
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, DC 20549

FORM 20-F

REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR 12(g) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2021

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Date of event requiring this shell company report _____

For the transition period from _____ to _____

Commission file number 1-14700

台灣積體電路製造股份有限公司

(Exact Name of Registrant as Specified in Its Charter)

Taiwan Semiconductor Manufacturing Company Limited
(Translation of Registrant's Name Into English)

Republic of China
(Jurisdiction of Incorporation or Organization)

No. 8, Li-Hsin Road 6
Hsinchu Science Park
Hsinchu 300-096, Taiwan
Republic of China
(Address of Principal Executive Offices)

Wendell Huang, Vice President & Chief Financial Officer & Spokesperson

Telephone: 886-3-5055901 / Email: invest@tsmc.com

No. 8, Li-Hsin Road 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, Republic of China
(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Securities registered or to be registered pursuant to Section 12(g) of the Act:

None
(Title of Class)

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:

None
(Title of Class)

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report.

As of December 31, 2021, 25,930,380,458 Common Shares, par value NT\$10 each were outstanding.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or (15) (d) of the Securities Exchange Act of 1934. Yes No

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or an emerging growth company. See definition of "large accelerated filer," "accelerated filer," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer Accelerated Filer Non-Accelerated Filer Emerging Growth Company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards[†] provided pursuant to Section 13(a) of the Exchange Act.

[†]The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP International Financial Reporting Standards as issued by the International Accounting Standards Board Other

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow.

Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

* Not for trading, but only in connection with the listing on the New York Stock Exchange, Inc. of American Depositary Shares ("ADS") representing such Common Shares

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“TSMC”, “tsmc”, “Open Innovation Platform”, “CyberShuttle”, “CoWoS”, “TSMC-SolC”, “3DFabric”, “TSMC 3DFabric”, and “N12e” are some of our registered and/or pending trademarks used by us in various jurisdictions, including the United States of America. All rights reserved.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING INFORMATION

This annual report includes statements that are, or may be deemed to be, “forward-looking statements” within the meaning of U.S. securities laws. Such statements are made under the “safe harbor” provision under Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). The terms “anticipates,” “expects,” “may,” “will,” “could,” “should” and other similar expressions identify forward-looking statements. These statements appear in a number of places throughout this annual report and include statements regarding our intentions, beliefs or current expectations concerning, among other things, our results of operations, financial condition, liquidity, prospects, growth, strategies and the industries in which we operate.

By their nature, forward-looking statements involve risks and uncertainties because they relate to events and depend on circumstances that may or may not occur in the future. Forward-looking statements are not guarantees of future performance and our actual results of operations, financial condition and liquidity, and the development of the industries in which we operate may differ materially from those made in or suggested by the forward-looking statements contained in this annual report. Important factors that could cause those differences include, but are not limited to:

- general local and global economic conditions;
- the political stability of our local region;
- outlook of the major and emerging end markets for our products, such as smartphones, high performance computing, internet of things (“IoT”), automotive and digital consumer electronics;
- the volatility of the semiconductor and electronics industry;
- our ability to develop new technologies successfully and remain a technological leader;
- the increased competition from other companies and our ability to retain and increase our market share;
- overcapacity in the semiconductor industry;
- our reliance on certain major customers;
- the reliability of our information technology systems and resilience to any cyberattacks;
- our ability to maintain control over expansion and facility modifications;
- our ability to generate growth and profitability;
- our ability to hire and retain qualified personnel;
- our ability to acquire required equipment and supplies necessary to meet business needs;
- our ability to protect our technologies, intellectual property rights and third-party licenses;
- disruptive events, such as earthquakes or droughts;
- the COVID-19 pandemic;
- power and other utility shortages;
- construction issues as we expand our capacity; and
- fluctuations in foreign currency rates, in particular, any material appreciation of the NT dollar against the U.S. dollar, and our ability to manage such risks.

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Forward-looking statements include, but are not limited to, statements regarding our strategy and future plans, future business condition and financial results, our capital expenditure plans, our capacity management plans, expectations as to the commercial production using 3-nanometer and more advanced technologies, technological upgrades, investment in research and development, future market demand, future regulatory or other developments in our industry, business expansion plans or new investments as well as business acquisitions and financing plans. If any one or more of the assumptions underlying the industry or market data turns out to be incorrect, actual results may differ from the projections based on these assumptions. You should not place undue reliance on these forward-looking statements. Please see “Item 3. Key Information – Risk Factors” for a further discussion of certain factors that may cause actual results to differ materially from those indicated by our forward-looking statements.

As used in this annual report, all references to “we,” “us,” the “Company” and “TSMC” are to Taiwan Semiconductor Manufacturing Company Limited and its consolidated subsidiaries.

EXCHANGE RATES

We publish our financial statements in New Taiwan dollars, the lawful currency of the R.O.C. In this annual report, “\$,” “US\$” and “U.S. dollars” mean United States dollars, the lawful currency of the United States, and “NT\$” and “NT dollars” mean New Taiwan dollars. This annual report contains translations of certain NT dollar amounts into U.S. dollars at specified rates solely for the convenience of the reader. Unless otherwise noted, all translations from NT dollars to U.S. dollars in this annual report were made at NT\$27.74 to US\$1.00, the exchange rate set forth in the H.10 statistical release of the Federal Reserve Board on December 30, 2021.

No representation is made that the NT dollar or U.S. dollar amounts referred to herein could have been or could be converted into U.S. dollars or NT dollars, as the case may be, at any particular rate or at all.

PART I

ITEM 1. IDENTITY OF DIRECTORS, SENIOR MANAGEMENT AND ADVISORS

Not applicable.

ITEM 2. OFFER STATISTICS AND EXPECTED TIMETABLE

Not applicable.

ITEM 3. KEY INFORMATION

Capitalization and Indebtedness

Not applicable.

Reasons for the Offer and Use of Proceeds

Not applicable.

Risk Factors

We wish to caution readers that the following important factors, and those important factors described in other reports submitted to, or filed with, the SEC, among other factors, could affect our actual results and could cause our actual results to differ materially from those expressed in any forward-looking statements made by us or on our behalf, and that such factors may adversely affect our business and financial status and therefore the value of your investment:

Risks Relating to Our Business

Any global systemic political, economic and financial crisis (as well as the indirect effects flowing therefrom) could negatively affect our business, results of operations, and financial condition.

In recent times, several major systemic political, economic and financial crises negatively affected global business, banking and financial sectors, including the semiconductor industry and markets.

Since 2018, there have been political, and trade tensions among a number of the world's major economies. These tensions have resulted or may result in the implementation of tariff, non-tariff trade barriers and sanctions, including the use of export control restrictions and sanctions against certain countries and individual companies. These trade barriers and other measures have been particularly impactful to the semiconductor industry and related markets. Prolonged or increased use of trade barriers and such measures may result in a decrease in the growth of the global economy and the semiconductor industry, and could cause turmoil in global markets that often result in declines in electronic products sales from which we generate our income through our products and services. Also, any increase in the use of export control restrictions and sanctions to target certain countries and entities, any expansion of the extraterritorial jurisdiction of export control laws, or complete or partial ban on semiconductor products sales to certain entities could impact not only our ability to continue supplying products to those customers, but also our customers' demand for our products, and could even lead to changes in semiconductor supply chains. For example, in May 2020 and again in August 2020, the U.S. tightened its export control measures against Huawei Technology Co. Ltd. and its affiliates (collectively, "Huawei"), including an expanded license requirement for providing Huawei with items subject to the U.S. export control jurisdiction. To comply with relevant laws and regulations, we have discontinued shipment of products to Huawei since September 15, 2020. On the other hand, measures adopted by an affected country to counteract the impact of another country's actions or regulations could lead to significant legal liability to multinational corporations including our own. For example, in January 2021, China adopted a blocking statute that, among other matters, entitles Chinese entities incurring damages from a multinational's compliance with foreign laws to seek civil remedies. In February 2022, several countries and regions began to impose various measures, including sanctions and export controls, against Russia, including certain individuals and entities, as a result of the military conflict in Ukraine. As of the date of this annual report, our current results of operations have not been materially affected by the expanded export control regulations or the novel rules or measures adopted to counteract them. Nevertheless, depending on future developments in global trade tensions and military conflicts, such regulations, rules, or measures may have an adverse impact on our business and operations, and we may incur significant legal liability and financial losses as a result.

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Any future systemic political, economic or financial crisis or market volatility, including but not limited to interest rate and foreign exchange rate fluctuations, inflation or deflation and changes in economic, fiscal and monetary policies in major economies, could cause revenue or profits for the semiconductor industry as a whole to decline dramatically, and if the economic conditions or financial conditions of our customers were to deteriorate, the demand for our products and services may decrease and additional accounting related allowances may be required, which could reduce our operating income and net income. Further, in times of market instability, sufficient external financing may not be available to us on a timely basis, on commercially reasonable terms to us, or at all. If sufficient external financing is not available when we need such financing to meet our capital requirements, we may be forced to curtail our expansion, modify plans or delay the deployment of new or expanded services until we obtain such financing. In conclusion, any future global systemic crisis, including further escalation of trade tensions as described above, could materially and adversely affect our results of operations.

Our global manufacturing, design and sales activities subject us to risks associated with political, economic, financial, military or other conditions or developments in various jurisdictions, including in particular the R.O.C., as well as in international trade, which could negatively affect our business and financial status and therefore the market value of your investment.

The majority of our principal executive officers and our principal production facilities are located in the R.O.C., and the majority of our net revenue is derived from our operations in the R.O.C. In addition, we have operations worldwide and a significant percentage of our revenue comes from sales to locations outside the R.O.C. Operating in the R.O.C. and overseas exposes us to changes in laws, rules, regulations and the enforcements of such laws, rules and regulations in certain key areas that could have a material impact on our operations, such as intellectual property, labor, antitrust, export control, import restrictions, and trade barriers or disputes. In addition, deterioration in general political, economic, financial or social conditions, military conflicts, the risk of outbreak of war or hostilities, terrorism events, security risks, social unrest, health conditions and possible disruptions in transportation networks in the various jurisdictions in which we operate or elsewhere, could have an adverse impact on our business and results of operations as well as the market price and the liquidity of our ADSs and common shares. Furthermore, any major change in economic, fiscal and/or trade policies in the U.S. from which we derive a substantial portion of our revenue or in another major jurisdiction could severely affect our business, financial condition and results of operations. For example, recent political and trade tensions among major economies as well as military conflicts (such as the conflict in Ukraine in early 2022) have resulted in the imposition of trade barriers, such as sanctions and import and export controls, which could increase our manufacturing costs, limit our access to certain supplies, make our pricing less competitive, and limit our ability to offer our products and services in some markets or source key materials and key production equipment, which may have adverse direct or indirect effects on our sales.

Any law or government policy that encourages our customers to relocate their manufacturing capacity or supply chain to their own countries or require their respective contractors, subcontractors and relevant agents to do so could also impair our ability to sustain our current level of productivity and manufacturing efficiency. An important aspect of our business operation is an ecosystem of interconnected semiconductor fabs, employees and suppliers in the R.O.C. that provides us with significant operational synergies, flexibility and efficiencies. For example, we are able to temporarily reassign thousands of our engineers and other relevant personnel from one manufacturing site to another to refine specific designs and adapt manufacturing processes in a timely manner. These advantages permit us to operate our manufacturing fabs efficiently and resolve any technical or commercial difficulties quickly to maintain our competitive edge. Restrictions on our ability to transfer people among our operations in the R.O.C., the United States, the P.R.C. and Japan efficiently due to, for example, immigration or travel restrictions may impair or reduce these advantages, and we may not be able to sustain our current ability to supply our customers with goods and services at the current level of cost, quality, quantity and delivery schedule to which our customers have been accustomed.

In addition, the financial markets have viewed certain past developments in relations between the R.O.C. and the P.R.C. as occasions to depress general market prices of the securities of R.O.C. companies, including our own. Also, the R.O.C. government has not lifted some trade and investment restrictions imposed on R.O.C. companies on the amount and types of certain investments that can be made in the P.R.C. Our plans, investment applications and/or any relevant regulatory approvals to establish or possibly expand operations in the P.R.C. may be delayed, interrupted, suspended or cancelled due to unforeseeable social and political factors in the R.O.C. or the P.R.C.

Decreases in demand and average selling prices for products that contain semiconductors may adversely affect demand for our products and may result in a decrease in our revenue and earnings.

A vast majority of our revenue is derived from customers who use our products in smartphones, high performance computing, IoT, automotive, and digital consumer electronics. Any deterioration in or a slowdown in the growth of such end markets resulting in a substantial decrease in the demand for overall global semiconductor foundry services, including our products and services, could adversely affect our revenue. Further, semiconductor manufacturing facilities require substantial investment to construct and are largely fixed cost assets once they are in operation. Because we own most of our manufacturing capacities, a significant portion of our operating costs is fixed. In general, these costs do not decline when customer demand or our capacity utilization rates drop, and thus declines in customer demand, among other factors, may significantly decrease our margins. Conversely, as product demand rises and factory utilization increases, the fixed costs are spread over increased output, which can improve our margins. In addition, the historical trend of declining average selling prices (or “ASP”) of end use applications places downward pressure on the prices of the components that go into such applications. Decreases in the ASP of end use applications may increase pricing pressure on components produced by us, which, in turn, may negatively impact our revenue, margin and earnings.

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Since we are dependent on the highly cyclical semiconductor and electronics industries, which have experienced significant and sometimes prolonged periods of downturns and overcapacity, our revenue, earnings and margins may fluctuate significantly.

The electronics industries and semiconductor market are cyclical and subject to significant and often rapid fluctuations in product demand, which could impact our semiconductor foundry business. Variations in order levels from our customers may result in volatility in our revenue and earnings. From time to time, the electronics and semiconductor industries have experienced significant and occasionally prolonged periods of downturns and overcapacity. Because we are, and will continue to be, dependent on the requirements of electronics and semiconductor companies for our services, periods of downturns and overcapacity in the general electronics and semiconductor industries could lead to reduced demand for overall semiconductor foundry services, including our services. If we cannot take appropriate actions, such as reducing our costs to sufficiently offset declines in demand, our revenue, margin and earnings will likely suffer during periods of downturns and overcapacity.

If we are unable to remain a technological leader in the semiconductor industry, unable to timely respond to fast-changing semiconductor market dynamics, or unable to maintain our edge in product quality, we may become less competitive.

The semiconductor industry and its technologies are constantly changing. We compete by developing process technologies using increasingly advanced nodes and on manufacturing products with more functions. We also compete by developing new derivative technologies. If we do not anticipate these changes in technologies and rapidly develop new and innovative technologies, or our competitors unforeseeably gain sudden access to additional technologies, we may not be able to provide foundry services on competitive terms. In addition, our customers have significantly decreased the time in which their products or services are launched into the market. If we are unable to meet these shorter product time-to-market, we risk losing these customers. These factors have also been intensified by the shift of the global technology market to consumer driven products, such as smartphones, and increasing competition and concentration of customers (all further discussed among these risk factors). Also, the uncertainty and instability inherent in advanced technologies also impose challenges for achieving expected product quality and product yield. If we fail to maintain quality, it may result in loss of revenue and additional cost, as well as loss of business or customer trust. For example, in January 2019, we discovered yield problems in 12-nanometer and 16-nanometer wafers caused by a batch of photoresist, which resulted in delayed delivery of products and had a negative effect on our gross margin and operating margin in the first quarter of 2019. To reduce future risks of such incidences, we have since strengthened inline wafer inspection and tightened control of incoming material to deal with the increasing complexity of leading-edge technologies. If we are unable to innovate new technologies that meet the demand of our customers or overcome the above factors, we may become less competitive and our revenue may decline significantly.

In light of the rise of new foundry service providers worldwide, if we are unable to compete effectively in the highly competitive foundry segment of the semiconductor industry, we may lose customers and/or our profit margin and earnings may decrease.

The markets for our foundry services are highly competitive. We compete with other foundry service providers, as well as a number of integrated device manufacturers. Some of these companies may have access to more advanced technologies than us. Other companies may have greater financial and other resources than us, such as the possibility of receiving direct or indirect government subsidies, economic stimulus funds, or other incentives that may be unavailable to us. For example, Chinese companies are expected to be key players for new semiconductor fab development and fab equipment spending in part due to various incentives provided by the Chinese government. The governments of Europe, the United States, South Korea, and Japan also have incentive programs to incentivize developments of their domestic semiconductor industries. Although governments in certain of the countries or regions where we are currently expanding or planning to expand our production capacity have extended or may in the future extend certain financial incentives to us, there is no assurance that we will be able to apply for or receive such financial incentives at the levels we expect or at all. Additionally, any financial incentives we receive may be subject to strict conditions, or the grantors could seek to recover any funds provided to us, or cancel, reduce or deny our requests subsidies or grants in the future. This could materially increase our operating costs and adversely affect our results of operations.

Furthermore, our competitors may, from time to time, also decide to undertake aggressive pricing initiatives in one or several technology nodes. These competitive activities may decrease our customer base or our ASP, or both. If we are unable to compete effectively with such new and aggressive competitors on technology, manufacturing capacity, product quality and customer satisfaction, we risk losing customers to such new contenders.

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If we are unable to manage our capacity and production facilities effectively, our competitiveness may be weakened.

We perform long-term market demand forecasts for our products and services to manage our overall capacity. Based on our market demand forecasts, we have continued to add capacity to meet market needs for our products and services, including in Taiwan, in Nanjing, China, in Arizona, U.S., and in Kumamoto, Japan.

Implementing these capacity expansion plans will increase our costs, and the increases may be substantial. For example, we would need to build new facilities, purchase additional equipment and hire and train personnel to operate the new equipment. If we do not increase our net revenue accordingly, our financial performance may be adversely affected by these increased costs. See “Item 4. Information on The Company – Capacity Management and Technology Upgrade Plans” for a further discussion

In addition, market conditions are dynamic and our market demand forecasts may change significantly at any time. During periods of decreased demand, certain manufacturing lines or tools in some of our manufacturing facilities may be suspended or shut down temporarily. However, if demand subsequently increases rapidly over a short period of time, we may not be able to restore the capacity in a timely manner to take advantage of the upturn. In such circumstances, our financial performance and competitiveness may be adversely affected.

Having one or more large customers that account for a significant percentage of our revenue may render us vulnerable to the loss of or significant curtailment of purchases by such customers that could in turn adversely affect our results of operations. Similarly, the increasing consolidation of our customers may further increase our revenue concentration.

Over the years, our customer profile and the nature of our customers’ business have changed dramatically. While we generate revenue from hundreds of customers worldwide, our ten largest customers in 2019, 2020 and 2021 accounted for approximately, 71%, 74% and 71% of our net revenue in the respective year. Our largest customer in 2019, 2020 and 2021 accounted for 23%, 25% and 26% of our net revenue in the respective year. Our second largest customer in 2019, 2020 and 2021 accounted for 14%, 12% and 10% of our net revenue in the respective year. A more concentrated customer base will subject our revenue to seasonal demand fluctuations from our large customers, and cause different seasonal patterns of our business. This customer concentration results in part from the changing dynamics of the electronics industry with the structural shift to mobile devices and applications and software that provide the content for such devices.

There are only a limited number of customers who are successfully exploiting this new business model paradigm. Also, we have seen the changes of nature in our customers’ business models in response to this new business model paradigm. For example, there is a growing trend toward the system companies developing their own designed semiconductors and working directly with semiconductor foundries which makes their products and services more marketable in a changing consumer market. Also, since the global semiconductor industry is becoming increasingly competitive, some of our customers have engaged in industry consolidations in order to remain competitive. Such consolidations have taken the form of mergers and acquisitions. If more of our major customers consolidate, this will further decrease the overall number of our customer pool. In addition, regulatory restrictions, such as export controls directed at our major customers, could impact our ability to supply products to those customers, reduce those customers’ demand for our products and services and impact their business operations.

The loss of, or significant curtailment of purchases by, one or more of our top customers, including curtailments due to increased competitive pressures, heightened regulatory scrutiny, industry consolidation, changes in applicable regulatory restrictions, product designs, manufacturing sourcing or outsourcing policies or practices of these customers, or the timing of customer or distributor inventory adjustments, or changes in our major customers’ business models may adversely affect our results of operations and financial condition.

If our information technology systems or those of our service providers with whom we share our confidential information succumb to cyberattacks by third parties worldwide, our business and operations may be severely interrupted or even shut down, and our results of operations, financial condition, prospects and reputation may also be materially and adversely affected.

Even though we have established a comprehensive internet and computing security network, we cannot guarantee that our computing systems which control or maintain vital corporate functions, such as our manufacturing operations and enterprise accounting, would be completely immune to crippling cyberattacks. In the event of a serious cyberattack, our systems may lose important corporate data or our production lines may be shut down pending the resolution of such attack. Major cyberattacks could also lead to loss or divulgence of trade secrets and other sensitive information, such as proprietary information of our customers and other stakeholders and personal information of our employees. While we seek to continuously review and assess our cybersecurity policies and procedures to ensure their adequacy and effectiveness, we cannot guarantee that we will not be susceptible to new and emerging risks and attacks in the evolving landscape of cybersecurity threats.

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Malicious hackers may also try to introduce computer viruses, corrupted software or ransomware into our network systems to disrupt our operations, blackmail us to regain control of our computing systems, or spy on us for sensitive information. These attacks may result in us having to pay damages for our delayed or disrupted orders or incur significant expenses in implementing remedial and improvement measures to further enhance our cybersecurity network, and may also expose us to significant legal liabilities arising from or related to legal proceedings or regulatory investigations associated with such breaches.

In the past, we experienced and may in the future be subject to attack by malicious software contained in the equipment we purchase and install. We have implemented and continually update rigorous cybersecurity measures to prevent and minimize harm caused by such attacks. Such measures include advanced virus scanning tools to prevent a fab from installing virus-infected software, strengthening firewall and network controls to prevent computer viruses from spreading among tools and fabs, the installation of anti-virus and advanced malware detection solutions across our computer devices, and enhancement of data center security through faster patch cycle times. In addition, we have deployed secure PCs and laptops, developed a public cloud security policy with monitoring, defined and regularly reviewed the security key performance indicators (“KPI”), introduced new technology for data protection, and improved email phishing detection and regularly performed employee awareness testing. We also established an integrated and automatic security operation platform, enhanced the automation of cybersecurity event detection and response, enhanced internal assessment automation, practiced the response to ransomware attacks and conducted external security risk assessments. In addition, to reduce supply chain risks, through collaboration, we helped major suppliers improve their security maturity with KPI monitoring and share with them industry security events and best practices on demand and by schedule. Moreover, we led the SEMI standard taskforce to formulate and release information security standards for semiconductor equipment (SEMI E187) to help improve the resilience of semiconductor supply chain. While these ongoing enhancements further improve our cybersecurity defense solutions, there can be no assurance that we are immune to cyberattacks.

In addition, we employ certain third-party service providers for us and our affiliates worldwide with whom we need to share highly sensitive and confidential information to enable them to provide the relevant services. While we require such third-party service providers to strictly fulfill the confidentiality and/or internet security requirements in our service agreements with them, there is no assurance that each of them will comply with such obligations. Moreover, such third-party service providers may also be susceptible to cyberattacks. If we or our service providers are not able to timely resolve the respective technical difficulties caused by such cyberattacks, or ensure the integrity and availability of our data (and data belonging to our customers and other third parties) or maintain control of our or our service providers’ computing systems, our commitments to our customers and other stakeholders may be materially impaired and our results of operations, financial condition, prospects and reputation may also be materially and adversely affected.

We may not be able to implement our planned growth and development or maintain our leading position if we are unable to recruit and retain key executives, managers and skilled technical and service personnel.

We rely on the continued services and contributions of our management team, skilled technical and professional personnel. Our business could suffer from the inability to fulfill personnel needs with high quality professionals in a timely fashion caused by the loss of personnel, illegal talent poaching, immigration controls, or related changes in market demand for our products and services. Since there is fierce competition for talent recruitment, we cannot ensure timely fulfillment of our personnel demand.

We may be unable to obtain in a timely manner and at a reasonable cost equipment that is necessary for us to remain competitive.

Our operations and ongoing expansion plans depend on our ability to obtain an appropriate amount of equipment and related services from a limited number of suppliers in a market that is characterized from time to time by limited supply and long delivery cycles. During such times, supplier-specific or industry-wide lead times for delivery can be longer than previously expected and the cost of ownership may intrinsically increase. To better manage our supply chain, we have implemented various collaborative business models and risk management contingencies with suppliers to ensure supply and shorten the procurement lead time. However, if we are unable to timely acquire the equipment and parts we need, we may fail to successfully implement our capacity expansion plans and exploit time sensitive business opportunities. Additionally, ongoing trade tensions could result in increased prices for, or even unavailability of, key equipment, including as a result of necessary export licenses being delayed or denied, additional export control measures, and other tariff or non-tariff barriers. If we are unable to obtain equipment in a timely manner to fulfill our customers’ demand on technology and production capacity, or at a reasonable cost, our financial condition and results of operations could be negatively impacted.

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Our revenue and profitability may decline if we are unable to obtain adequate supplies of raw materials in a timely manner and at commercially reasonable prices.

Our production operations require that we obtain adequate supplies of raw materials, such as silicon wafers, gases, chemicals, and photoresist, on a timely basis and at commercially reasonable prices. In the past, shortages in the supply of some materials, whether by specific vendors or by the semiconductor industry generally, have resulted in occasional industry-wide price adjustments and delivery delays. Moreover, major natural disasters, trade barriers and political or economic turmoil, including military conflicts and inflation, occurring within the country of origin of such raw materials may also significantly disrupt the availability of such raw materials or increase their prices. Also, since we procure some of our raw materials from sole-sourced suppliers, there is a risk that our need for such raw materials may not be met or that back-up supplies may not be readily available. Importation and domestic production limitations may also limit our ability to obtain adequate supplies of raw materials as well as materials of the necessary quality. In addition, recent trade tensions could result in increased prices or even unavailability of raw materials due to tariffs, export control or other non-tariff barriers. Our revenue and earnings could decline if we are unable to obtain adequate supplies of the necessary raw materials in a timely manner or if there are significant increases in the costs of raw materials.

Any inability to obtain, preserve, enforce, defend and protect our technologies, intellectual property rights and third-party licenses could harm our competitive position.

Our ability to compete successfully and to achieve future growth depends in part on the continued strength of our intellectual property portfolio. While we actively enforce and protect our intellectual property rights, there can be no assurance that our efforts will be adequate to prevent the misappropriation or improper use of our proprietary technologies, software, trade secrets or know-how. Also, we cannot assure you that, as our business or business models expand into new areas, we will be able to develop independently the technologies, patents, software, trade secrets or know-how necessary to conduct our business or that we can do so without unknowingly infringing the intellectual property rights of others. As a result, we may have to rely on, to a certain degree, licensed technologies and patent licenses from others. To the extent that we rely on licenses from others, there can be no assurance that we will be able to obtain any or all of the necessary licenses in the future on terms we consider reasonable or at all. The lack of necessary licenses could expose us to claims for damages and/or injunctions from third parties, as well as claims for indemnification by our customers in instances where we have contractually agreed to indemnify our customers against damages resulting from infringement claims.

We have received, from time to time, communications from third parties, including non-practicing entities and semiconductor companies, asserting that our technologies, our manufacturing processes, or the design IPs of the semiconductors made by us or the use of those semiconductors by our customers may infringe their patents or other intellectual property rights. Because of the nature of the industry, our market position, and the expansion of our manufacturing operations outside of Taiwan, we may receive an increased number of such communications in the future. The assertions made and lawsuits initiated by litigious, well-funded, non-practicing entities are particularly aggressive in their monetary demand and in seeking court-issued injunctions. Such lawsuits and assertions may increase our cost of doing business and may potentially be extremely disruptive if these asserting entities succeed in blocking the trade of products made and services offered by us. See “Item 8. Financial Information – Legal Proceedings” for a further discussion. Also, with the expansion of our manufacturing operations into certain non-R.O.C jurisdictions, we have faced increased challenges in managing risks of intellectual property misappropriation. Despite our efforts to adopt robust measures to mitigate the risk of intellectual property misappropriation in such new jurisdictions, we cannot guarantee that the protection measures we adopted will be sufficient to prevent us from potential infringements by others, or at all.

If we fail to obtain or maintain certain technologies or intellectual property licenses or fail to prevent our intellectual property from being misappropriated and, if litigation relating to alleged intellectual property matters occurs, it could: (i) prevent us from manufacturing particular products or selling particular services or applying particular technologies; and (ii) reduce our ability to compete effectively against entities benefiting from our misappropriated intellectual property, which could reduce our opportunities to generate revenue.

Our operational results could also be materially and adversely affected by disruptive events, such as earthquakes and droughts, in the locations in which we, our customers or our suppliers operate or by industrial accidents, fires or explosions.

The frequency and severity of disruptive events, including damaging earthquakes, other natural disasters and extreme weather, has been increasing in part due to climate change or systemic regional geological changes. We have manufacturing and other operations, and are expanding our production capacity, in locations that may experience natural disasters, such as flooding, earthquakes, tsunamis, typhoons, and droughts that may cause interruptions or shortages in the supply of utilities, such as water and electricity, which in turn could disrupt operations. In addition, our suppliers and customers also have operations in such locations. For example, most of our production facilities, as well as those of many of our suppliers and customers and upstream providers of complementary semiconductor manufacturing services, are located in Taiwan and Japan, areas susceptible to earthquakes, tsunamis, flooding, typhoons, and droughts from time to time that may cause shortages of electricity or water, or interruptions to our operations.

Thus, if one or more natural disasters result in a prolonged disruption to our operations or those of our customers or suppliers, or if any of our fabs or vendor facilities were to be damaged or cease operations as a result of an explosion or fire, it could reduce our manufacturing capacity and cause the loss of important customers, and thereby have an adverse, material impact on our operational and financial performance.

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The COVID-19 pandemic could materially adversely affect our business and results of operations.

The ongoing COVID-19 pandemic may materially adversely affect our business and results of operations in several ways, including but not limited to: (i) interruption of the operations of our supply chains for equipment, parts and materials in terms of manufacturing, logistics, and manpower arrangements for tool installation; (ii) significant fluctuation in our customers' demands for certain products, leading to uncertainties for our capacity planning and also for meeting customer demand, which may harm our business with our customers and subject us to the risk of legal disputes; and (iii) strict border control measures which may delay or restrict our employees or vendors from completing necessary training programs or providing services; and (iv) potential production delays for our products due to forced factory or office closures or partial operation.

We have formed an "Epidemic Prevention Committee" to identify, implement and monitor actions stemming from the dynamic exigencies of the pandemic, including but not limited to, health management of our employees, splitting operation and work from home arrangements, identification and control of high risk individuals, rapid investigation of confirmed cases, management of production inventory, supply chain management, and capacity management for demand changes. As of the date of this annual report, our current business and results of operations have not been materially affected by the pandemic. However, there is no certainty that the measures we have taken will be sufficient to mitigate further risks posed by the COVID-19 pandemic, and our ability to perform critical functions and to meet customers' needs could be materially adversely affected as a result. In addition, there is also a risk that any post-pandemic downward changes in consumers' demand for electronic products may, in turn, lead to reduced demand for and place downward pressure on the price of our products and services.

Our operation may be interrupted, and our expansion may be limited, by power or other utility shortages.

We have occasionally suffered power outages or surges in Taiwan caused by difficulties encountered by our electricity supplier, the Taiwan Power Company, or other power consumers on the same power grid. Some of these have resulted in interruptions to our operations. Such shortages or interruptions in electricity supply could further be exacerbated by changes in the energy policy of the government, which intends to make Taiwan a nuclear-free country by 2025. If we are unable to secure reliable and uninterrupted supply of electricity to power our manufacturing fabs within Taiwan, our ability to fill customers' orders would be severely jeopardized.

In addition, severe weather events, such as droughts, and any measures taken by governments in response to such severe weather events, may materially affect our operations. For further information, see "— Our operational results could also be materially and adversely affected by disruptive events, such as earthquakes and droughts, in the locations in which we, our customers or our suppliers operate or by industrial accidents, fires or explosions."

If such events were to occur over prolonged periods of time, our operations and financial performance may be materially adversely affected.

Our future capacity expansions in the R.O.C. and elsewhere could be curtailed by shortages in water and electricity.

As we are expanding our capacity, construction and land acquisition issues could delay the progress of our expansion.

We have multiple expansion projects that are currently underway, including the design and construction of new fabs worldwide. Labor shortages, interruptions in the supply chains for various building materials, and construction issues could substantially delay the completion of our expansion projects. Any prolongation of such delays could result in substantial additional costs or failure to meet our capacity expansion plans. In addition, future expansions of our operations in the R.O.C. or elsewhere could be impacted by the limited availability of commercial-use land.

Adverse fluctuations in exchange rates could decrease our operating margin and/or revenue.

Substantially all of our sales are denominated in U.S. dollars and over half of our capital expenditures are denominated in currencies other than the NT dollar, primarily in U.S. dollars, Euros and Japanese yen. As a result, any significant fluctuations to our disadvantage in the exchange rate of the NT dollar against such currencies, in particular a weakening of the U.S. dollar against the NT dollar, would have an adverse impact on our revenue and operating profit as expressed in NT dollars. For example, every 1% depreciation of the U.S. dollar against the NT dollar would result in an approximately 0.4 percentage point decrease in our operating margin based on our 2021 results.

Conversely, if the U.S. dollar appreciates significantly versus other major currencies, the demand for the products and services of our customers and for our goods and services will likely decrease, which will negatively affect our revenue. Please see "Item 11. Quantitative and Qualitative Disclosures About Market Risk" for a further discussion.

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Our failure to comply with applicable laws and regulations material to our operations, such as export control, environmental and climate related laws and regulations, or the inability to timely obtain requisite approvals necessary for the conduct of our business, such as fab land and construction approvals, could harm our business and operational results or subject us to potential significant legal liability.

