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## **The Chinese Government’s Financial Support for the Semiconductor Industry: Further Strengthening Support Despite Dilemma**

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The Chinese government considers the semiconductor industry to be an important industry closely related not only to economic development but also to national security. Since the mid-2010s it has invested a large amount of resources to increase its self-sufficiency. However, its aggressive measures to support the semiconductor industry have been met with opposition from the United States and other countries, which see them as trade-distorting. At the same time, China’s support measures are also causing duplication of investment within China. In this paper, we will examine how the Chinese government is trying to adjust its support measures, especially financial support measures, for the semiconductor industry in the midst of this dilemma, focusing on financial measures. We will also consider the implications for Japan.

### **1. China's rapid catch-up in the semiconductor industry**

Since the birth of China's semiconductor industry in the 1950s, the Chinese government has intermittently implemented measures to foster the country's semiconductor industry with a focus on domestic production, not only for economic development but also for security reasons<sup>1</sup>. This trend has been further strengthened under the Xi Jinping administration. The Outline of the Program for National Integrated Circuit Industry Development<sup>2</sup> issued by the State Council in June 2014 states that “the IC industry is the core of the IT industry and is a strategic, fundamental, and leading industry that supports economic and social development and national security,” and that the strong dependence on imported ICs is a risk to the competitiveness of the industry and information security. Based on this recognition, the Chinese government has taken various measures with aim of accelerating the



development of the entire semiconductor supply chain in China, including design, manufacturing, packaging and testing, manufacturing equipment, and materials. These measures include: (1) establishing the Leading Group for National Integrated Circuit Industry Development to strengthen the government's leadership in this realm; (2) establishing National Integrated Circuit Industry Investment Fund and supporting the establishment of similar funds by local governments; (3) strengthening financial support for the semiconductor industry; and (4) steadily implementing tax incentives.

In May 2015, the Chinese government issued Made in China 2025, a document filled with a sentiment of anti-globalism<sup>3</sup>. The Technology Roadmap (October 2015)<sup>4</sup>, an appendix to the same document, sets the targets of raising the self-sufficiency rate (the rate at which domestic demand is met by domestically produced goods) from 41% as of 2015 to 49% by 2020 and to 75% by 2030. Another new Technology Roadmap issued in February 2018 further raised the self-sufficiency rate target (33%, 2016 actual; 58% by 2020; and 80% by 2030)<sup>5</sup>.

According to the U.S. Semiconductor Industry Association (SIA), the Chinese semiconductor companies' global market share in terms of net sales was 5% in 2020, which was lower than that of the U.S. (47%), Korea (20%), Japan (10%), EU (10%) and Taiwan (7%). In addition, the share has basically remained unchanged since 2015<sup>6</sup>. However, China's semiconductor production capacity has been expanding rapidly. As of the end of 2015, China's semiconductor production capacity accounted for only 9.7% of the world's total production capacity<sup>7</sup>. However, by the end of 2020, the number had grown to 15.3%, surpassing the United States and closing in on Japan<sup>8</sup>. The improvement in Chinese companies' design capability has also been remarkable. According to a survey by IC Insights, HiSilicon, a fabless manufacturer owned by Huawei (Huawei Technologies), has 5 nm design capability and ranked among the world's top ten companies in terms of net sales in the January-March period of 2021<sup>9</sup>. In the outsourced semiconductor assembly and test (OSAT) company ranking, three Chinese companies are ranked among the top 10 in the July-September period of 2020<sup>10</sup>.

## **2. China's semiconductor industry faces restrictions on development due to U.S. sanctions**



The U.S. considers China's rapid catch-up in the semiconductor industry to be an economic and security threat and has issued a series of sanctions against China on grounds of intellectual property infringement and national security concerns.

In October 2018, Fujian Jinhua Integrated Circuit (JHICC), a major Chinese DRAM manufacturer, was added to the Entity List (EL) by the U.S. Department of Commerce. In November of the same year, the U.S. Department of Justice indicted JHICC on charges of economic espionage. As a result, the DRAM joint production business between JHICC and United Microelectronics Corporation (UMC), a leading Taiwanese foundry, came to a halt<sup>11</sup>.

The Huawei Technologies Group was also added to the EL in May 2019. It has been also affected by the Direct Product Rule, which was expanded in scope in May 2020 and further expanded in August 2020. As a result, the Group's entities have faced difficulties in procuring semiconductors, semiconductor manufacturing equipment, and other products using equipment manufactured using US-origin technology. Huawei's subsidiary, HiSilicon, also slumped in revenue and fell out of the top 15 in the global ranking in terms of net sales in the January-March period of 2021<sup>12</sup>.

The Semiconductor Manufacturing International Corporation (SMIC), China's largest local foundry, has also become a target of US sanctions. It is said that SMIC has been unable to procure the most advanced extreme ultraviolet (EUV) (extreme ultraviolet) lithography equipment from ASML due to the US government's negotiation with the Dutch government. In addition, since SMIC was added to the EL in December 2020, the export, re-export, and domestic transfer of U.S. products to the foundry that are necessary for the manufacture of semiconductors with a circuit line width of 10 nm or less have been basically prohibited, and the U.S. Department of Commerce will determine the acceptability of other products on a case-by-case basis.

In the background of the U.S. government's response is a strong suspicion that Chinese companies are stealing U.S. intellectual property rights, as well as a recognition that the Chinese government's measures to foster the semiconductor industry are both significant in scale and trade-distorting. The cost of building an advanced logic IC plant and operating it for a 10 year in China is estimated to be 63% of that in the U.S., and it is estimated that 70% of the difference is attributable to



subsidized measures by the Chinese government. The cost difference between the U.S. and China is expected to widen because Chinese semiconductor companies enjoy more favorable terms for their investments and loans than are determined by market mechanisms<sup>13</sup>.

In addition, the U.S. government has raised doubts about the fact that the Chinese government has not reported the National IC Industry Investment Fund, which was established to foster semiconductor-related industries, and similar local funds in Shanghai, Hubei, and Beijing to the WTO as subsidies, despite that they presumably have a subsidized character. The U.S. government is also concerned about the fact that investments and loans by the China Development Bank (CDB), China's government-owned financial institution, and investments by CDB Capital, a wholly-owned subsidiary of CDB, have not been reported to the WTO as subsidies<sup>14</sup>. The Trilateral Trade Ministers' Meeting between Japan, the United States, and the European Union, shares common awareness of the need to review WTO rules on subsidies with China in mind although it does not explicitly refer to specific countries<sup>15</sup>.

