poorly-thought-out plans or fraud, such as Hongxin Semiconductor Manufacturing Corporation (Zhang, 2020; Qiu, 2021).

3. Screening of companies and regions; use of private funds; enhancement of policy support for equipment and materials

The Chinese government is responding to this by embarking on the review of its semiconductor industry development policy.³ In the press conference on October 20, 2020, China's National Development and Reform Commission announced a policy of preventing overlapping investments by (i) enhancing the deployment plan based on the principle of "regional agglomeration and the concentration of firms," (ii) building a risk prevention mechanism (building a mechanism for early problem sorting, early detection, early feedback, and early processing; strengthening communication and collaboration with banks and funds), and (iii) ensuring that every party takes clear responsibility.

Meanwhile, China also made it clear that it would accelerate the execution of Several Policies for Expediting High-quality Growth of the Integrated Circuit Sector and Software Sector in a New Era (hereinafter referred to as "Several Policies") announced in July 2020. The Several Policies set forth preferential corporate income tax rates for manufacturers (or projects) of chips with a circuit line width of 28 nm or less who have been in business for 15 years or more, as well as the establishment of more diverse funding routes. They focus not only on continuous use of sovereign wealth funds, but also on encouragement of venture capital funds; development of a mechanism for compensation of lending risk by local governments; development of stock collateral loans, account receivable collateral loans, and supply chain finance; asking commercial financial institutions to reinforce mid- and long-term lending; acceptance of equity finance by insurance funds; encouragement and support of listing on the Science and Technology Innovation Board and ChiNext; support of issuance of mid- and long-

² "Local governments' enthusiasm for semiconductor manufacturing," *Caixin Weekly*, Vol. 47, 2019.

³ gov.cn, October 20, 2020. (http://www.gov.cn/xinwen/2020-10/20/content_5552705.htm, accessed on January 30, 2021.)



term bonds, etc. In short, they focus on actively providing private funds to the semiconductor industry through environmental improvement and guidance. Indeed, China's equity investment in the semiconductor industry in 2020 reached 140 billion yuan, about 4.5 times year on year (Winsoul Capital, 2021).

Support for domestic production of IC manufacturing equipment and materials is also expected to be enhanced as U.S. sanction measures have made it difficult to procure equipment for producing advanced semiconductors. The National IC Industry Investment Fund reportedly intends to diversify its investments from semiconductor production in the first stage (established in September 2014) to production equipment and materials in the second stage (established in September 2019).

4. Wide-ranging negotiations are urgently needed for more stable transactions by Japanese companies

It is unlikely, however, that the screening of support targets will be significantly intensified. That is because the Chinese government recognizes that industrial development requires a certain level of competition and because it has to increase the success rate of domestic procurement by having multiple projects. It positions the semiconductor industry as a strategic, basic and leading industry that supports socioeconomic development and national security, believing that "Only by mastering crucial core technologies with our own hands, can we fundamentally safeguard our national economic security, national defense security, and security in other areas" (Chinese president Xi Jinping, May 28, 2018). The government is likely to rush for domestic production of semiconductors even by tolerating some waste of resources.

You cannot rule out the possibility that these measures to accelerate domestic production of semiconductors may exacerbate friction with the U.S., leading to the U.S. government coming up with new sanctions against China. For example, in addition to sovereign wealth funds whose investments are suspected to be market-distorting, how the Chinese government will approach commercial financial institutions in terms of loans and investments is a potential factor that may intensify the friction. On the other hand, the Chinese government has a retaliatory system in place against third countries and their companies in response to U.S. sanctions against China, by enforcing the Chinese Export Control Law, Rules on Counteracting Unjustified Extra-territorial Application of Foreign Legislation and Other Measures, etc. These could impair the predictability and stability of transactions by Japanese semiconductor-related companies. Decreasing this risk requires urgent measures: (i) consensus-making with the U.S., etc. about how to control the export of semiconductors and related equipment and materials to China, and resulting clarification of non-sensitive areas, and (ii) encouraging China to change its industrial policy through negotiations toward the Japan-China-Korea Free Trade Agreement



(FTA), China's joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), etc.

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