Because we engage in manufacturing activities in multiple jurisdictions and conduct business with our customers located worldwide, such activities are subject to a myriad of governmental regulations. For example, the manufacturing, assembling and testing of our products require the use of metals, chemicals, and materials that are subject to environmental, climate-related, health and safety, and humanitarian conflict-free sourcing laws, regulations and guidelines issued worldwide. Our failure to comply with any such laws or regulations, as amended from time to time, and our failure to comply with any information and document sharing requests from the relevant authorities in a timely manner could result in:

- significant penalties and legal liabilities, such as the denial of import or export permits or third party private lawsuits, criminal or administrative proceedings;
- the temporary or permanent suspension of production of the affected products;
- the temporary or permanent inability to procure or use certain production critical chemicals or materials;
- unfavorable alterations in our manufacturing, fabrication and assembly and test processes;
- challenges from our customers that place us at a significant competitive disadvantage, such as loss of actual or potential sales contracts in case we are unable to satisfy the applicable legal standard or customer requirement;
- restrictions on our operations or sales;
- loss of tax benefits, including termination of current tax incentives, disqualification of tax credit application and repayment of the tax benefits that we are not entitled to; and
- damages to our goodwill and reputation.

Complying with applicable laws and regulations, such as environmental and climate related laws and regulations, could also require us, among other things, to do the following: (a) purchase, use or install remedial equipment; (b) implement remedial programs such as climate change mitigation programs; (c) modify our product designs and manufacturing processes, or incur other significant expenses such as obtaining renewable energy sources, renewable energy certificates or carbon credits, substitute raw materials or chemicals that may cost more or be less available for our operations.

Our inability to timely obtain approvals necessary for the conduct of our business could impair our operational and financial results. For example, if we are unable to timely obtain environmental related approvals needed to undertake the development and construction of a new fab or expansion project, then such inability may delay, limit, or increase the cost of our expansion plans that could also in turn adversely affect our business and operational results. In light of increased public interest in environmental issues, our operations and expansion plans may be adversely affected or delayed responding to public concern and social environmental pressures even if we comply with all applicable laws and regulations.

For further details, please see our compliance record with Taiwan and international environmental and climate related laws and regulations as well as our business continuity management of climate change policy in “Item 4. Information on The Company – Environmental and Climate Related Laws and Regulations”.

Any adverse results of potential antitrust proceedings that we may be subject to could harm our business and operational results or subject us to potential significant legal liability.

We are subject to antitrust laws and regulations in multiple jurisdictions, and from time to time receive related inquiries from enforcement agencies. For example, on September 28, 2017, we were contacted by the European Commission, which asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We cooperated with the European Commission to provide the requested information and documents. The European Commission subsequently decided to close the investigation in May 2020. Any adverse results of potential antitrust proceedings could harm our business and distract our management, and thereby have a material adverse effect on our results of operations or prospects, and subject us to potential significant legal liability.

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Any impairment charges may have a material adverse effect on our net income.

Under IFRSs, we are required to evaluate our tangible assets, right-of-use assets and intangible assets for impairment whenever triggering events or changes in circumstances indicate that the asset may be impaired. If certain criteria are met, we are required to record an impairment charge. We are not able to estimate the extent or timing of any impairment charge for future years. Any impairment charge required may have a material adverse effect on our net income.

The determination of an impairment charge at any given time is mainly based on the projected results of operations over several years subsequent to that time. Consequently, an impairment charge is more likely to occur during a period when our operating results are otherwise already depressed. See “Item 5. Operating and Financial Reviews and Prospects – Critical Accounting Policies, Judgments and Key Sources of Estimation and Uncertainty” for a discussion of how we assess if an impairment charge is required and, if so, how the amount is determined.

Any failure to achieve and maintain effective internal controls could have a material adverse effect on our business and results of operations.

Effective internal controls are necessary for us to provide reasonable assurance with respect to our financial reports and to effectively prevent fraud. If we cannot provide reasonable assurance with respect to our financial reports and effectively prevent fraud and corruption, our reputation and results of operations could be harmed.

We are required to comply with various R.O.C. and U.S. laws and regulations on internal controls, but internal controls may not prevent or detect misstatements because of their inherent limitations, including the possibility of human error, the circumvention or overriding of controls, fraud or corruption.

Therefore, even effective internal controls can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. If we fail to maintain the adequacy of our internal controls, our business and operating results could be harmed, we could fail to meet our reporting obligations, and there could be a material adverse effect on the market price of our common shares and ADSs.

Any amendments to existing tax regulations or the implementation of any new tax laws in the R.O.C., the United States or other jurisdictions in which we operate our business may have an adverse effect on our net income.

While we are subject to tax laws and regulations in various jurisdictions in which we operate or conduct business, our principal operations are in the R.O.C. and we are exposed primarily to taxes levied by the R.O.C. government. Any unfavorable changes of tax laws and regulations in this jurisdiction could increase our effective tax rate and have an adverse effect on our operating results. Further, changes in the tax laws of foreign jurisdictions could arise as a result of the base erosion and profit shifting (BEPS) project that was undertaken by the Organisation for Economic Cooperation and Development (OECD). These changes may increase tax uncertainty and have an adverse effect on our operating results. See “Item 5. Operating and Financial Reviews and Prospects – Taxation” for further discussion of significant tax regulation changes.

Risks Relating to Ownership of ADSs

Your voting rights as a holder of ADSs will be limited.

Holders of American Depositary Receipts (ADRs) evidencing ADSs may exercise voting rights with respect to the common shares represented by these ADSs only in accordance with the provisions of our ADS deposit agreement. The deposit agreement provides that, upon receipt of notice of any meeting of holders of our common shares, the depositary bank will, as soon as practicable thereafter, mail to the holders (i) the notice of the meeting sent by us, (ii) voting instruction forms and (iii) a statement as to the manner in which instructions may be given by the holders.

ADS holders will not generally be able to exercise the voting rights attaching to the deposited securities on an individual basis. According to the provisions of our ADS deposit agreement, the voting rights attaching to the deposited securities must be exercised as to all matters subject to a vote of shareholders collectively in the same manner, except in the case of an election of directors. Election of directors is by means of cumulative voting. See “Item 10. Additional Information – Voting of Deposited Securities” for a more detailed discussion of the manner in which a holder of ADSs can exercise its voting rights.

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You may not be able to participate in rights offerings and may experience dilution of your holdings.

We may, from time to time, distribute rights to our shareholders, including rights to acquire securities. Under our ADS deposit agreement, the depositary bank will not distribute rights to holders of ADSs unless the distribution and sale of rights and the securities to which these rights relate are either exempt from registration under the United States Securities Act of 1933, as amended, (the “Securities Act”), with respect to all holders of ADSs, or are registered under the provisions of the Securities Act. Although we may be eligible to take advantage of certain exemptions for rights offerings by certain foreign companies, we can give no assurance that we can establish an exemption from registration under the Securities Act, and we are under no obligation to file a registration statement with respect to any such rights or underlying securities or to endeavor to have such a registration statement declared effective. Accordingly, holders of ADSs may be unable to participate in our rights offerings and may experience dilution of their holdings as a result.

If the depositary bank is unable to sell rights that are not exercised or not distributed or if the sale is not lawful or reasonably practicable, it will allow the rights to lapse, in which case you will receive no value for these rights.

The value of your investment may be reduced by possible future sales of common shares or ADSs by us or our shareholders or fluctuations in foreign exchange.

One or more of our existing shareholders may, from time to time, dispose of significant numbers of our common shares or ADSs. For example, the National Development Fund of the R.O.C., which owned 6.38% of TSMC’s outstanding shares as of February 28, 2022, had from time to time in the past sold our shares in the form of ADSs in several transactions.

We cannot predict the effect, if any, that future sales of ADSs or common shares, or the availability of ADSs or common shares for future sales, will have on the market price of ADSs or common shares prevailing from time to time. Sales of substantial amounts of ADSs or common shares in the public market, or the perception that such sales may occur, could depress the prevailing market price of our ADSs or common shares. In addition, fluctuations in the exchange rate between the U.S. dollar and the NT dollar may affect the U.S. dollar value of our common shares and the market price of the ADSs and the U.S. dollar value of any cash dividends paid in NT dollars on our common shares represented by ADSs.

The market value of our shares may fluctuate due to the volatility of, and government intervention in, the R.O.C. securities market.

The Taiwan Stock Exchange has experienced from time to time substantial fluctuations in the prices and volumes of sales of listed securities. There are currently limits on the range of daily price movements on the Taiwan Stock Exchange. In response to past declines and volatility in the securities markets in Taiwan, and in line with similar activities by other countries in Asia, the government of the R.O.C. formed the Stabilization Fund, which had purchased and may from time to time purchase shares of Taiwan companies to support these markets. In addition, other funds associated with the R.O.C. government had in the past purchased, and may from time to time purchase, shares of Taiwan companies on the Taiwan Stock Exchange or other markets. These funds had disposed and may from time to time dispose shares of Taiwan companies so purchased at a later time. In the future, market activity by government entities, or the perception that such activity is taking place, may take place or cease, may cause fluctuations in the market prices of our ADSs and common shares.

ITEM 4. INFORMATION ON THE COMPANY

Our History and Structure

Our legal and commercial name is 台灣積體電路製造股份有限公司 (Taiwan Semiconductor Manufacturing Company Limited). We believe we are currently the world’s largest dedicated foundry in the semiconductor industry. We were founded in 1987 as a joint venture among the R.O.C. government and other private investors and were incorporated in the R.O.C. as a company limited by shares on February 21, 1987. Our common shares have been listed on the Taiwan Stock Exchange since September 5, 1994, and our ADSs have been listed on the New York Stock Exchange (“NYSE”) since October 8, 1997.

Our Principal Office

Our principal executive office is located at No. 8, Li-Hsin Road 6, Hsinchu Science Park, Hsinchu, Taiwan, Republic of China. Our telephone number at that office is (886-3) 563-6688. Our website is www.tsmc.com. Information contained on our website is not incorporated herein by reference and does not constitute part of this annual report.

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Business Overview of the Company

As a foundry, we manufacture semiconductors using our manufacturing processes for our customers based on proprietary integrated circuit designs provided by them. We offer a comprehensive range of wafer fabrication processes, including processes to manufacture complementary metal oxide silicon (“CMOS”) logic, mixed-signal, radio frequency (“RF”), embedded memory, bipolar complementary metal oxide silicon (“BiCMOS”, which uses CMOS transistors in conjunction with bipolar junction transistor) mixed-signal and others. We also offer design, mask making, TSMC 3DFabric™ advanced packaging and testing services. We produced 26 percent of the world semiconductor excluding memory output value in 2021, as compared to 24 percent in the previous year.

We believe that our scale and capacity, particularly for advanced technologies, is a major competitive advantage. Please see “– Semiconductor Manufacturing Capacity and Technology” and “– Capacity Management and Technology Upgrade Plans” for a further discussion of our capacity.

We count among our customers many of the world’s leading semiconductor companies, ranging from fabless semiconductor companies, system companies to integrated device manufacturers, including, but not limited to, Advanced Micro Devices, Inc., Broadcom Limited, Intel Corporation, MediaTek Inc., NVIDIA Corporation, NXP Semiconductors N.V., OmniVision Technology Inc., Qualcomm Inc., and Renesas Electronics Corporation.

Our Semiconductor Facilities

We currently operate one 150mm wafer fab, six 200mm wafer fabs, five 300mm wafer fabs, and four advanced backend fabs. Our corporate headquarters and seven of our fabs are located in the Hsinchu Science Park, two fabs are located in the Central Taiwan Science Park, four fabs are located in the Southern Taiwan Science Park, one fab is located in the United States, one fab is located in Shanghai, and one fab is located in Nanjing. Our corporate headquarters and our seven fabs in Hsinchu occupy parcels of land of a total of approximately 814,355 square meters. We have leased these parcels from the Hsinchu Science Park Administration in Hsinchu under agreements that will be up for renewal between December 2026 and December 2040. We have leased from the Central Taiwan Science Park Administration a parcel of land of approximately 590,584 square meters for our Taichung fabs under agreements that will be up for renewal between September 2029 and June 2041. We have leased from the Southern Taiwan Science Park Administration approximately 1,842,039 square meters of land for our fabs in the Southern Taiwan Science Park under agreements that will be up for renewal between December 2024 and December 2041. We also own approximately 143,215 square meters of land located in Miaoli, Taiwan. WaferTech, LLC (“WaferTech”) owns a parcel of land of approximately 1,052,186 square meters in the State of Washington in the United States, where the WaferTech fab and related offices are located. TSMC China owns the land use rights of 369,087 square meters of land in Shanghai, where Fab 10 and related offices are located. TSMC Nanjing owns the land use rights of 453,401 square meters of land in Nanjing, where Fab 16 and related offices are located. TSMC Arizona Corporation (“TSMC Arizona”) owns a parcel of land of approximately 4,775,885 square meters in the State of Arizona where Fab 21 and related offices will be located. Other than certain equipment under leases located at testing areas, we own all of the buildings and equipment for our fabs.

Semiconductor Manufacturing Capacity and Technology

We manufacture semiconductors on silicon wafers based on proprietary circuitry designs provided by our customers. Two key factors that characterize a foundry’s manufacturing capabilities are output capacity and fabrication process technologies. Since our establishment, we have possessed the largest capacity among the world’s dedicated foundries. We also believe that we are the technology leader among the dedicated foundries in terms of our net revenue of advanced semiconductors of 7-nanometer and below, and are one of the leaders in the semiconductor manufacturing industry for mainstream and specialty technologies. We were recognized with the 2021 IEEE Corporate Innovation Award for our leadership in 7-nanometer semiconductor foundry technology, enabling customers’ innovation in widespread applications. In addition, our 5-nanometer technology successfully entered volume production in 2020. Also, we are continuing to make progress on the development of 3-nanometer technology, which we expect to enter volume production in the second half of 2022.

The following table lists our wafer fabs and those of our subsidiaries in operation as of February 28, 2022, together with the year of commencement of commercial production, wafer size and the most advanced technology for volume production:

Fab⁽¹⁾	Year of commencement of commercial production	Wafer size	The most advanced technology for volume production⁽²⁾
2	1990	6-inch	450
3	1995	8-inch	150
5	1997	8-inch	150
6	2000	8-inch	110
8	1998	8-inch	110

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<u>Fab⁽¹⁾</u>	<u>Year of commencement of commercial production</u>	<u>Wafer size</u>	<u>The most advanced technology for volume production⁽²⁾</u>
10	2004	8-inch	150
11	1998	8-inch	150
12	2001	12-inch	5
14	2004	12-inch	16
15	2012	12-inch	7
16	2018	12-inch	16
18	2020	12-inch	5

(1) Fabs 2, 3, 5, 8 and Fab 12 are located in Hsinchu Science Park. Fab 6, Fab 14, and Fab 18 are located in the Southern Taiwan Science Park. Fab 15 is located in Central Taiwan Science Park. Fab 11 is located in the Washington State, United States. Fab 10 is located in Shanghai, China and Fab 16 is located in Nanjing, China.

(2) In nanometers, as of 2021 year-end.

In 2021, our annual capacity (in 12-inch equivalent wafers) was approximately 14 million wafers, compared to approximately 13 million wafers in 2020. This increase was primarily from the expansion of our 5-nanometer and 7-nanometer advanced technologies.

Capacity Management and Technology Upgrade Plans

We manage our overall capacity and technology upgrade plans based on long term market demand forecasts for our products and services. According to our current market demand forecasts, we intend to maintain the strategy of expanding manufacturing capacity and upgrading manufacturing technologies to meet both the fabrication and the technology needs of our customers.

Our capital expenditures in 2019, 2020 and 2021 were NT\$460,422 million, NT\$507,239 million and NT\$839,196 million (US\$30,039 million, translated from a weighted average exchange rate of NT\$27.94 to US\$1.00), respectively. Our capital expenditures in 2022 are expected to be between US\$40 billion and US\$44 billion, which, depending on market conditions, may be adjusted later. Our capital expenditures for 2019 were funded by our operating cash flow. Our capital expenditures for 2020 and 2021 were funded by our operating cash flow and proceeds from the issuance of corporate bonds, and our capital expenditures for 2022 are also expected to be funded in the same way. In 2022, we anticipate our capital expenditures to focus primarily on the following:

- installing and expanding capacity, mainly for 5-nanometer and 3-nanometer nodes, including building/facility expansion for Fab 21 and Fab 18;
- expanding capacity for specialty technologies and advanced packaging, including building/facility expansion for the Kumamoto fab in Japan; and
- investing in research and development projects for new process technologies.

We are entering a period of higher growth as the multiyear megatrends of 5G and high performance computing are expected to fuel strong demand for our semiconductor technologies in the next several years. In addition, the COVID-19 pandemic also accelerates digitalization in every aspect. We are working closely with our customers to address their needs in a sustainable manner.

These investment plans are preliminary and may change according to market conditions.

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Markets and Customers

We categorize our net revenue mainly based on the countries where our customers are headquartered, which may be different from the countries to which we actually sell or ship our products or different from where products are actually ordered. Under this approach, the following table presents a geographic breakdown of our net revenue during the periods indicated:

Geography	Year ended December 31,					
	2019		2020		2021	
	Net Revenue	Percentage	Net Revenue	Percentage	Net Revenue	Percentage
	(NT\$ in millions, except percentages)					
North America	640,335	60%	827,511	62%	1,035,982	65%
Asia Pacific ⁽¹⁾	96,512	9%	144,448	11%	225,950	14%
China	208,101	20%	233,783	17%	164,552	10%
EMEA ⁽²⁾	67,568	6%	70,214	5%	89,010	6%
Japan	57,469	5%	63,299	5%	71,921	5%
Total	<u>1,069,985</u>	<u>100%</u>	<u>1,339,255</u>	<u>100%</u>	<u>1,587,415</u>	<u>100%</u>

(1) China and Japan are excluded from Asia Pacific.

(2) EMEA stands for Europe, Middle East, and Africa.

In 2021, our net revenue increased by a total of NT\$248,160 million compared to 2020, which was mainly due to an increase in orders from North America of NT\$208,471 million, or a 25% year-over-year increase, from Asia Pacific of NT\$81,502 million, or a 56% year-over-year increase and from EMEA of NT\$18,796 million, or a 27% year-over-year increase. The increase was partially offset by a decrease in orders from China of NT\$69,231 million, or a 30% year-over-year decrease. In 2020, our net revenue increased from all geographies by a total of NT\$269,270 million compared to 2019, which was mainly due to an increase in orders from North America of NT\$187,176 million, or a 29% year-over-year increase, and from Asia Pacific of NT\$47,936 million, or a 50% year-over-year increase.

We provide worldwide customer support. Our office in Hsinchu and wholly-owned subsidiaries in the United States, Canada, Japan, China, the Netherlands and South Korea are dedicated to serving our customers worldwide. Foundry services, which are both technologically and logistically intensive, involve frequent and in-depth interaction with customers. We believe that the most effective means of providing foundry services is by developing direct and close relationships with our customers. Our customer service and technical support managers work closely with the sales force to offer integrated services to customers. To facilitate customer interaction and information access on a real-time basis, a suite of web-based applications have also been offered to provide more active interactions with customers in design, engineering and logistics.

Advance Payment by Customers. Because of the fast-changing technology and functionality in semiconductor design, foundry customers generally do not place purchase orders far in advance to manufacture a particular type of product. However, some of our customers have entered into agreements with us to pay temporary receipts in order to retain specified capacity at our fabs. The treatment of advance temporary receipts, either by refund or by accounts receivable offsetting, will be determined by mutual consent when the terms and conditions set forth in the agreements are satisfied. See note 23 to our consolidated financial statements for further information.

The Semiconductor Fabrication Process

In general, the semiconductor manufacturing process begins with a thin silicon wafer on which an array of semiconductor devices is fabricated. The following processes cover assembly, packaging, and testing of the semiconductor devices. Our focus is on wafer fabrication although we also provide other services either directly or through outsourcing arrangements.

Our Foundry Services

Range of Services. Because of our ability to provide a full array of services, we are able to accommodate customers with a variety of needs at every stage of the overall foundry process. The flexibility in input stages allows us to cater to a variety of customers with different in-house capabilities and thus to service a wider class of customers as compared to a foundry that cannot offer design or mask making services, for example.

Fabrication Processes. We manufacture semiconductors mainly using the complementary metal-oxide-semiconductor (“CMOS”) process. The CMOS process is currently the mainstream semiconductor manufacturing process. We use the CMOS process to manufacture logic semiconductors, mixed-signal/radio frequency semiconductors, which combine analog and digital circuitry in a single semiconductor, micro-electro-mechanical-system (“MEMS”), which combines micrometer featured mechanical parts, analog and digital circuitry in a single semiconductor, and embedded memory semiconductors, which combine logic and memory in a single semiconductor, etc.

Types of Semiconductors We Manufacture. We manufacture different types of semiconductors with different specific functions by changing the number and the combinations of conducting, insulating and semiconducting layers and by defining different patterns in which such layers are applied on the wafer. At any given point in time, there are thousands of different products in various stages of fabrication at our fabs. We believe that the keys to maintaining high production quality and utilization rates are our effective management and control of the manufacturing process technologies which comes from our extensive experience as the longest existing dedicated foundry and our dedication to quality control and process improvements. Our semiconductors are used for a variety of different platforms. The principal platforms include:

Smartphone Platform: We offer leading process technologies such as 4-nanometer Fin Field-Effect Transistor (“FinFET”) and 5-nanometer FinFET logic process technologies, as well as comprehensive intellectual properties for premium product applications to further enhance chip performance, reduce power consumption, and decrease chip size. For mainstream product applications, we offer a broad range of logic process technologies, including 6-nanometer FinFET, 7-nanometer FinFET plus, 7-nanometer FinFET, 12-nanometer FinFET compact plus (“12FFC+”), 12-nanometer FinFET compact (“12FFC”), 16-nanometer FinFET compact plus (“16FFC+”), 16-nanometer FinFET compact (“16FFC”), 28-nanometer high performance compact (“HPC”), 28-nanometer high performance mobile compact plus (“28HPC+”), and 22-nanometer ultra-low power (“22ULP”) logic process technologies, in addition to comprehensive intellectual properties, to satisfy customer needs for high-performance and low-power chips. Furthermore, for premium and mainstream product applications, we offer highly competitive, leading-edge specialty technologies to deliver specialty companion chips for customers’ logic application processors, including RF, embedded flash memory, emerging memory technologies, power management, sensors, and display chips, as well as advanced TSMC 3DFabric™ packaging technologies such as the leading integrated fan-out (“InFO”) technology.

High Performance Computing Platform: Driven by data explosion and application innovation, high performance computing has become one of the key growth drivers for our business. We provide customers, both fabless IC design companies and system companies, with leading-edge process technologies such as 4-nanometer FinFET, 5-nanometer FinFET, 6-nanometer FinFET, 7-nanometer FinFET and 12-nanometer/ 16-nanometer FinFET, as well as comprehensive intellectual properties including high-speed interconnect intellectual properties to meet customers’ product requirements for transferring and processing vast amounts of data anywhere and anytime. In particular, we introduced our first HPC-focused technology, N4X, representing the ultimate performance and maximum clock frequencies in our 5-nanometer family. Based on advanced process nodes, a variety of high performance computing products have been launched, such as central processing units (CPUs), graphics processor units (GPUs), field programmable gate arrays (FPGAs), server processors, accelerators, high-speed networking chips, etc. Those products can be used in current and future 5G, AI, cloud, and data centers. We also offer multiple advanced TSMC 3DFabric™ packaging technologies, such as CoWoS®, InFO, and TSMC-SoIC™, to enable homogeneous and heterogeneous chip integration to meet customers’ requirements for high performance, high compute density and efficiency, low latency and high integration. We will continue to optimize our high performance computing platform and strengthen collaboration with customers to help customers capture market growth in high performance computing markets.

IoT Platform: We provide leading, comprehensive, and highly integrated ultra-low power (“ULP”) technology platforms to enable innovations for artificial intelligence (“AI”) of things (“AIoT”, AI+ IoT) applications. Our offerings include the new FinFET-based 12-nanometer technology—N12e™ featuring energy efficiency with high performance that results in more computing power and AI inferencing, 22-nanometer ultra-low leakage (“ULL”), 28-nanometer ULP, 40-nanometer ULP, and 55-nanometer ULP, which have been widely adopted by various edge AI system-on-a-Chip (“SoC”) and battery-powered applications. We also extend our low Vdd (low operating voltage) offerings with wide-range operating voltage simulation program with integrated circuit emphasis (SPICE) models for extreme low-power applications. We also offer competitive and comprehensive specialty technologies in RF, enhanced analog devices, embedded flash memory, emerging memory, sensors, and display chips, as well as multiple TSMC 3DFabric™ advanced packaging technologies, including leading InFO technology, to support the fast-growing demand in AIoT edge computing and wireless connectivity.

Automotive Platform: Our Automotive Platform provides a comprehensive spectrum of technologies and services to support the three megatrends – safer, smarter and greener – in the automotive industry. We are also an industry leader in providing a robust automotive intellectual property ecosystem, which covers 16-nanometer FinFET and 7-nanometer FinFET technologies and extends to 5-nanometer FinFET technology, for advanced driver-assistance systems (“ADAS”), advanced in-vehicle infotainment (“IVI”), as well as zonal controllers for new electrical/electronic (“E/E”) architecture for the automotive industry. In addition to the advanced logic technology platform, we offer a broad array of competitive specialty technologies, including 28-nanometer embedded flash memory, 28-, 22- and 16-nanometer millimeter wave RF, high sensitivity CMOS Image/Lidar (light detection and ranging) sensors, and power management integrated circuit (“PMIC”). Magnetic random access memory (“MRAM”), an emerging technology, has demonstrated automotive Grade-1 capability on 22-nanometer and is under development with good progress on 16-nanometer to meet automotive Grade-1 requirements. All these automotive technologies are applied to our automotive process qualification standards based on AEC-Q100 standards or meeting our customers’ technology specifications.

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Digital Consumer Electronics (“DCE”) Platform: We provide customers with leading and comprehensive technologies to deliver AI-enabled smart devices for DCE applications, including smart digital TVs (“DTV”), set-top boxes (“STB”), AI-embedded smart cameras, and associated wireless local area networks (“WLAN”), PMIC, timing controllers (“T-CON”) and so on. Our leading 7-nanometer FinFET compact, 16FFC/12FFC, 22ULP/22ULL and 28HPC+ technologies have been widely adopted by leading global makers for 8K/4K DTV, 4K streaming STB/ over-the-top (“OTT”), digital single-lens reflex (“DSLR”) devices, and so on. We will continue to make these technologies more cost competitive through die size shrink for customers’ digital intensive chip designs, and to drive lower power consumption for more cost-effective packaging.

The following table presents a breakdown of our net revenue by platform during the periods indicated:

Platform	Year ended December 31,					
	2019		2020		2021	
	Net Revenue	Percentage	Net Revenue	Percentage	Net Revenue	Percentage
	(NT\$ in millions, except percentages)					
Smartphone	523,613	49%	645,304	48%	695,091	44%
High Performance Computing	315,822	30%	439,810	33%	587,780	37%
Internet of Things	86,343	8%	110,355	8%	133,006	8%
Automotive	47,914	4%	44,367	3%	67,077	4%
Digital Consumer Electronics	53,733	5%	54,556	4%	55,577	4%
Others	42,560	4%	44,863	4%	48,884	3%
Total	1,069,985	100%	1,339,255	100%	1,587,415	100%

Due to accelerated digital transformation caused by the COVID-19 pandemic, the increase in our net revenue from 2020 to 2021 mainly came from the High Performance Computing Platform of NT\$147,970 million, or a 34% year-over-year increase, and from the Smartphone Platform of NT\$49,787 million, or an 8% year-over-year increase. The increase also came from the Automotive Platform of NT\$22,710 million, or a 51% year-over-year increase. The increase in our net revenue from 2019 to 2020 mainly came from the High Performance Computing Platform of NT\$123,988 million, or a 39% year-over-year increase, and from the Smartphone Platform of NT\$121,691 million, or a 23% year-over-year increase. The increase also came from the Internet of Things Platform of NT\$24,012 million, or a 28% year-over-year increase.

Design and Technology Platforms. Modern integrated circuit designers need sophisticated design infrastructure to optimize productivity and cycle time. Such infrastructure includes design flow for electronic design automation (“EDA”), silicon proven building blocks such as libraries and intellectual properties, simulation and verification design kits such as process design kit (or PDK) and technology files. All of this infrastructure is built on top of the technology foundation, and each technology needs its own design infrastructure to be usable for designers. This is the concept of our technology platforms.

For years, we and our alliance partners have spent considerable effort, time and resources to build our technology platforms. We unveiled an Open Innovation Platform® (“OIP”) initiative in 2008 to further enhance our technologies offerings. More OIP deliverables were introduced over the years, as well as in 2021. In the design methodology area, we announced EDA and intellectual property readiness of 3-nanometer and 5-nanometer, as well as continuous development of solutions to enhance power, performance and area (or PPA) on existing production technology nodes, including 6-nanometer, 12-nanometer and 22-nanometer nodes based on 7-nanometer, 16-nanometer and 28-nanometer, respectively. In addition, we also announced the availability of various 3-Dimensional Integrated Circuit reference flows to support TSMC 3DFabric™ that covers a wide range of design applications.

Multi-project Wafer Program (“CyberShuttle®”). To help our customers reduce costs, we offer a dedicated multi-project wafer processing service that allows us to provide multiple customers with circuits produced with the same mask. This program reduces mask costs by a very significant amount, resulting in accelerated time-to-market for our customers. We have extended this program to all of our customers and library and intellectual property partners using our broad selection of process technologies, ranging from the latest 3-, 4-, 5-, 6-, 7-, 12-, 16-, 22-, 28-, 40-, 45-, 55-, 65- and 90-nanometer processes to 0.13-, 0.18-, 0.25-, 0.35- and 0.5-micron. This extension offers a routinely scheduled multi-project wafer run to customers on a shared-cost basis for prototyping and verification.

We developed our multi-project wafer program in response to the current SoC development methodologies, which often require the independent development, prototyping and validation of several intellectual properties before they can be integrated onto a single device. By sharing mask costs among our customers to the extent permissible, the SoC supplier can enjoy reduced prototyping costs and greater confidence that the design will be successful.

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Customer Service

We believe that our dedication to customer service has been an indispensable factor in attracting new customers, helping to ensure the satisfaction of existing customers, and building a mutually beneficial relationship with our customers. The key elements are our:

- customer-oriented culture through multi-level interaction with customers;
- ability to deliver products of consistent quality, competitive ramp-up speed and fast yield improvement;
- responsiveness to customers' issues and requirements, such as engineering change and special wafer handling requests;
- flexibility in manufacturing processes, supported by our competitive technical capability and production planning;
- dedication to help reduce customer costs through collaboration and services, such as our multi-project wafer program, which combines multiple designs on a single mask set for cost-saving; and
- availability of our online service which provides necessary information in design, engineering and logistics to ensure seamless services to our customers throughout the product life cycle.

We also conduct an annual customer satisfaction survey to assess customer satisfaction and to ensure that their needs are adequately understood and addressed. Continuous improvement plans based upon customer feedback are an integral part of this business process. We use data derived from the survey as a base to identify future focus areas. We believe that satisfaction leads to better customer relationships, which would result in more business opportunities.

Research and Development

The semiconductor industry is characterized by rapid changes in technology, frequently resulting in the introduction of new technologies to meet customers' demand and in the obsolescence of recently introduced technology and products. We believe that, in order to stay technologically ahead of our competitors and to maintain our market position in the foundry segment of the semiconductor industry, we need to maintain our position as a technology leader not only in the foundry segment but in the semiconductor industry in general. We spent NT\$91,419 million, NT\$109,486 million and NT\$124,735 million (US\$4,497 million) in 2019, 2020 and 2021, respectively, on research and development, which represented 8.6%, 8.2% and 7.9% of our net revenue, respectively. We plan to continue to invest significant amounts on research and development in 2022, with the goal of maintaining a leading position in the development of advanced process technologies. Our research and development efforts have allowed us to provide our customers access to certain advanced process technologies, such as 16-, 10-, 7- and 5-nanometer technology for volume production, prior to the implementation of those advanced process technologies by our competitors and many integrated device manufacturers. In addition, we expect to advance our process technologies further down to 3-nanometer and 2-nanometer and below in the coming years to maintain our technology leadership. We will also continue to invest in research and development for our mature technologies offerings to provide function-rich process capabilities to our customers. Our research and development efforts are divided into centralized research and development activities and research and development activities undertaken by each of our fabs. Our centralized research and development activities are principally directed toward developing new logic, SoC, derivatives and package/system-in-package (or SIP) technologies, and cost-effective 3D wafer level system integration solutions, including Integrated Fan-Out ("InFO"), Chip-on-Wafer-on-Substrate ("CoWoS[®]"), and System on Integrated Chip ("TSMC-SoIC[®]") technologies. Fab-conducted research and development activities mostly focus on upgrading the manufacturing process technologies.

In continuing to advance our process technologies, we intend to rely primarily on our internal engineering capability, know-how and research and development efforts, including collaboration with our customers, equipment vendors and external research and development consortia.

We also continually create inventions and in-house know-how. Since our inception, we have applied for and have been issued a substantial number of patents in the United States and other countries, the majority of which are semiconductor-related.

Competition

We compete internationally and domestically with other foundry service providers, as well as with a number of integrated device manufacturers. We compete primarily on process technologies, manufacturing excellence, customer trust and service quality, such as earlier technology readiness, better quality, faster yield improvement and shorter cycle time. The level of competition varies with the process technologies involved. For example, in more mature technologies, competitors tend to be numerous and offer specialized processes. Some companies compete with us in selected geographic regions or niche application markets. In recent years, substantial investments have been made by others to establish new foundry capacities worldwide, or to transform certain manufacturing operations of integrated device manufacturers into foundry capacities.

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Equipment

The quality and technology of the equipment used in the semiconductor manufacturing process are important in that they effectively define the limits of our process technologies. Advances in process technologies cannot be brought about without commensurate advances in equipment technology. We have periodic meetings with important suppliers with respect to co-developing next-generation equipment.

The principal pieces of equipment used by us to manufacture semiconductors are scanners, cleaners and track equipment, inspection equipment, etchers, furnaces, wet stations, strippers, implanters, sputters, chemical vapor deposition (CVD) equipment, chemical mechanism polish (CMP) equipment, testers and probers. Other than certain equipment under leases located at testing areas, we own all of the equipment used at our fabs.