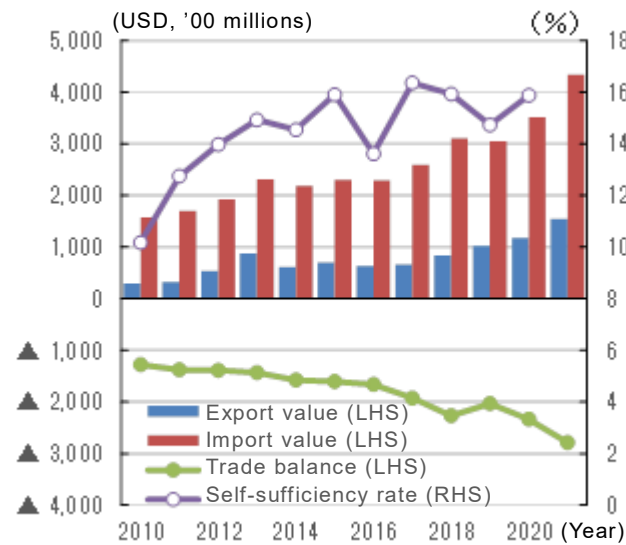
### **3. Chinese government having an increasing sense of crisis over stable procurement of semiconductors**

The difficulty in procuring semiconductors and advanced semiconductor manufacturing equipment due to the U.S. government's sanctions against China, as well as the worsening shortage of semiconductors after the new corona, are likely to make the Chinese government even more aware of the need to build its own semiconductor supply chain by strengthening its fostering measures.

IC Insights estimates that China's self-sufficiency rate for ICs as of 2020 was 15.9%<sup>16</sup> with a plateau since 2015 (Figure 1). On the other hand, IC imports in 2021 have grown by 23.3% year on year, with the trade deficit widening from 233.5 billion dollars in 2020 to 278.8 billion dollars in 2021. In addition, China's global market shares for semiconductor materials, manufacturing equipment, electronic design automation (EDA) tools, and IP cores are only, respectively, 13%, 2%, and 1%<sup>17</sup>. China remains vulnerable to export restrictions by the US, Japan, and the Netherlands.<sup>18</sup>



Figure 1: China's IC trade value and self-sufficiency rate



(Note) The self-sufficiency rates are according to IC Insights. Excluding foreign companies operating in China, IC Insights estimates that local Chinese companies' IC self-sufficiency rate in 2020 would drop down to 5.9%.

(Sources) Prepared based on data from General Administration of Customs of China, CEIC Data, IC Insights, "China Forecast to Fall Far Short of its 'Made in China 2025' Goals for ICs," *Research Bulletin*, January 6, 2021.

On May 28, 2018, President Xi Jinping mentioned that the country was facing bottlenecks in high-end chips and other technologies and said, "Core technologies are not something that can be demanded, bought, or invited. Only by acquiring it can we fundamentally guarantee the nation's economic, national defense, and other security," Chinese Communist Party (CCP) revealed in its journal *QIUSHI*<sup>19</sup> about two years later, on March 15, 2021. Xi's comment was probably intended to share the sense of crisis within the country once again.

In addition, the Ministry of Science and Technology's *Science and Technology Daily* has carried a series of articles on 35 technological areas that have become China's "chokepoints," highlighting seven of them: steppers, IC chips, tactile sensors, high-end capacitors and resistors, EDA, target materials, and photoresists. It was noted that many of the "chokepoints" are found in semiconductor-related technologies<sup>20</sup>.

Furthermore, the outline of the 14th Five-Year Plan for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 announced in March 2021 highlights the IC space as an advanced manufacturing cluster to be fostered, which is an advanced technology domain to be tackled, as well as the next-



generation IT space including semiconductors as a strategic emerging industry. In relation to the acceleration of digitalization with a goal of the strengthening of the competitiveness of semiconductor materials such as photoresists for IC, research on high-end semiconductors and related manufacturing equipment and software, and the accelerated enhancement of industrial competitiveness are also cited as important goals for the future<sup>21</sup>.

Increasingly recognizing the strategic importance of the semiconductor industry, the Chinese government is stepping up its support measures. It is reflected in the Several Policies for Promoting the High-Quality Development of the Integrated Circuit Industry and the Software Industry in the New Era (hereinafter referred to as the “Several Policy”) announced in August 2020.

The Several Policy covers a wide range of fields (see Table 1) including preferential corporate income tax treatment for IC production companies and projects with circuit widths of 28 nm or less and operating periods of 15 years or more, and tariff exemptions for companies that meet the said conditions. The Policy also calls for the establishment of more diverse financing channels. On top of the continued use of government investment funds, the Policy emphasizes the importance of the private-sector funds being provided to the semiconductor industry based on the guidance to be given and through an environment for more proactive financing to be developed. Specifically, the government is encouraging the use of venture capital funds, the establishment of a mechanism for local governments to compensate for borrowing risks, developing equity-backed loans, loans backed by accounts receivable, and supply chain finance, requiring commercial banks to strengthen their medium- to long-term lending, allowing insurance funds to participate in equity financing, and encouraging and supporting the listing of companies on STAR Market and ChiNext, the markets for emerging companies, Chinese versions of NASDAQ, and supporting the issuance of medium- to long-term bonds.



Table 1: Summary of “Several Policies for Promoting the High-Quality Development of the Integrated Circuit Industry and the Software Industry in the New Era”

field	Main contents
Fiscal and taxation	<ul style="list-style-type: none"> <li>✓ Companies and projects with IC line width of 28nm or less and a management period of 15 years or more shall be given preferential treatment for exemption from corporate income tax collection during the first year to the tenth year, while tax incentives for those with a line width of more than 28nm shall be reduced according to the level.</li> <li>✓ Priority IC design and software companies shall be exempted from corporate income tax payment for the first five years starting from the year they become profitable, and from the sixth year, they shall pay corporate income tax at a reduced rate of 10%.</li> <li>✓ Companies that meet the designated conditions shall be exempted from tariffs on raw materials, consumables, cleanroom construction materials and related equipment, and parts for semiconductor manufacturing equipment.</li> </ul>
Investment and financing	<ul style="list-style-type: none"> <li>✓ Full use of existing national and local government investment funds. Establishment of multiple financing channels and investment funds for the utilization of social capital based on market principles.</li> <li>✓ Encourage local governments to establish loan risk compensation mechanisms to support IC and software companies. Develop equity-backed loans, accounts receivable-backed loans, supply chain finance, etc.</li> <li>✓ Encourage commercial financial institutions to increase support for medium and long-term loans to the IC and software industries. Acceptance of equity investment by insurance funds. Support for non-banks to establish asset management products that contribute to the development of the IC and software industries.</li> <li>✓ Encourage and support eligible IC companies and software companies to raise funds through listing in China and abroad (ChiNext, STAR Market, etc.).</li> <li>✓ Support for bond issuance by qualified companies</li> </ul>
Research and development	<ul style="list-style-type: none"> <li>✓ Focus on research and development of key core technologies such as high-end chips and ICs (equipment, key materials, etc.).</li> <li>✓ Encourage software companies to implement national standards for quality, information security, and development management.</li> </ul>
Import and export	<ul style="list-style-type: none"> <li>✓ Financial institutions may provide financing and insurance support for software export contracts signed between software enterprises and enterprises with high domestic/foreign credit ratings. Promote the export of IC, software and information technology services.</li> </ul>
Talent	<ul style="list-style-type: none"> <li>✓ Encourage local governments to commend and reward high-end talents who have made outstanding contributions in the field of IC and software, as well as high-level engineers and R&amp;D designers in accordance with relevant national regulations and improve the equity incentive mechanism.</li> </ul>
Intellectual property	<ul style="list-style-type: none"> <li>✓ Strictly implement the IPR protection system for IC and software. All computers (including large computers, servers, minicomputers,</li> </ul>