In implementing our capacity management and technology advancement plans, we expect to make significant purchases of equipment required for semiconductor manufacturing. Some of the equipment is available from a limited number of vendors and/or is manufactured in relatively limited quantities, and certain equipment has only recently been developed. We believe that our relationships with our equipment suppliers are good and that we have enjoyed the advantages of being a major purchaser of semiconductor fabrication equipment. We work closely with manufacturers to provide equipment customized to our needs for certain advanced technologies.

Raw Materials

Our manufacturing processes use many raw materials, primarily silicon wafers, chemicals, gases and various types of precious metals. Although most of our raw materials are available from multiple suppliers, some materials are purchased through sole-sourced vendors. Our raw material procurement policy is to select only those vendors who have demonstrated quality control and reliability on delivery time and to maintain multiple sources for each raw material whenever possible so that a quality or delivery problem with any one vendor will not adversely affect our operations. The quality and delivery performance of each vendor is evaluated quarterly and quantity allocations are adjusted for subsequent periods based on the evaluation.

The most important raw material used in our production is silicon wafer, which is the basic raw material from which integrated circuits are made. The principal suppliers for our wafers are Formosa SUMCO Technology Corporation of Taiwan, GlobalWafers of Taiwan, Shin-Etsu Handotai of Japan, Siltronic AG of Germany, Soitec Microelectronics of Singapore, and SUMCO Corporation of Japan. Together they supplied approximately 91.8%, 92.6% and 96.0% of our total wafer needs in 2019, 2020 and 2021, respectively. We have in the past obtained, and believe we will continue to be able to obtain, a sufficient supply of wafers. In order to secure a reliable and flexible supply of high quality wafers, we have entered into long-term agreements and intend to continue to develop strategic relationships with major wafer vendors to cover our anticipated wafer needs for future years. Also, we actively address supply chain issues and bring together fab operations, materials management, quality system and risk management teams to mitigate potential supply chain risks and enhance supply chain agility. This taskforce works with our primary suppliers to review their business continuity plans, qualify their dual-plant materials, prepare safety inventories, improve the quality of their products and manage the supply chain risks of their suppliers. Please see “Item 3. Key Information – Risk Factors – Risks Relating to Our Business” for a discussion of the risk related to raw materials, including the fluctuation of prices of our main raw materials.

Environmental and Climate Related Laws and Regulations

The semiconductor production process generates gaseous chemical wastes, greenhouse gases (“GHG”), liquid wastes, wastewater and other industrial wastes in various stages of the manufacturing process. We have installed in our fabs various types of pollution control equipment for the treatment of gaseous and liquid chemical wastes and wastewater, equipment for GHG emission reduction and equipment for the recycling of used chemicals and treated water. Operations at our fabs are subject to regulations and periodic monitoring by the R.O.C. Environmental Protection Administration, the U.S. Environmental Protection Agency, the State Environmental Protection Administration of China and the Japan Ministry of the Environment, and local environmental protection authorities in Taiwan, the U.S., China and Japan.

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We have adopted pollution control and GHG emission reduction measures to ensure compliance with environmental protection and climate related standards consistent with the practice of the semiconductor industry in Taiwan, the U.S., China and Japan. We conduct environmental audits at least once annually to ensure that we are in compliance in all material respects with applicable environmental and climate related laws and regulations. An environmental, safety and health (“ESH”) team operates at the corporate level that is responsible for policy establishment and enforcement, coordination with ESH teams located at each manufacturing facility and for coordination and interaction with government agencies worldwide.

To fulfill our commitment to environmental sustainability in our business and operations, we have continued to explore and participate in initiatives to expand our use of renewable energy. Between 2019 and 2021, we purchased an approximately 3,810 GWh in renewable energy, renewable energy certificates, and carbon credits, which enabled our overseas sites to be 100% powered by clean energy. Following Taiwan’s power liberalization, we are expanding our use of renewable energy. As of the end of 2021, we have signed power purchase agreements to purchase 1.6 GW of renewable energy, thereby eliminating an estimated 2.6 million metric tons of carbon dioxide equivalent emissions per year.

Environmental, Social and Governance (“ESG”) Initiatives

We believe that our innovative technologies and services can help to bring positive changes and make positive contributions to the global community. We are strongly committed to pursuing a sustainable future and achieving our vision of contributing to society through a range of ESG initiatives. In 2011, we established the Corporate Social Responsibility Committee (renamed as the ESG Committee in 2021), which is in compliance with the vision and mission of the TSMC Corporate Social Responsibility Policy (renamed as the ESG Policy in 2021). We have been further connected to the international sustainability trend by establishing a CSR Executive Committee in 2019 (renamed as the ESG Steering Committee in 2021), which is comprised of senior executives from various functions and tasked with developing our ESG strategies. In addition, we have mapped out a blueprint for sustainable development that connects our core advantages with United Nations’ Sustainable Development Goals (SDGs).

We currently focus our ESG efforts in the following key areas:

Green manufacturing. We aim to lead the industry in developing advanced semiconductor technologies and employing green product and process innovations to help address the impacts of climate change. We are committed to green manufacturing that implements continuous improvement projects in the areas of climate change, energy management, water management, waste management, and air pollution control.

Building a responsible supply chain. We seek to build a green and sustainable supply chain for the semiconductor industry by working with our supplier partners and helping them to incorporate sustainability standards into their daily operations.

Creating a diverse and inclusive workplace. Our employees are the most valuable asset of TSMC. We are committed to building a diverse and encompassing workplace where each and every employee enjoys human rights, skill development and a safe work environment.

Talent development. We seek to inspire the next generation of talent in the semiconductor industry through collaborations with top universities and research institutions and support of science, technology, engineering and mathematics-related education.

Caring for the disadvantaged. We promote positive social change and reduce the resource gaps through the work of the TSMC Charity Foundation and the TSMC Education and Culture Foundation, which focus on serving the underserved communities, empowering the youth, promoting environmental awareness, and supporting arts and culture.

For further information on our ESG initiatives, please see our annual Corporate Social Responsibility Reports, which are available on our ESG website at <https://esg.tsmc.com/en/resources/documents.html>. The information contained on our website is not incorporated herein by reference and does not constitute part of this annual report. Pursuant to the requirements of the R.O.C. Financial Supervisory Commission (the “R.O.C. FSC”), commencing in 2022, our Corporate Social Responsibility Report will be renamed the Sustainability Report.

Electricity and Water

We have occasionally suffered power outages or surges in Taiwan caused by difficulties encountered by our electricity supplier, the Taiwan Power Company or other power consumers on the same power grid. Such power outages or surges may lead to interruptions in our production schedule. The semiconductor manufacturing process uses extensive amounts of electricity and fresh water. Due to changes in the energy policy of the government, the growth of manufacturers in the Hsinchu Science Park, Southern Taiwan Science Park and Central Taiwan Science Park, and the droughts that Taiwan experiences from time to time, there is concern regarding future availability of sufficient electricity and fresh water and the potential impact that insufficient electricity and water supplies may have on our semiconductor production. To help address these potential shortages, we have adopted various natural resources conservation methodologies. Please see “Item 3. Key Information – Risk Factors – Risks Relating to Our Business” for a discussion of the risk related to shortages in electricity and water.

Risk Management

We maintain a comprehensive enterprise risk management system to integrate the prevention and control of risk. We have also prepared emergency response, crisis management and business continuity plans to respond to natural disasters and other disruptive events such as cyberattacks or epidemic/pandemic outbreaks that could interrupt the operation of our business. These plans have been developed in order to prevent or reduce the loss of personnel or damage to our facilities, equipment and machinery caused by natural disasters and other disruptive events. We also maintain insurance with respect to our facilities, equipment and inventories. The insurance for the fabs and their equipment covers, subject to some limitations, various risks, including fire, typhoons, earthquakes and other risks generally up to the respective policy limit for their replacement values and lost profits due to business interruption. In addition, we have insurance policies covering losses with respect to the construction of all our fabs. Equipment and inventories in transit are also insured. No assurance can be given, however, that insurance will fully cover any losses and our emergency response plans will be effective in preventing or reducing losses in the future.

For further information, please see detailed risk factors related to the impact of climate change regulations and international accords, and natural disasters on our operations in “Item 3. Key Information – Risk Factors – Risks Relating to Our Business”.

Our Subsidiaries and Affiliates

Vanguard International Semiconductor Corporation (“VIS”). In 1994, we, the R.O.C. Ministry of Economic Affairs and other investors established VIS, then an integrated dynamic random access memory (“DRAM”) manufacturer. VIS commenced volume commercial production in 1995 and listed its shares on the Taipei Exchange (originally the R.O.C. Over-the-Counter Securities Exchange) in March 1998. In 2004, VIS completely terminated its DRAM production and became a dedicated foundry company. As of February 28, 2022, we owned approximately 28.3% of the equity interest in VIS. Please see “Item 7. Major Shareholders and Related Party Transactions” for a further discussion.

WaferTech. In 1996, we entered into a joint venture called WaferTech (of which the manufacturing entity is Fab 11) with several U.S.-based investors to construct and operate a foundry in the United States. Initial trial production at WaferTech commenced in July 1998 and commercial production commenced in October 1998. As of February 28, 2022, we owned 100% of the equity interest in WaferTech.

Systems on Silicon Manufacturing Company Pte. Ltd. (“SSMC”). In March 1999, we entered into an agreement with Koninklijke Philips NV (“Philips”) and EDB Investment Pte. Ltd. to found a joint venture, SSMC, and build a fab in Singapore. The SSMC fab commenced production in December 2000. As of February 28, 2022, we owned approximately 38.8% of the equity interest in SSMC. Please see “Item 7. Major Shareholders and Related Party Transactions” for a further discussion.

Global Unichip Corporation (“GUC”). In January 2003, we acquired a 52.0% equity interest in GUC, a SoC design service company that provides large scale SoC implementation services. GUC listed its shares on Taiwan Stock Exchange in November 2006. As of February 28, 2022, we owned approximately 34.8% of the equity interest in GUC. Please see “Item 7. Major Shareholders and Related Party Transactions” for a further discussion.

TSMC China. In August 2003, we established TSMC China (of which the manufacturing entity is Fab 10), a wholly-owned subsidiary primarily engaged in the manufacture and sale of integrated circuits. TSMC China commenced production in late 2004.

VisEra Technologies Company, Ltd. (“VisEra Technologies”). In October 2003, we and OmniVision Technologies Inc. (“OVT”), entered into an agreement to form VisEra Technologies, a joint venture in Taiwan, for the purpose of providing back-end service for CMOS image sensor manufacturing business. In November 2015, we obtained an additional 42.7% beneficial equity interest in VisEra Technologies from OVT when OVT was acquired by a Chinese consortium. Following the above transactions, we owned approximately 86.9% of the equity interest in VisEra Technologies. In March 2021, we disposed a total of 39.5 million common shares of VisEra Technologies to facilitate its IPO in Taiwan. VisEra Technologies started to trade on the Emerging Board of Taipei Exchange in April 2021 and had its listing application approved by Taiwan Stock Exchange Corporation in March 2022. As of February 28, 2022, we owned approximately 72.8% of the equity interest in VisEra Technologies.

TSMC Global. In December 1998, we established TSMC Holding Ltd. in the B.V.I. as a company with limited liability. In 2006, TSMC Holding Ltd. was renamed to TSMC Global Ltd. TSMC Global is a wholly-owned subsidiary primarily engaged in corporate treasury investment activities.

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Xintec, Inc. (“Xintec”). In January 2007, we acquired a 51.2% equity interest in Xintec, a supplier of wafer level packaging service, to support our CMOS image sensor manufacturing business. In March 2015, Xintec listed its shares on the Taipei Exchange. Subsequent to Xintec’s IPO, our shareholding in Xintec was diluted to approximately 41.2%. As of February 28, 2022, we owned approximately 41.0% of the equity interest in Xintec. Please see “Item 7. Major Shareholders and Related Party Transactions” for a further discussion.

TSMC Nanjing. In May 2016, we established TSMC Nanjing (of which the manufacturing entity is Fab 16), a wholly-owned subsidiary primarily engaged in the manufacture and sale of integrated circuits. TSMC Nanjing commenced commercial production in April 2018.

TSMC Arizona. In November 2020, we established TSMC Arizona, a wholly-owned subsidiary that is expected to be primarily engaged in the manufacture and sale of integrated circuits. TSMC Arizona plans to build and operate an advanced semiconductor manufacturing facility, Fab 21, in the City of Phoenix area. Construction on the site commenced in April 2021. TSMC Arizona targets to commence commercial production in 2024.

Japan Advanced Semiconductor Manufacturing (“JASM”). In December 2021, we established JASM, which is expected to be primarily engaged in the manufacture and sale of integrated circuits. In January 2022, Sony Semiconductor Solution Corporation (“Sony”) acquired a less than 20% equity interest in JASM. Subsequently, in February 2022, DENSO Corporation (“DENSO”) also announced that it will acquire a more than 10% minority equity interest in JASM for a consideration of approximately US\$350 million. JASM plans to spend approximately US\$8.6 billion in capital expenditure, with strong support from the Japanese government, to build a semiconductor manufacturing facility in Kumamoto, Japan for 22-nanometer and 28-nanometer process as well as 12-nanometer and 16-nanometer FinFET process technology, with an expected production capacity of 55,000 12-inch wafers per month. Construction of the fab commenced in 2022 and commercial production is expected to commence in 2024. As of February 28, 2022, we owned approximately 81.0% of the equity interest in JASM.

ITEM 4A. UNRESOLVED STAFF COMMENTS

None.

ITEM 5. OPERATING AND FINANCIAL REVIEWS AND PROSPECTS

The following discussion covers items for and a comparison between the fiscal years ended December 31, 2021 and 2020. For the discussion covering items for the fiscal year ended December 31, 2019 and a comparison between the fiscal years ended December 31, 2020 and 2019, please refer to “Item 5” of our annual report on Form 20-F for the fiscal year ended December 31, 2020 filed with the U.S. Securities and Exchange Commission (“U.S. SEC”).

Overview

We manufacture a variety of semiconductors based on designs provided by our customers. Our business model is commonly called a “dedicated semiconductor foundry.” As the leader of the foundry segment, our net revenue and net income attributable to shareholders of the parent were NT\$1,339,255 million and NT\$510,744 million in 2020, and NT\$1,587,415 million (US\$57,225 million) and NT\$592,359 million (US\$21,354 million) in 2021, respectively. Our net revenue in 2021 increased by 18.5% compared to 2020, mainly attributed to the growing demand for 5-nanometer and 7-nanometer products, partially offset by the appreciation of the NT dollar against the U.S. dollar on a weighted average basis from 2020 to 2021.

The principal source of our revenue is wafer fabrication, which accounted for approximately 89% of our net revenue in 2021. The rest of our net revenue was mainly derived from packaging and testing services, mask making, design, and royalty income. Factors that significantly impact our revenue include:

- worldwide demand and capacity supply for semiconductor products;
- pricing;
- production capacity;
- technology development; and
- fluctuation in foreign currency exchange rates.

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While the above factors are significant factors, four of which are elaborated as follows:

Pricing. We establish pricing levels for specific periods of time with our customers, some of which are subject to adjustment during the course of that period to take into account market conditions and other factors. We believe that customers find value in our flexible manufacturing capabilities, focus on customer service and timely delivery of high yield products, and this value is reflected in our pricing. Our pricing enables us to continue to invest significantly in research and development to deliver ever-improving products to our customers.

Production Capacity. We currently own and operate our semiconductor manufacturing facilities. For the year of 2020 and 2021, our production capacity was approximately 13 million and 14 million 12-inch equivalent wafers, respectively.

Technology Development. Our operation utilizes a variety of process technologies, ranging from mature process technologies of 0.25 micron or above circuit resolutions to advanced process technologies of 5-nanometer circuit resolutions. The table below presents a breakdown of wafer revenue by circuit resolution during the periods indicated:

Resolution	Year ended December 31,		
	2019	2020	2021
	Percentage of total wafer revenue ⁽¹⁾	Percentage of total wafer revenue ⁽¹⁾	Percentage of total wafer revenue ⁽¹⁾
5-nanometer	—	8%	19%
7-nanometer	27%	33%	31%
10-nanometer	3%	—	—
16-nanometer	20%	17%	14%
20-nanometer	1%	1%	—
28-nanometer	16%	13%	11%
40/45-nanometer	10%	9%	7%
65-nanometer	8%	5%	5%
90-nanometer	3%	2%	2%
0.11/0.13 micron	2%	3%	3%
0.15/0.18 micron	8%	7%	6%
≥0.25 micron	2%	2%	2%
Total	100%	100%	100%

⁽¹⁾ The figure represents wafer revenue from a certain technology as a percentage of the total wafer revenue.

In 2021, the 5-nanometer and 7-nanometer revenues represented 19% and 31% of total wafer revenue, respectively. Advanced technologies (7-nanometer and below) accounted for 50% of total wafer revenue, up from 41% in 2020.

In 2020, the 5-nanometer and 7-nanometer revenues represented 8% and 33% of total wafer revenue, respectively. Advanced technologies (7-nanometer and below) accounted for 41% of total wafer revenue, up from 27% in 2019.

Foreign Currency Exchange Rate. Substantially all of our sales are denominated in U.S. dollars while we publish our financial statements in NT dollars. As a result, fluctuations in exchange rates of the NT dollar against the U.S. dollar would have a significant impact on our reported revenue. The NT dollar appreciation in 2021 had an unfavorable effect on our revenue, with weighted average exchange rates of the NT dollar per U.S. dollar appreciating from NT\$29.43 in 2020 to NT\$27.94 in 2021.

Critical Accounting Policies, Judgments and Key Sources of Estimation and Uncertainty

Summarized below are our accounting policies that we believe are important to the portrayal of our financial results and also involve the need for management to make estimates about the effect of matters that are uncertain in nature. Actual results may differ from these estimates, judgments and assumptions. Certain accounting policies are particularly critical because of their significance to our reported financial results and the possibility that future events may differ significantly from the conditions and assumptions underlying the estimates used and judgments made by us in preparing our financial statements. We have considered the economic implications of COVID-19 on critical accounting estimates and will continue to evaluate the impact on our financial position and financial performance as a result of the pandemic. The following discussion should be read in conjunction with the consolidated financial statements and related notes, which are included in this annual report.

Critical Accounting Policies and Judgments

Revenue Recognition. We recognize revenue when performance obligations are satisfied. Our performance obligations are satisfied when customers obtain control of the promised goods, which is generally when the goods are delivered to our customers' specified locations.

Commencement of Depreciation Related to Property, Plant and Equipment Classified as Equipment under Installation and Construction in Progress (EUI/CIP). Commencement of depreciation related to EUI/CIP involves determining when the assets are available for their intended use. The criteria we use to determine whether EUI/CIP are available for their intended use involves subjective judgments and assumptions about the conditions necessary for the assets to be capable of operating in the intended manner.

Judgments on Lease Terms. In determining a lease term, we consider all facts and circumstances that create an economic incentive to exercise or not to exercise an option, including any expected changes in facts and circumstances from the commencement date until the exercise date of the option. Main factors considered include contractual terms and conditions covered by the optional periods, and the importance of the underlying asset to the lessee's operations, etc. The lease term is reassessed if a significant change in circumstances that are within our control occurs.

Critical Accounting Policies and Key Sources of Estimation and Uncertainty

Estimation of Sales Returns and Allowances. Sales returns and other allowances is estimated and recorded based on historical experience and in consideration of different contractual terms. The amount is deducted from revenue in the same period the related revenue is recorded. We periodically review the reasonableness of the estimates. However, because of the inherent nature of estimates, actual returns and allowances could be different from our estimates. If the actual returns are greater than our estimated amount, we could be required to record an additional liability, which would have a negative impact on our recorded revenue and gross margin. For further information, please refer to note 23 to the consolidated financial statements.

Inventory Valuation. Inventories are stated at the lower of cost or net realizable value for finished goods, work-in-progress, raw materials, supplies and spare parts. Inventory write-downs are made on an item-by-item basis, except where it may be appropriate to group similar or related items.

A significant amount of our manufacturing costs is fixed because our extensive manufacturing facilities (which provide us large production capacity) require substantial investment to construct and are largely fixed-cost assets once they become operational. When the capacity utilization increases, the fixed manufacturing costs are spread over a larger amount of output, which would lower the inventory cost per unit.

We evaluate our ending inventory based on standard cost under normal capacity utilization, and reduce the carrying value of our inventory when the actual capacity utilization is higher than normal capacity utilization. No adjustment is made to the carrying value of inventory when the actual capacity utilization is at or lower than normal capacity utilization. Normal capacity utilization is established based on historic loadings compared to total available capacity in our wafer manufacturing fabs.

We also evaluate our ending inventory and reduce the carrying value of inventory for normal waste, obsolescence and unmarketable items by an amount that is the difference between the cost of the inventory and the net realizable value. The net realizable value of the inventory is determined mainly based on assumptions of future demand within a specific time horizon, which is generally 180 days or less.

Impairment of Tangible Assets, Right-of-Use Assets and Intangible Assets Other than Goodwill. We assess the impairment of tangible assets (property, plant and equipment), right-of-use assets and intangible assets other than goodwill whenever triggering events or changes in circumstances indicate that the asset may be impaired and the carrying value may not be recoverable.

Indicators we consider important which could trigger an impairment review include, but are not limited to, the following:

- significant underperformance relative to historical or projected future operating results;
- significant changes in the manner of our use of the acquired assets or our overall business strategy; and
- significant unfavorable industry or economic trends.

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When we determine that the carrying value of tangible assets, right-of-use assets and intangible assets may not be recoverable based upon the existence of one or more of the above indicators of impairment, we measure any impairment for tangible assets, right-of-use assets and intangible assets based on projected future cash flow. If the tangible assets, right-of-use assets or intangible assets are determined to be impaired, we recognize an impairment loss through a charge to our operating results to the extent the recoverable amount, measured at the present value of discounted cash flows attributable to the assets, is less than their carrying value. Such cash flow analysis includes assumptions about expected future economic and market conditions, the applicable discount rate, and the future revenue generation from the use or disposition of the assets. We also perform a periodic review to identify assets that are no longer used and are not expected to be used in future periods and record an impairment charge to the extent that the carrying amount of the tangible assets, right-of-use assets and intangible assets exceeds the recoverable amount. If the recoverable amount subsequently increases, the impairment loss previously recognized will be reversed to the extent of the increase in the recoverable amount, provided that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset in prior years.

In the process of evaluating the potential impairment of tangible assets, right-of-use assets and intangible assets other than goodwill, we are required to review for impairment groups of assets related to the lowest level of identifiable independent cash flows. We determine the independent cash flows that can be related to specific asset groups. In addition, we determine the remaining useful lives of assets and the expected future revenue and expenses associated with the assets. Any change in these estimates based on changed economic conditions or business strategies could result in significant impairment charges or reversal in future periods. Our projection for future cash flow is generally lower during periods of reduced earnings. As a result, an impairment charge is more likely to occur during a period when our operating results are already otherwise depressed.

In 2019, we recognized a reversal of impairment loss of NT\$301 million due to redeployment of certain idle machinery and equipment. In 2021, we recognized an impairment loss of NT\$274 million for certain machinery and equipment that was assessed to have no future use, and the recoverable amount of certain machinery and equipment was nil. As of December 31, 2020 and 2021, net tangible assets, right-of-use assets and intangible assets amounted to NT\$1,603,649 million and NT\$2,029,296 million (US\$73,154 million), respectively.

Realization of Deferred Income Tax Assets. When we have temporary differences in the amount of tax expenses recorded for tax purposes and financial reporting purposes, we may be able to reduce the amount of tax that we would otherwise be required to pay in future periods. We generally recognize deferred tax assets to the extent that it is probable that sufficient taxable income will be available in the future to utilize such assets. The income tax benefit or expense is recorded when there is a net change in our total deferred tax assets and liabilities in a period. The ultimate realization of the deferred tax assets depends upon the generation of future taxable income during the periods in which the temporary differences may be utilized. Specifically, the realization of deferred income tax assets is impacted by our expected future revenue growth and profitability, tax holidays, Alternative Minimum Tax (“AMT”), the surtax imposed on unappropriated earnings and the amount of tax credits that can be utilized within the statutory period. In determining the amount of deferred tax assets as of December 31, 2021, we considered past performance, the general outlook of the semiconductor industry, business conditions, future taxable income and prudent and feasible tax planning strategies.

Because the determination of the amount of deferred tax assets that can be realized is based, in part, on our forecast of future profitability, it is inherently uncertain and subjective. Changes in market conditions and our assumptions may cause the actual future profitability to differ materially from our current expectation, which may require us to increase or decrease the deferred tax assets that we have recorded. As of December 31, 2020 and 2021, deferred tax assets were NT\$25,958 million and NT\$49,154 million (US\$1,772 million), respectively. Deferred tax assets increased by NT\$23,196 million in 2021, mainly due to depreciation of certain fixed assets that resulted in temporary differences between the carrying value of these fixed assets and their tax basis, which may be deductible for tax purposes in the future.

Determination of Lessees’ Incremental Borrowing Rates. In determining a lessee’s incremental borrowing rate used in discounting lease payments, we mainly take into account the market risk-free rates, the estimated lessee’s credit spreads and secured status in a similar economic environment.

Results of Operations

The following table sets forth, for the periods indicated, certain financial data from our consolidated statements of profit or loss and other comprehensive income, expressed in each case as a percentage of net revenue:

	For the year ended December 31,		
	2019	2020	2021
Net revenue	100.0%	100.0%	100.0%
Cost of revenue	(54.0)%	(46.9)%	(48.4)%
Gross profit	46.0%	53.1%	51.6%
Operating expenses			
Research and development	(8.6)%	(8.2)%	(7.9)%
General and administrative	(2.0)%	(2.1)%	(2.3)%

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	For the year ended December 31,		
	2019	2020	2021
Marketing	(0.6)%	(0.5)%	(0.5)%
Total operating expenses	(11.2)%	(10.8)%	(10.7)%
Other operating income and expenses, net	0.0%	0.0%	0.0%
Income from operations	34.8%	42.3%	40.9%
Income before income tax	36.4%	43.7%	41.8%
Income tax expense	(3.3)%	(5.5)%	(4.5)%
Net income	33.1%	38.2%	37.3%
Other comprehensive loss for the year, net of income tax	(1.1)%	(2.3)%	(0.4)%
Total comprehensive income for the year	32.0%	35.9%	36.9%
Net income attributable to shareholders of the parent	33.1%	38.1%	37.3%
Net income attributable to non-controlling interests	0.0%	0.1%	0.0%

Year to Year Comparisons

Net Revenue and Gross Margin

	For the year ended December 31,					% Change in NTS from 2020
	2019	2020	% Change in NTS from 2019	2021		
	NT\$	NT\$		NT\$	US\$	
	(in millions, except for percentages and wafer shipment)					
Net revenue	1,069,985	1,339,255	25.2%	1,587,415	57,225	18.5%
Cost of revenue	(577,283)	(628,125)	8.8%	(767,878)	(27,681)	22.2%
Gross profit	492,702	711,130	44.3%	819,537	29,544	15.2%
Gross margin percentage	46.0%	53.1%	—	51.6%	51.6%	—
Wafer (12-inch equivalent) shipment ⁽¹⁾	10,068	12,398	—	14,179	14,179	—

(1) In thousands.

Net Revenue

Our net revenue in 2021 increased by 18.5% from 2020, which was mainly attributed to an increase in wafer shipments and ASP due to higher advanced technology (7-nanometer and below) revenue weighting, partially offset by an appreciation of the NT dollar against the U.S. dollar. We shipped approximately 14.2 million 12-inch equivalent wafers in 2021 compared to 12.4 million in 2020.

Gross Margin

Our gross margin fluctuates with the level of capacity utilization, price change, cost improvement, product mix and exchange rate, among other factors. Furthermore, our gross margin would be negatively impacted in the year when a new technology is introduced.

In 2021, our gross margin decreased to 51.6% of net revenue from 53.1% in 2020, mainly ascribed to an unfavorable impact from NT dollar appreciation and dilution from 5-nanometer products, partially offset by cost improvement.

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Operating Expenses

	For the year ended December 31,					
	2019	2020	% Change in NT\$ from 2019	2021		% Change in NT\$ from 2020
				NT\$	US\$	
	(in millions, except percentages)					
Research and development	91,419	109,486	19.8%	124,735	4,497	13.9%
General and administrative	21,737	28,457	30.9%	36,929	1,331	29.8%
Marketing	6,349	7,113	12.0%	7,559	272	6.3%
Total operating expenses	119,505	145,056	21.4%	169,223	6,100	16.7%
Percentage of net revenue	11.2%	10.8%	—	10.7%	10.7%	—
Other operating income and expenses, net	(496)	710	—	(333)	(13)	(146.9)%
Income from operations	372,701	566,784	52.1%	649,981	23,431	14.7%
Operating Margin	34.8%	42.3%	—	40.9%	40.9%	—

Operating expenses increased by NT\$24,167 million in 2021, or 16.7%, from 2020.

Research and Development Expenses

We remain strongly committed to being the leader in advanced process technologies development. We believe that continuing investment in process technologies is essential for us to remain competitive in the markets we serve.

Research and development expenses increased by NT\$15,249 million in 2021, or 13.9%, from 2020. The increases were mainly attributed to a higher level of research activities for 2-nanometer, 3-nanometer and 4-nanometer process technologies, as we continued to advance to smaller processing nodes, partially offset by a lower level of research activities for 5-nanometer and 7-nanometer.

We plan to continue our investment in technology research and development in 2022.

General and Administrative and Marketing Expenses

General and administrative and marketing expenses in 2021 increased by NT\$8,918 million, or 25.1%, compared to 2020, mainly reflecting donation of vaccines and start-up expense of overseas fab preparation.

Other Operating Income and Expenses, Net

Net other operating income and expenses in 2021 decreased by NT\$1,043 million from 2020, mainly due to a loss on disposal of property, plant and equipment of NT\$274 million, compared to a gain on disposal of property, plant and equipment of NT\$189 million in 2020, and higher impairment loss on property, plant and equipment of NT\$264 million compared to 2020.

Non-Operating Income and Expenses

	For the year ended December 31,					
	2019	2020	% Change in NT\$ from 2019	2021		% Change in NT\$ from 2020
				NT\$	US\$	
	(in millions, except percentages)					
Share of profits of associates	2,861	3,562	24.5%	5,513	199	54.8%
Interest income	16,190	9,018	(44.3)%	5,708	206	(36.7)%
Other income	417	661	58.5%	973	35	47.2%
Foreign exchange gain (loss), net	2,095	(3,303)	(257.7)%	13,663	492	—
Finance costs	(3,251)	(2,082)	(36.0)%	(5,414)	(195)	160.0%
Other gains and losses, net	(1,151)	10,106	—	(7,388)	(266)	(173.1)%
Net non-operating income	17,161	17,962	4.7%	13,055	471	(27.3)%

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Non-operating income and expenses in 2021 decreased by NT\$4,907 million, or 27.3%, from 2020, mainly due to higher finance costs of NT\$3,332 million and lower interest income of NT\$3,310 million compared to 2020. The decreases were partially offset by higher share of profits of associates of NT\$1,951 million.

Income Tax Expense

	For the year ended December 31,					% Change in NT\$ from 2020
	2019	2020	% Change in NT\$ from 2019	2021		
	NT\$	NT\$		NT\$	US\$	
	(in millions, except percentages)					
Income tax expense	(35,835)	(73,738)	105.8%	(70,155)	(2,529)	(4.9)%
Net income	354,027	511,008	44.3%	592,881	21,373	16.0%
Net income attributable to shareholders of the parent	353,948	510,744	44.3%	592,359	21,354	16.0%
Net margin attributable to shareholders of the parent	33.1%	38.1%	—	37.3%	37.3%	—

Income tax expenses decreased by NT\$3,583 million in 2021, or 4.9%, from 2020. The decrease was mainly due to the adjustment of surtax imposed on prior year's unappropriated earnings in 2021, partially offset by higher surtax imposed on current year's unappropriated earnings as a result of higher 2021 undistributed earnings. The adjustment of unappropriated earnings in 2021 was the deduction of capital expenditures in calculation of surtax imposed on undistributed earnings.

Liquidity and Capital Resources

Our sources of liquidity include cash flow from operations, cash and cash equivalents, current portion of marketable securities, and issuances of corporate bonds.

Our primary source of liquidity is cash flow from operations. Cash flow from operations for 2021 was NT\$1,112,161 million (US\$40,092 million), reflecting an increase of NT\$289,495 million from 2020.

Our cash, cash equivalents and current portion of marketable securities increased to NT\$1,188,456 million (US\$42,843 million) as of December 31, 2021, compared to NT\$791,477 million as of December 31, 2020. The current portion of marketable securities primarily consisted of fixed income securities. In 2021, we issued NT dollar-denominated corporate bonds totaling NT\$114,600 million (US\$4,131 million) and US dollar-denominated corporate bonds of US\$9,000 million. For further information, please refer to note 19 and note 31 to the consolidated financial statements.

We believe that our cash generated from operations, cash and cash equivalents, current portion of marketable securities, and ability to access capital market will be sufficient to fund our working capital needs, capital expenditures, debt repayments, dividend payments and other business requirements associated with existing operations over the next 12 months.

	For the year ended December 31,			
	2019	2020	2021	
	NT\$	NT\$	NT\$	US\$
	(in millions)			
Net cash generated by operating activities	615,139	822,667	1,112,161	40,092
Net cash used in investing activities	(458,802)	(505,782)	(836,366)	(30,150)
Net cash generated by (used in) financing activities	(269,639)	(88,615)	136,608	4,925
Effect of exchange rate changes on cash and cash equivalents	(9,114)	(23,498)	(7,584)	(274)
Net increase (decrease) in cash and cash equivalents	(122,416)	204,772	404,819	14,593

Cash and cash equivalents increased by NT\$404,819 million in 2021, following an increase of NT\$204,772 million in 2020.

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Operating Activities

In 2021, we generated NT\$1,112,161 million (US\$40,092 million) net cash from operating activities, as compared to NT\$822,667 million in 2020. The net cash generated from operating activities was primarily from NT\$663,036 million in income before income tax, NT\$422,395 million in non-cash depreciation and amortization expenses, and net changes in working capital with others and income tax payment of NT\$26,730 million. The higher depreciation and amortization expenses in 2021 were mainly attributed to continuing investment in production capacity for advanced technologies.

In 2020, net cash generated from operating activities was primarily from NT\$584,746 million in income before income tax and NT\$331,725 million in non-cash depreciation and amortization expenses, partially offset by income tax payment, change in working capital and others of NT\$93,804 million. The higher depreciation and amortization expenses in 2020 were mainly attributed to continuing investment in production capacity for advanced technologies.

Investing Activities

In 2021, net cash used in investing activities was NT\$836,366 million (US\$30,150 million), as compared to NT\$505,782 million in 2020. The primary use of cash in investing activities in 2021 was for capital expenditures of NT\$839,196 million.

In 2020, net cash used in investing activities was primarily for capital expenditures of NT\$507,239 million.

Our capital expenditures for 2021 were primarily related to:

- installing and expanding capacity, mainly for 5-nanometer and 3-nanometer nodes;
- expanding capacity for advanced packaging and specialty technologies;
- expanding buildings/facilities for Fab 18 and a 300mm wafer fab in Arizona, U.S.; and
- investing in research and development projects for new process technologies.

See “Item 3. Risk Factors” section for the risks associated with the inability of raising the requisite funding for our expansion programs. Please also see “Item 4. Information on The Company – Capacity Management and Technology Upgrade Plans” for discussion of our capacity management and capital expenditures.

Financing Activities

In 2021, net cash generated by financing activities was NT\$136,608 million (US\$4,925 million), as compared to net cash used of NT\$88,615 million in 2020. The net cash generated by financing activities in 2021 was mainly from proceeds from issuance of corporate bonds and an increase in short-term loans, partially offset by cash dividend payments.

In 2020, net cash used by financing activities was mainly for cash dividend payments, repayments of corporate bonds and short-term loans, partially offset by the proceeds from issuance of corporate bonds.

As of December 31, 2021, our short-term loans were NT\$114,921 million (US\$4,143 million), which were denominated in Euros. Our aggregate long-term debt was NT\$617,947 million (US\$22,276 million), of which NT\$4,567 million (US\$165 million) was classified as current. The long-term debt mainly included NT dollar- and U.S. dollar-denominated corporate bonds with fixed interest rates ranging from 0.36% to 3.25% and remaining maturity ranging from less than 1 year to 39 years.

Cash Requirements

The following table sets forth the maturity of our long-term debt, including principal and interest payments, outstanding as of December 31, 2021:

	Long-term debt (in NT\$ millions)
During 2022	13,764
During 2023	28,020
During 2024	16,999
During 2025	61,756
During 2026 and thereafter	637,361

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The following table sets forth information on our material contractually obligated payments (including principals and interests) for the periods indicated as of December 31, 2021:

Contractual Obligations	Payments Due by Period					
	Total	Less than 1 Year	1-3 Years	3-5 Years	More than 5 Years	
		(in NT\$ millions)				
Short-Term Loans ⁽¹⁾	114,767	114,767	—	—	—	
Long-Term Debt ⁽²⁾	757,900	13,764	45,019	192,612	506,505	
Capital Leases ⁽³⁾	24,302	2,372	3,896	3,385	14,649	
Other Obligations ⁽⁴⁾	185,994	30,613	155,381	—	—	
Capital Purchase or Other Purchase Obligations ⁽⁵⁾	1,280,304	1,185,814	94,490	—	—	
Total Contractual Cash Obligations	2,363,267	1,347,330	298,786	195,997	521,154	

(1) The maximum amount and average amount of short-term loans outstanding during the year ended December 31, 2021 were NT\$154,439 million and NT\$121,036 million, respectively. See note 18 to our consolidated financial statements for further information regarding interest rates and future repayment dates.

(2) Represents corporate bonds payable and long-term bank loans. See note 19 and note 20 to our consolidated financial statements for further information regarding interest rates and future repayment of long-term debts.

(3) Capital lease obligations are described in note 6, note 16, note 31 and note 33 to our consolidated financial statements.

(4) Represents advance temporary receipts from customer. See “Item 4. Information on The Company — Commitments by Customers” and note 23 to our consolidated financial statements for further information.

(5) Represents commitments for construction or purchase of equipment, raw material and other property or services. These commitments were not recorded on our statement of financial position as of December 31, 2021, as we had not received related goods or taken title of the property.

During 2021, we used derivative financial instruments to partially hedge the currency exchange rate risk related to non-NT dollar-denominated assets and liabilities and certain forecasted transactions, and interest rate risk related to our fixed income investments and anticipated debt issuance. See “Item 11. Quantitative and Qualitative Disclosures about Market Risk” for a further discussion about currency exchange rate risk, interest rate risk, and derivative financial instruments we used to hedge such risks. See also note 5 to the consolidated financial statements for our accounting policy of derivative financial instruments, and note 8, note 11 and note 33 to the consolidated financial statements for additional details regarding our derivative financial instruments transactions.

Generally, we do not provide letters of credit to, or guarantees for, any entity other than our consolidated subsidiaries.

Significant amount of capital is required to build, expand, and upgrade our production facilities and equipment. Our capital expenditures for 2022 are expected to be between US\$40 billion and US\$44 billion, which, depending on market conditions, may be adjusted later.

Taxation

The corporate income tax rate in R.O.C. is 20%. Pursuant to the regulations under the R.O.C. Statute for Industrial Innovation, we are eligible for a tax credit for 10% or 15% of qualified research and development expenditures. In addition, our undistributed earnings are reduced by deduction of capital expenditures in calculation of surtax imposed on undistributed earnings.

The alternative minimum tax (“AMT”) imposed under the R.O.C. AMT Act is a supplemental income tax which applies if the amount of regular income tax calculated pursuant to the R.O.C. Income Tax Act and relevant laws and regulations is below the amount of basic tax prescribed under the R.O.C. AMT Act. The taxable income for calculating AMT includes most income that is exempt from income tax under various legislations, such as tax holidays. The prevailing AMT rate for business entities is 12%. As we are eligible for tax holidays, AMT is generally applicable to us.

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We are eligible for five-year tax holidays for income generated from construction and capacity expansions of production facilities according to regulations under the Statute for Upgrading Industries of the R.O.C. The exemption period may begin at any time within five years, as applicable, following the completion of a construction or expansion of production facilities. The Statute for Upgrading Industries expired at the end of 2009. However, under the Grandfather Clause, we can continue to be eligible for five-year tax holidays if the relevant investment plans were approved by R.O.C. tax authority before the expiration of the Statute. Pursuant to the Grandfather Clause, we commenced the exemption period for part of Fab 15 (Phase I to IV) and part of Fab 14 (Phase III to IV) in 2018. The aggregate tax benefits of such exemption periods in 2020 and 2021 were NT\$47,115 million and NT\$57,000 million (US\$2,055 million), net of AMT effect, respectively.

Off Balance Sheet Arrangements

There are no off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenue or expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors.

Recent Accounting Pronouncements

Please refer to note 4 to the consolidated financial statements.

Summary Financial Information of the Obligor Group

The debt securities issued by TSMC Arizona under an indenture (the “Indenture”), dated as of October 18, 2021, among TSMC Arizona, as the issuer, TSMC, as guarantor, and Citibank, N.A., as trustee, are unconditionally and irrevocably guaranteed as to payment of principal, interest and premium, if any, by TSMC. TSMC Arizona and TSMC are referred to collectively as the Obligor Group. Each guarantee provided under the Indenture is referred to as a Guarantee and collectively, the Guarantees. TSMC Arizona Corporation is a corporation incorporated under the laws of the State of Arizona and a wholly-owned subsidiary of TSMC. As of December 31, 2021, the debt securities issued by TSMC Arizona are: (i) US\$1.25 billion aggregate principal amount of the 1.750% Guaranteed Notes due 2026, (ii) US\$1.25 billion aggregate principal amount of the 2.500% Guaranteed Notes due 2031, (iii) US\$1 billion aggregate principal amount of the 3.125% Guaranteed Notes due 2041 and (iv) US\$1 billion aggregate principal amount of the 3.250% Guaranteed Notes due 2051.

Under the terms of the Indenture and the Guarantees, TSMC fully, unconditionally and irrevocably guarantees to each holder the full and prompt payment of the principal of, and premium (if any) and interest on, such debt securities (including any Additional Amounts, as defined in the Indenture, payable in respect thereof) when and as the same shall become due and payable as provided in such debt securities. TSMC (i) agrees that its obligations under the Guarantees will be enforceable irrespective of any invalidity, irregularity or unenforceability of the debt securities or the Indenture and (ii) waives its right to require the trustee to pursue or exhaust its legal or equitable remedies against the issuer prior to exercising its rights under the Guarantees. Moreover, if at any time any amount paid under a debt security or the Indenture is rescinded or must otherwise be restored, the rights of the holders of the debt securities under the Guarantees will be reinstated with respect to such payments as though such payment had not been made.

The Guarantees (i) constitute senior unsecured obligations of TSMC, (ii) at all times rank at least equally with all other present and future senior unsecured obligations of TSMC, except as may be required by mandatory provisions of law, (iii) are senior in right of payment to all future subordinated obligations of TSMC and (iv) are effectively subordinated to secured obligations of TSMC, to the extent of the assets serving as security therefor.

TSMC will be released from and relieved of its obligations under a Guarantee in the event (i) of repayment in full of the relevant series of debt securities, or (ii) that there is a Legal Defeasance (as defined in the Indenture) of the relevant series of debt securities, in each case provided that the transaction is otherwise carried out pursuant to and in accordance with all other applicable provisions of the Indenture.

The following summarized financial information is presented for the Obligor Group on a combined basis after elimination of intercompany transactions between entities in the combined group and amounts related to investments in any subsidiary that is a non-guarantor. This information is not intended to present the financial position or results of operations of the combined group of companies in accordance with U.S. GAAP or IFRSs.

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Statement of Profit or Loss for Obligor Group

	For the year ended	
	December 31, 2021	
	NT\$	US\$
	(in millions)	
Net sales – external	533,649	19,237
Net sales – to subsidiaries outside of the Obligor Group	1,041,097	37,531
Total net sales	1,574,746	56,768
Gross profit	788,629	28,429
Income from continuing operations	625,383	22,544
Net income	592,359	21,354
Net income attributable to Obligor Group	592,359	21,354

Statement of Financial Position for Obligor Group

	As of	
	December 31, 2021	
	NT\$	US\$
	(in millions)	
Assets		
Current assets – external	753,642	27,168
Current assets – due from subsidiaries outside of the Obligor Group	143,110	5,159
Total current assets	896,752	32,327
Non-current assets—external	2,047,339	73,804
Non-current assets – due from subsidiaries outside of the Obligor Group	564,084	20,335
Total non-current assets	2,611,423	94,139
Total assets	3,508,175	126,466
Liabilities		
Current liabilities – external	701,370	25,284
Current liabilities – due from subsidiaries outside the Obligor Group	28,782	1,038
Total current liabilities	730,152	26,322
Non-current liabilities – external	501,401	18,075
Non-current liabilities – due from subsidiaries outside of the Obligor Group	127,362	4,591
Total non-current liabilities	628,763	22,666
Total liabilities	1,358,915	48,988

Climate Change Related Issues

The manufacturing, assembling and testing of our products require the use of chemicals and materials that are subject to environmental, climate related, health and safety laws and regulations issued worldwide as well as international accords such as the Paris Agreement. Climate change related laws or regulations currently are too indefinite for us to assess the impact on our future financial condition with any degree of reasonable certainty. For example, the Taiwan “Greenhouse Gas Reduction and Management Act”, which became effective on July 1, 2015, was amended in October 2021, and the amendment is expected to come into force in 2022. The act will be renamed as “Climate Change Adaptation Act” and may affect us financially to a certain extent, such as through the levying of a carbon tax/fee. We expect to see more of its relevant regulations promulgated by the regulators in the future. Also, the R.O.C. legislative authority is reviewing, at all times, various environmental issues to develop laws and regulations relating to environmental protection and climate related changes. The impact of such laws and regulations, as well as of the carbon tax/fee, is indeterminable at the moment. Please see detailed risk factors related to the impact of climate change regulations and international accords in “Item 3. Key Information – Risk Factors – Risks Relating to Our Business”. Please also see our compliance record with Taiwan and international environmental and climate related laws and regulations in “Item 4. Information on The Company – Environmental and Climate Related Laws and Regulations”.

ITEM 6. DIRECTORS, SENIOR MANAGEMENT AND EMPLOYEES**Directors and Executive Officers****MANAGEMENT**

Members of our Board of Directors are elected by our shareholders. Our Board of Directors is currently composed of ten directors. Of our current ten directors, six are independent directors: Sir Peter L. Bonfield, Ms. Kok-Choo Chen, Mr. Michael R. Splinter, Mr. Moshe N. Gavriellov, Mr. Yancey Hai and Dr. L. Rafael Reif. The chairman of the Board of Directors is elected by the directors. The chairman of the Board of Directors presides at all meetings of the Board of Directors, and also has the authority to act as our representative. The term of office for directors is three years.

Pursuant to the R.O.C. Securities and Exchange Act, effective from January 1, 2007, a public company is required to either establish an audit committee or to have supervisors. A public company's audit committee should be composed of all of its independent directors but not less than three, of which at least one member should have accounting or related financial management expertise, and the relevant provisions under the R.O.C. Securities and Exchange Act, the R.O.C. Company Act and other laws applicable to the supervisors are also applicable to the audit committee. Pursuant to the R.O.C. Securities and Exchange Act, effective from March 18, 2011, we are also required to establish a compensation committee which must be composed of qualified independent members as defined under local law. TSMC established its audit committee (the "Audit Committee") and compensation committee (the "Compensation Committee") in 2002 and 2003, respectively (several years before being legally required to do so), both of which are now composed entirely of independent directors.

Pursuant to the R.O.C. Company Act, a person may serve as our director in his personal capacity or as the representative of another legal entity. A director who serves as the representative of a legal entity may be removed or replaced at any time at the discretion of that legal entity, and the replacement director may serve the remainder of the term of office of the replaced director. For example, the National Development Fund of the R.O.C., one of our largest shareholders, has served as our director since our founding. As a corporate entity, the National Development Fund is required to appoint a representative to act on its behalf. Dr. Ming-Hsin Kung has been the representative of the National Development Fund since July 24, 2020.

The following table sets forth the name of each director and executive officer, their positions, the year in which their term expires and the number of years they have been with us as of February 28, 2022. The business address for each of our directors and executive officers is No. 8, Li Hsin Road 6, Hsinchu Science Park, Hsinchu, Taiwan, Republic of China.

Name	Position with our company	Term Expires	Years with our company
Mark Liu	Chairman	2024	29
C.C. Wei	Vice Chairman/ Chief Executive Officer	2024/ —	24
Ming-Hsin Kung	Director (Representative of the National Development Fund)	2024	2
F.C. Tseng	Director	2024	35
Sir Peter L. Bonfield	Independent Director	2024	20
Kok-Choo Chen	Independent Director	2024	11
Michael R. Splinter	Independent Director	2024	7
Moshe N. Gavriellov	Independent Director	2024	3
Yancey Hai	Independent Director	2024	2
L. Rafael Reif ⁽¹⁾	Independent Director	2024	1
Lora Ho	Senior Vice President, Europe & Asia Sales and Human Resources	—	23
Wei-Jen Lo	Senior Vice President, Research & Development	—	18
Rick Cassidy	Senior Vice President, Corporate Strategy Office/ CEO & President, TSMC Arizona	—	25
Y.P. Chin	Senior Vice President, Operations	—	35
Y.J. Mii	Senior Vice President, Research & Development	—	28
J.K. Lin	Senior Vice President, Information Technology and Materials Management & Risk Management	—	35
J.K. Wang	Senior Vice President, Corporate Planning Organization	—	35
Cliff Hou	Senior Vice President, Europe & Asia Sales and Research & Development/ Corporate Research	—	25
Kevin Zhang	Senior Vice President, Business Development	—	6
Sylvia Fang	Vice President, Legal and General Counsel/ Corporate Governance Officer	—	27

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<u>Name</u>	<u>Position with our company</u>	<u>Term Expires</u>	<u>Years with our company</u>
Connie Ma	Vice President, Human Resources	—	8
Y.L. Wang	Vice President, Operations/ Fab Operations I	—	30
Doug Yu	Vice President, Pathfinding for System Integration & TSMC Distinguished Fellow	—	28
T.S. Chang	Vice President, Operations/ Advanced Technology and Mask Engineering & TSMC Fellow	—	27
Michael Wu	Vice President, Research & Development/ Platform Development	—	26
Min Cao	Vice President, Research & Development/ Pathfinding	—	20
Marvin Liao	Vice President, Operations/ Advanced Packaging Technology and Service	—	20
Y.H. Liaw	Vice President, Operations/ Fab Operations II	—	34
Simon Jang	Vice President, Research & Development/ Advanced Tool and Module Development	—	29
Wendell Huang	Vice President, Finance and Chief Financial Officer/ Spokesperson	—	23
C.S. Yoo	Vice President, Research and Development/ More than Moore Technologies	—	34
Jun He	Vice President, Quality and Reliability	—	5
Geoffrey Yeap	Vice President, Research & Development/ Platform Development	—	6
Chris Horng-Dar Lin	Vice President, Corporate Information Technology and Chief Information Officer	—	1
Jonathan Lee ⁽²⁾	Vice President, Corporate Planning Organization	—	15
Arthur Chuang ⁽³⁾	Vice President, Operations/ Facility	—	33
L.C. Lu ⁽³⁾	Vice President, Research & Development/ Design & Technology Platform & TSMC Fellow	—	22
K.C. Hsu ⁽⁴⁾	Vice President, Research & Development/ Integrated Interconnect & Packaging	—	1

(1) Dr. L. Rafael Reif joined our Board of Directors on July 26, 2021.

(2) Mr. Jonathan Lee was promoted to Vice President on June 9, 2021.

(3) Dr. Arthur Chuang and Dr. L.C. Lu were promoted to Vice President on August 10, 2021.

(4) Mr. K.C. Hsu was hired on November 1, 2021, and was promoted to Vice President on November 9, 2021.

Mark Liu is the Chairman. Dr. Mark Liu was our President and Co-Chief Executive Officer from November 2013 to June 2018. Prior to that, he was our Executive Vice President and Co-Chief Operating Officer from March 2012 to November 2013, Senior Vice President of Operations from 2009 to 2012, Senior Vice President of Advanced Technology Business from 2008 to 2009. From 2005 to 2008, Dr. Liu was Senior Vice President of Operations II. He served in a number of executive positions at TSMC Fabs and the Operations organization from 1999 to 2005. From 1999 to 2000, he served as the President of Worldwide Semiconductor Manufacturing Company. Prior to joining us in 1993, from 1987 to 1993, Dr. Liu was with AT&T Bell Laboratory, Holmdel, NJ, as a research manager for the High Speed Electronics Research Laboratory, working on optical fiber communication systems. From 1983 to 1987, he was a process integration manager of CMOS technology development at Intel Corporation, Santa Clara, CA, developing silicon process technologies for Intel microprocessor. Dr. Liu is currently the Chairman of Taiwan Semiconductor Industry Association. He holds a Ph.D. in electrical engineering and computer science from University of California, Berkeley.

C.C. Wei is the Vice Chairman and Chief Executive Officer. Dr. C.C. Wei was our President and Co-Chief Executive Officer from November 2013 to June 2018. He was our Executive Vice President and Co-Chief Operating Officer from March 2012 to November 2013, Senior Vice President of Business Development from 2009 to 2012, and Senior Vice President of Mainstream Technology Business from 2008 to 2009. From 2005 to 2008, Dr. Wei was Senior Vice President of Operations I. He served in a number of executive positions at TSMC Fabs and the Operations organization from 1998 to 2005. Before joining us in 1998, he was Senior Vice President of Technology at Chartered Semiconductor Manufacturing Ltd. in Singapore and Senior Manager for Logic and SRAM technology development at STMicroelectronics N.V. in Texas. He holds a Ph.D. in electrical engineering from Yale University.

Ming-Hsin Kung, the representative of the National Development Fund, is a director. Dr. Ming-Hsin Kung is the Minister of National Development Council (“NDC”), and has been Minister without Portfolio of the Executive Yuan since 2019. He previously served as Deputy Minister of Economic Affairs from 2017 to 2019, and Deputy Minister of NDC as well as Convener of the National Development Fund (“NDF”) under Executive Yuan from 2016 to 2017, responsible for supervising policies related to industrial development, investment, talent and energy. Currently, Dr. Kung also represents the NDF to sit on the Board of Directors of Taiwan Capital Management Corp. Prior to joining the public sector, Dr. Kung was Vice President of Taiwan Institute of Economic Research from 2006 to 2016, and he had long been an advisor and consultant to Taiwan government. Dr. Kung received an M.A. in Economics from National Taiwan University, and a Ph.D. in Economics from National Chung Hsing University.

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F.C. Tseng is a director. Dr. F.C. Tseng is currently the Chairman of TSMC Education and Culture Foundation and Director of Cloud Gate Culture and Arts Foundation and of Zu-Ming Medical Foundation. Previously he served as our Vice Chairman from July 2005 to June 2018. Prior to that, he was Deputy Chief Executive Officer from August 2001 to June 2005. He is also the Chairman of TSMC China Co., Ltd. and Global Unichip Corp., and the Vice Chairman of VIS. He formerly served as an independent director, Chairman of Audit Committee and a member of Compensation Committee of Acer Inc. He also served as the President of VIS from 1996 to 1998 and our President from May 1998 to August 2001. Prior to his presidency at VIS, Dr. Tseng served as our Senior Vice President of Operations. He holds a Ph.D. in electrical engineering from National Cheng-Kung University and has been active in the semiconductor industry for over 50 years.

Sir Peter L. Bonfield is an independent director. Sir Peter L. Bonfield was the Chief Executive Officer and Chairman of the Executive Committee of British Telecommunications from January 1996 to January 2002, and the Vice President of the British Quality Foundation from its creation in 1993 until 2012. He also served as director of L.M. Ericsson in Sweden, Chairman of GlobalLogic Inc. in the U.S. and Senior Advisor to Hampton Group in London and the Chair of Council and Senior Pro-Chancellor at Loughborough University in the United Kingdom. He is currently the Chairman of the Board of Directors of NXP Semiconductor N.V. in the Netherlands, and the non-executive director of Imagination Technologies Group Ltd. (a non-public company) and of Darktrace plc, both are in the United Kingdom. He is also an Advisory Board member of the Longreach Group Ltd. in Hong Kong and a Senior Advisor to Alix Partners LLP in London. He also serves as a board mentor of Chairman Mentors International (CMI) Ltd. (a non-public company) in London. He is a fellow of The Royal Academy of Engineering. He holds an honors degree in engineering from Loughborough University.

Kok-Choo Chen is an independent director. Ms. Kok-Choo Chen served as the Chairman of National Performing Arts Center from 2014 to January 2017, and an advisor to the R.O.C. Executive Yuan from 2009 to 2016. She was the founder and Executive Director of Taipei Story House from 2003 to 2015. She served as our Senior Vice President and General Counsel from 1997 to 2001. Currently, Ms. Chen is the Founder and Executive Director of the Museum207 located in Taipei and Director of Republic of China Female Cancer Foundation. Ms. Chen has over 24 years of experience working in international law firms. She had also taught law at Soochow University, National Chengchi University and National Tsing Hua University in Taiwan for over 28 years. Ms. Chen is licensed to practice law in England, Singapore and California.

Michael R. Splinter is an independent director. Mr. Michael R. Splinter served as Chief Executive Officer of Applied Materials from 2003 to 2012 and as Chairman of the Board of Directors since 2009 and retired in June 2015. Prior to that, he served at Intel Corp. as Executive Vice President of Sales and Marketing from 2001 to 2003, and Executive Vice President of Technology and Manufacturing group from 1996 to 2001. Mr. Splinter currently serves as Chairman of NASDAQ, Inc., Director of Pica8, Inc. (a non-public company) in the United States, Gogoro Inc. (a non-public company) in Cayman Islands, Tigo Energy, Inc. (a non-public company) in the United States and Kioxia Holdings Corp. (a non-public company) in Japan, and General Partner of WISC Partners LP. in the United States. He also serves as Chairman of the Board of US-Taiwan Business Council. Mr. Splinter holds a master degree in electrical engineering, and an honorary Ph.D. in engineering from the University of Wisconsin-Madison.

Moshe N. Gavrielov is an independent director. Mr. Moshe N. Gavrielov served as President and CEO of Xilinx, Inc. from January 2008 to January 2018 and as Director of Xilinx, Inc. from February 2008 to January 2018. Prior to that, he served at Cadence Design Systems, Inc. as Executive Vice President and General Manager of the Verification Division from April 2005 to November 2007, and CEO of Verisity, Ltd. from March 1998 to April 2005. He also served at a variety of executive management positions in LSI Logic Corp. for nearly 10 years, and engineering and engineering management positions in National Semiconductor Corporation and Digital Equipment Corporation. Currently, Mr. Gavrielov is the Executive Chairman of Wind River Systems, Inc. (a non-public company) in the United States, Chairman of SiMa Technologies, Inc. (a non-public company) in the United States and of Foretellig, Ltd. (a non-public company) in Israel. He also serves as the Director of San Jose Institute of Contemporary Art. Mr. Gavrielov holds a bachelor degree in electrical engineering and a master degree in computer science from Technion—Israel Institute of Technology.

Yancey Hai is an independent director. Mr. Yancy Hai is the Chairman of the Board of Delta Electronics, Inc. (“Delta”) since June 2012. He served as Vice Chairman and CEO of Delta since 2004, and as the Chair of Strategic Committee of Delta from 2012 to 2021. Currently he is the Chair of ESG Committee of Delta. Before joining Delta, Mr. Hai was the country manager of GE Capital Taiwan. Currently he also serves as a director of the Board and member of ESG & Net Zero Committee of CTCI Corporation, and as an independent director of the Board, member of the Audit Committee, CSR Committee and Chair of Remuneration Committee of USI Corporation, and as a director of the following Delta’s subsidiaries (which are all non-public companies): Delta Electronics (Shanghai) Co., Ltd., Delta Networks, Inc., Delta Electronics Capital Company and Cytect Co., Ltd. Mr. Hai is currently the Executive Director of Taipei Computer Association, Senior Strategy Consultant of Cloud Computing & IoT Association in Taiwan, Director of Taiwan Business Council for Sustainable Development, Delta Electronic Foundation and Felix Chang Foundation. Mr. Hai holds a master’s degree in international business management from the University of Texas at Dallas.

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L. Rafael Reif is an independent director. Dr. L. Rafael Reif has been the President of the Massachusetts Institute of Technology (MIT) since 2012. Since 1980, he held a number of faculty positions at MIT, including Provost, Head of the Department of Electrical Engineering and Computer Science (EECS), Associate Department Head of Electrical Engineering, Director of Microsystems Technology Laboratories, and Fariborz Maseeh Professor of Emerging Technology. Dr. Reif is an elected member of the American Academy of Arts and Sciences, the National Academy of Engineering and the Chinese Academy of Engineering, a fellow of the National Academy of Inventors, and also belongs to Tau Beta Pi, the Electrochemical Society and the IEEE. In addition, he is the inventor or co-inventor of 13 patents, has edited or co-edited five books and has supervised 38 doctoral theses to date. Currently, Dr. Reif is also the co-chair of the Growth Technical Advisory Board, Applied Materials, Inc. Dr. Reif holds a master's degree and a Ph.D. in electrical engineering from Stanford University, an honorary Doctor of Laws degree from the Chinese University of Hong Kong, and honorary doctorates from Tsinghua University, the Technion and Arizona State University.

Lora Ho is our Senior Vice President of Europe & Asia Sales and Human Resources. Prior to that, she was Senior Vice President of Finance and Europe & Asia Sales/ Chief Financial Officer/ Spokesperson from January 2019 to August 2019. She was promoted to Senior Vice President of Finance and Chief Financial Officer/ Spokesperson in August 2010 and Vice President of Finance and Chief Financial Officer/ Spokesperson in September 2003. Prior to joining us in 1999 as controller, she had served as Vice President of Finance and Chief Financial Officer at Acer Semiconductor Manufacturing Inc. since 1990. Ms. Ho holds an MBA from National Taiwan University.

Wei-Jen Lo is our Senior Vice President of Research & Development. He was promoted to Senior Vice President of Research & Development in February 2014. He was Vice President of Research & Development from February 2013 to February 2014, Vice President of Operations/ Manufacturing Technology from October 2009 to February 2013, Vice President of Advanced Technology Business from September 2009 to October 2009, Vice President of Research & Development from June 2006 to September 2009, and Vice President of Operations from July 2004 to June 2006. Prior to joining us in 2004, he was Director in charge of advanced technology development with Intel Corporation. Dr. Lo holds a Ph.D. in solid state physics & surface chemistry from University of California, Berkeley.

Rick Cassidy is our Senior Vice President of Corporate Strategy Office and CEO & President of TSMC Arizona. Prior to that, he served as Chief Executive Officer of TSMC North America from 2017 to January 2019. He was promoted to Senior Vice President in February 2014, Vice President in November 2008 and had led TSMC North America from January 2005 to 2018. He joined us in 1997 and has held various positions in TSMC North America, including Business Operations, Field Technical Support, and Business Management. He holds a B.A. degree in engineering technology from United States Military Academy at West Point.

Y.P. Chin is our Senior Vice President of Operations. Prior to that, he was Senior Vice President of Operations/ Product Development from November 2016 to April 2020. He was promoted to Senior Vice President in November 2016. He was Vice President of Operations from October 2009 to November 2016, Vice President of Advanced Technology Business from March 2008 to October 2009. Prior to that, he was Senior Director of Operations II from June 2006 to March 2008 and Senior Director of Product Engineering & Services from 2000 to 2006. He joined us in 1987 and has held various positions in product and engineering functions. He holds a master degree in electrical engineering from National Cheng Kung University.

Y.J. Mii is our Senior Vice President of Research & Development. He was promoted to Senior Vice President in November 2016. He was Vice President of Research & Development from August 2011 to November 2016. Prior to that, he was our Senior Director of Platform I Division from 2006 to 2011. He joined us in 1994 and has been involved continuously in the development and manufacturing of advanced CMOS technologies in both Operations and Research & Development. He holds a Ph.D. in electrical engineering from the University of California, Los Angeles.

J.K. Lin is our Senior Vice President of Information Technology and Materials Management & Risk Management. He led the organization from August 2018 and was promoted to Senior Vice President in November 2018. Prior to that, he was our Vice President of Operations/ Mainstream Fabs from August 2010 to August 2018. He joined us in 1987 and held various positions in manufacturing functions. He holds a B.S. degree from National Changhua University of Education.

J.K. Wang is our Senior Vice President of Corporate Planning Organization. Prior to that, he was Senior Vice President of Operations/ Fab Operations from November 2018 to April 2020. He was promoted to Senior Vice President of Operations in November 2018. He was Vice President of Operations/ 300mm Fabs from August 2010 to August 2018 and Operations/ Fab Operations from August to November 2018. He joined us in 1987 and held various positions in manufacturing and research and development functions. He holds a master degree in chemical engineering from National Cheng-Kung University.

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Cliff Hou is our Senior Vice President of Europe & Asia Sales and Research & Development/ Corporate Research. He was Senior Vice President of Research & Development/ Technology Development from May 2020 to October 2020. He was promoted to Senior Vice President in May 2020. Prior to that, he was Vice President of Research & Development/ Technology Development from August 2018 to May 2020, Vice President of Research & Development/ Design and Technology Platform from August 2011 to August 2018, and Senior Director of Design and Technology Platform from 2010 to 2011. He joined us in 1997 and established the Company's technology design kit and reference flow development organizations. He holds a Ph.D. in electrical and computer engineering from Syracuse University.

Kevin Zhang is our Senior Vice President of Business Development. He was promoted to Senior Vice President in August 2020. He joined us in November 2016 as Vice President of Research & Development/ Design and Technology Platform. Prior to joining us in November 2016, he was a Vice President of Technology and Manufacturing Group of Circuit Technology at Intel. He holds a Ph.D. in electrical engineering from Duke University.

Sylvia Fang is our Vice President of Legal and General Counsel/ Corporate Governance Officer. She was promoted to Vice President and General Counsel of Legal Organization in August 2014. She joined us in 1995 and held various positions in legal functions. She holds a master degree in comparative law from University of Iowa. Ms. Fang is licensed to practice law in Taiwan.

Connie Ma is our Vice President of Human Resources. She was promoted to Vice President of Human Resources in August, 2014. Prior to joining us as Director of Human Resources in June 2014, she was a Senior Vice President of Global Human Resources at Trend Micros, Inc. She holds an EMBA from National Taiwan University.

Y.L. Wang is our Vice President of Operations/ Fab Operations I. Prior to that, he was Vice President of Operations/ Fab Operations from August 2018 to April 2020, Vice President of Research & Development/ Technology Development from February 2016 to August 2018 and Vice President of Operations/ Fab 14B from November 2015 to January 2016 after his promotion to this position. He joined us in 1992 and held various positions in manufacturing functions. He holds a Ph.D. in electronics engineering from National Chiao Tung University.

Doug Yu is our Vice President of Pathfinding for System Integration & TSMC Distinguished Fellow. He was Vice President of Research & Development/ Integrated Interconnect & Packaging from November 2016 to December 2020 after his promotion to this position. Prior to that, he was our Senior Director of Integrated Interconnect & Packaging Division. He joined us in 1994 and was in charge of development of interconnect technology for integrated circuits. He holds a Ph.D. in materials engineering from Georgia Institute of Technology.

T.S. Chang is our Vice President of Operations/ Advanced Technology and Mask Engineering & TSMC Fellow. He was Vice President & TSMC Fellow of Operations/ Product Development from November 2018 to April 2020 and Vice President & TSMC Fellow of Operations/ Fab 12B & TSMC Fellow from February 2018 to November 2018 after his promotion to this position. Prior to that, he was our Senior Director of Fab 12B & TSMC Fellow. He joined us in 1995 and held various positions in manufacturing functions. He holds a Ph.D. in electrical engineering from National Tsing Hua University.

Michael Wu is our Vice President of Research & Development/ Platform Development. He was promoted to Vice President in February 2018. Prior to that, he was our Senior Director of Platform Development Division. He joined us in 1996 and participated in advanced CMOS technology development. He holds a Ph.D. in electrical engineering from University of Wisconsin-Madison.