rights	and laptops) sold in China must have genuine software pre-installed.
Market application	<ul style="list-style-type: none"> <li>✓ Increase support for specialized service platforms such as crowd-creation spaces, technology business incubators, and university science parks that serve the IC and software industries.</li> <li>✓ Accelerate the establishment of IC and software related standards.</li> </ul>
International cooperation	<ul style="list-style-type: none"> <li>✓ Encourage international companies to build R&amp;D centers in China. Strengthen the communication and exchange between domestic and international industry associations/organizations. In-depth international division of labor and cooperation, and participation in the establishment of international standards.</li> <li>✓ Facilitate domestic enterprises to build R&amp;D centers outside China to make better use of international innovation resources and improve the level of industrial development.</li> </ul>

(Source) Prepared based on “Circular of State Council on Policies for Encouraging the High-Quality Development of IC Industry and Software Industry in the New Period” issued August 4, 2020.

#### 4. **The Dilemma of semiconductor industry support measures being further strengthened**

On the other hand, the strengthening of fostering measures may further intensify the confrontation with the U.S. and other countries and make it more difficult to procure and adopt the manufacturing equipment, materials, and technology necessary for the development of semiconductors. The U.S. is seeking to establish common export controls to be shared with other countries through the establishment of the Multilateral Microelectronics Security Fund, the U.S. Innovation and Competition Act, and bilateral discussions with Japan, Europe, and other countries.

In addition, Beijing’s measures to foster the semiconductor industry since the late 2010s have exposed distortions such as duplicative investment. In fact, in recent years there has been a succession of semiconductor projects that have either ceased operations or fallen into bankruptcy (see Table 2). In July 2021, Tsinghua Unigroup that owns Unigroup Guoxin Microelectronics and UNISOC, both major semiconductor design companies, as well as Yangtze Memory Technologies (YMTC), a major flash memory company, applied to the court for bankruptcy reorganization (equivalent to court-guided civil rehabilitation proceedings).





Table 2: Semiconductor projects in China that have been shut down or gone bankrupt  
in recent years

Company name (Location)	Business commencement year	Main products	Planned investment amount
Wuhan Hongxin Semiconductor Manufacturing (Wuhan City, Hubei Province)	2017	Semiconductor Contract Manufacturing	Total investment of 128.0 billion RMB
Global Foundries IC Manufacturing (Chengdu City, Sichuan Province)	2017	Semiconductor Contract Manufacturing	Total investment of approx. 9.053 billion dollars
Nanjing TACOMA Semiconductor Technology (Nanjing City, Jiangsu Province)	2015	CMOS sensor	Total investment 2.5 billion dollars
Dehuai Semiconductor (Huai'an City, Jiangsu Province)	2016	CMOS sensor	Total investment of 45.0 billion RMB
Ningbo Chengxing Semiconductor Technology (Ningbo City, Zhejiang Province)	2019	IC Design and Service	Investment amount in 6.8759 million dollars
Kuntong Semiconductor Technology (Xi'an City, Shaanxi Province)	2018	Flexible semiconductors	Total investment of approx. 40.0 billion RMB
Huaxintong Semiconductor Technology (Gui'an New District, Guizhou Province)	2016	Semiconductor chip	First stage registered capital of 1.85 billion RMB
Changsha Innovation Semiconductor (Changsha City, Hunan Province)	2010	silicon wafer	Registered capital of 31.00 million dollars
Hebei Endeavor Microelectronics Technology (Shijiazhuang City, Hebei Province)	2015	IGBT	Total investment of 1.0 billion RMB



Jiangsu Zhongjing Aerospace Semiconductor Industry Development (Huai'an City, Jiangsu Province)	2017	CMOS sensor	Total investment of 12.0 billion RMB
Guangdong Haixin Integrated Circuit (Guangzhou City, Guangdong Province)	2020	Power semiconductors	Total investment of 6.9 billion RMB

(Source) Prepared based on “Multiple Industrial Parks Failed in Chipmaking Campaigns -- Even Unfinished Projects Will Be Accepted by Local Governments if They Change Their Project Titles”, *21st Century Business Herald*, September 23, 2020, “The Proliferation of Unfinished Projects in China’s Chipmaking Campaign is Coming! Only Because No Way to Purchase Photolithography Machine? The Reasons behind are So Painful”, *Tencent Net*, April 22, 2021, “In-Depth Investigation -- The Great Fraud of Hundred-Billion Chips”, *36Kr*, January 29, 2021, and “Shikabane ruirui no Chugoku handotai; soredemo akiramenai Shu-shi [China’s Semiconductors Industry are Dying Out, But Mr. Xi Won’t Give Up],” *Nihon Keizai Shimbun Electronic Edition*. November 2, 2020.

In response to this situation, the Chinese government began disciplining redundant investments in October 2020. On top of the Several Policies issued on August 2020 referring to the necessity to avoid low-level redundant investments, the National Development and Reform Commission (NDRC) held a press conference on October 20, 2020, at which it criticized the situation where “companies lacking three elements”--experience, technology, and talents--were entering the semiconductor market, and that some localities had blindly launched projects, resulting in the actualization of risk of duplication of low-level semiconductor projects. In some cases, construction has been suspended or factories have been abandoned and left empty. As countermeasures, the press conference presentation called for: (1) strengthening the accountability of local governments that provided support, and upholding the principle of self-responsibility of companies and financial institutions; (2) improving communication among stakeholders for early problem identification, early detection, early feedback, and early action; (3) reviewing the policy system to introduce a normative semiconductor market order and improve the quality of innovation capacity and development; and (4) strengthening the allocation of semiconductor projects based on the principle of “centralization and regional concentration”<sup>22</sup>. “Centralization and regional concentration” mean to narrow down



companies and regions about which it is recognized that they participate in a semiconductor project. On November 28, 2020, Wang Zhijun, Vice Minister of the Ministry of Industry and Information Technology, emphasized the need for mergers and reorganization of semiconductor companies<sup>23</sup>.