Min Cao is our Vice President of Research & Development/ Pathfinding. He was promoted to Vice President in February 2018. Prior to that, he was our Senior Director of Path-finding Division. He joined us in 2002 and participated in development of multiple generations of advanced CMOS technology. He holds a Ph.D. in physics from Stanford University.

Marvin Liao is our Vice President of Operations/ Advanced Packaging Technology and Service. He was promoted to Vice President in November 2018. Prior to that, he was Technical Director in Fab 6 upon joining us in 2002 and later Senior Director of Backend Technology and Service Division. He holds a Ph.D. in materials science from University of Texas-Arlington.

Y.H. Liaw is our Vice President of Operations/ Fab Operations II. He was Vice President of Operations/ Fab Operations from June 2019 to April 2020 and Vice President of Operations/ Fab 15B from February 2019 to June 2019 after his promotion to this position. He joined us in 1988 and held various positions in manufacturing functions. He holds a M.S. degree in chemical engineering from National Tsing Hua University.

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Simon Jang is our Vice President of Research & Development/ Advanced Tool and Module Development. He was promoted to Vice President in August 2019. Prior to that, he was our Senior Director of Advanced Tool and Module Development Division. He joined us in 1993 and held various positions in research and development functions. He holds a Ph.D. in materials science & engineering from Massachusetts Institute of Technology.

Wendell Huang is our Vice President of Finance and Chief Financial Officer/ Spokesperson. He was promoted to Vice President of Finance in September 2019. Prior to that, he was Deputy Chief Financial Officer of Finance from January 2019 to August 2019 and Senior Director of Finance Division from 2010 to 2018. Prior to joining us in 1999, he was Vice President of Corporate Finance at ING Barings. He holds an MBA from Cornell University.

C.S. Yoo is our Vice President of Research & Development/ More than Moore Technologies. Prior to that, he was Vice President of Europe and Asia Sales from November 2020 to December 2020 after his promotion to this position. He was our Senior Director of Office of Strategy Customer Program from May 2019 to November 2020 and Senior Director of E-Beam Operation Division from February 2010 to May 2019. He joined us in 1988 and held various positions in manufacturing functions. He holds a Ph.D. in chemical engineering from Worcester Polytech Institute.

Jun He is our Vice President of Quality and Reliability. He was promoted to Vice President in November 2020 and was our Senior Director of Quality and Reliability from May 2019 to November 2020. Prior to that, he was Senior Director of Manufacturing, Quality & Reliability Division, from July 2018 to May 2019, and Senior Director of Advanced Technology, Quality & Reliability Division, from May 2017 to July 2018. Prior to joining us in May 2017, he was a Senior Director of Technology and Manufacturing Group of Quality and Reliability at Intel. He holds a Ph.D. in materials science and engineering from University of California, Santa Barbara.

Geoffrey Yeap is our Vice President of Research & Development/ Platform Development. He was promoted to Vice President in February 2021 and was our Senior Director of Platform Development Division from August 2016 to February 2021. Prior to that, he was Senior director of Advanced Technology from March 2016 to August 2016. Prior to joining us in March 2016, he was Vice President of Engineering, Silicon Technology in Qualcomm. He holds a Ph.D. in electrical and computer engineering from University of Texas-Austin.

Chris Horng-Dar Lin is our Vice President of Corporate Information Technology and Chief Information Officer. He was promoted to Vice President in February 2021. Prior to joining us in January 2021, he was Vice President of Information Technology in Mozilla. He holds a Ph.D. in electrical engineering and computer science from University of California, Berkeley.

Jonathan Lee is our Vice President of Corporate Planning Organization. He was promoted to Vice President in June 2021 and was our Senior Director of Strategic Planning Division from February 2012 to June 2021. Prior to joining us in 2007, he was President in Biomorph Microsystems. He holds a M.S. degree in Accounting from CUNY-Baruch College.

Arthur Chuang is our Vice President of Operations/ Facility. He was promoted to Vice President in August 2021 and was our Senior Director of Operations/ Facility Division from January 2015 to August 2021, and Director of Operations/ Fabs Facility Division from March 2002 to January 2015. Prior to joining us in 1989, he was an engineer at Texas Instruments. He holds a Ph.D. in Civil Engineering from National Taiwan University.

L.C. Lu is our Vice President of Research & Development/ Design & Technology Platform & TSMC Fellow. He was promoted to Vice President in August 2021 and was our Senior Director & TSMC Fellow of Research & Development/ Design & Technology Platform from August 2018 to August 2021, and Research & Development/ Digital IPs Solution from March 2016 to August 2018. Prior to joining us in 2000, he was Director of Software Division in Avant Tech. Inc. He holds a Ph.D. in Computer Science from Yale University.

K.C. Hsu is our Vice President of Integrated Interconnect & Packaging. He was promoted to Vice President in November 2021. Prior to joining us in November 2021, he was Chairman, Taiwan in Micron Technology, Inc. He holds a M.S. degree in Management of Technology from National Yang Ming Chiao Tung University.

There is no family relationship between any of the persons named above. Other than that one of our Directors, Dr. Ming-Hsin Kung, is the representative of our shareholder, National Development Fund of the Executive Yuan, there is no arrangement or understanding with major shareholders, customers, suppliers or others, pursuant to which any person referred to above was selected as a director or member of senior management.

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Share Ownership

The following table sets forth certain information as of February 28, 2022 with respect to our common shares owned by our directors and executive officers.

Name of Shareholders(1)	Number of Common Shares Owned(2)	Percentage of Outstanding Common Shares(2)
Mark Liu, Chairman	12,913,114	0.05%
C.C. Wei, Vice Chairman and Chief Executive Officer	5,879,207	0.02%
Ming-Hsin Kung, Director (Representative of the National Development Fund)(3)	1,653,709,980	6.38%
F.C. Tseng, Director	29,472,675	0.11%
Sir Peter L. Bonfield, Independent Director	—	—
Kok-Choo Chen, Independent Director	—	—
Michael R. Splinter, Independent Director	—	—
Moshe N. Gavriellov, Independent Director	—	—
Yancey Hai, Independent Director	—	—
L. Rafael Reif, Independent Director	—	—
Lora Ho, Senior Vice President	4,570,080	0.02%
Wei-Jen Lo, Senior Vice President	1,441,127	0.01%
Rick Cassidy, Senior Vice President/ CEO & President of TSMC Arizona	—	—
Y.P. Chin, Senior Vice President	6,920,122	0.03%
Y.J. Mii, Senior Vice President	1,000,419	0.00%
J.K. Lin, Senior Vice President	12,648,251	0.05%
J.K. Wang, Senior Vice President	2,603,947	0.01%
Cliff Hou, Senior Vice President	384,676	0.00%
Kevin Zhang, Senior Vice President	70,000	0.00%
Sylvia Fang, Vice President & General Counsel/ Corporate Governance Officer	700,285	0.00%
Connie Ma, Vice President	236,000	0.00%
Y.L. Wang, Vice President	218,535	0.00%
Doug Yu, Vice President & TSMC Distinguished Fellow	250,000	0.00%
T.S. Chang, Vice President & TSMC Fellow	173,781	0.00%
Michael Wu, Vice President	483,501	0.00%
Min Cao, Vice President	363,152	0.00%
Marvin Liao, Vice President	90,485	0.00%
Y.H. Liaw, Vice President	370,000	0.00%
Simon Jang, Vice President	350,695	0.00%
Wendell Huang, Vice President & Chief Financial Officer/ Spokesperson	1,651,756	0.01%
C.S. Yoo, Vice President	1,703,690	0.01%
Jun He, Vice President	9,000	0.00%
Geoffrey Yeap, Vice President	22,000	0.00%
Chris Horng-Dar Lin, Vice President & Chief Information Officer	16,000	0.00%
Jonathan Lee, Vice President	334,458	0.00%
Arthur Chuang, Vice President	2,602,981	0.01%
L.C. Lu, Vice President & TSMC Fellow	130,227	0.00%
K.C. Hsu, Vice President	16,000	0.00%

(1) None of our directors and executive officers owned any stock option as of February 28, 2022.

(2) The disclosed number of shares owned by the directors and executive officers did not include any common shares held in the form of ADS by such individuals as such individual ownership of ADSs had not been disclosed or otherwise made public. The disclosed number of shares owned by the directors and executive officers also did not include shares owned by their related parties. As of February 28, 2022, we held 1,387,000 of our common shares in treasury as a result of repurchases made pursuant to the Share Repurchase Program, and such repurchased shares are not included in the total number of outstanding common shares. See “Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers” for a further discussion. Except for the number of shares held by the National Development Fund, Executive Yuan, each of these individuals owned less than one percent of all common shares outstanding as of February 28, 2022.

(3) Represented shares held by the National Development Fund, Executive Yuan.

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The following table sets forth certain information as of March 1, 2022, with respect to restricted stock awards (“RSAs”) held by our executives under our equity incentive plan for the year 2021 (see “— Employee Restricted Stock Awards Rules for Year 2021” for a further discussion).

Name	Common Shares Underlying Outstanding RSAs⁽¹⁾	Exercise Price	Grant Date	Expiration Date
C.C. Wei, Vice Chairman and Chief Executive Officer				
Lora Ho, Senior Vice President				
Wei-Jen Lo, Senior Vice President				
Y.P. Chin, Senior Vice President				
Y.J. Mii, Senior Vice President				
J.K. Lin, Senior Vice President				
J.K. Wang, Senior Vice President				
Cliff Hou, Senior Vice President				
Kevin Zhang, Senior Vice President				
Sylvia Fang, Vice President & General Counsel/ Corporate Governance Officer				
Connie Ma, Vice President				
Y.L. Wang, Vice President				
Doug Yu, Vice President & TSMC Distinguished Fellow				
T.S. Chang, Vice President & TSMC Fellow				
Michael Wu, Vice President	1,387,000	—	March 1, 2022	—
Min Cao, Vice President				
Marvin Liao, Vice President				
Y.H. Liaw, Vice President				
Simon Jang, Vice President				
Wendell Huang, Vice President & Chief Financial Officer/ Spokesperson				
C.S. Yoo, Vice President				
Jun He, Vice President				
Geoffrey Yeap, Vice President				
Chris Horng-Dar Lin, Vice President & Chief Information Officer				
Jonathan Lee, Vice President				
Arthur Chuang, Vice President				
L.C. Lu, Vice President & TSMC Fellow				
K.C. Hsu, Vice President				
Y.C. Huang ⁽²⁾				

(1) The RSAs granted under the Employee Restricted Stock Awards Rules for Year 2021 held by each of these directors and executives represent less than one percent of our total outstanding common shares.

(2) Dr. Y.C. Huang is an eligible executive in accordance with the Employee Restricted Stock Awards Rules for Year 2021 but is not an executive officer.

Employee Restricted Stock Awards Rules for Year 2021

In 2021, we adopted the Employee Restricted Stock Awards Rules for Year 2021 (the “2021 Rules”), which authorized the grant of up to 2,600,000 common shares, with par value of NT\$10 per share, in the form of RSAs to eligible executives of TSMC. The 2021 Rules became effective on August 6, 2021. The purpose of the 2021 Rules is to attract and retain corporate executives and link their compensation with shareholders’ interests and our ESG achievements.

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The 2021 Rules provide that RSAs may only be granted to full-time executives of TSMC who meet certain performance requirements. The number of RSAs granted is determined by our Chairman and Chief Executive Officer and approved by the Compensation Committee and the Board of Directors. Grants under the 2021 Rules are made free of charge to the recipient and are subject to certain vesting conditions, as outlined in the 2021 Rules. In particular, the maximum amount of RSAs that may vest each year are as follows: 50% on the first anniversary of the grant, 25% on the second anniversary of the grant and 25% on the third anniversary of the grant.

Issuances under the 2021 Rules may be granted over a period of one year from the effective date.

In February 2022, our Board of Directors resolved to approve the issuance of 1,387,000 units of RSAs under the 2021 Rules.

Employee Restricted Stock Awards Rules for Year 2022

In April 2022, our Board of Directors approved the Employee Restricted Stock Awards Rules for Year 2022 (the “2022 Rules”), which authorize the grant of up to 3,065,000 common shares, with par value of NT\$10 per share, in the form of RSAs to eligible executives and critical talents of TSMC and TSMC’s subsidiaries. The 2022 Rules are subject to shareholder approval at the annual general meeting in June 2022, and approval by the R.O.C. FSC. The purpose of the 2022 Rules is to attract and retain corporate executives and critical talents and link their compensation with shareholders’ interests and/or our ESG achievements.

The 2022 Rules provide that RSAs may only be granted to full-time executives or critical talents of TSMC and TSMC’s subsidiaries who meet certain performance requirements. The number of RSAs granted is to be determined by our Chairman and Chief Executive Officer and approved by the Compensation Committee and the Board of Directors. Grants under the 2022 Rules would be made free of charge to the recipient and are subject to certain vesting conditions, as outlined in the 2022 Rules. In particular, the maximum amount of RSAs that may vest each year would be as follows: 50% on the first anniversary of the grant, 25% on the second anniversary of the grant and 25% on the third anniversary of the grant.

Issuances under the 2022 Rules may be granted over a period of one year from the effective date.

Compensation

According to our Articles of Incorporation, not more than 0.3 percent of our annual profits, after recovering any losses incurred in prior years, may be distributed as compensation to our directors and at least one percent of our annual profits may be distributed as profit sharing bonuses to employees, including executive officers. Compensation to directors is always paid in cash, while bonuses to our executive officers may be granted in cash, stock, or stock options or the combination of all these three. Individual awards are based on each individual’s job responsibility, contribution and performance. See note 30 to our consolidated financial statements. Under our Articles of Incorporation, directors who also serve as executive officers are not entitled to any director compensation.

Remuneration Paid to Directors

The following table presents the remuneration paid and benefits in kind granted to our non-employee directors in 2021:

<u>Name/Title</u>	<u>Fees Earned or</u>	<u>Stock</u>	<u>All Other</u>	<u>Total</u>	
	<u>Paid in Cash</u>	<u>Awards</u>	<u>Compensation⁽²⁾</u>	<u>NT\$</u>	<u>US\$</u>
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>		
			(in millions)		
Mark Liu, Chairman	398.7	—	1.6	400.4	14.4
F.C. Tseng, Director ⁽¹⁾	10.6	—	1.3	11.9	0.4
Ming-Hsin Kung, Director (Representative of National Development Fund, Executive Yuan)	10.6	—	—	10.6	0.4
Sir Peter L. Bonfield, Independent Director	14.8	—	—	14.8	0.5
Stan Shih, Independent Director	7.5	—	—	7.5	0.3
Kok-Choo Chen, Independent Director	13.2	—	—	13.2	0.5
Michael R. Splinter, Independent Director	14.8	—	—	14.8	0.5
Moshe N. Gavrielov, Independent Director	14.8	—	—	14.8	0.5
Yancey Hai, Independent Director	13.2	—	—	13.2	0.5
L. Rafael Reif, Independent Director	6.4	—	—	6.4	0.2
Total	504.4	—	2.9	507.3	18.3

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- (1) In addition to the above, F.C. Tseng received NT\$11.0 million of compensation from non-consolidated affiliates and NT\$15.1 million of Advisor Fee from TSMC.
- (2) Included pensions funded according to applicable law and expenses for company cars, but did not include compensation paid to car drivers made available to directors.

On March 1, 2022, Dr. Mark Liu was granted cash-settled compensation linked to the price of TSMC's common shares. Such cash-settled compensation represents the right to receive an amount of cash equal to the market value of common shares of TSMC at the time of vesting. The grant is subject to the same vesting conditions as the aforementioned 2021 Rules.

Compensation Paid to Executive Officers⁽¹⁾

The following table presents the compensation paid and benefits in kind granted to our executive officers in 2021:

<u>Name/Title</u>	<u>Salary</u>	<u>Bonus⁽⁶⁾</u>	<u>Stock Awards</u>	<u>All Other Compensation⁽⁷⁾</u>	<u>Total</u>	
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>US\$</u>
	(in millions)					
C.C. Wei, Chief Executive Officer	13.3	381.9	—	5.1	400.3	14.4
Wendell Huang, Vice President & Chief Financial Officer/ Spokesperson	5.2	54.3	—	1.5	61.1	2.2
Lora Ho, Senior Vice President						
Wei-Jen Lo, Senior Vice President						
Rick Cassidy, Senior Vice President/ CEO & President of TSMC Arizona						
Y.P. Chin, Senior Vice President						
Y.J. Mii, Senior Vice President						
J.K. Lin, Senior Vice President						
J.K. Wang, Senior Vice President						
Cliff Hou, Senior Vice President						
Kevin Zhang, Senior Vice President						
Sylvia Fang, Vice President & General Counsel/ Corporate Governance Officer						
Connie Ma, Vice President						
Y.L. Wang, Vice President						
Doug Yu, Vice President & TSMC Distinguished Fellow	137.6	1,728.6	—	50.6	1,916.8	69.1 ⁽⁸⁾
T.S. Chang, Vice President & TSMC Fellow						
Michael Wu, Vice President						
Min Cao, Vice President						
Marvin Liao, Vice President						
Y.H. Liaw, Vice President						
Simon Jang, Vice President						
C.S. Yoo, Vice President						
Jun He, Vice President						
Geoffrey Yeap, Vice President ⁽²⁾						
Chris Horng-Dar Lin, Vice President and Chief Information Officer ⁽²⁾						
Jonathan Lee, Vice President ⁽³⁾						
Arthur Chuang, Vice President ⁽⁴⁾						
L.C. Lu, Vice President & TSMC Fellow ⁽⁴⁾						
K.C. Hsu, Vice President ⁽⁵⁾						
Total	<u>156.2</u>	<u>2,164.8</u>	<u>—</u>	<u>57.3</u>	<u>2,378.2</u>	<u>85.7</u>

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- (1) The total compensation paid to the executive officers is decided based on their job responsibility, contribution, company performance and projected future risks the Company will face. It is reviewed by the Compensation Committee then submitted to the Board of Directors for approval.
- (2) Dr. Geoffrey Yeap and Dr. Chris Horng-Dar Lin were promoted to Vice President, effective February 9, 2021. These amounts did not include compensation for the period before their promotion.
- (3) Mr. Jonathan Lee was promoted to Vice President, effective June 9, 2021. These amounts did not include compensation for the period before his promotion.
- (4) Dr. Arthur Chuang and Dr. L.C. Lu were promoted to Vice President, effective August 10, 2021. These amounts did not include compensation for the period before their promotion.
- (5) Mr. K.C. Hsu was promoted to Vice President, effective November 9, 2021. These amounts did not include compensation for the period before his promotion.
- (6) Included cash bonus and profit sharing bonus.
- (7) Included pensions funded according to applicable law and expenses for company cars.
- (8) Aggregate amount for executive officers other than C.C. Wei and Wendell Huang.

Board Practices

General

For a discussion of the term of office of the Board of Directors, see “– Directors and Executive Officers – Management”. No benefits are payable to members of the Board upon termination of their relationship with us.

Audit Committee

Our Audit Committee was established on August 6, 2002 to assist our Board of Directors in the review and monitoring of our financial and accounting matters, and the integrity of our financial reporting process and controls.

All members of the Audit Committee must have a basic understanding of finance and accounting and at least one member must have accounting or related financial management expertise.

Currently, the Audit Committee consists of six members comprising all of our independent directors. The members of the Audit Committee are Sir Peter L. Bonfield, the Chairman of our Audit Committee, Ms. Kok-Choo Chen, Mr. Michael R. Splinter, Mr. Moshe N. Gavrielov, Mr. Yancey Hai and Dr. L. Rafael Reif. In addition, Mr. Jan C. Lobbezoo was appointed to serve as a financial expert consultant to the Audit Committee from February 14, 2006 onwards. See “Item 16A. Audit Committee Financial Expert”. The Audit Committee is required to meet at least once every quarter. Our Audit Committee charter grants the Audit Committee the authority to conduct any investigation which it deems appropriate to fulfill its responsibilities. It has direct access to all our books, records, facilities, personnel, as well as registered public accountants. It has the authority to, among other things, appoint, terminate and approve all fees to be paid to our registered public accountants, subject to the approval of the Board of Directors as appropriate, and to oversee the work performed by the registered public accountants. The Audit Committee also has the authority to engage special legal, accounting, or other consultants it deems necessary in the performance of its duties. Beginning on January 1, 2007, the Audit Committee also assumed the responsibilities of supervisors pursuant to the R.O.C. Securities and Exchange Act.

The Audit Committee convened four regular meetings and two special meetings in 2021. In addition to these meetings, the Audit Committee members and consultant participated in one special meeting and three telephone conferences to discuss our annual report to be filed with the Taiwan and U.S. authorities and investor conference materials with management.

As part of its risk oversight of our operations and financial controls, our Audit Committee receives and reviews periodic reports from the head of Corporate Information Security function relating to our information technology and security matters, including any cybersecurity incidents, assessment of new and emerging cybersecurity risks and threats and their proposed improvement measures. Based on such reviews and their discussions with the head of Corporate Information Security function, our Audit Committee assists our Board to review, assess, and enhance the adequacy and effectiveness of our cybersecurity policies and procedures on an ongoing basis.

Compensation Committee

Our Board of Directors established a Compensation Committee in June 2003 to assist our Board of Directors in discharging its responsibilities related to our compensation and benefit policies, plans and programs, and the compensation of our directors of the Board and executives.

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The members of the Compensation Committee are appointed by the Board as required by the R.O.C. laws. The Compensation Committee, by its charter, shall consist of no fewer than three independent directors of the Board. Currently, the Compensation Committee comprises all of our six independent directors. The members of the Compensation Committee are Mr. Michael R. Splinter, the Chairman of our Compensation Committee, Sir Peter L. Bonfield, Ms. Kok-Choo Chen, Mr. Moshe N. Gavriellov, Mr. Yancey Hai and Dr. L. Rafael Reif.

The Compensation Committee convened four regular meetings and two special meetings in 2021.

Employees

The following table sets out, as of the dates indicated, the number of our full-time employees serving in the capacities indicated.

Function	As of December 31,		
	2019	2020	2021
Managers	5,364	5,857	6,635
Professionals	24,416	27,767	31,920
Assistant Engineers/Clericals	4,357	4,832	6,620
Technicians	17,160	18,375	19,977
Total	51,297	56,831	65,152

The following table sets out, as of the dates indicated, a breakdown of the number of our full-time employees by geographic location:

Location of Facility and Principal Offices	As of December 31,		
	2019	2020	2021
Hsinchu Science Park, Taiwan	24,442	25,776	27,382
Southern Taiwan Science Park, Taiwan	12,771	16,114	20,428
Central Taiwan Science Park, Taiwan	7,333	7,668	8,486
Taoyuan County, Taiwan	1,475	1,661	1,701
Miaoli County, Taiwan	—	—	628
China	3,679	3,859	4,131
North America	1,513	1,620	2,188
Europe	50	52	54
Japan	32	78	152
Korea	2	3	2
Total	51,297	56,831	65,152

As of December 31, 2021, our total employee population was 65,152 with an educational makeup of 4.1% Ph.Ds, 47.3% masters, 27.6% university bachelors, 8.9% college degrees and 12.0% others. Among this employee population, 59.2% were at a managerial or professional level. Continuous learning is the cornerstone of our employee development strategy. Individual development plans are tailor-made to individual development needs for each employee. Employee development is further supported and enforced by a comprehensive network of resources including on the job training, coaching, mentoring, job rotation, classroom training, e-learning and external learning opportunities.

Pursuant to our Articles of Incorporation, our employees participate in our profits sharing program by way of a bonus. Employees in the aggregate are entitled to not less than 1% of our annual profits (defined under local law), after recovering any losses incurred in prior years. Our practice has been to determine the amount of the bonus based on our operating results and industry practice in the R.O.C. In 2020 and 2021, we distributed employees' business performance bonus of NT\$34,753 million and employees' cash profit sharing bonus of NT\$34,753 million to our employees in relation to year 2020 profits. In 2021 and 2022, we distributed employees' business performance bonus of NT\$35,601 million (US\$1,283 million) to our employees in relation to year 2021 profits. Employees' cash profit sharing bonus of NT\$35,601 million (US\$1,283 million) in relation to year 2021 profits will be distributed in July 2022.

As to employee relations, we value two-way communication and are committed to keeping our communication channels open and transparent between the management level and their subordinates. In addition, we are dedicated to providing diverse employee engagement programs, which support our goals in reinforcing close rapport with employees and maintaining harmonious labor relations.

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ITEM 7. MAJOR SHAREHOLDERS AND RELATED PARTY TRANSACTIONS

Major Shareholders

The following table sets forth certain information as of February 28, 2022, with respect to our common shares owned by (i) each person who, according to our records, beneficially owned five percent or more of our common shares and by (ii) all directors and executive officers as a group.

<u>Names of Shareholders</u>	<u>Number of Common Shares Owned</u>	<u>Percentage of Total Outstanding Common Shares⁽¹⁾</u>
National Development Fund, Executive Yuan	1,653,709,980	6.38%
BlackRock, Inc. ⁽²⁾	1,317,566,696	5.08%
Directors and executive officers as a group ⁽³⁾	87,626,164	0.34%

(1) As of February 28, 2022, we held 1,387,000 of our common shares in treasury as a result of repurchases made pursuant to the Share Repurchase Program, and such repurchased shares are not included in the number of total outstanding common shares. See “Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers” for a further discussion.

(2) According to the Schedule 13G of BlackRock, Inc. filed with the U.S. SEC on February 7, 2022, BlackRock, Inc. is the parent holding company or control person of several entities with interests in us. We do not have further information with respect to BlackRock, Inc.’s ownership in us subsequent to its Schedule 13G filed on February 7, 2022.

(3) Excluded ownership of the National Development Fund, Executive Yuan.

As of February 28, 2022, a total of 25,928,993,458 common shares were outstanding. With certain limited exceptions, holders of common shares that are not R.O.C. persons are required to hold their common shares through their custodians in the R.O.C. As of February 28, 2022, 5,320,503,163 common shares were registered in the name of a nominee of Citibank, N.A., the depository under our ADS deposit agreement. Citibank, N.A., advised us that, as of February 28, 2022, 1,064,100,627 ADSs, representing 5,320,503,135 common shares, were held of record by Cede & Co. and 166 other registered shareholders domiciled in and outside of the United States. We have no further information as to common shares held, or beneficially owned, by U.S. persons.

Our major shareholders have the same voting rights as our other shareholders. For a description of the voting rights of our shareholders, see “Item 10. Additional Information – Description of Common Shares – Voting Rights”.

We are currently not aware of any arrangement that may at a subsequent date result in a change of control of us.

Related Party Transactions

Vanguard International Semiconductor Corporation (“VIS”)

In 1994, we, the R.O.C. Ministry of Economic Affairs and other investors established VIS, then an integrated DRAM manufacturer. VIS commenced volume commercial production in 1995 and listed its shares on the Taipei Exchange in March 1998. In 2004, VIS completely terminated its DRAM production and became a dedicated foundry company. As of February 28, 2022, we owned approximately 28.3% of the equity interest in VIS.

Pursuant to the terms of a manufacturing agreement between both parties, VIS was obligated to use its best commercial efforts to manufacture wafers at specified yield rates for us up to a fixed amount of reserved capacity per month, and TSMC was required to use its best commercial efforts to maintain utilization of such reserved capacity. In 2021, we had total purchases of NT\$3,726 million (US\$134 million) from VIS, representing 0.5% of our total cost of revenue.

Systems on Silicon Manufacturing Company Pte. Ltd. (“SSMC”)

SSMC is a joint venture in Singapore that we established with Philips and EDB Investment Pte. Ltd. to produce integrated circuits by means of advanced submicron manufacturing processes. These integrated circuits are made pursuant to the product design specifications provided primarily by us and Philips under an agreement with Philips, and EDB Investment Pte. Ltd. (the “SSMC Shareholders Agreement”) in March 1999 and, primarily by us and NXP Semiconductors N.V. (“NXP”), subsequent to the assignment by Philips of its rights to NXP and NXP’s assumption of Philips’ obligations under the SSMC Shareholders Agreement pursuant to the Assignment and Assumption Agreement effective September 25, 2006. SSMC’s business is limited to manufacturing wafers for us, our subsidiaries, NXP and NXP’s subsidiaries. On November 15, 2006, we and NXP exercised the option rights under the SSMC Shareholders Agreement to purchase all of the SSMC shares owned by EDB Investment Pte. Ltd. As a result, we now own 38.8%, and NXP owns 61.2% of SSMC. While we, together with NXP, have the right to purchase up to 100% of SSMC’s annual capacity, we and NXP are required to purchase, in the aggregate, at least 70% of SSMC’s full capacity. See below for a detailed discussion of the contract terms we entered into with SSMC.

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We entered into a technology cooperation agreement with SSMC effective March 30, 1999 in which SSMC agreed to base at least a major part of its production activities on processes compatible to those in use in our metal oxide semiconductor (“MOS”) integrated circuits wafer volume production fabs. In return, we agreed to provide SSMC with access to and benefit of the technical knowledge and experience relating to certain processes in use in our MOS integrated circuits wafer volume production fabs and to assist SSMC by rendering certain technical services in connection with its production activities. In addition, we granted to SSMC limited licenses of related intellectual property rights owned or controlled by us for the purpose of MOS integrated circuit production for the sole use in manufacturing products for us. SSMC pays to us during, and up to three years after, the term of this agreement a remuneration of a fixed percentage of the net selling price of all products manufactured by SSMC. In 2021, we had total purchases of NT\$3,843 million (US\$139 million) from SSMC, representing 0.5% of our total cost of revenue.

Global Unichip Corporation (“GUC”)

In January 2003, we acquired a 52.0% equity interest in GUC, a SoC design service company that provides large scale SoC implementation services. GUC listed its shares on the Taiwan Stock Exchange in November 2006. As of February 28, 2022, we owned approximately 34.8% of the equity interest in GUC.

In 2021, we had total sales of NT\$7,707 million (US\$278 million) to GUC, representing 0.5% of our total revenue.

Xintec, Inc. (“Xintec”)

In January 2007, we acquired a 51.2% equity interest in Xintec, a supplier of wafer level packaging service, to support our CMOS image sensor manufacturing business. Xintec listed its shares on the Taipei Exchange in March 2015. Subsequent to Xintec’s IPO, our shareholding in Xintec was diluted to approximately 41.2%. As of February 28, 2022, we owned approximately 41.0% of the equity interest in Xintec.

In 2021, we incurred total manufacturing expenses of NT\$5,460 million (US\$197 million) from Xintec, representing 0.7% of our total cost of revenue.

ITEM 8. FINANCIAL INFORMATION

Consolidated Financial Statements and Other Financial Information

Please see “Item 18. Financial Statements”. Other than as disclosed elsewhere in this annual report, no significant change has occurred since the date of the annual consolidated financial statements.

Legal Proceedings

We were not a party to any material litigation as of December 31, 2021, and are not currently a party to any other material litigation.

Dividends and Dividend Policy

Except as otherwise specified in the Articles of Incorporation or under the R.O.C. laws, we will not pay dividends or make other distributions to shareholders when there are no earnings. Our profits may be distributed by way of cash dividend, stock dividend, or a combination of cash and stock. Pursuant to our Articles of Incorporation, distributions of profits shall be made preferably by way of cash dividend. In addition, the ratio for stock dividends shall not exceed 50% of the total distribution. Distribution of stock dividends is subject to approval by the R.O.C. FSC.

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Pursuant to our Articles of Incorporation, our Board of Directors is authorized to approve quarterly cash dividends after the close of each quarter. After our Board of Directors approves quarterly cash dividends, we will distribute the dividend within six months. The respective amounts and payment dates of 2021 quarterly cash dividends are demonstrated in the table below.

Period	Approved Date	Payment Date	Cash Dividends Per Share (NT\$)	Total Amount (NT\$)
First quarter of 2021	June 9, 2021	October 14, 2021	2.75	71,308,546,260
Second quarter of 2021	August 10, 2021	January 13, 2022	2.75	71,308,546,260
Third quarter of 2021	November 9, 2021	April 14, 2022	2.75	71,308,546,260
Fourth quarter of 2021	February 15, 2022	July 14, 2022	2.75	71,308,546,260

Holders of outstanding common shares on a dividend record date will be entitled to the full dividend declared without regard to any subsequent transfer of the common shares.

Holders of ADRs evidencing ADSs are entitled to receive dividends, subject to the terms of the deposit agreement, to the same extent as the holders of common shares. Cash dividends will be paid to the depositary and, after deduction of any applicable R.O.C. taxes and except as otherwise provided in the deposit agreement, will be paid to holders. Stock dividends will be distributed to the depositary and, except as otherwise provided in the deposit agreement, will be distributed to holders by the depositary in the form of additional ADSs.

For information relating to R.O.C. withholding taxes payable on cash and stock dividends, see “Item 10. Additional Information – Taxation – R.O.C. Taxation – Dividends”.

ITEM 9. THE OFFER AND LISTING

The principal trading market for our common shares is the Taiwan Stock Exchange. Our common shares have been listed on the Taiwan Stock Exchange under the symbol “2330” since September 5, 1994, and the ADSs have been listed on the NYSE under the symbol “TSM” since October 8, 1997. The outstanding ADSs are identified by the CUSIP number 874039100.

ITEM 10. ADDITIONAL INFORMATION

Description of Common Shares

We are organized under the laws of the R.O.C. Set forth below is a description of our common shares, including summaries of the material provisions of our Articles of Incorporation, the R.O.C. Company Act, the R.O.C. Securities and Exchange Act and the regulations promulgated thereunder.

General

Our authorized share capital is NT\$280,500,000,000, divided into 28,050,000,000 common shares, of which 500,000,000 common shares are reserved for the issuance for our employee stock options and among which 25,930,380,458 common shares were issued and outstanding as of December 31, 2021. As of February 28, 2022, 25,928,993,458 common shares were outstanding, which excluded 1,387,000 common shares held in treasury as a result of repurchase made pursuant to the Share Repurchase Program (see “Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers” for a further discussion). No employee stock options were outstanding as of December 31, 2021 and February 28, 2022. On March 1, 2022, we granted a total of 1,387,000 common shares in the form of RSAs to our executives pursuant to our 2021 Rules. Please see “Item 6. Directors, Senior Management and Employees – Share Ownership” for a further discussion.

The R.O.C. Company Act, the R.O.C. Act for Establishment and Administration of Science Parks and the R.O.C. Securities and Exchange Act provide that any change in the issued share capital of a public company, such as us, requires the approval of its board of directors, (or, for capital reduction, a resolution of its shareholders meeting), the approval of, or the registration with, the R.O.C. FSC and the Ministry of Economic Affairs or the Science Park Administration (as applicable) and/or an amendment to its articles of incorporation (if such change also involves a change in the authorized share capital).

There are no provisions under either R.O.C. law or the deposit agreement under which holders of ADSs would be required to forfeit the common shares represented by ADSs.

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Dividends and Distributions

An R.O.C. company is generally not permitted to distribute dividends or to make any other distributions to shareholders in respect of any year for which it did not have either earnings or retained earnings. In addition, before distributing a dividend to shareholders following the end of a fiscal year, the company must recover any past losses, pay all outstanding taxes and set aside in a legal reserve, until such time as its legal reserve equals its paid-in capital, 10% of its net income for that fiscal year (less any past losses and outstanding tax), and may set aside a special reserve.

Before the R.O.C. Company Act was amended in August 2018, the Board of Directors submitted our financial statements for the preceding fiscal year and any proposal for the distribution of a dividend or the making of any other distribution to shareholders from our earnings or retained earnings (subject to compliance with the requirements described above) at the end of the preceding fiscal year to the shareholders for their approval at the annual general meeting of our shareholders. All common shares outstanding and fully paid as of the relevant record date are entitled to share equally in any dividend or other distribution so approved. Dividends may be distributed in cash, in the form of common shares or a combination thereof, as determined by the shareholders at the meeting.

The R.O.C. Company Act, amended in August 2018, allows a company, as authorized by its articles of incorporation, to distribute dividends on a quarterly basis or a semi-annual basis and to have its board of directors to approve the dividends in cash. Our 2019 Annual Shareholders' Meeting has approved the amendments to the Articles of Incorporation to authorize our Board of Directors to approve cash dividends after the close of each quarter.

In addition to permitting dividends to be paid out of earnings or retained earnings, the R.O.C. Company Act permits us to make distributions to our shareholders in cash or in the form of common shares from capital surplus and the legal reserve. However, dividend distribution out of our legal reserve can only be effected to the extent of the excessive amount of the accumulated legal reserve over 25% of our paid-in capital.

For information as to R.O.C. taxes on dividends and distributions, see “– Taxation – R.O.C. Taxation”.

Preemptive Rights and Issues of Additional Common Shares

Under the R.O.C. Company Act, when a public company, such as us, issues new shares of common stock for cash, 10% to 15% of the issue must be offered to its employees. The remaining new shares must be offered to existing shareholders in a preemptive rights offering, subject to a requirement under the R.O.C. Securities and Exchange Act that at least 10% of these issuances must be offered to the public. This percentage can be increased by a resolution passed at a shareholders' meeting, thereby limiting or waiving the preemptive rights of existing shareholders. The preemptive rights provisions do not apply to limited circumstances, such as:

- issuance of new shares upon conversion of convertible bonds; and
- offerings of new shares through a private placement approved at a shareholders' meeting.

Authorized but unissued shares of any class may be issued at such times and, subject to the above-mentioned provisions of the R.O.C. Company Act and the R.O.C. Securities and Exchange Act, upon such terms as the board of directors may determine. The shares with respect to which preemptive rights have been waived may be freely offered, subject to compliance with applicable R.O.C. law.

Meetings of Shareholders

Meetings of our shareholders may be general meetings or special meetings. General meetings of shareholders are generally held in Hsinchu, Taiwan, within six months after the end of each fiscal year. Special meetings of shareholders may be convened by resolution of the board of directors whenever it deems necessary, or under certain circumstances, by shareholders or the audit committee. For a public company such as us, notice in writing of shareholders' meetings, stating the place, time and purpose thereof, must be sent to each shareholder at least thirty days (in the case of general meetings) and fifteen days (in the case of special meetings) prior to the date set for each meeting.

Voting Rights

A holder of common shares has one vote for each common share. Except as otherwise provided by law, a resolution may be adopted by the holders of a simple majority of the total issued and outstanding common shares represented at a shareholders' meeting at which a majority of the holders of the total issued and outstanding common shares are present. The election of directors at a shareholders' meeting is by cumulative voting. As authorized under the R.O.C. Company Act and as required by the R.O.C. FSC, we have adopted a nomination procedure for election of our directors in our Articles of Incorporation. According to our Articles of Incorporation, ballots for the election of directors and independent directors are cast separately.

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The R.O.C. Company Act also provides that in order to approve certain major corporate actions, including but not limited to, (i) any amendment to the articles of incorporation (which is required for, among other actions, any increase in authorized share capital), (ii) execution, modification or termination of any contracts regarding leasing of all business or joint operations or mandate of the company's business to other persons, (iii) the dissolution, amalgamation or spin-off of a company or the transfer of the whole or an important part of its business or its properties or the taking over of the whole of the business or properties of any other company which would have a significant impact on the acquiring company's operations, (iv) the removal of directors or supervisors or (v) the distribution of any stock dividend, a meeting of the shareholders must be convened with a quorum of holders of at least two-thirds of all issued and outstanding shares of common stock at which the holders of at least a majority of the common stock represented at the meeting vote in favor thereof. However, in the case of a publicly held company such as us, such a resolution may be adopted by the holders of at least two-thirds of the shares of common stock represented at a shareholders' meeting at which holders of at least a majority of the issued and outstanding shares of common stock are present.

A shareholder may be represented at a shareholders' meeting by proxy. A valid proxy must be delivered to us at least five days prior to the commencement of the shareholders' meeting.

Holders of ADSs will not have the right to exercise voting rights with respect to the common shares represented thereby, except as described in "— Voting of Deposited Securities".

Other Rights of Shareholders

Under the R.O.C. Company Act, dissenting shareholders are entitled to appraisal rights in the event of amalgamation, spin-off or certain other major corporate actions. A dissenting shareholder may request us to redeem all of the shares owned by that shareholder at a fair price to be determined by mutual agreement or a court order if agreement cannot be reached. A shareholder may exercise these appraisal rights by serving a written notice on us prior to the related shareholders' meeting and by raising an objection at the shareholders' meeting. In addition to appraisal rights, any shareholder has the right to sue for the annulment of any resolution adopted at a shareholders' meeting where the procedures were legally defective within thirty days after the date of such shareholders' meeting. One or more shareholders who have held one percent or more of our issued and outstanding shares for six months or longer may require the audit committee to bring a derivative action against a director for that director's liability to us as a result of that director's unlawful actions or failure to act. In addition, one or more shareholders who have held three percent or more of our issued and outstanding shares for over a year may require the board of directors to convene a special shareholders' meeting by sending a written request to the board of directors, while one or more shareholders who have held over 50% of our issued and outstanding shares for three months may convene a special shareholders' meeting by themselves.

The R.O.C. Company Act allows shareholder(s) holding 1% or more of the total issued shares of a company to, during the period of time prescribed by the company, submit one proposal in writing or through any electronic means designated by us, which contains no more than three hundred words (Chinese characters) for discussion at the general meeting of shareholders. In addition, if a company adopts a nomination procedure for election of directors or supervisors in its articles of incorporation, shareholders representing 1% or more of the total issued shares of such company may submit a candidate list in writing to the company along with relevant information and supporting documents.

Register of Shareholders and Record Dates

Our share registrar, CTBC Bank Co., Ltd., maintains the register of our shareholders at its office in Taipei, Taiwan. Under the R.O.C. Company Act, the transfer of common shares in registered form is effected by endorsement of the transferor's and transferee's seals on the share certificates and delivery of the related share certificates. In order to assert shareholders' rights against us, however, the transferee must have his name and address registered on the register of shareholders. Shareholders are required to file their respective specimen signatures or seals with us. The settlement of trading in the common shares is carried out on the book-entry system maintained by the Taiwan Depository & Clearing Corporation and therefore, the share transfer will follow the procedures of the Taiwan Depository & Clearing Corporation.

The R.O.C. Company Act permits us to set a record date and close the register of shareholders for a specified period in order for us to determine the shareholders or pledgees that are entitled to certain rights pertaining to common shares by giving advance public notice. Under the R.O.C. Company Act, our register of shareholders should be closed for a period of sixty days, thirty days and five days immediately before each general meeting of shareholders, special meeting of shareholders and record date of dividend distribution, respectively.

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Annual Financial Statements

Under the R.O.C. Company Act, ten days before the general meeting of shareholders, our annual financial statements must be available at our principal office in Hsinchu for inspection by the shareholders.

Acquisition of Common Shares by Us

With minor exceptions, neither we nor our subsidiaries may acquire our common shares under the R.O.C. Company Act. However, under the R.O.C. Securities and Exchange Act, we may, by a board resolution adopted by majority consent at a meeting with two-thirds of our directors present, purchase our common shares on the Taiwan Stock Exchange or by a tender offer, in accordance with the procedures prescribed by the R.O.C. FSC, for any of the following purposes: (i) to transfer shares to our employees; (ii) to satisfy our obligations to provide our common shares upon exercise or conversion of any warrants, convertible bonds or convertible preferred shares; or (iii) if necessary, to maintain our credit and our shareholders' equity (such as for the purpose of supporting the trading price of our common shares during market dislocations), provided that the common shares so purchased shall be cancelled thereafter.

We are not allowed to purchase more than ten percent of our total issued and outstanding common shares. In addition, we may not spend more than the aggregate amount of our retained earnings, premium from issuing stock and the realized portion of the capital reserve to purchase our common shares.

We may not pledge or hypothecate any purchased common shares. In addition, we may not exercise any shareholders' rights attached to such common shares. In the event that we purchase our common shares on the Taiwan Stock Exchange, our affiliates, directors, officers and shareholders, together with their respective spouses, minor children and nominees holding more than 10% of our total shares (as well as such respective spouses, minor children and nominees) are prohibited from selling any of our common shares during the period in which we purchase our common shares.

Liquidation Rights

In the event of our liquidation, the assets remaining after payment of all debts, liquidation expenses, taxes and distributions to holders of preferred shares, if any, will be distributed pro rata to our shareholders in accordance with the R.O.C. Company Act.

Transaction Restrictions

The R.O.C. Securities and Exchange Act (i) requires each director, supervisor, officer or shareholder, together with his/her spouse and minor children and its/his/her nominees, holding more than ten percent of the shares of a public company to report the amount of that person's shareholding (as well as the shareholding of his/her spouse and minor children and its/his/her nominees), on a monthly basis, to that company and (ii) limits the number of shares that can be sold or transferred on the Taiwan Stock Exchange or on the Taipei Exchange by that person, as well as his/her respective spouse and minor children and its/his/her nominees, per day. The above sale and transfer of shares can be made only after that person (as well as his/her respective spouse and minor children and its/his/her nominees) has held the shares for more than six months and that person should report to the R.O.C. FSC at least three days before the intended sale or transfer; unless the number of shares to be sold or transferred does not exceed 10,000.

Material Contracts

TSMC is not currently a party to any material contract, other than contracts entered into in the ordinary course of our business.

Foreign Investment in the R.O.C.

Since 1983, the R.O.C. government has periodically enacted legislation and adopted regulations to permit foreign investment in the R.O.C. securities market.

On September 30, 2003, the R.O.C. Executive Yuan approved an amendment to Regulations Governing Investment in Securities by Overseas Chinese and Foreign National, or the Regulations, which took effect on October 2, 2003. According to the Regulations, the R.O.C. FSC abolished the mechanism of the so-called "qualified foreign institutional investors" and "general foreign investors" as stipulated in the Regulations before the amendment.

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Under the Regulations, foreign investors are classified as either “onshore foreign investors” or “offshore foreign investors” according to their respective geographical location. Both onshore and offshore foreign investors are allowed to invest in R.O.C. securities after they register with the Taiwan Stock Exchange. The Regulations further classify foreign investors into foreign institutional investors and foreign individual investors. “Foreign institutional investors” refer to those investors incorporated and registered in accordance with foreign laws outside of the R.O.C. (i.e., offshore foreign institutional investors) or their branches set up within the R.O.C. (i.e., onshore foreign institutional investors). Offshore overseas Chinese and foreign individual investors may be subject to a maximum investment ceiling that will be separately determined by the R.O.C. FSC after consultation with the Central Bank of the Republic of China (Taiwan). Currently, there is no maximum investment ceiling for offshore overseas Chinese and foreign individual investors. On the other hand, foreign institutional investors are not subject to any ceiling for investment in the R.O.C. securities market.

Except for certain specified industries, such as telecommunications, investments in R.O.C.-listed companies by foreign investors are not subject to individual or aggregate foreign ownership limits. Custodians for foreign investors are required to submit to the Central Bank of the Republic of China (Taiwan) and the Taiwan Stock Exchange a monthly report of trading activities and status of assets under custody and other matters. Capital remitted to the R.O.C. under these guidelines may be remitted out of the R.O.C. at any time after the date the capital is remitted to the R.O.C. Capital gains and income on investments may be remitted out of the R.O.C. at any time.

Foreign investors (other than foreign investors who have registered with the Taiwan Stock Exchange for making investments in the R.O.C. securities market) who wish to make direct investments in the shares of R.O.C. companies are required to submit a foreign investment approval application to the Investment Commission of the R.O.C. Ministry of Economic Affairs or other applicable government authority. The Investment Commission or such other government authority reviews each foreign investment approval application and approves or disapproves each application after consultation with other governmental agencies (such as the Central Bank of the Republic of China (Taiwan) and the R.O.C. FSC).

Under current R.O.C. law, any non-R.O.C. person possessing a foreign investment approval may repatriate annual net profits, interest and cash dividends attributable to the approved investment. Stock dividends attributable to this investment, investment capital and capital gains attributable to this investment may be repatriated by the non-R.O.C. person possessing a foreign investment approval after approvals of the Investment Commission or other government authorities have been obtained.

In addition to the general restriction against direct investment by non-R.O.C. persons in securities of R.O.C. companies, non-R.O.C. persons (except in certain limited cases) are currently prohibited from investing in certain industries in the R.O.C. pursuant to a “negative list”, as amended by the R.O.C. Executive Yuan. The prohibition on foreign investment in the prohibited industries specified in the negative list is absolute in the absence of a specific exemption from the application of the negative list. Pursuant to the negative list, certain other industries are restricted so that non-R.O.C. persons (except in limited cases) may invest in these industries only up to a specified level and with the specific approval of the relevant competent authority that is responsible for enforcing the relevant legislation that the negative list is intended to implement.

The R.O.C. FSC announced on April 30, 2009 the Regulations Governing Mainland Chinese Investors’ Securities Investments (“P.R.C. Regulations”) and amended the same on October 6, 2010. According to the P.R.C. Regulations, a P.R.C. qualified domestic institutional investor (“QDII”) is allowed to invest in R.O.C. securities (including less than 10% shareholding of an R.O.C. company listed on Taiwan Stock Exchange or the Taipei Exchange.) Nevertheless, the total investment amount of QDIIs cannot exceed US\$500 million. For each QDII, the custodians of such QDIIs must apply with the Taiwan Stock Exchange for the remittance amount for each QDII, which cannot exceed US\$100 million, and QDII can only invest in the R.O.C. securities market with the amount approved by the Taiwan Stock Exchange. In addition, QDIIs are currently prohibited from investing in certain industries, and their investment of certain other industries in a given company is restricted to a certain percentage pursuant to a list promulgated by the R.O.C. FSC and amended from time to time. P.R.C. investors other than QDII, however, are prohibited from making investments in an R.O.C. company listed on the Taiwan Stock Exchange or the Taipei Exchange, unless with approval from the Investment Commission of the R.O.C. Ministry of Economic Affairs for its investment of 10% or more (or other percentage applicable to certain restricted industries) of the equity interest of such R.O.C. company.

In addition to investments permitted under the P.R.C. Regulations, P.R.C. investors who wish to make (i) direct investment in the shares of R.O.C. private companies or (ii) investments, individually or aggregately, in 10% or more (or other percentage applicable to certain restricted industries) of the equity interest of an R.O.C. company listed on the Taiwan Stock Exchange or the Taipei Exchange are required to submit an investment approval application to the Investment Commission of the R.O.C. Ministry of Economic Affairs or other government authority. The Investment Commission of the R.O.C. Ministry of Economic Affairs or such other government authority reviews Investment Approval application and approves or disapproves each application after consultation with other governmental agencies. Furthermore, P.R.C. investor who wishes to be elected as an R.O.C. company’s director or supervisor shall also submit an investment approval application to the Investment Commission of the R.O.C. Ministry of Economic Affairs or other government authority for approval.

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Depository Receipts

In April 1992, the R.O.C. FSC enacted regulations permitting R.O.C. companies with securities listed on the Taiwan Stock Exchange, with the prior approval of the R.O.C. FSC, to sponsor the issuance and sale to foreign investors of depository receipts. Depository receipts represent deposited shares of R.O.C. companies. In December 1994, the R.O.C. FSC allowed companies whose shares are listed on the Taiwan Stock Exchange or traded on the Taipei Exchange, upon approval of the R.O.C. FSC, to sponsor the issuance and sale of depository receipts.

Our deposit agreement has been amended and restated on November 16, 2007 to: (i) make our ADSs eligible for the direct registration system, as required by the NYSE, by providing that ADSs may be certificated or uncertificated securities, (ii) enable the distribution of our reports by electronic means and (iii) reflect changes in R.O.C. laws in connection with the nomination of candidates for independent directors, for voting at the meeting of the shareholders. A copy of our amended and restated deposit agreement has been filed under the cover of Form F-6 on November 16, 2007.

A holder of depository receipts (other than citizens of the P.R.C. and entities organized under the laws of the P.R.C. save for QDII or those which otherwise obtain the approval of the Investment Commission of the R.O.C. Ministry of Economic Affairs) may request the depository to either cause the underlying shares to be sold in the R.O.C. and to distribute the sale proceeds to the holder or to withdraw from the depository receipt facility the shares represented by the depository receipts to the extent permitted under the deposit agreement (for depository receipts representing existing shares, immediately after the issuance of the depository receipts; and for depository receipts representing new shares, in practice four to seven business days after the issuance of the depository receipts) and transfer the shares to the holder.

We, or the foreign depository bank, may not increase the number of depository receipts by depositing shares in a depository receipt facility or issuing additional depository receipts against these deposits without specific R.O.C. FSC approval, except in limited circumstances. These circumstances include issuances of additional depository receipts in connection with:

- dividends or free distributions of shares;
- the exercise by holders of existing depository receipts of their pre-emptive rights in connection with capital increases for cash; or
- if permitted under the deposit agreement and custody agreement, the deposit of common shares purchased by any person directly or through a depository bank on the Taiwan Stock Exchange or the Taipei Exchange (as applicable) or held by such person for deposit in the depository receipt facility.

However, the total number of deposited shares outstanding after an issuance under the circumstances described in the third clause above may not exceed the number of deposited shares previously approved by the R.O.C. FSC plus any depository receipts created under the circumstances described in the first two clauses above. Issuances of additional depository receipts under the circumstances described in the third clause above will be permitted to the extent that previously issued depository receipts have been canceled and the underlying shares have been withdrawn from the depository receipt facility.

Under current R.O.C. law, a non-R.O.C. holder of ADSs who withdraws and holds the underlying shares must register with the Taiwan Stock Exchange and appoint an eligible local agent to:

- open a securities trading account with a local securities brokerage firm;
- open an NT dollars bank account;
- pay taxes;
- remit funds; and
- exercise rights on securities and perform other matters as may be designated by the holder.

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Under existing R.O.C. laws and regulations, without this account, holders of ADSs that withdraw and hold the common shares represented by the ADSs would not be able to hold or subsequently transfer the common shares, whether on the Taiwan Stock Exchange or otherwise. In addition, a withdrawing non-R.O.C. holder must appoint a local custodian for handling confirmation and settlement of trades, safekeeping of securities and cash proceeds and reporting of information.

Holders of ADSs who are non-R.O.C. persons withdrawing common shares represented by ADSs are required under current R.O.C. law and regulations to appoint an agent in the R.O.C. for filing tax returns and making tax payments. This agent, a “tax guarantor”, must meet certain qualifications set by the R.O.C. Ministry of Finance and, upon appointment, becomes a guarantor of the withdrawing holder’s R.O.C. tax payment obligations. In addition, under current R.O.C. law, repatriation of profits by a non-R.O.C. withdrawing holder is subject to the submission of evidence of the appointment of a tax guarantor to, and approval thereof by, the tax authority, or submission of tax clearance certificates or submission of evidencing documents issued by such agent (so long as the capital gains from securities transactions are exempt from R.O.C. income tax).

Under existing R.O.C. laws and regulations relating to foreign exchange control, a depository may, without obtaining further approvals from the Central Bank of the Republic of China (Taiwan) or any other governmental authority or agency of the R.O.C., convert NT dollars into other currencies, including U.S. dollars, in respect of the following: proceeds of the sale of shares represented by depository receipts, proceeds of the sale of shares received as stock dividends and deposited into the depository receipt facility and any cash dividends or cash distributions received. In addition, a depository, also without any of these approvals, may convert inward remittances of payments into NT dollars for purchases of underlying shares for deposit into the depository receipt facility against the creation of additional depository receipts. A depository may be required to obtain foreign exchange approval from the Central Bank of the Republic of China (Taiwan) on a payment-by-payment basis for conversion from NT dollars into other currencies relating to the sale of subscription rights for new shares. Proceeds from the sale of any underlying shares by holders of depository receipts withdrawn from the depository receipt facility may be converted into other currencies without obtaining approval from the Central Bank of the Republic of China (Taiwan). Proceeds from the sale of the underlying shares withdrawn from the depository receipt facility may be used for reinvestment in the Taiwan Stock Exchange or the Taipei Exchange, subject to compliance with applicable laws and regulations.

Direct Share Offerings

Since 1997, the R.O.C. government has amended regulations to permit R.O.C. companies listed on the Taiwan Stock Exchange or the Taipei Exchange to issue shares directly (not through depository receipt facility) overseas.

Overseas Corporate Bonds

Since 1989, the R.O.C. FSC has approved a series of overseas corporate bonds issued by R.O.C. companies listed on the Taiwan Stock Exchange or the Taipei Exchange in offerings outside the R.O.C. Under current R.O.C. law, these overseas corporate bonds can be:

- converted by bondholders, other than citizens of the P.R.C. and entities organized under the laws of the P.R.C. save for QDII or those that have obtained the approval of the Investment Commission of the R.O.C. Ministry of Economic Affairs, into shares of R.O.C. companies; or
- subject to R.O.C. FSC approval, converted into depository receipts issued by the same R.O.C. company or by the issuing company of the exchange shares, in the case of exchangeable bonds.

The relevant regulations also permit public companies to issue corporate debt in offerings outside the R.O.C. Proceeds from the sale of the shares converted from overseas convertible bonds may be used for reinvestment in securities listed on the Taiwan Stock Exchange or traded on the Taipei Exchange, subject to compliance with applicable laws and regulations.

Exchange Controls in the R.O.C.

The R.O.C. Foreign Exchange Control Statute and regulations provide that all foreign exchange transactions must be executed by banks designated to handle such business by the R.O.C. FSC and by the Central Bank of the Republic of China (Taiwan). Current regulations favor trade-related foreign exchange transactions. Consequently, foreign currency earned from exports of merchandise and services may now be retained and used freely by exporters, and all foreign currency needed for the importation of merchandise and services may be purchased freely from the designated foreign exchange banks.

Trade aside, R.O.C. companies and resident individuals may, without foreign exchange approval, remit to and from the R.O.C. foreign currency of up to US\$50 million (or its equivalent) and US\$5 million (or its equivalent), respectively, in each calendar year. Furthermore, any remittance of foreign currency into the R.O.C. by a R.O.C. company or resident individual in a year will be offset by the amount remitted out of R.O.C. by such company or individual (as applicable) within its annual quota and will not use up its annual inward remittance quota to the extent of such offset. The above limits apply to remittances involving a conversion of NT dollars to a foreign currency and vice versa. A requirement is also imposed on all enterprises incorporated or registered in the R.O.C. to register their medium- and long-term foreign debts with the Central Bank of the Republic of China (Taiwan).

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In addition, foreign persons may, subject to certain requirements, but without foreign exchange approval of the Central Bank of the Republic of China (Taiwan), remit outside and into the R.O.C. foreign currencies of up to US\$100,000 (or its equivalent) for each remittance. The above limit applies to remittances involving a conversion of NT dollars to a foreign currency and vice versa. The above limit does not, however, apply to the conversion of NT dollars into other currencies, including U.S. dollars, in respect of the proceeds of sale of any underlying shares withdrawn from a depositary receipt facility.

Voting of Deposited Securities

Holders may direct the exercise of voting rights with respect to the common shares represented by the ADSs only in accordance with the provisions of the deposit agreement as described below and applicable R.O.C. law. See “Item 3. Key Information – Risk Factors – Risks Relating to Ownership of ADSs – Your voting rights as a holder of ADSs will be limited”.

Except as described below, the holders will not be able to exercise the voting rights attaching to the common shares represented by the ADSs on an individual basis. According to provisions of the deposit agreement, the voting rights attaching to the common shares represented by ADSs must be exercised as to all matters subject to a vote of shareholders by the depositary bank or its nominee, who represents all holders of ADSs, collectively in the same manner, except in the case of an election of directors. Directors are elected by cumulative voting unless our Articles of Incorporation stipulate otherwise.

In the deposit agreement, the holders will appoint the depositary bank as their representative to exercise the voting rights with respect to the common shares represented by the ADSs.

We will provide the depositary bank with copies (including English translations) of notices of meetings of our shareholders and the agenda of these meetings, including a list of the director candidates, if an election of directors is to be held at the meeting. The depositary bank will mail these materials, together with a voting instruction form to holders as soon as practicable after the depositary bank receives the materials from us. In order to validly exercise its voting rights, the holder of ADSs must complete, sign and return to the depositary bank the voting instruction form by a date specified by the depositary bank.

Subject to the provisions described in the second succeeding paragraph, which will apply to the election of directors done by means of cumulative voting, if persons together holding at least 51% of the ADSs outstanding at the relevant record date instruct the depositary bank to vote in the same manner in respect of one or more resolutions to be proposed at the meeting (other than the election of directors), the depositary bank will notify the instructions to the chairman of our board of directors or a person he may designate. The depositary bank will appoint the chairman or his designated person to serve as the voting representative of the depositary bank or its nominee and the holders. The voting representative will attend such meeting and vote all the common shares represented by ADSs to be voted in the manner so instructed by such holders in relation to such resolution or resolutions.

If, for any reason, the depositary bank has not by the date specified by it received instructions from persons together holding at least 51% of all the ADSs outstanding at the relevant record date to vote in the same manner in respect of any resolution specified in the agenda for the meeting (other than the election of directors), then the holders will be deemed to have instructed the depositary bank or its nominee to authorize and appoint the voting representative as the representative of the depositary bank and the holders to attend such meeting and vote all the common shares represented by all ADSs as the voting representative deems appropriate with respect to such resolution or resolutions, which may not be in your interests; provided, however, that the depositary bank or its nominee will not give any such authorization and appointment unless it has received an opinion of R.O.C. counsel addressed to the depositary bank and in form and substance satisfactory to the depositary bank, at its sole expense, to the effect that, under R.O.C. law (i) the deposit agreement is valid, binding and enforceable against us and the holders and (ii) the depositary bank will not be deemed to be authorized to exercise any discretion when voting in accordance with the deposit agreement and will not be subject to any potential liability for losses arising from such voting. We and the depositary bank will take such actions, including amendment of the provisions of the deposit agreement relating to voting of common shares, as we deem appropriate to endeavor to provide for the exercise of voting rights attached to the common shares represented by all ADSs at shareholders’ meetings in a manner consistent with applicable R.O.C. law.

The depositary bank will notify the voting representative of the instructions for the election of directors received from holders and appoint the voting representative as the representative of the depositary bank and the holders to attend such meeting and vote the common shares represented by ADSs as to which the depositary bank has received instructions from holders for the election of directors, subject to any restrictions imposed by R.O.C. law and our Articles of Incorporation. Holders who by the date specified by the depositary bank have not delivered instructions to the depositary bank will be deemed to have instructed the depositary bank to authorize and appoint the voting representative as the representative of the depositary bank or its nominee and the holders to attend such meeting and vote all the common shares represented by ADSs as to which the depositary bank has not received instructions from the holders for the election of directors as the voting representative deems appropriate, which may not be in your best interests. Candidates standing for election as representatives of a shareholder may be replaced by such shareholder prior to the meeting of the shareholders, and the votes cast by the holders for such candidates shall be counted as votes for their replacements.

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By accepting and continuing to hold ADSs or any interest therein, the holders will be deemed to have agreed to the voting provisions set forth in the deposit agreement, as such provisions may be amended from time to time to comply with applicable R.O.C. law.

There can be no assurance that the holders will receive notice of shareholders' meetings sufficiently prior to the date established by the depository bank for receipt of instructions to enable you to give voting instructions before the cutoff date.

Moreover, in accordance with the deposit agreement, as further amended and restated as of November 16, 2007 and pursuant to R.O.C. Company Act, holders that individually or together with other holders hold at least 51% of the ADSs outstanding at the relevant record date are entitled to submit each year one written proposal for voting at the general meeting of shareholders; provided, that (i) such proposal is in Chinese language and does not exceed 300 Chinese characters, (ii) such proposal is submitted to the depository bank at least two business days prior to the expiry of the relevant submission period, which shall be publicly announced by us each year in a report on Form 6-K filed with the U.S. SEC prior to the commencement of the 60 days closed period for general meetings of shareholders, (iii) such proposal is accompanied by a written certificate to the depository bank, in the form required by the depository bank, certifying that such proposal is being submitted by holders that individually or together with other holders hold at least 51% of the ADSs outstanding at the date of the submission and, if the date of the submission is on or after the relevant record date, also certifying that the holders who submitted the proposal held at least 51% of the ADSs outstanding as of the relevant record date, (iv) if the date of the submission is prior to the relevant record date, the holders who submitted the proposal must also provide, within five business days after the relevant record date, a second written certificate to the depository bank, in the form required by the depository bank, certifying that the holders who submitted the proposal continued to hold at least 51% of the ADSs outstanding at the relevant record date, (v) such proposal is accompanied by a joint and several irrevocable undertaking of all submitting holders to pay all fees and expenses incurred in relation to the submission (including the costs and expenses of the depository bank or its agent to attend the general meeting of the shareholders) as such fees and expenses may be reasonably determined and documented by the depository bank or us, and (vi) such proposal shall only be voted upon at the general meeting of shareholders if such proposal is accepted by our board of directors as eligible in accordance with applicable law for consideration at a shareholders meeting.

Taxation

R.O.C. Taxation

The following is a general summary of the principal R.O.C. tax consequences of the ownership and disposition of ADSs or common shares by and to a non-resident individual or entity. It applies only to a holder that is:

- an individual who is not an R.O.C. citizen, who owns ADSs and who is not physically present in the R.O.C. for 183 days or more during any calendar year; or
- a corporation or a non-corporate body that is organized under the laws of a jurisdiction other than the R.O.C. and has no fixed place of business or business agent in the R.O.C.

Holders of ADSs should consult their own tax advisors as to the particular R.O.C. tax consequences of owning the ADSs which may affect them.

Dividends. Effective from 2018, dividends declared by us out of our retained earnings and distributed to the holders are subject to R.O.C. withholding tax at 21% on the amount of the distribution in the case of cash dividends or on the par value of the common shares in the case of stock dividends unless a lower withholding rate is provided under a tax treaty between the R.O.C and the jurisdiction where the holders are residents. Starting year 2019, no retained earnings tax paid can offset as a credit against the 21% withholding tax.

Distribution of common shares or cash out of our capital reserves is not subject to R.O.C. withholding tax, except under limited circumstances.

Capital Gains. Starting from January 1, 2016, capital gains realized from the sale or disposal of the common shares are exempt from R.O.C. income tax under Article 4-1 of the R.O.C. Income Tax Act.

Sales of ADSs are not regarded as sales of R.O.C. securities and thus any gains derived from transfers of ADSs are not regarded as R.O.C.-sourced income. Accordingly, any gains derived from transfers of ADSs by holders are not currently subject to R.O.C. income tax.

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Subscription Rights. Distributions of statutory subscription rights for common shares in compliance with R.O.C. law are not subject to any R.O.C. tax. Proceeds derived from sales of statutory subscription rights evidenced by securities are subject to securities transaction tax at the rate of 0.3% of the gross amount received. Holders are exempt from income tax on capital gains from the sale of statutory subscription rights evidenced by securities. Proceeds derived from sales of statutory subscription rights not evidenced by securities are not subject to securities transaction tax but the capital gains are subject to R.O.C. income tax at a fixed rate of 20%.

Subject to compliance with R.O.C. law, we, at our sole discretion, can determine whether statutory subscription rights shall be evidenced by issuance of securities.

Securities Transaction Tax. A securities transaction tax, at the rate of 0.3% of the sales proceeds, will be withheld upon a sale of common shares in the R.O.C. Transfers of ADSs are not subject to R.O.C. securities transaction tax. Withdrawal of common shares from the deposit facility is not subject to R.O.C. securities transaction tax.

Estate and Gift Tax. R.O.C. estate tax is payable on any property within the R.O.C. left by a deceased, and R.O.C. gift tax is payable on any property within the R.O.C. donated by an individual. Estate tax and gift tax are currently payable at the progressive rates of 10%, 15% and 20%. Under R.O.C. estate and gift tax laws, common shares issued by R.O.C. companies are deemed located in the R.O.C. regardless of the location of the holder. It is unclear whether a holder of ADSs will be considered to hold common shares for this purpose.

Tax Treaty. The R.O.C. does not have a double taxation treaty with the United States. On the other hand, the R.O.C. has double taxation treaties with Indonesia, Singapore, South Africa, Australia, Vietnam, New Zealand, Malaysia, North Macedonia, Israel, Gambia, the Netherlands, the United Kingdom, Senegal, Sweden, Belgium, Denmark, Paraguay, Hungary, France, Eswatini, India, Slovakia, Switzerland, Germany, Thailand, Luxembourg, Kiribati, Austria, Italy, Japan, Canada, Poland, Czech Republic and Saudi Arabia which may limit the rate of R.O.C. withholding tax on dividends paid with respect to common shares in R.O.C. companies. The ADS holders may or may not be considered to hold common shares for the purposes of these treaties. The holders should consult their tax advisors concerning their eligibility for the benefits with respect to the ADSs.