Thus, the Chinese government is caught between the need to quickly develop the semiconductor industry by investing a large amount of policy resources and the resulting risk of further intensifying external friction and redundant investments.

### **5. Current status of financial support: (i) Fiscal support (subsidies and tax reduction)**

Next, we will consider the extent to which the Chinese government is stepping up its financial support for the semiconductor industry in this dilemma, focusing on the quantitative aspect.

The first is the status of fiscal support and we start with the status of subsidies. Since it is difficult to get a complete picture of the subsidies provided by the Chinese government, this paper will attempt to get a quantitative picture of the subsidies provided to semiconductor-related companies based on the “government subsidies”<sup>24</sup> described in the financial statements of Chinese A-Share listed companies although that would break down only part of the entire picture. The table 3 below summarizes this information.

This information shows that government subsidies to semiconductor-related companies have increased significantly from 2.65 billion RMB in 2015 to 11.65 RMB in 2020 or by 4.4 times. By the January-September period of 2021, the subsidies to semiconductor-related companies increased 11.7% year on year and reached 7.88 billion RMB. In 2015, the amount of subsidies received by semiconductor-related companies accounted for 2.1% of the total amount of subsidies received by all A-Share listed companies; this percentage increased to 5.9% by the January-September period of 2021. The ratio of government subsidies to pre-tax profits for semiconductor-related companies is also notably higher than for all A-Share listed companies, Thus, the Chinese government has not reduced its support for the



semiconductor industry to date.

Table 3: Government subsidies to semiconductor-related Share-A listed companies

(RMB, '00 mill.; %)

	Government subsidies	Income before taxes	Ratio of government subsidies to income before taxes
2015	26.5 (2.1)	142.9 (0.4)	18.5 [3.2]
2016	34.9 (2.6)	208.1 (0.5)	16.8 [3.2]
2017	54.4 (3.8)	187.6 (0.4)	29.0 [2.9]
2018	70.9 (4.2)	191.4 (0.4)	37.0 [3.2]
2019	90.0 (4.6)	319.4 (0.6)	28.2 [3.5]
2020	116.5 (5.3)	504.2 (0.9)	23.1 [3.9]
2020 (1-9)	70.5 (5.2)	408.6 (0.9)	17.3 [3.1]
2021 (1-9)	78.8(5.9)	802.7(1.4)	9.8 [2.4]

(Note) Semiconductor-related companies are defined as those classified in the “semiconductor/semiconductor manufacturing equipment” industry by Wind or in the “semiconductor” industry by Shenwan Securities (total 140 companies). The figures in parentheses “( )” in the table show the percentage of the semiconductor-related companies in terms of amount in all A-Share listed companies. Figures in square brackets “[ ]” indicate the ratio of government subsidies to the pre-tax profits of all A-Share listed companies.

(Source) Prepared based on data from Wind.

Among these, SMIC, China's largest foundry, receives the largest amount of government subsidies (see table 4). SMIC received 2.49 billion RMB in 2020, which accounts for 21.4% of the total amount of subsidies received by all semiconductor-related companies and is the 4th largest of those received by all A-Share listed companies (2020)<sup>25</sup>. SMIC received 1.63 billion RMB government subsidies in the January-September period of 2021, basically unchanged from the same period of the preceding year when it received 1.66 billion RMB. These numbers indicate the strategic importance of SMIC to the Chinese government.

The reasons for the company's receipt of government subsidies in 2020 are only briefly described. The subsidies mainly consist of those for the purpose of acquiring assets for government projects such as developing advanced process technologies. Other purposes of the subsidies include fiscal incentives and import subsidies, although their details are unknown<sup>26</sup>.



Table 4: Corporate income tax paid by semiconductor-related companies (15 Companies that received the largest government subsidies in 2020)

(RMB, mill.; %)

Company name	Main Products	Government subsidies	Income before income taxes (A)	Statutory tax rate (B)	Income tax payment based on statutory tax rate (C = A*B)	Actual income tax payment (D)	Actual income tax rate (E)	Breakdown of the difference between the actual amount paid and the legal amount paid (D-C)			tax reduction effect (H = (F + G)/A)
								Impact of preferential tax treatment (F)	Effect of applying different tax rate to subsidiaries (G)	Increase/decrease due to other factors (tax deferral, overseas taxation etc.) (H)	
SMIC	Foundry	2,489.0	4,491	25.0	1,123	470	10.5	▲1,553	▲100	1,000	▲36.8
ZSMLS	LED chips, etc.	1,034.3	767	25.0	192	464	60.4	▲34	18	287	▲2.0
Sanan Opto	LED chips, non-silicon semiconductor materials, etc.	680.8	1,161	25.0	290	144	12.4	0	▲123	▲23	▲10.6
HC SemiTek	LED chips, etc.	510.4	17	25.0	4	▲1	▲5.0	▲11	▲7	12	▲100.2
NAURA	Semiconductor manufacturing equipment, etc.	400.3	684	15.0	103	53	7.8	0	▲1	▲48	▲0.2
TJSEMI	Silicon wafer, ingot, etc.	349.0	1,692	25.0	423	217	12.8	0	▲181	▲25	▲10.7
Aiko Solar	Solar cells, etc.	330.0	911	25.0	228	105	11.5	▲42	▲92	11	▲14.7
LONGI	Mono-silicon	302.8	9,912	15.0	1,487	1,212	12.2	▲88	▲514	328	▲6.1
TONGWEI	Solar cells, silicon, etc.	296.7	4,274	25.0	1,068	559	13.1	▲40	0	▲470	▲0.9
AMEC	Semiconductor manufacturing facilities	253.4	513	25.0	128	20	4.0	▲104	▲3	▲1	▲20.9
Jinko Solar	Solar cells, silicon, etc.	247.7	1,182	15.0	177	139	11.8	▲77	38	1	▲3.3
HT-Tech	Packaging/testing	220.0	908	15.0	136	88	9.7	0	11	▲59	1.2
NSIG	Silicon wafer	187.4	114	25.0	29	24	21.1	▲0	▲8	4	▲7.4
JCET	Packaging/testing	184.9	1,431	15.0	215	125	8.8	▲75	▲43	29	▲8.3
JA SOLAR	Solar cells, silicon, etc.	169.7	1,814	25.0	453	265	14.6	0	▲126	▲62	▲7.0

(Note) The companies covered are the same as in the table 3. Note that "Impact of preferential taxation" includes only those items that are specifically indicated



in the financial statements. Therefore, it is possible that the impact of preferential tax treatment is also included in “changes due to other factors.” (Source) Prepared based on data from Wind.

In terms of financial support, tax reduction has also been a major factor in supporting the cash flow of semiconductor-related companies. The table 4 shows the corporate income tax (equivalent to corporate tax) paid by the 15 semiconductor-related companies that receive the largest amounts of government subsidies in 2020. It shows that five of these companies are subject to the preferential 15% tax rate applied to high-tech companies, and even in the case of companies that are subject to the normal 25% tax rate, the actual corporate income tax rate is greatly reduced due to additional deductions<sup>27</sup> for R&D expenses and preferential tax rates applied to their subsidiaries. The average income tax rate for 118 semiconductor-related A-share listed companies that reported a surplus for 2020, and for which the actual amount of corporate income tax paid was known, was 7.4%. Although there are some cases in which the amount of corporate income tax paid has decreased due to factors other than preferential tax treatment, such as tax deferral, many of these companies have certainly benefited from the tax reduction.

## **6. Current status of financial support: (2) Equity finance**

Secondly, with government encouragement, semiconductor-related companies has been active in equity financing.

A survey conducted by Zero2IPO Research shows that the number and amount of investments in semiconductor and electronic equipment companies in 2020 increased by 42.0% and 281.9% respectively year on year. In 2021, they increased by respectively 86.7% and 63.5% year on year. In terms of the amount of investment, their investments ranked second, almost on a par with the first-ranking biotech and healthcare industry. In terms of the number of investments, it ranked third after IT and biotech/healthcare (see Table 5).

Both the number and amount of financing by the semiconductor and semiconductor manufacturing equipment companies on the A-share market have increased sharply in 2020, and their percentages in the entire market have also increased (see Table 6).



Though the amount financed by these companies decreased in 2021, it was still over 100 billion RMB.

Table 5: Equity financing by industry in China

(Unit: cases; RMB, '00 mill., %)

	2020				2021			
	Number of investments	Change (%)	Investment amount	Change (%)	Number of investments	Change (%)	Investment amount	Change (%)
Semiconductor and electronic equipment	990	42.0	1,523	281.9	1,848	86.7	2,491	63.5
IT	1,845	▲ 14.7	1,129	▲ 3.4	3,166	71.6	2,264	100.5
Bio/healthcare	1,422	19.7	1,771	74.3	2,517	77.0	2,498	41.0
Internet	1,008	▲ 20.3	1,249	16.5	1,106	9.7	1,543	23.5
Machinery manufacturing	400	▲ 12.1	474	▲ 42.3	667	66.8	622	31.2
Other	2,884	▲ 8.8	4,248	19.6	4,871	68.9	7,302	71.9
Total	7,559	▲ 8.2	8,871	16.3	12,327	63.1	14,229	60.4

(Source) Prepared based on Zero2IPO Research, “Reviews and Prospects on Equity Investment Market of China 2021(Full Version)”, January 26, 2022, p.22, p.27 and Zero2IPO Research, “Major Release! Reviews and Prospects on Equity Investment Market of China 2020”, February 3, 2021, p.25, p.31

Table 6: Financing by semiconductor and semiconductor manufacturing equipment companies in the A-Share market

(Unit: companies; RMB, '00 mill.; %)

	Semiconductor and related manufacturing equipment		A-Share Market total		Percentage in A-Share Market	
	Number of companies	Amount procured	Number of companies	Amount procured	Number of companies	Amount procured
2017	24	239	1,143	17,168	2.1	1.4
2018	15	165	530	12,106	2.8	1.4
2019	28	660	655	15,423	4.3	4.3
2020	46	1,398	1,087	16,786	4.2	8.3
2021	49	1,168	1,212	18,178	4.0	6.4
2022	4	178	78	2,211	5.1	8.0

(Note) Domestic financing in China only. The classification in semiconductor and semiconductor manufacturing equipment companies is in accordance with Wind. The numbers for 2022 are for January only.

(Source) Prepared based on data from Wind.

There are also many semiconductor-related companies that are preparing to go public. As of January 31, 2022, 15 semiconductor-related companies, including a Chinese CPU maker Loongson Technology Corporation, have passed the examination for





getting listed on the Shanghai Stock Exchange and are currently undergoing registration review by China Securities Regulatory Commission (CSRC). In addition, another two companies, BYD Semiconductor owned by BYD and a power supply IC design and distribution company Shanghai Xinlong Semiconductor Technology, are about to proceed to registration review by CSRC. Besides, 30 other companies are under review by the Shanghai Stock Exchange for IPO.

While the Chinese government is tightening restrictions on the IPOs of financial technology and model innovation companies established by platformers and others, it is actively supporting the listing of “Hard & Core Technology” companies<sup>28</sup>. The term “Hard & Core Technology” refers to “key technologies and core technologies that are based on scientific discoveries and technological inventions, that have been developed through long-term research, that are difficult to develop and have clear applications, that represent the cutting edge of global science and technology, and that will lead to a new scientific and technological revolution and industrial revolution.” SMIC presumably belongs to the Hard & Core Technology category and, therefore, was actively supported in its IPO. SMIC's application to get listed on the STAR market was received by the Shanghai Stock Exchange on June 1, 2020, and it went public on July 16 of the same year. It took the company only a 1 month and a half to get listed.

Government Guidance Funds (in Chinese 政府引导基金), which are established with the aim of attracting private capital, are also presumably becoming more aggressive in its investment in semiconductor-related industries.

In 2014, the Chinese government established National Integrated Circuit Industry Investment Fund (known as the “Big Fund”) with investments from the Ministry of Finance, CDB Finance, China Tobacco and other investors (138.7 billion RMB). In 2019, the second Big Fund was established with the aim of raising 200 billion RMB. The investment targets include semiconductor manufacturing such as foundries SMIC and HLMC and a NAND flash memory manufacturer Yangtze Memory Technologies (YMTC); semiconductor manufacturing equipment companies such as etching equipment manufacturer AMEC (Shanghai); semiconductor materials companies such as a silicon maker NSIG and a composite semiconductor maker Sanan Optoelectronics, fabless semiconductor companies such as a printer chip maker



Ninestar Corporation and an SSD chip company Goke Microelectronics; and packaging and testing companies such as UNISOC, Jiangsu Changjiang Electronics Technology, and TongFu Microelectronics. Thus, these government funds cover the entire supply chain of the semiconductor industry.<sup>29</sup> As of the end of January 2022, The Big Fund I has directly invested in 82 companies and the Big Fund II has directly invested in 21 companies<sup>30</sup>. These investees include investment firms that the funds established jointly with other companies, and these investment firms have made additional investments in many more semiconductor-related industries.

In addition, there are national government-led guiding funds for high-tech industries as well as investment funds for IC and high-tech industries established by local governments, which are apparently actively investing. According to Gaogong Industry Institute, the total target amount of IC industry investment funds established or planned by local governments until June 2019 has surpassed 700 billion RMB<sup>31</sup>.