United States Federal Income Taxation

This section discusses the material United States federal income tax consequences of owning and disposing of our common shares or ADSs. It applies to you only if you hold your common shares or ADSs as capital assets for United States federal income tax purposes. This discussion addresses only United States federal income taxation and does not discuss all of the tax consequences that may be relevant to you in light of your individual circumstances, including foreign, state or local tax consequences, estate and gift tax consequences, and tax consequences arising under the Medicare contribution tax on net investment income or the alternative minimum tax. This section does not apply to you if you are a member of a special class of holders subject to special rules, including:

- dealers or traders in securities or foreign currencies;
- banks and certain other financial institutions;
- brokers;
- traders in securities that elect to use a mark-to-market method of accounting for their securities holdings;
- tax-exempt organizations, retirement plans, individual retirement accounts and other tax-deferred accounts;
- life insurance companies;
- persons that actually or constructively own 10% or more of the combined voting power of our voting stock or of the total value of our stock;
- persons that hold common shares or ADSs as part of a straddle or a hedging or conversion or integrated transaction for United States federal income tax purposes;
- persons who are former citizens or former long-term residents of the United States, or
- U.S. holders (as defined below) whose functional currency is not the U.S. dollar.

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This section is based on the Internal Revenue Code of 1986, as amended, its legislative history, existing and proposed Treasury regulations, and published rulings and court decisions, all as currently in effect. These laws are subject to change, possibly on a retroactive basis. In addition, this section is based in part upon the assumption that each obligation in the Deposit Agreement and any related agreement will be performed in accordance with its terms. In general, for United States federal income tax purposes, if you hold ADRs evidencing ADSs, you will be treated as the owner of the shares represented by those ADSs. Exchanges of shares for ADRs, and ADRs for shares, generally will not be subject to United States federal income tax.

You are a U.S. holder if you are a beneficial owner of common shares or ADSs and you are, for United States federal income tax purposes:

- a citizen or resident of the United States;
- a United States domestic corporation, or other entity subject to United States federal income tax as a domestic corporation;
- an estate whose income is subject to United States federal income tax regardless of its source; or
- a trust if a United States court can exercise primary supervision over the trust's administration and one or more United States persons are authorized to control all substantial decisions of the trust.

A "non-U.S. holder" is a beneficial owner of common shares or ADSs that is not a United States person and is not a partnership for United States federal income tax purposes.

If a partnership (including any entity treated as a partnership for United States federal income tax purposes) is a beneficial owner of the common shares or ADSs, the United States tax treatment of a partner in the partnership generally will depend on the status of the partner and the activities of the partnership. A holder of the common shares or ADSs that is a partnership and partners in such a partnership should consult their own tax advisors concerning the United States federal income tax consequences of purchasing, owning and disposing of common shares or ADSs.

The tax treatment of your common shares or ADSs will depend in part on whether or not we are classified as a passive foreign investment company, or PFIC, for United States federal income tax purposes. Except as discussed below under "—PFIC Rules", this discussion assumes that we are not classified as a PFIC for United States federal income tax purposes.

You should consult your own tax advisor regarding the United States federal, state, local income tax and other tax consequences of owning and disposing of common shares or ADSs in your particular circumstances.

U.S. Holders

Taxation of Distributions

Under the United States federal income tax laws, if you are a U.S. holder, the gross amount of any distribution we pay in respect of your common shares or ADSs out of our current or accumulated earnings and profits (as determined for United States federal income tax purposes), other than certain pro-rata distributions of our common shares, including the amount of any R.O.C. tax withheld, will be treated as a dividend that is subject to United States federal income taxation. Because we do not expect to calculate our earnings and profits under U.S. federal income tax principles, a U.S. holder should expect that any distribution made by us to such holder will generally be treated as a dividend. If you are a noncorporate U.S. holder, dividends that constitute qualified dividend income will be taxable to you at the preferential rates applicable to long-term capital gains, provided that you hold our common shares or ADSs for more than 60 days during the 121-day period beginning 60 days before the ex-dividend date and meet other holding period requirements. Dividends we pay with respect to the ADSs will be qualified dividend income provided that, in the year that you receive the dividend, the ADSs are readily tradable on the NYSE or another established securities market in the United States. Our ADSs are listed on the NYSE, and we therefore expect that dividends we pay with respect to the ADSs will be qualified dividend income. It is unclear whether dividends we pay with respect to the common shares will be qualified dividend income. The dividend is taxable to you when you, in the case of common shares, or the Depositary, in the case of ADSs, receive the dividend actually or constructively. The dividend will not be eligible for the dividends-received deduction generally allowed to United States corporations in respect of dividends received from other United States corporations. The amount of the dividend distribution that you must include in your income will be the U.S. dollar value of the NT dollar payments made, determined at the spot NT dollar/U.S. dollar rate on the date the dividend distribution is includible in your income, regardless of whether the payment is in fact converted into U.S. dollars. Generally, any gain or loss resulting from currency exchange fluctuations during the period from the date you include the dividend payment in income to the date you convert the payment into U.S. dollars will be treated as ordinary income or loss and will not be eligible for the special tax rate applicable to qualified dividend income. The gain or loss generally will be income or loss from sources within the United States for foreign tax credit limitation purposes.

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Subject to generally applicable limitations and restrictions, the R.O.C. taxes withheld from dividend distributions and paid over to the R.O.C. will be eligible for credit against your U.S. federal income tax liabilities. Special rules apply in determining the foreign tax credit limitation with respect to dividends that are subject to the preferential tax rates. Dividends will generally be income from sources outside the United States. Dividends will generally be “passive” income for purposes of computing the foreign tax credit allowable to you. The rules applicable to the United States foreign tax credit are complex, and you should consult your own tax adviser concerning the availability of the credit in your particular circumstances.

Pro rata distributions of common shares by us to holders of common shares or ADSs may not be subject to U.S. federal income tax. Accordingly, such distributions may not give rise to taxable foreign-source income against which the R.O.C. tax imposed on such distributions may be credited.

Taxation of Capital Gains

If you are a U.S. holder and you sell or otherwise dispose of your common shares or ADSs, you will recognize capital gain or loss for United States federal income tax purposes equal to the difference between the U.S. dollar value of the amount that you realize and your tax basis, determined in U.S. dollars, in your common shares or ADSs. Capital gain of a noncorporate U.S. holder is generally taxed under existing law at preferential rates where the property is held more than one year. The gain or loss will generally be income or loss from sources within the United States for foreign tax credit limitation purposes. Your ability to deduct capital losses is subject to limitations.

Passive Foreign Investment Company Rules

We believe that our common shares and ADSs should not currently be treated as stock of a PFIC for United States federal income tax purposes and we do not expect to become a PFIC in the foreseeable future. However, this conclusion is a factual determination that is made annually, and thus may be subject to change. It is therefore possible that we could become a PFIC in a future taxable year. Accordingly, no assurance can be given that we will not be considered by the U.S. Internal Revenue Service to be a PFIC in current or future years.

In general, if you are a U.S. holder, we will be a PFIC with respect to you if for any taxable year in which you held our common shares or ADSs:

- at least 75% of our gross income for the taxable year is passive income; or
- at least 50% of the value, determined on the basis of a quarterly average, of our assets is attributable to assets that produce or are held for the production of passive income.

Passive income generally includes dividends, interest, royalties, rents (other than certain rents and royalties derived in the active conduct of a trade or business), annuities and gains from assets that produce passive income. If a foreign corporation owns directly or indirectly at least 25% by value of the stock of another corporation, the foreign corporation is treated for purposes of the PFIC tests as owning its proportionate share of the assets of the other corporation, and as receiving directly its proportionate share of the other corporation’s income.

If we are treated as a PFIC, and you are a U.S. holder that does not make a mark-to-market election, as described below, you will be subject to special rules with respect to:

- any gain you realize on the sale or other disposition of your common shares or ADSs; and
- any excess distribution that we make to you (generally, any distributions to you during a single taxable year that are greater than 125% of the average annual distributions received by you in respect of the common shares or ADSs during the three preceding taxable years or, if shorter, the portion of your holding period for the common shares or ADSs that preceded the taxable year in which you receive the distribution).

Under these rules:

- the gain or excess distribution will be allocated ratably over your holding period for the common shares or ADSs,

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- the amount allocated to the taxable year in which you realized the gain or excess distribution will be taxed as ordinary income,
- the amount allocated to each prior year, with certain exceptions, will be taxed at the highest tax rate in effect for that year, and
- the interest charge generally applicable to underpayments of tax will be imposed in respect of the tax attributable to each such year.

Special rules apply for calculating the amount of the foreign tax credit with respect to excess distributions by a PFIC.

If you own common shares or ADSs in a PFIC that are treated as marketable stock, you may make a mark-to-market election. If you make this election, you will not be subject to the PFIC rules described above. Instead, in general, you will include as ordinary income each year the excess, if any, of the fair market value of your common shares or ADSs at the end of the taxable year over your tax basis in your common shares or ADSs. These amounts of ordinary income will not be eligible for the favorable tax rates applicable to qualified dividend income or long-term capital gains. You will also be allowed to take an ordinary loss in respect of the excess, if any, of the tax basis of your common shares or ADSs over their fair market value at the end of the taxable year (but only to the extent of the net amount of previously included income as a result of the mark-to-market election). Your tax basis in the common shares or ADSs will be adjusted to reflect any such income or loss amounts. Your gain, if any, recognized upon the sale of your common shares or ADSs will be taxed as ordinary income.

Also, where a company that is a PFIC meets certain reporting requirements, a U.S. holder could avoid certain adverse PFIC consequences described herein by making a “qualified electing fund” (“QEF”) election to be taxed currently on its proportionate share of the PFIC’s ordinary income and net capital gains. U.S. holders will not be able to treat a company as a QEF if the company does not prepare the information that U.S. holders would need to make a QEF election. We do not intend to prepare or provide the information that would enable U.S. holders to make a QEF election.

In addition, notwithstanding any election you make with regard to the common shares or ADSs, dividends that you receive from us will not constitute qualified dividend income to you if we are a PFIC either in the taxable year of the distribution or the preceding taxable year. Moreover, your common shares or ADSs will be treated as stock in a PFIC if we were a PFIC at any time during your holding period in your common shares or ADSs, even if we are not currently a PFIC. For purposes of this rule, if you make a mark-to-market election with respect to your common shares or ADSs, you will be treated as having a new holding period in your common shares or ADSs beginning on the first day of the first taxable year beginning after the last taxable year for which the mark-to-market election applies. Dividends that you receive that do not constitute qualified dividend income are not eligible for taxation at the preferential rates applicable to qualified dividend income. Instead, you must include the gross amount of any such dividend paid by us out of our current or accumulated earnings and profits (as determined for United States federal income tax purposes) in your gross income, and it will be subject to tax at rates applicable to ordinary income as well as the special rules provided with respect to excess distributions, if applicable, as described above.

If you own common shares or ADSs during any year that we are a PFIC with respect to you, you generally must file Internal Revenue Service Form 8621.

The rules dealing with PFICs and with the QEF and mark-to-market elections are very complex and are affected by various factors in addition to those described above, including our ownership of any non-U.S. subsidiaries. As a result, U.S. holders should consult their own tax advisors concerning the PFIC rules.

Information with Respect to Foreign Financial Assets

U.S. Holders that own “specified foreign financial assets” with an aggregate value in excess of US\$50,000 may be required to file an information report with respect to such assets with their tax returns. “Specified foreign financial assets” may include any financial accounts maintained by foreign financial institutions, as well as any of the following, but only if they are not held in accounts maintained by financial institutions: (i) stocks and securities issued by non-U.S. persons, (ii) financial instruments and contracts held for investment that have non-U.S. issuers or counterparties and (iii) interests in foreign entities. U.S. holders should consult their tax advisors regarding the application of these rules to their ownership of common shares or ADSs.

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Non-U.S. Holders

Except as described in the section titled “Information Reporting and Backup Withholding” below, a non-U.S. holder will not be subject to U.S. federal income or withholding tax on the payment of dividends and the proceeds from the disposition of common shares or ADSs unless: such item is effectively connected with the conduct by the non-U.S. holder of a trade or business within the United States and, in the case of a resident of a country which has a treaty with the United States and is eligible for the benefits of the treaty with the United States, such item is attributable to a permanent establishment or, in the case of an individual, a fixed place of business, in the United States; or the non-U.S. holder is an individual who holds the common shares or ADSs as a capital asset and is present in the United States for 183 days or more in the taxable year of the disposition, certain other conditions are met, and such non-U.S. holder does not qualify for an exemption. If the first exception applies, the non-U.S. holder generally will be subject to U.S. federal income tax with respect to such item in the same manner as a U.S. holder unless otherwise provided in an applicable income tax treaty; a non-U.S. holder that is a corporation for U.S. federal income tax purposes may also be subject to a branch profits tax with respect to such item at a rate of 30% (or at a reduced rate under an applicable income tax treaty). If the second exception applies, the non-U.S. holder generally will be subject to U.S. federal income tax at a rate of 30% (or at a reduced rate under an applicable income tax treaty) on the amount by which such non-U.S. holder’s capital gains allocable to U.S. sources exceed capital losses allocable to U.S. sources during the taxable year of disposition of the common shares or ADSs.

Information Reporting and Backup Withholding

U.S. holders generally are subject to information reporting requirements with respect to dividends paid on common shares or ADSs and on the proceeds from the sale, exchange or disposition of common shares or ADSs unless the holder is a corporation or otherwise establishes a basis for exemption. In addition, U.S. holders are subject to back-up withholding on dividends paid on common shares or ADSs, and on the sale, exchange or other disposition of common shares or ADSs, unless each such U.S. holder provides a taxpayer identification number and a duly executed IRS Form W-9 or otherwise establishes an exemption. Non-U.S. holders generally are not subject to information reporting or backup withholding with respect to dividends, or the proceeds from the sale, exchange or other disposition of common shares or ADSs, provided that each such non-U.S. holder certifies as to its foreign status on the applicable duly executed IRS Form W-8 or otherwise establishes an exemption. Backup withholding is not an additional tax and the amount of any backup withholding will be allowed as a credit against a U.S. holder’s or non-U.S. holder’s U.S. federal income tax liability and may entitle such holder to a refund, provided that certain required information is timely furnished to the IRS.

Documents on Display

The U.S. SEC maintains a website www.sec.gov that contains reports, proxy statements and other information regarding registrants, including the Company, that file electronically with the U.S. SEC. Please note that copies of the Company’s Form 20-F and Form SD filed by us can be inspected at the website set forth above and are also available on our website at www.tsmc.com (the website does not form part of this annual report on Form 20-F).

ITEM 11. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISKS

We are exposed to financial market risks, primarily in currency exchange rates, interest rates and equity investment prices. A portion of these risks is hedged.

Foreign Currency Risk: Substantially all of our revenue is denominated in U.S. dollars and over half of our capital expenditures are denominated in currencies other than NT dollars, primarily in U.S. dollars, Euros and Japanese yen. As a result, any significant fluctuations to our disadvantage in the exchange rate of the NT dollar against such currencies, in particular a weakening of the U.S. dollar against the NT dollar, would have an adverse impact on our revenue and operating profit as expressed in NT dollars.

We use foreign currency derivatives contracts, such as currency forwards or currency swaps, to protect against currency exchange rate risks associated with non-NT dollar-denominated assets and liabilities and certain forecasted transactions. These hedges reduce, but do not entirely eliminate, the effect of foreign currency exchange rate movements on our assets and liabilities. Based on a sensitivity analysis performed on our total monetary assets and liabilities, a hypothetical adverse foreign currency exchange rate change of 10% as of December 31, 2020 and 2021 would have decreased our net income by NT\$898 million and NT\$1,435 million (US\$52 million) in 2020 and 2021 respectively, after taking into account hedges and offsetting positions. For further information, please refer to note 8, note 11 and note 33 to the consolidated financial statements.

Interest Rate Risks: We are exposed to interest rate risks primarily in relation to our investment portfolio and outstanding debt. Changes in interest rates affect the interest earned on our cash and cash equivalents and fixed income securities, the fair value of those securities, as well as the interest paid on our debt.

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The objective of our investment policy is to achieve a return that will allow us to preserve principal and support liquidity requirements. The policy generally requires us to invest in investment grade securities and limits the amount of credit exposure to any one issuer. Our cash and cash equivalents, as well as fixed income investments in both fixed- and floating-rate securities, carry a degree of interest rate risk. The majority of our fixed income investments are fixed-rate securities, which are classified as financial assets at fair value through other comprehensive income, and may have their fair value adversely affected due to a rise in interest rates. At the same time, if interest rates fall, cash and cash equivalents as well as floating-rate securities may generate less interest income than expected.

We have entered and may in the future enter into interest rate derivatives to partially hedge interest rate risk on our fixed income investments and anticipated debt issuance. However, these hedges can offset only a limited portion of the financial impact from movements in interest rates.

Based on a sensitivity analysis performed on our fixed income investments with an aggregate carrying amount of NT\$133,369 million and NT\$124,637 million (US\$4,493 million) as of December 31, 2020 and 2021, a hypothetical adverse interest rate change of 100 basis points across all maturities would have decreased our other comprehensive income by NT\$3,144 million and NT\$3,767 million (US\$136 million) in 2020 and 2021, respectively, after taking into account interest rate hedges. For further information, please refer to note 9, note 10, note 11 and note 33 to the consolidated financial statements.

As of December 31, 2021, we had outstanding floating- and fixed-rate debt with varying maturities for an aggregate carrying amount of NT\$732,868 million (US\$26,419 million). All of our short-term debt is floating-rate, hence a rise in interest rates may result in higher interest expense than expected. The majority of our long-term debt is fixed-rate and measured at amortized cost and, as such, changes in interest rates would not affect future cash flows or the carrying amount. For further information, please refer to note 18, note 19, note 20 and note 33 to the consolidated financial statements.

Certain of our fixed income investments are primarily based on the London Interbank Offered Rate (“LIBOR”), which will be replaced by alternative benchmark rates after June 30, 2023. The transition from LIBOR to alternative benchmark rates might result in a reduction in our interest income.

Other Market Risk: Our equity securities are subject to a wide variety of market-related risks that could substantially reduce the fair value of our holdings. We currently do not reduce our equity market exposure through hedging activities. As of December 31, 2020 and 2021, we had investments in private equity securities mostly through a number of investment funds with a carrying value of NT\$4,515 million and NT\$5,888 million (US\$212 million), respectively. Based on a sensitivity analysis performed on our equity investments as of December 31, 2020 and 2021, a hypothetical adverse price change of 10% would have decreased our other comprehensive income by approximately NT\$446 million and NT\$596 million (US\$21 million) in 2020 and 2021, respectively. The actual disposal value of these investments may be significantly different from their carrying value. For further information, please refer to note 33 to the consolidated financial statements.

ITEM 12D. DESCRIPTION OF SECURITIES OTHER THAN EQUITY SECURITIES

Depository Fees and Charges

Under the terms of the Depository Agreement for the TSMC American Depositary Shares (ADSs), an ADS holder may have to pay the following service fees to the depository bank:

Service	Fees
Issuance of ADS	Up to US\$0.05 (or fractions thereof) per ADS issued
Cancellation of ADS	Up to US\$0.05 (or fractions thereof) per ADS cancelled
Distribution of cash proceeds (i.e., upon sale of rights and other entitlements)	Up to US\$0.02 (or fractions thereof) per ADS held
Distribution of ADS rights or other free distributions of Stock (excluding stock dividends)	Up to US\$0.05 (or fractions thereof) per ADS issued

Depository fees payable upon the issuance and cancellation of ADSs are typically paid to the depository bank by the brokers (on behalf of their clients) receiving the newly-issued ADSs from the depository bank and by the brokers (on behalf of their clients) delivering the ADSs to the depository bank for cancellation. The brokers in turn charge these transaction fees to their clients.

Depository Payment

In 2021, we received reimbursement of proxy related expenses of US\$250 from Citibank, N.A., the Depository Bank for our ADR program.

PART II

ITEM 13. DEFAULTS, DIVIDEND ARREARAGES AND DELINQUENCIES

None.

ITEM 14. MATERIAL MODIFICATIONS TO THE RIGHTS OF SECURITY HOLDERS AND USE OF PROCEEDS

None.

ITEM 15. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures. Pursuant to Rule 13(a)-15(b) of the Exchange Act, an evaluation was carried out under the supervision and with the participation of our principal executive and principal financial officers of the effectiveness of our disclosure controls and procedures. Based upon that evaluation, the Chief Executive Officers and Chief Financial Officer concluded that these disclosure controls and procedures were effective as of December 31, 2021.

Management’s Annual Report on Internal Control over Financial Reporting. Management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting is a process designed under the supervision of our principal executive and principal financial officers to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external reporting purposes in accordance with IFRSs as issued by the IASB. Our internal control over financial reporting includes policies and procedures that pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and dispositions of assets; provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with IFRSs as issued by the IASB, and that receipts and expenditures are being made only in accordance with authorizations of our management and directors; and provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

As of the end of 2021, management conducted an assessment of the effectiveness of our internal control over financial reporting based on the framework established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”). Based on this assessment, management has determined that our internal control over financial reporting as of December 31, 2021, was effective.

Our independent registered public accounting firm, Deloitte & Touche, independently assessed the effectiveness of our company’s internal control over financial reporting. Deloitte & Touche has issued an attestation report, which is included at the end of this Item 15.

Changes in Internal Control over Financial Reporting. During 2021, there was no material change to our internal control over financial reporting.

Attestation Report of the Independent Registered Public Accounting Firm.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of
Taiwan Semiconductor Manufacturing Company Limited

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Taiwan Semiconductor Manufacturing Company Limited and subsidiaries (the “Company”) as of December 31, 2021, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

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We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2021, of the Company and our report dated April 14, 2022, expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche
Taipei, Taiwan
Republic of China
April 14, 2022

ITEM 16A. AUDIT COMMITTEE FINANCIAL EXPERT

Our Audit Committee has engaged a financial expert consultant who our board of directors determined has the attributes required of an "audit committee financial expert" as defined under the applicable rules of the U.S. SEC issued pursuant to Section 407 of the Sarbanes-Oxley Act of 2002. In particular, our board of directors appointed Mr. Jan C. Lobbezoo to serve as an independent financial expert consultant to our Audit Committee from February 14, 2006 onwards. Our board of directors believes that the Audit Committee members along with the advisors of the Audit Committee, including the financial expert consultant, possess sufficient financial knowledge and experience.

ITEM 16B. CODE OF ETHICS

We have adopted a "Ethics and Business Conduct Policy" for employees, officers and directors, which also applies to our Chief Executive Officer, Chief Financial Officer, Controller, and any other persons performing similar functions.

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We will provide to any person without charge, upon request, a copy of our “Ethics and Business Conduct Policy”. Any request should be made per email to our Investor Relations Division at invest@tsmc.com.

ITEM 16C. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The table below summarizes the fees that we paid for services provided by Deloitte & Touche (PCAOB ID No. 1060) and its affiliated firms (the “Deloitte Entities”) for the years ended December 31, 2020 and 2021.

	For the year ended December 31,	
	2020	2021
	NT\$	NT\$
	(In thousands)	
Audit Fees	60,253	63,871
Audit Related Fees	9,982	23,197
All Other Fees	81	75
Total	<u>70,316</u>	<u>87,143</u>

Audit Fees. This category includes the audit of our annual financial statements and internal control over financial reporting, review of quarterly financial statements and services that are normally provided by the independent auditors in connection with statutory and regulatory filings or engagements for those fiscal years. This category also includes advice on audit and accounting matters that arose during, or as a result of, the audit or the review of quarterly financial statements and statutory audits required by non-U.S. jurisdictions, including statutory audits required by the Tax Bureau of the R.O.C., Customs Bureau of the R.O.C., and the R.O.C. FSC.

Audit Related Fees. This category consists of assurance and related services by the Deloitte Entities that are reasonably related to the performance of the audit or review of our financial statements and are not reported above under “Audit Fees.” The services for the fees disclosed under this category were related to corporate bonds offering and such fees were borne by the underwriter.

All Other Fees. This category consists of research tool for accounting standards and regulations.

Our policy and procedures require all services performed by Deloitte & Touche to be pre-approved by the Audit Committee. The Audit Committee agreed to delegate to the Chairman of the Audit Committee authority to pre-approve non-material unanticipated non-audit services and to report any such items to the Audit Committee for ratification at its next scheduled meeting. All audit and non-audit services performed by Deloitte & Touche in 2020 and 2021 were pre-approved by the Audit Committee.

ITEM 16D. EXEMPTIONS FROM THE LISTING STANDARDS FOR AUDIT COMMITTEES

Not applicable.

ITEM 16E. PURCHASES OF EQUITY SECURITIES BY THE ISSUER AND AFFILIATED PURCHASERS

We did not acquire any common shares during 2021. On February 15, 2022, our Board of Directors resolved to approve the buyback and subsequent cancellation of up to 1,387,000 of our common shares over the period from February 16, 2022 to April 15, 2022 (the “Share Repurchase Program”). Between February 16, 2022 and February 25, 2022, we bought back an aggregate of 1,387,000 common shares for an aggregate purchase amount of approximately NT\$872 million (US\$31 million), which represents an average purchase price per share of approximately NT\$628. As of the date of this annual report, such common shares repurchased in connection with the Share Repurchase Program are held in treasury and are expected to be cancelled within 6 months after the completion of the share repurchase. The purpose of the Share Repurchase Program was to offset the dilutive effect of the issuance of RSAs under our equity incentive plan for the year 2021 (see “Item 6. Directors, Senior Management and Employees—Employee Restricted Stock Awards Rules for Year 2021” for a further discussion).

The table below sets forth certain information related to purchases made by us of our common shares in the periods indicated.

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Period	Total number of common shares purchased <i>(number of common shares)</i>	Average price paid per common share <i>(NT\$)</i>	Total number of common shares purchased as part of publicly announced plans or programs <i>(number of shares)</i>	Maximum number (or approximate dollar value) of common shares that may yet be purchased under the plans or programs <i>(number of common shares)</i>
February, 2022 (From February 16, 2022 to February 25, 2022)	1,387,000	628	1,387,000	—
Total	1,387,000	628	1,387,000	—

ITEM 16F. CHANGE IN REGISTRANT’S CERTIFYING ACCOUNTANT

Not applicable.

ITEM 16G. CORPORATE GOVERNANCE

TSMC’s corporate governance practices are governed by applicable Taiwan law, specifically, the R.O.C. Company Act and R.O.C. Securities and Exchange Act, and also TSMC’s Articles of Incorporation. Also, because TSMC securities are registered with the U.S. SEC and are listed on the NYSE, TSMC is subject to corporate governance requirements applicable to NYSE-listed foreign private issuers.

Under Section 303A of the NYSE Listed Company Manual, NYSE-listed non-US companies may, in general, follow their home country corporate governance practices in lieu of most of the new NYSE corporate governance requirements. However, all NYSE-listed foreign private issuers must comply with NYSE Sections 303A.06, 303A.11, 303A.12(b) and 303A.12(c).

Item 16G as well as NYSE Section 303A.11 requires that foreign private issuers disclose any significant ways in which their corporate governance practices differ from US companies under NYSE listing standards. This requirement is not intended to suggest that one country’s corporate governance practices are better or more effective than another. A NYSE-listed foreign private issuer is required to provide to its US investors, a brief, general summary of the significant differences, either: (a) on the company website in English, or (b) in its annual report distributed to its US investors. To comply with NYSE Section 303A.11, TSMC has prepared the comparison in the table below.

The most relevant differences between TSMC corporate governance practices and NYSE standards for listed companies are as follows:

NYSE Standards for US Companies under Listed Company Manual Section 303A	TSMC Corporate Practices
<p>NYSE Section 303A.01 requires a NYSE-listed company to have a majority of independent directors on its board of directors.</p>	<p>Taiwan law does not require a board of directors of publicly traded companies to consist of a majority of independent directors. Taiwan law requires public companies meeting certain criteria to have at least two independent directors but no less than one fifth of the total number of directors on its board of directors. In addition, Taiwan law requires public companies to disclose information pertaining to their directors, including their independence status. Please see TSMC’s annual report and Form 20-F for the relevant year filed with the Taiwan authorities and the U.S. SEC (both of which are available online at www.tsmc.com) for information on the total number of TSMC directors and directors who would be considered independent under NYSE Section 303A.02 and Taiwan law.</p>
<p>NYSE Section 303A.02 establishes general standards to evaluate directors’ independence (no director qualifies as independent unless the board of directors affirmatively determines that the director has no material relationship with the listed company either directly or as a partner, shareholder or officer of an organization that has a relationship with the listed company).</p>	<p>Taiwan law establishes comparable standards to evaluate director independence. For further information, please consult TSMC’s Taiwan annual report for the relevant year.</p>

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<p>NYSE Section 303A.03 requires non-management directors to meet at regularly scheduled executive meetings that are not attended by management.</p>	<p>Taiwan law does not contain such a requirement. Except for meetings of sub-committees of the board of directors and those held by managing directors, Taiwan law does not allow separate board meetings of part but not all of the board of directors.</p>
<p>NYSE Section 303A.04 requires listed companies to have a nominating/corporate governance committee comprised entirely of independent directors which committee shall have a written charter establishing certain minimum responsibilities as set forth in NYSE Section 303A.04(b)(i) and providing for an annual evaluation of the committee's performance.</p>	<p>Taiwan law does not contain such a requirement. However, TSMC's directors must be nominated either by the shareholders or by the entire board of directors.</p>
<p>NYSE Section 303A.05(a) requires listed companies to have a compensation committee comprised entirely of independent directors.</p>	<p>Taiwan law requires certain public companies, such as us, to establish a compensation committee by September 30, 2011. TSMC, however, has established its compensation committee since 2003, which has met the requirements under the Taiwan law. Taiwan law permits a non-director independent member, appointed by the board of directors, to serve as a member on the compensation committee, so long as such member meets the independent and other requirements under the relevant Taiwan law. Also, as required by the TWSE, the compensation committee of the companies listed on the TWSE must consist of a majority of independent directors, and all the members of the compensation committee shall elect an independent director to act as the convener and the chairperson of the meeting. Please see TSMC's annual report and Form 20-F for the relevant year filed with the Taiwan authorities and the U.S. SEC (both of which are available online at www.tsmc.com) for further information regarding the composition and functions of its compensation committee.</p>
<p>NYSE Section 303A.05(b) requires a compensation committee's charter to establish certain minimum responsibilities and to provide for an annual evaluation of the committee's performance.</p>	<p>Taiwan law requires certain public companies, such as us, to establish a compensation committee by September 30, 2011. TSMC, however, has established its compensation committee since 2003, which has met the requirements under the Taiwan law, and TSMC's compensation committee charter contains the same responsibilities as those provided under NYSE Section 303A.05(b)(i) and mandates the committee to review the adequacy of its charter annually.</p>
<p>NYSE Section 303A.06 requires listed companies to have an audit committee that satisfies the requirements of Rule 10A-3 under the Exchange Act. Foreign private issuers must satisfy the requirements of Rule 10A-3 under the Exchange Act by July 31, 2005.</p>	<p>TSMC voluntarily established its audit committee before the promulgation of related Taiwan law. Our audit committee fully complies with both local law requirements and corporate governance standards. Please see TSMC's annual report and Form 20-F for the relevant year filed with the Taiwan authorities and the U.S. SEC (both of which are available online at www.tsmc.com) for further information regarding the composition of its audit committee. TSMC's audit committee members are all financially literate and are assisted by a financial expert consultant.</p>
<p>NYSE Section 303A.07(a) requires an audit committee to consist of at least three board members. All of its members shall be financially literate or must acquire such financial knowledge within a reasonable period and at least one of its members shall have experience in accounting or financial administration.</p>	<p>Taiwan law requires all independent directors of a public company to be members of the audit committee if the company has established such a committee of which at least one shall have accounting or financial expertise. Please see TSMC's annual report and Form 20-F for the relevant year filed with the Taiwan authorities and the U.S. SEC (both of which are available online at www.tsmc.com) for further information regarding the composition of its audit committee. TSMC's audit committee members are all financially literate and are assisted by a financial expert consultant.</p>

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<p>NYSE Section 303A.07(a) requires that if an audit committee member is simultaneously a member of the audit committee of more than three public companies, and the listed company does not limit the number of audit committees on which its members may serve, then, in each case the board of that company shall determine whether the simultaneous service would prevent such member from effectively serving on the listed company’s audit committee, and shall report its decision in the annual proxy statement of the company or in the company’s annual report on Form 10-K filed with the U.S. SEC.</p>	<p>Taiwan law does not contain such requirement. Taiwan law requires all independent directors of a public company to be members of the audit committee if the company has established such a committee. Taiwan law forbids an independent director from serving as an independent director on a total of more than four Taiwan public companies.</p>
<p>NYSE Section 303A.07(a) requires all members of the audit committee to be independent.</p>	<p>Taiwan law requires all independent directors of a public company to be members of the audit committee if the company has established such a committee.</p>
<p>NYSE Section 303A.07(b) requires an audit committee to have a written charter establishing the duties and responsibilities of its members, including the duties and responsibilities required, at a minimum, by Rule 10A-3(b)(2), (3), (4) & (5) of the Exchange Act.</p>	<p>Taiwan law requires comparable standards. TSMC currently has a written audit committee charter containing the same duties and responsibilities as those provided under Section 10A-3(b)(1) of the Exchange Act.</p>
<p>NYSE Section 303A.07(b)(iii)(B) and (C) establishes audit committee objectives: (i) to discuss the annual audited financial statements and the quarterly financial statements of the company with management and the independent auditor, including the information disclosed under the heading “Management’s Discussion and Analysis of Financial Condition and Results of Operations”; and (ii) to discuss the company’s press releases relating to its earnings as well as the financial information and guidelines relating to its earnings that are supplied to analysts and rating agencies.</p>	<p>TSMC’s written audit committee charter establishes the same audit committee objectives.</p>
<p>NYSE Section 303A.07(b)(iii)(G) requires an audit committee to establish clear policies for hiring external auditor’s employees.</p>	<p>Taiwan law does not contain such requirement.</p>
<p>NYSE Section 303A.07(c) requires each company to have an internal audit function that provides to the management and to the audit committee ongoing assessments on the company’s risk management processes and internal control system.</p>	<p>Taiwan law requires public companies to establish an internal audit function. Internal auditors are subject to strict qualification standards under Taiwan law, which require the board of directors to approve the appointment of the head of a company’s internal audit function. TSMC’s internal audit function has substantially the same responsibilities as provided under NYSE Section 303A.07(d).</p>
<p>NYSE Section 303A.08 requires each company to give to shareholders the opportunity to vote on all equity based compensation plans and material revisions thereto with certain exceptions.</p>	<p>Taiwan law imposes a similar requirement. Employee stock option plans (“ESOPs”) are required to be approved by the board of directors. Shareholders’ approval is not required if the number of options granted under the relevant ESOP does not exceed the reservation made in TSMC’s Articles of Incorporation and if the exercise price is not below the price as determined by relevant regulations. Otherwise, any change to such reservation in the Articles requires shareholders’ approval. Employee restricted stock awards are required to be approved by the board of directors and the shareholders’ meeting with a quorum of holders of at least two-thirds of all issued and outstanding shares of common stock at which the holders of at least a majority of the common stock represented at the meeting vote in favor thereof. However, in the case of a publicly held company such as TSMC, such a resolution by the shareholders’ meeting may be adopted by the holders of at least two-thirds of the shares of common stock represented at a shareholders’ meeting at which holders of at least a majority of the issued and outstanding shares of common stock are present. TSMC currently has one equity-based compensation plan in effect, which was approved by the Board of Directors on April 22, 2021, and by the shareholders on July 26, 2021.</p>

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<p>NYSE Section 303A.09 requires public companies to adopt and disclose corporate governance guidelines, including several issues for which such reporting is mandatory, and to include such information on the company’s website (which website should also include the charters of the audit committee, the nominating committee, and the compensation committee.)</p>	<p>Taiwan law does not contain such requirement. Under Taiwan law, if a listed company has voluntarily adopted corporate governance guidelines, it must set up a dedicated section on its website to disclose the relevant information and inform investors how to access such guidelines.</p>
<p>NYSE Section 303A.09 requires the board of directors to make a self-assessment of its performance at least once a year to determine if it or its committees function effectively and report thereon.</p>	<p>Starting from 2020, companies listed on the TWSE are required by TWSE’s new rule to conduct self-assessment or peer assessment on the performance of the board of directors and each director every year and to submit the assessment results to TWSE by the end of the first quarter of the next year. TSMC has been conducting annual self-assessment on its Audit Committee’s performance since 2011 and on its board of directors as well as each director since 2020 in compliance with TWSE’s requirements.</p>
<p>NYSE Section 303A.10 provides for the adoption of a Code of Business Conduct and Ethics and sets out the topics that such code must contain.</p>	<p>Taiwan law does not contain such requirement. But, because of sound corporate governance principles, TSMC has adopted an “Ethics and Business Conduct Policy”, which complies with the Sarbanes-Oxley Act’s requirements concerning financial officers and CEO accountability.</p>
<p>NYSE Section 303A.12(a) requires the CEO, on a yearly basis, to certify to the NYSE that he or she knows of no violation by the company of NYSE rules relating to corporate governance.</p>	<p>Taiwan law does not contain such a requirement. But, in order to comply with relevant U.S. SEC regulations, TSMC’s CEO is required to certify in TSMC’s 20-F annual report that, to his or her knowledge the information contained therein fairly represents in all material respects the financial condition and results of operation of TSMC.</p>
<p>NYSE Section 303A.12(b) requires the CEO to notify the NYSE in writing whenever any executive officer of the company becomes aware of any substantial non-fulfillment of any applicable provision under NYSE Section 303A.</p>	<p>Taiwan law does not contain such requirement. But, in order to be consistent with the corporate governance principles established under the Sarbanes-Oxley Act of 2002, TSMC’s CEO complies with the notice provision as set forth under NYSE Section 303A.12(b).</p>
<p>NYSE Section 303A.12(c) requires each listed company to submit an executed Written Affirmation annually to the NYSE and Interim Written Affirmation each time a specified change occurs in the board or any of the committees subject to Section 303A.</p>	<p>Taiwan law does not contain such requirement. But, in order to comply with the corporate governance principles established under the Sarbanes-Oxley Act of 2002, TSMC complies with NYSE Section 303A.12(c).</p>

ITEM 16H. MINE SAFETY DISCLOSURE

Not applicable.