In addition, the CV Institute found that investments made by Government Guidance Funds in semiconductor manufacturing and design software have come to account for approx. 70% in the total number of investments in the “chokepoints.” Although the definition of “choke points” and the percentage of “chokepoint” investments in the total number of investments are not known, this activity suggests that Government Investment Funds are focused on fostering the semiconductor industry<sup>32</sup>.

### **7. Current status of financial support: (3) Bank loans**

Third, banks' lending to semiconductor-related industries has also expanded significantly.

China's Central Economic Work Conference held in December 2019 announced a policy of substantially increasing medium- to long-term loans to the manufacturing sector and of lowering financing costs<sup>33</sup>. This policy has prompted the outstanding balance of medium- to long-term loans to the manufacturing industry to increase rapidly. As the end of 2019, the said growth rate was 14.9% year on year. The year-on-year rate increased to 35.2% as of the end of 2020<sup>34</sup> and 31.8% as of the end of 2021, which was 18.1 percentage points higher than the growth rate in all industries. In



2021, the outstanding balance of medium- to long-term loans to the high-tech industries increased by 32.8% partly due<sup>35</sup> to the Chinese government's call for increased lending to advanced manufacturing, strategic emerging industries and supply chain resilience, according to Liu Guoqiang, Deputy Governor of the People's Bank of China<sup>36</sup>. In addition to China Development Bank, a government-affiliated financial institution, commercial banks are also stepping up their medium- to long-term lending to high-tech industries.

There are no statistics on how much of the medium- to long-term loans to the manufacturing sector went to semiconductor-related industries. A look at the 10 semiconductor-related A-share listed companies with the largest balance of long-term loans (over one year) among those companies that disclose the balance of their long-term loans as of the end of September 2021 shows that many of the semiconductor-related A-share companies have maintained a high level of growth in their long-term loans since the end of 2019 (see Table 7). These figures suggest that semiconductor-related industries are also among the main recipients of medium- to long-term lending.

On the other hand, the overall interest rate for borrowing does not seem to be so favorable. Estimates of the average interest rate for semiconductor-related companies (companies listed on the A-share market) were 7.1% and 5.3% for 2019 and 2020 respectively<sup>37</sup>. The average lending prime rates (5-year) for 2019 and 2020 were 4.8% and 4.7% respectively. Thus, the interest payment rate for semiconductor-related companies is not extremely low. However, SMIC's interest payment rate is outstandingly low (2019, 1.8%; 2020, 1.5%). Some commercial banks have reduced their lending rates by 100 basis points for sound advanced manufacturing companies<sup>38</sup>.



Table 7: The outstanding balances of medium- to long-term loans to semiconductor-related companies; and their growth rates

(RMB, mill.; %)

Company name	Primary business	Long-term debt outstanding				Growth rate			
		End-2018	End-2019	End-2020	End-Sept. 2021	End-2018	End-2019	End-2020	End-Sept. 2021
SMIC	Foundry	123,967	139,878	263,310	300,646	9.1	12.8	88.2	14.2
TJSEM I	Silicon wafer, ingot, etc.	58,784	76,810	92,258	152,975	41.1	30.7	20.1	65.8
Ninestar	Semiconductor design	79,775	74,706	70,402	74,433	▲ 11.6	▲ 6.4	▲ 5.8	5.7
TONGWEI	Solar cells, silicon, etc.	6,905	40,890	62,966	71,931	▲ 31.5	492.2	54.0	14.2
Trina Solar	Solar cells, etc.	14,326	26,042	41,083	40,279	▲ 56.1	81.8	57.8	▲ 2.0
TFME	Packaging/testing	3,608	7,581	24,488	37,943	▲ 53.3	110.1	223.0	54.9
WILLS EMI	Semiconductor design and manufacturing	420	9,280	31,816	36,971	▲ 40.0	2,109.5	242.8	16.2
HT-Tech	Packaging/testing	13,738	15,058	20,521	34,078	236.1	9.6	36.3	66.1
JCET	Packaging/testing	29,338	15,844	29,784	24,150	▲ 21.2	▲ 46.0	88.0	▲ 18.9
Sanan Opto	LED chips, non-silicon semiconductor materials, etc.	3,020	1,200	9,052	22,972	▲ 53.7	▲ 60.3	654.4	153.8

(Note) Among semiconductor-related companies, 10 companies with the largest balance of long-term loans as of the end of September 2021 are listed. The growth rate at the end of 2021 is a growth from the end of 2020. Other figures are year-on-year comparisons.

(Source) Prepared based data from Wind

## 8. Future Prospects and Implications for Japan

As we have seen, the Chinese government has been stepping up its financial support for the semiconductor industry to date. Recently released policy documents suggest that this stance is likely to continue in the future. The Guiding Opinions on Banking and Insurance Industries Supporting Achieving Sci-tech Self-reliance and Self-strengthening at Higher Levels issued by the China Banking and Insurance Regulatory Commission (CBIRC) issued on November 26, 2021, provides the Commission's policy to continue to increase the outstanding loan balance for high-tech companies and the number of companies eligible for loans in a sustainable manner. It also encourages the extension of loan periods for liquid funds, the setting of flexible loan interest rates, and the adoption of flexible interest repayment methods that take into



account the production and management cycles of high-tech enterprises. Promoting the development of equity financing by supporting the establishment of start-up investment funds by investment subsidiaries of commercial banks, insurance companies and trust companies, and of government industrial investment funds is also advocated. It also encourages the inclusion of equity shares and profit beneficiary rights of unlisted high-tech companies in mutual funds, and the implementation of feasibility studies on the establishment of an investment fund using insurance funds to help realize the national high-tech strategy<sup>39</sup>.

The Chinese government is also aware of the need to strengthen risk management, and the above-mentioned guiding principles include adherence to risk management principles. The Chinese government is also aware of the need for mergers and reorganization in response to the duplication of investment and the overproduction of inferior projects. In fact, M&As in the semiconductor industry have been recently on the rise. According to Zero2IPO Research, the number of M&As involving semiconductors and electronic equipment in 2021 was 198, up by 33.8% year on year. The total value of M&A increased by 57.4% year on year, reaching 111.2 billion RMB. In terms of value, the M&As in this sector have been the second largest only after the construction industry's 159.7 billion RMB<sup>40</sup>.

However, it is presumed that semiconductor-related companies being established in China are increasing rapidly, rather than existing companies being reorganized. According to a survey conducted by the corporate information website Qichacha Tec, which shows only a broad tendency, the number of newly registered companies that include semiconductors in their name, products, and/or business scope has increased from 6,791 in 2019 to 20,875 in 2020, and to 32,077 in the January-September period of 2021 (up by 153.4% year on year)<sup>41</sup>.

As mentioned above, restrictions on the export of advanced manufacturing equipment to China have been adopted, and, therefore, it is unlikely that China will experience an oversupply in the field of semiconductors with manufacturing processes of 10 nm or less. On the other hand, it is highly likely that China will continue to invest aggressively in more mature processes, materials, and equipment. Though the success or failure of the large-scale support is a matter of debate, the possibility cannot be



ruled out that the number of semiconductor-related companies gaining a competitive edge in China as a result of this support will increase in the future.

Japan, the U.S., Europe, South Korea, and Taiwan are also increasing their support for the semiconductor industry in order to strengthen their supply chains and ensure economic security, and the possibility of an oversupply of mature processes in and after 2023 has been pointed out. Given that China is also planning to invest more funds in fostering the semiconductor industry as mentioned above, it is necessary to be aware of the high possibility that the oversupply in the semiconductor industry will increase in the medium term.

For this reason, it is important to ensure consistency with WTO rules when designing subsidy policies for the semiconductor industry in Japan, and to urge the United States and other countries that are attempting to coordinate subsidy policies with friendly countries through frameworks such as the Multilateral Microelectronics Security Fund to ensure consistency with WTO rules. While some of China's support measures for the semiconductor industry are consistent with WTO rules, such as additional deductions of research and development costs, the OECD has pointed out that major companies are provided with loans with interest rates that deviate greatly from market interest rates and equity financing on a large scale in a manner that allows low-profit margins in light of market practices<sup>42</sup>. This survey is based on the actual results from 2014 to 2018. It will be imperative to conduct similar surveys on an ongoing basis and work with other countries to encourage China to take necessary corrective measures. We will also need to keep a close eye on developments such as Beijing encouraging commercial banks to provide loans to the semiconductor industry.

As Japan enters an era of a declining population, the importance of international trade and the maintenance of international trade order will inevitably increase in the view of economic development. In addition, Japan is constrained by its lack of fiscal capacity. It would be undesirable for Japan if other countries were to disregard the WTO rules for economic security reasons and compete with each other to inject large amounts of subsidies into the semiconductor industry. International coordination of the rules for fostering the semiconductor industry will be of great importance in order to avoid a similar situation in other advanced areas related to security.



<sup>1</sup> Yuan Zhijia, “*Handotai sangyo: Seifu shudo no sangyo ikusei* [The Semiconductor Industry: Industry Development at the Initiative of the Government],” in Tomoo Marukawa (ed.), *Ikoki Chugoku no sangyo seisaku* [Industrial Policy in China in Transition], Kenkyu Sosho [Research Book] 504), Institute of Developing Economies, Japan External Trade Organization, 2000, Chapter 11.

<sup>2</sup> State Council, “*Outline of the Program for National Integrated Circuit Industry Development*”, June 24, 2014

<sup>3</sup> State Council, “*Made in China 2025*”, May 19, 2015。 Regarding the idea of anti-globalism of Made in China 2025, see Tomoo Marukawa, *Gurobarizumu eno anbibarensu: “Chugoku Seizo 2025” to Chugoku no IC sangyo* [Ambivalence toward Globalism: Made in China 2025 and China’s IC Industry]; and Japan Institute of International Affairs, *Han gurobarizumu saiko: Kokusai Chitsujo wo yurugasu kiken yoin no kenkyu, Sekai Keizai Kenkyukai hokokusho* [Revisiting Anti-Globalism: Study of Risk Factors That Shake the International Economic Order, Report of World Economic Study Group] Ministry of Foreign Affairs Diplomatic and National Security Studies and Research Project 2020, Chapter 4.

<sup>4</sup> National Manufacturing Power Construction Strategy Advisory Committee, “*Technology Roadmap of Important Domains of Made in China*”, October, 2015, p.1.

<sup>5</sup> National Manufacturing Power Construction Strategy Advisory Committee and Center for Strategic Studies, Chinese Academy of Engineering, *Green Paper of Technological Innovations of Important Domains of “Made in China” -- Technology Roadmap*, Publishing House of Electronics Industry, 2018, p.2.

<sup>6</sup> Semiconductor Industry Association, *2021 Factbook*, 2021, p. 3.

<sup>7</sup> IC Insights, “Taiwan Passes South Korea to Become #1 in Total IC Wafer Fab Capacity: China now has over 50% more IC wafer fabrication capacity than Europe,” *Research Bulletin*, February 29, 2016. Taiwan ranked first in global market share as of the end of 2015 (21.7%), followed by South Korea ranking second (20.5%), Japan, third (17.3%), North America, fourth (14.2%), and China, fifth.

<sup>8</sup> IC Insights, “Taiwan Maintains Edge as Largest Base for IC Wafer Capacity,” *Research Bulletin*, July 13, 2021. As of the end of 2020, Taiwan ranked first (21.4%), South Korea, second (20.4%), Japan, third (15.8%), and China, fourth. North America's share was 12.6%.

<sup>9</sup> IC Insights, “HiSilicon First China-Based Semi Supplier to be Ranked in Top-10: Top-10 semiconductor suppliers log strong 16% jump in 1Q20/1Q19 sales,” *Research Bulletin*, May 6, 2020.

<sup>10</sup> John Wang, “Top 10 Largest OSAT Companies' Revenues Exceed US\$6.7 Billion, While Amkor Scores Highest YoY Growth, According to TrendForce,” November 16, 2020.

<sup>11</sup> Momoko Kawakami, “*Beichu haiteku masatsu to Taiwan no jirenma: JHICC-UMC jiken kara mieru mono* [U.S.-China High-Tech Friction and Taiwan's Dilemma: What We Can See from the JHICC-UMC Incident],” IDE Square—*Ronko* [Discussion Paper], Institute of Developing Economies, Japan External Trade Organization, March 2019.

<sup>12</sup> IC Insights, “Top-15 Semi Companies Log Year-on-year Growth of 21% in 1Q21,” *Research Bulletin*, May 25, 2021.

<sup>13</sup> Antonio Varas, Raj Varadarajan, Jimmy Goodrish, and Falan Yinug, *Government*





*Incentives and US Competitiveness in Semiconductor Manufacturing*, September, 2020.

<sup>14</sup> World Trade Organization, "Committee on Subsidies and Countervailing Measures - Subsidies - Questions posed by the United States regarding the new and full notification of China," G/SCM/Q2/CHN/106, January 27, 2022.

<sup>15</sup> Ministry of Economy, Trade and Industry, "Joint Statement of the Trilateral Trade Ministers Meeting of Japan, the United States and the European Union (provisional Japanese translation)," January 14, 2020.

<sup>16</sup> IC Insights provides estimates that cover ICs. On the other hand, the calculation of semiconductor self-sufficiency for "Made in China 2025" does not provide a relevant comparison because the range of products covered in it is likely to be broader.

<sup>17</sup> Semiconductor Industry Association, *SIA Whitepaper: Taking Stock of China's Semiconductor Industry*, July 2021, p.2.

<sup>18</sup> Antonio Varas, Raj Varadarajan, Jimmy Goodrich, and Falan Yinug, *Strengthening the Global Semiconductor Supply Chain in an Uncertain Era: BCG and Semiconductor Industry Association*, April 2021.

<sup>19</sup> Xi Jinping, "Try Hard to Be a Major Scientific Center and Innovative High Land in the World", *QIUSHI*, vol.6 of 2021, March 15, 2021.

<sup>20</sup> "35 Key Technologies that China Had Been Seized by the Throat", *Science and Technology Daily*, September 24, 2020.

<sup>21</sup> "Outline of the People's Republic of China's 14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035", March 12, 2021.

<sup>22</sup> "National Development and Reform Commission Committed on Failure of Local Chipmaking Campaigns -- Notification and Accountability Would Be Demanded if Heavy Losses were Caused", *Caixin Net*, October 20, 2020.

<sup>23</sup> "Vice Minister of Industry and Information Technology Said Blind Investments and Unfinished Projects Emerged in the Chip Industry", *China News Net*, November 29, 2020.

<sup>24</sup> The term "government subsidies" used here refers precisely to "government subsidies recorded as non-recurring income in the current period." Specifically, it refers to "monetary or non-monetary assets acquired free of charge by an entity from the government" (including those acquired free of charge from third parties acting on behalf of the government), excluding government subsidies that are related to the recurring management and operations of the enterprise, are in line with state policies and regulations, and are received on an ongoing basis in fixed or fixed amounts in light of certain criteria. However, there are many subsidies that are not included in this "government subsidy."

First, "government subsidies recorded as non-recurring income in the current year" does not include, as mentioned above, "government subsidies that are related to the recurring management and operations of the enterprise, are in line with state policies and regulations, and are received on an ongoing basis in fixed or fixed amounts in light of certain criteria." An example is the refund of value-added tax (VAT) on independently developed and produced products that has been applied to the software and IC industries for a "long time" since 2000.

("Ministry of Finance, State Taxation Administration and General Administration of Customs Issued the Notice on Related Problems of Tax Policy for Encouraging the Development of Software Industry and IC Industry", September 22, 2000.)



Second, the determination of whether a subsidy is “non-recurring revenue” or not is left up to the enterprise in the first instance, with many subsidies reportedly being recorded as “recurring revenue.”

(“The Accounting Treatment of Financial Grants and Tax Return and the Confirmation of Recurrent/Non-recurring Gains and Losses”, [XIANDAN SHUO], June 19, 2018)

Third, it can be inferred that investments from the government and sovereign wealth funds are basically not accounted for as "government subsidies," even if in reality they are more in the nature of corporate support “Accounting Standard for Business of Enterprises No.16 Government Grants”, Article 5, Item 3).

Fourth, even if low-interest loans that deviate from market interest rates are provided to support companies through policy banks or state-owned enterprises, it is unlikely that these loans are accounted for as "government subsidies. Direct forgiveness of corporate debt and debt-equity swaps involving the government, as well as the provision of goods and services at low prices through the government or state-owned enterprises, are also unlikely to be accounted for as "government subsidies. These could, however, be considered subsidies under the WTO Subsidies Agreement.

Lastly, because the data is for listed companies, it does not cover subsidies received by unlisted companies.

<sup>25</sup> The largest: Sinopec Group (8.61 billion RMB); Second largest: SAIC MOTOR Group (3.08 billion RMB), and the third largest CRRC Corporation (2.73 billion RMB).

<sup>26</sup> Semiconductor Manufacturing International Corporation, “Annual Report 2020”, April 1, 2021, pp.208-209, 218-219.

<sup>27</sup> The additional research and development cost deduction for manufacturers in 2020 is 75% of the same cost. It was raised to 100% in 2021.

<sup>28</sup> See, e.g. China Securities Regulatory Commission, “CSRC Revised the *Guideline for Evaluation of Scientific Innovation Attributes (Trial)*”, April 16, 2021.

<sup>29</sup> Essense Securities, “One Question for Each Week (6) -- Semiconductor Comprehensive Investment Map Analysis”, June 19, 2021, and Wind.

<sup>30</sup> Wind.

<sup>31</sup> Gaogong Industry Institute, “Analysis Report on the Development Tendency of China’s Semiconductor Industry in the 14th Five-Year Plan”, January 14, 2020

<sup>32</sup> ZeroIPO Research, “Reviews and Prospects on Equity Investment Market of China 2021(Full Version)”, January 26, 2022, p.75

<sup>33</sup> “The Central Economic Work Conference was Held in Beijing -- Xi Jinping and Li Keqiang Made Important Speeches, and Li Zhanshu, Wang Yang, Wang Huning, Zhao Leji, Han Zheng Attended the Conference”, *Xinhua Net*, December 12, 2019.

<sup>34</sup> Information Office of the State Council, “Photos and Transcript Record of the Press Conference About Financial Statistics in 2020 Held by the State Council Information Office (SCIO)”, January 15, 2021.

<sup>35</sup> General Office of China Banking and Insurance Regulatory Commission Issued the “Notice on Completing the Related Work of Manufacturing Financial Service Well in 2021”, April 25, 2021.

<sup>36</sup> Information Office of the State Council, “Photos and Transcript Record of the Press Conference About Financial statistics in 2021 Held by the State Council Information Office (SCIO)”, January 8, 2022.

<sup>37</sup> Interest payment rate = Interest expense for the year / (average of the balance of



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interest-bearing debt at the end of the previous year and the balance of interest-bearing debt at the end of the year) x100 (Source: Wind)

<sup>38</sup>“More Long-term Loans are offered, Near-term Worries of Enterprises are Lessened”, *Economic Daily*, August 3, 2020.

<sup>39</sup> China Banking and Insurance Regulatory Commission “CBIRC Issues the Guiding Opinions on Banking and Insurance Industries Supporting Achieving Sci-tech Self-reliance and Self-strengthening at Higher Levels”, November 26, 2021, and China Banking and Insurance Regulatory Commission, “CBIRC Officials Answer Media's Questions on the Guiding Opinions on Banking and Insurance Industries Supporting Achieving Sci-tech Self-reliance and Self-strengthening at Higher Levels”, December 3, 2021.

<sup>40</sup> Zero2IPO Research, “Reviews and Prospects on Equity Investment Market of China 2021(Full Version)”, January 26, 2022, p.46, and Zero2IPO Research, “Major Release! Reviews and Prospects on Equity Investment Market of China 2020”, February 3, 2021, p.62

<sup>41</sup> “Qichacha Tec Shows that in the First Nine Months of this Year, Chip Enterprises in China Newly Increased 32,100”, *The Paper*, October 19, 2021.

<sup>42</sup> OECD, "Measuring distortions in international markets: the semiconductor value chain," *OECD Trade Policy Papers*, No. 234, 2019.