ITEM 16I. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 17. FINANCIAL STATEMENTS

The Company has elected to provide the financial statements and related information specified in Item 18 in lieu of Item 17.

ITEM 18. FINANCIAL STATEMENTS

Refer to the consolidated financial statements starting on page F-1 of this annual report.

ITEM 19. EXHIBITS

(a) See page F-1 for an index of the financial statements filed as part of this annual report.

(b) Exhibits to this annual report:

- 1.1⁽¹⁾ [Articles of Incorporation of Taiwan Semiconductor Manufacturing Company Limited, as amended and restated on June 5, 2019.](#)
- 2a.1 [Description of Securities Registered Under Section 12 of the Exchange Act.](#)
- 2b.1 The Company hereby agrees to furnish to the U.S. Securities and Exchange Commission, upon request, copies of instruments defining the rights of holders of long-term debt of the Company and its subsidiaries.
- 3.1⁽²⁾ [Rules for Election of Directors, as amended and restated on June 12, 2012.](#)
- 3.2⁽¹⁾ [Rules and Procedures of Board of Directors Meetings, as amended and restated on May 14, 2019.](#)
- 3.3⁽³⁾ Rules and Procedures of Shareholders' Meetings, as amended and restated on May 7, 2002. (P).
- 4.1⁽⁴⁾ [Land Lease with Southern Taiwan Science Park Administration \(formerly Tainan Science Park Administration\) relating to the fabs located in Southern Taiwan Science Park \(effective August 1, 2017 to July 31, 2037\) \(in Chinese with English summary\).](#)
- 4.2⁽⁵⁾ [Land Lease with Southern Taiwan Science Park Administration \(formerly Tainan Science Park Administration\) relating to the fabs located in Southern Taiwan Science Park \(effective May 1, 2018 to April 30, 2038\) \(English summary\).](#)
- 4.3⁽¹⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective November 1, 2019 to October 31, 2039\) \(English summary\).](#)
- 4.4⁽⁶⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 3 and F12 \(Phase III\) \(effective December 4, 2009 to December 31, 2028\) \(English summary\).](#)
- 4.5⁽⁷⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 3 and F12 \(Phase III\) \(effective July 1, 2015 to December 31, 2034\) \(in Chinese with English summary\).](#)
- 4.6⁽⁸⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 8 \(effective March 15, 2017 to March 14, 2037\) \(English summary\).](#)
- 4.7⁽¹⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 12 \(Phase I\) and Corporate Headquarters \(effective December 1, 2019 to December 31, 2038\) \(English summary\).](#)
- 4.9⁽⁹⁾ Shareholders Agreement, dated as of March 15, 1999, by and among EDB Investments Pte. Ltd., Koninklijke Philips Electronics N.V. and Taiwan Semiconductor Manufacturing Company Ltd. (P).
- 4.10⁽⁶⁾ [Land Lease with Hsinchu Science Park Administration relating to Fabs 2 and 5 \(effective April 1, 2008 to December 31, 2027\) \(English summary\).](#)
- 4.11⁽⁶⁾ [Land Lease with Hsinchu Science Park Administration relating to Fabs 3 \(effective May 16, 2013 to December 31, 2032\) \(English summary\).](#)
- 4.12⁽¹⁰⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 12 and Corporate Headquarters \(Phase II\) \(effective January 1, 2021 to December 31, 2040\) \(English summary\).](#)

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- 4.13⁽²⁾ [Land Lease with Central Science Industrial Park Administration relating to the fabs located in Taichung Science Park \(effective September 1, 2009 to September 1, 2029\) \(English summary\).](#)
- 4.14⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective May 14, 2005 to December 31, 2024\) \(English summary\).](#)
- 4.15⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective April 15, 2006 to December 31, 2024\) \(English summary\).](#)
- 4.16⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective December 1, 2009 to November 30, 2029\) \(English summary\).](#)
- 4.17⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective December 15, 2006 to December 31, 2024\) \(English summary\).](#)
- 4.18⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective October 1, 2011 to September 30, 2030\) \(English summary\).](#)
- 4.19⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective August 1, 2012 to July 31, 2032\) \(English summary\).](#)
- 4.20⁽⁸⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective January 22, 2014 to July 31, 2032\) \(English summary\).](#)
- 4.21⁽⁶⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective February 1, 2012 to January 31, 2032\) \(English summary\).](#)
- 4.22⁽¹⁰⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 12 \(Phase V, VI, VII\) \(effective February 1, 2021 to December 31, 2026\) \(English summary\).](#)
- 4.23⁽¹⁰⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 12 \(Phase V, VI, VII\) \(effective February 1, 2021 to December 31, 2026\) \(English summary\).](#)
- 4.25⁽⁶⁾ [Land Lease with Hsinchu Science Park Administration relating to Fabs 2 and 5 \(effective April 1, 2010 to December 31, 2029\) \(English summary\).](#)
- 4.26⁽⁶⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 12 \(Phase I and Phase IV bridge\) \(effective July 21, 2008 to December 31, 2027\) \(English summary\).](#)
- 4.27⁽¹⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 8 \(effective May 15, 2019 to December 31, 2038\) \(English summary\).](#)
- 4.28⁽¹¹⁾ [Land Lease with Hsinchu Science Park Administration relating to Fab 12 \(effective December 1, 2014 to December 31, 2033\) \(English summary\).](#)
- 4.29⁽¹¹⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective March 1, 2014 to February 28, 2034\) \(English summary\).](#)
- 4.30⁽¹¹⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs located in Southern Taiwan Science Park \(effective August 1, 2014 to July 31, 2034\) \(English summary\).](#)
- 4.31⁽⁷⁾ [Land Lease with Hsinchu Science Park Administration relating to AP3 located in Longtan Science Park \(effective April 15, 2015 to December 31, 2034\) \(English summary\).](#)
- 4.32⁽⁷⁾ [Land Lease with Southern Taiwan Science Park Administration relating to the fabs \(AP2B and F6 bridge\) located in Southern Taiwan Science Park \(effective March 16, 2015 to March 15, 2035\) \(English summary\).](#)
- 4.33⁽⁷⁾ [Land Lease with Central Science Industrial Park Administration relating to F15B located in Taichung Science Park \(effective March 25, 2015 to December 31, 2034\) \(English summary\).](#)
- 4.34⁽⁷⁾ [Land Lease with Central Science Industrial Park Administration relating to AP5 located in Taichung Science Park \(effective December 14, 2015 to July 26, 2031\) \(English summary\).](#)
- 4.35⁽⁴⁾ [Land Lease with Southern Taiwan Science Park Administration relating to Fab18 located in Southern Taiwan Science Park \(effective August 1, 2017 to July 31, 2037\) \(English summary\).](#)
- 4.36⁽⁴⁾ [Land Lease with Hsinchu Science Park Administration relating to F12 \(Phase VII\) \(effective February 1, 2017 to January 31, 2037\) \(English summary\).](#)

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4.37(5)	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab18 located in Southern Taiwan Science Park (effective December 1, 2018 to November 30, 2038) (English summary).</u>
4.38(1)	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab18 located in Southern Taiwan Science Park (effective January 1, 2020 to December 31, 2034) (English summary).</u>
4.39(1)	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab18 located in Southern Taiwan Science Park (effective January 1, 2020 to December 31, 2034) (English summary).</u>
4.40(1)	<u>Land Lease with Hsinchu Science Park Administration relating to Fab12(Phase 8 and Phase 9) (effective February 5, 2020 to December 31, 2039) (English summary).</u>
4.41(10)	<u>Land Lease with Southern Taiwan Science Park Administration relating to T-Site Water Reclamation Plant (effective April 1, 2020 to March 31, 2040) (English summary).</u>
4.42(10)	<u>Land Lease with Southern Taiwan Science Park Administration relating to T-Site Water Reclamation Plant (effective September 1, 2020 to March 31, 2040) (English summary).</u>
4.43(10)	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab18 located in Southern Taiwan Science Park (effective October 1, 2020 to September 30, 2040) (English summary).</u>
4.44(10)	<u>Land Lease with Southern Taiwan Science Park Administration relating to a warehouse (effective October 26, 2020 to October 25, 2040) (English summary).</u>
4.45(10)	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab18 located in Southern Taiwan Science Park (effective October 20, 2020 to October 19, 2040) (English summary).</u>
4.46(10)	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab14 & Fab18 located in Southern Taiwan Science Park (effective January 6, 2021 to January 5, 2041) (English summary).</u>
4.47	<u>Land Lease with Southern Taiwan Science Park Administration relating to Fab14 & Fab18 located in Southern Taiwan Science Park (effective January 1, 2022 to December 31, 2041) (English summary).</u>
4.48	<u>Land Lease with Central Science Park Administration relating to TCZWM located in Taichung Science Park (effective June 21, 2021 to June 20, 2041) (English summary).</u>
4.49	<u>Land Lease with Southern Taiwan Science Park Administration relating to the fabs (F18 bridge) located in Southern Taiwan Science Park (effective January 1, 2022 to December 31, 2041) (English summary).</u>
4.50	<u>Taiwan Semiconductor Manufacturing Company Ltd. Employee Restricted Stock Awards Rules for Year 2021.</u>
4.51	<u>Taiwan Semiconductor Manufacturing Company Ltd. Employee Restricted Stock Awards Rules for Year 2022 (as approved by the Board of Directors on April 12, 2022, and subject to shareholder approval and approval by the R.O.C. Financial Supervisory Commission).</u>
8.1	<u>Subsidiaries of Taiwan Semiconductor Manufacturing Company Ltd.</u>
12.1	<u>Certification of Chief Executive Officer required by Rule 13a-14(a) under the Exchange Act.</u>
12.2	<u>Certification of Chief Financial Officer required by Rule 13a-14(a) under the Exchange Act.</u>
13.1	<u>Certification of Chief Executive Officer required by Rule 13a-14(b) under the Exchange Act.</u>
13.2	<u>Certification of Chief Financial Officer required by Rule 13a-14(b) under the Exchange Act.</u>
17	<u>Issuers of Guaranteed Securities.</u>
101.INS	iXBRL Instance Document. (Embedded within the Inline XBRL document)
101.SCH	iXBRL Taxonomy Extension Schema Document.
101.CAL	iXBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	iXBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	iXBRL Taxonomy Extension Label Linkbase Document.
101.PRE	iXBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File. (Embedded within the Inline XBRL document)

(1) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2019, filed by TSMC on April 15, 2020.

(2) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2012, filed by TSMC on April 2, 2013.

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- (3) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2001, filed by TSMC on May 9, 2002.
- (4) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2017, filed by TSMC on April 19, 2018.
- (5) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2018, filed by TSMC on April 17, 2019.
- (6) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2013, filed by TSMC on April 14, 2014.
- (7) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2015, filed by TSMC on April 11, 2016.
- (8) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2016, filed by TSMC on April 13, 2017.
- (9) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 1998, filed by TSMC on April 30, 1999.
- (10) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2020, filed by TSMC on April 16, 2021.
- (11) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2014, filed by TSMC on April 13, 2015.
- (P) Paper filing.

SIGNATURE

Pursuant to the requirements of Section 12 of the Securities Exchange Act of 1934, the registrant certifies that it meets all the requirements for filing on Form 20-F and has duly caused this annual report to be signed on its behalf by the undersigned.

Date: April 14, 2022

TAIWAN SEMICONDUCTOR MANUFACTURING
COMPANY LIMITED

By: /s/ Wendell Huang
Name: Wendell Huang
Title: Vice President, Finance and
Chief Financial Officer / Spokesperson

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of
Taiwan Semiconductor Manufacturing Company Limited

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of financial position of Taiwan Semiconductor Manufacturing Company Limited (a Republic of China corporation) and subsidiaries (the “Company”) as of December 31, 2020 and 2021, the related consolidated statements of profit or loss and other comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Our audits also comprehended the translation of New Taiwan dollar amounts into U.S. dollar amounts and, in our opinion, such translation has been made in conformity with the basis stated in Note 3 to the consolidated financial statements. Such U.S. dollar amounts are presented solely for the convenience of the readers outside the Republic of China.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company’s internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated April 14, 2022, expressed an unqualified opinion on the Company’s internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

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Property, plant and equipment (PP&E) - commencement of depreciation related to PP&E classified as equipment under installation and construction in progress (EUI/CIP) - Refer to Notes 5, 6, and 15

Critical Audit Matter Description

The Company's evaluation of when to commence depreciation of EUI/CIP involves determining when the assets are available for their intended use. The criteria the Company uses to determine whether EUI/CIP are available for their intended use involves subjective judgments and assumptions about the conditions necessary for the assets to be capable of operating in the intended manner. Changes in these assumptions could have a significant impact on when depreciation is recognized.

Given the subjectivity in determining the date to commence depreciation of EUI/CIP, performing audit procedures to evaluate the reasonableness of the Company's judgments and assumptions required a high degree of auditor judgment.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the evaluation of when to commence depreciation of EUI/CIP included the following, among others:

1. We read the Company's policy and understood the criteria used to determine when to commence depreciation.
2. We tested the effectiveness of the controls over the evaluation of when to commence depreciation of EUI/CIP.
3. We sampled the year-end balance of EUI/CIP and performed the following for each selection:
 - a. Evaluated whether the selection did not meet the criteria specified by the Company for commencement of depreciation.
 - b. Observed the assets and evaluated their status.
4. We sampled and evaluated whether the selection of EUI/CIP met the criteria specified by the Company for commencement of depreciation during the year.
5. We sampled and evaluated whether the selection of EUI/CIP met the criteria specified by the Company for commencement of depreciation subsequent to year end.

/s/ Deloitte & Touche
Taipei, Taiwan
Republic of China

April 14, 2022

We have served as the Company's auditor since 1987.

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

(In Millions of New Taiwan Dollars or U.S. Dollars)

	<u>Notes</u>	<u>December 31, 2020</u>	<u>December 31, 2021</u>	
		NT\$	NT\$	US\$ (Note 3)
ASSETS				
CURRENT ASSETS				
Cash and cash equivalents	7	\$ 660,170.6	\$ 1,064,990.2	\$ 38,391.9
Financial assets at fair value through profit or loss	8	2,259.4	159.0	5.7
Financial assets at fair value through other comprehensive income	9	122,448.5	119,519.3	4,308.5
Financial assets at amortized cost	10	6,598.0	3,773.6	136.0
Hedging financial assets	11	0.1	13.5	0.5
Notes and accounts receivable, net	12	145,480.3	197,586.1	7,122.8
Receivables from related parties	34	558.1	715.3	25.8
Other receivables from related parties	34	50.6	61.5	2.2
Inventories	6, 13, 37	137,353.4	193,102.3	6,961.2
Other financial assets	35	10,676.1	16,630.6	599.5
Other current assets		6,590.2	10,521.5	379.3
Total current assets		<u>1,092,185.3</u>	<u>1,607,072.9</u>	<u>57,933.4</u>
NONCURRENT ASSETS				
Financial assets at fair value through other comprehensive income	9	4,514.9	5,887.9	212.3
Financial assets at amortized cost	10	4,372.2	1,533.4	55.3
Investments accounted for using equity method	14	18,730.2	21,762.2	784.5
Property, plant and equipment	6, 15	1,555,589.1	1,975,118.7	71,201.1
Right-of-use assets	6, 16	27,728.5	32,734.4	1,180.0
Intangible assets	6, 17	25,768.1	26,821.7	966.9
Deferred income tax assets	6, 27	25,958.2	49,153.9	1,772.0
Refundable deposits		1,343.0	2,624.9	94.6
Other noncurrent assets		4,411.0	2,592.2	93.4
Total noncurrent assets		<u>1,668,415.2</u>	<u>2,118,229.3</u>	<u>76,360.1</u>
TOTAL		<u>\$ 2,760,600.5</u>	<u>\$ 3,725,302.2</u>	<u>\$ 134,293.5</u>

(Continued)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

(In Millions of New Taiwan Dollars or U.S. Dollars)

	Notes	December 31, 2020		December 31, 2021	
		NT\$	NT\$	NT\$	US\$ (Note 3)
LIABILITIES AND EQUITY					
CURRENT LIABILITIES					
Short-term loans	18, 31	\$ 88,559.0	\$ 114,921.3	\$ 4,142.8	
Financial liabilities at fair value through profit or loss	8	94.1	681.9	24.6	
Hedging financial liabilities	11	1.2	9.6	0.3	
Accounts payable		38,987.3	47,285.6	1,704.6	
Payables to related parties	34	2,107.7	1,437.2	51.8	
Salary and bonus payable		20,071.2	23,802.1	858.0	
Accrued profit sharing bonus to employees and compensation to directors and supervisors	30	35,681.0	36,524.7	1,316.7	
Payables to contractors and equipment suppliers		157,805.0	145,742.2	5,253.9	
Cash dividends payable	22	129,652.0	142,617.1	5,141.2	
Income tax payable	6, 27	68,656.7	78,496.6	2,829.7	
Long-term liabilities - current portion	19, 20, 31	2,600.0	4,566.7	164.6	
Accrued expenses and other current liabilities	6, 16, 23, 31, 34	87,683.2	162,267.8	5,849.7	
Total current liabilities		631,898.4	758,352.8	27,337.9	
NONCURRENT LIABILITIES					
Bonds payable	19, 31	254,105.1	610,070.6	21,992.4	
Long-term bank loans	20, 31	1,967.6	3,309.1	119.3	
Deferred income tax liabilities	6, 27	1,729.9	1,873.9	67.6	
Lease liabilities	6, 16, 31	20,560.6	20,764.2	748.5	
Net defined benefit liability	21	11,914.1	11,036.9	397.9	
Guarantee deposits		265.6	686.8	24.8	
Others	23	2,395.4	167,525.4	6,039.1	
Total noncurrent liabilities		292,938.3	815,266.9	29,389.6	
Total liabilities		924,836.7	1,573,619.7	56,727.5	
EQUITY ATTRIBUTABLE TO SHAREHOLDERS OF THE PARENT					
Capital stock	22	259,303.8	259,303.8	9,347.7	
Capital surplus	22	56,347.2	64,761.5	2,334.6	
Retained earnings	22				
Appropriated as legal capital reserve		311,147.0	311,147.0	11,216.5	
Appropriated as special capital reserve		42,259.1	59,304.2	2,137.9	
Unappropriated earnings		1,220,434.0	1,517,351.7	54,699.0	
		1,573,840.1	1,887,802.9	68,053.4	
Others	22	(54,679.8)	(62,608.4)	(2,257.0)	
Equity attributable to shareholders of the parent		1,834,811.3	2,149,259.8	77,478.7	
NON - CONTROLLING INTERESTS		952.5	2,422.7	87.3	
Total equity		1,835,763.8	2,151,682.5	77,566.0	
TOTAL		\$ 2,760,600.5	\$ 3,725,302.2	\$ 134,293.5	

The accompanying notes are an integral part of the consolidated financial statements.

(Concluded)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**CONSOLIDATED STATEMENTS OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME****(In Millions of New Taiwan Dollars or U.S. Dollars, Except Earnings Per Share that are in New Taiwan or U.S. Dollars)**

	<u>Notes</u>	<u>2019</u> NT\$	<u>2020</u> NT\$	<u>2021</u> NT\$	<u>US\$</u> (Note 3)
NET REVENUE	6, 23, 34, 38	\$1,069,985.4	\$1,339,254.8	\$1,587,415.0	\$57,224.8
COST OF REVENUE	6, 13, 30, 34, 37	<u>577,283.5</u>	<u>628,124.7</u>	<u>767,877.7</u>	<u>27,681.3</u>
GROSS PROFIT		<u>492,701.9</u>	<u>711,130.1</u>	<u>819,537.3</u>	<u>29,543.5</u>
OPERATING EXPENSES	6, 30, 34				
Research and development		91,418.7	109,486.0	124,734.8	4,496.6
General and administrative		21,737.2	28,457.6	36,929.6	1,331.3
Marketing		<u>6,348.6</u>	<u>7,112.8</u>	<u>7,558.6</u>	<u>272.4</u>
Total operating expenses		<u>119,504.5</u>	<u>145,056.4</u>	<u>169,223.0</u>	<u>6,100.3</u>
OTHER OPERATING INCOME AND EXPENSES, NET	15, 16, 30	<u>(496.3)</u>	<u>710.0</u>	<u>(333.4)</u>	<u>(12.0)</u>
INCOME FROM OPERATIONS	38	<u>372,701.1</u>	<u>566,783.7</u>	<u>649,980.9</u>	<u>23,431.2</u>
NON-OPERATING INCOME AND EXPENSES					
Share of profits of associates		2,861.0	3,562.0	5,512.7	198.7
Interest Income	24	16,189.4	9,018.4	5,708.8	205.8
Other income		417.3	660.6	973.1	35.1
Foreign exchange gain (loss), net		2,095.2	(3,303.3)	13,662.7	492.5
Finance costs	25	(3,250.9)	(2,081.5)	(5,414.2)	(195.2)
Other gains and losses, net	26	<u>(1,151.0)</u>	<u>10,106.4</u>	<u>(7,388.0)</u>	<u>(266.3)</u>
Total non-operating income and expenses		<u>17,161.0</u>	<u>17,962.6</u>	<u>13,055.1</u>	<u>470.6</u>
INCOME BEFORE INCOME TAX		389,862.1	584,746.3	663,036.0	23,901.8
INCOME TAX EXPENSE	6, 27	<u>35,835.1</u>	<u>73,738.3</u>	<u>70,155.4</u>	<u>2,529.0</u>
NET INCOME		<u>354,027.0</u>	<u>511,008.0</u>	<u>592,880.6</u>	<u>21,372.8</u>
OTHER COMPREHENSIVE INCOME (LOSS)	6, 21, 22, 27				
Items that will not be reclassified subsequently to profit or loss:					
Remeasurement of defined benefit obligation		253.9	(3,516.8)	242.1	8.7
Unrealized gain on investments in equity instruments at fair value through other comprehensive income		334.3	423.7	1,900.8	68.5
Gain (loss) on hedging instruments		(109.6)	24.1	(41.4)	(1.5)
Share of other comprehensive loss of associates		(18.2)	(11.6)	(30.2)	(1.1)
Income tax benefit (expense) related to items that will not be reclassified subsequently		<u>(21.0)</u>	<u>422.7</u>	<u>(85.3)</u>	<u>(3.1)</u>
		<u>439.4</u>	<u>(2,657.9)</u>	<u>1,986.0</u>	<u>71.5</u>

(Continued)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**CONSOLIDATED STATEMENTS OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME****(In Millions of New Taiwan Dollars or U.S. Dollars, Except Earnings Per Share that are in New Taiwan or U.S. Dollars)**

	<u>Notes</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	
		NT\$	NT\$	NT\$	US\$ (Note 3)
Items that may be reclassified subsequently to profit or loss:					
Exchange differences arising on translation of foreign operations		\$ (14,689.1)	\$ (29,847.2)	\$ (6,181.8)	\$ (222.8)
Unrealized gain/(loss) on investments in debt instruments at fair value through other comprehensive income		2,566.4	2,466.7	(3,431.8)	(123.7)
Gain on hedging instruments		—	—	131.6	4.7
Share of other comprehensive loss of associates		(140.2)	(283.4)	(120.0)	(4.3)
Income tax expense related to items that may be reclassified subsequently		—	—	(3.4)	(0.1)
		<u>(12,262.9)</u>	<u>(27,663.9)</u>	<u>(9,605.4)</u>	<u>(346.2)</u>
Other comprehensive loss for the year, net of income tax		<u>(11,823.5)</u>	<u>(30,321.8)</u>	<u>(7,619.4)</u>	<u>(274.7)</u>
TOTAL COMPREHENSIVE INCOME FOR THE YEAR		<u>\$ 342,203.5</u>	<u>\$ 480,686.2</u>	<u>\$ 585,261.2</u>	<u>\$21,098.1</u>
NET INCOME ATTRIBUTABLE TO:					
Shareholders of the parent		\$ 353,948.0	\$ 510,744.0	\$ 592,359.2	\$21,354.0
Non-controlling interests		79.0	264.0	521.4	18.8
		<u>\$ 354,027.0</u>	<u>\$ 511,008.0</u>	<u>\$ 592,880.6</u>	<u>\$21,372.8</u>
TOTAL COMPREHENSIVE INCOME ATTRIBUTABLE TO:					
Shareholders of the parent		\$ 342,124.9	\$ 480,422.1	\$ 584,737.3	\$21,079.2
Non-controlling interests		78.6	264.1	523.9	18.9
		<u>\$ 342,203.5</u>	<u>\$ 480,686.2</u>	<u>\$ 585,261.2</u>	<u>\$21,098.1</u>
EARNINGS PER SHARE 28					
Basic earnings per share		<u>\$ 13.65</u>	<u>\$ 19.70</u>	<u>\$ 22.84</u>	<u>\$ 0.82</u>
Diluted earnings per share		<u>\$ 13.65</u>	<u>\$ 19.70</u>	<u>\$ 22.84</u>	<u>\$ 0.82</u>
EARNINGS PER EQUIVALENT ADS					
Basic earnings per share		<u>\$ 68.25</u>	<u>\$ 98.48</u>	<u>\$ 114.22</u>	<u>\$ 4.12</u>
Diluted earnings per share		<u>\$ 68.25</u>	<u>\$ 98.48</u>	<u>\$ 114.22</u>	<u>\$ 4.12</u>

The accompanying notes are an integral part of the consolidated financial statements.

(Concluded)

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Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(In Millions of New Taiwan Dollars)

	Equity Attributable to Shareholders of the Parent										Others				
	Capital Stock - Common Stock			Retained Earnings				Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at Fair Value Through Other Comprehensive Income	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total	Total	Non-controlling Interests	Total Equity
	Shares (In Millions)	Amount	Capital Surplus	Legal Capital Reserve	Special Capital Reserve	Unappropriated Earnings	Total								
BALANCE, JANUARY 1, 2019	25,930.3	\$ 259,303.8	\$ 56,316.0	\$ 276,033.9	\$ 26,907.5	\$ 1,057,317.5	\$1,360,258.9	\$(12,042.4)	\$ (3,429.3)	\$ 23.6	\$ (1.8)	\$(15,449.9)	\$1,660,428.8	\$ 676.3	\$1,661,105.1
Appropriations of earnings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Legal capital reserve	—	—	—	35,113.1	—	(35,113.1)	—	—	—	—	—	—	—	—	—
Special capital reserve	—	—	—	—	(16,232.4)	16,232.4	—	—	—	—	—	—	—	—	—
Cash dividends to shareholders	—	—	—	—	—	(388,955.7)	(388,955.7)	—	—	—	—	—	(388,955.7)	—	(388,955.7)
Total	—	—	—	35,113.1	(16,232.4)	(407,836.4)	(388,955.7)	—	—	—	—	—	(388,955.7)	—	(388,955.7)
Net income in 2019	—	—	—	—	—	353,948.0	353,948.0	—	—	—	—	—	353,948.0	79.0	354,027.0
Other comprehensive income (loss) in 2019, net of income tax	—	—	—	—	—	217.1	217.1	(14,829.0)	2,898.5	(109.7)	—	(12,040.2)	(11,823.1)	(0.4)	(11,823.5)
Total comprehensive income (loss) in 2019	—	—	—	—	—	354,165.1	354,165.1	(14,829.0)	2,898.5	(109.7)	—	(12,040.2)	342,124.9	78.6	342,203.5
Disposal of investments in equity instruments at fair value through other comprehensive income	—	—	—	—	—	162.1	162.1	—	(162.1)	—	—	—	(162.1)	—	—
Basis adjustment for gain on hedging instruments	—	—	—	—	—	—	—	—	—	82.3	—	82.3	82.3	—	82.3
Adjustments to share of changes in equities of associates	—	—	19.4	—	—	—	—	—	—	—	1.6	1.6	21.0	0.2	21.2
From share of changes in equities of subsidiaries	—	—	0.3	—	—	—	—	—	—	—	—	—	0.3	(0.3)	—
Donation from shareholders	—	—	4.0	—	—	—	—	—	—	—	—	—	4.0	4.0	—
Decrease in non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	(73.1)	(73.1)
BALANCE, DECEMBER 31, 2019	25,930.3	\$ 259,303.8	\$ 56,339.7	\$ 311,147.0	\$ 10,675.1	\$ 1,003,808.3	\$1,325,630.4	\$(26,871.4)	\$ (692.9)	\$ (3.8)	\$ (0.2)	\$(27,568.3)	\$1,613,705.6	\$ 681.7	\$1,614,387.3
Appropriations of earnings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Special capital reserve	—	—	—	—	31,584.0	(31,584.0)	—	—	—	—	—	—	—	—	—
Cash dividends to shareholders	—	—	—	—	—	(259,303.8)	(259,303.8)	—	—	—	—	—	(259,303.8)	—	(259,303.8)
Total	—	—	—	—	31,584.0	(290,887.8)	(259,303.8)	—	—	—	—	—	(259,303.8)	—	(259,303.8)
Net income in 2020	—	—	—	—	—	510,744.0	510,744.0	—	—	—	—	—	510,744.0	264.0	511,008.0
Other comprehensive income (loss) in 2020, net of income tax	—	—	—	—	—	(3,121.8)	(3,121.8)	(30,130.2)	2,906.0	24.1	—	(27,200.1)	(30,321.9)	0.1	(30,321.8)
Total comprehensive income (loss) in 2020	—	—	—	—	—	507,622.2	507,622.2	(30,130.2)	2,906.0	24.1	—	(27,200.1)	480,422.1	264.1	480,686.2
Disposal of investments in equity instruments at fair value through other comprehensive income	—	—	—	—	—	(108.7)	(108.7)	—	108.7	—	—	108.7	—	—	—
Basis adjustment for loss on hedging instruments	—	—	—	—	—	—	—	—	—	(20.3)	—	(20.3)	(20.3)	—	(20.3)
Adjustments to share of changes in equities of associates	—	—	0.3	—	—	—	—	—	—	—	0.2	0.2	0.5	—	0.5
Donation from shareholders	—	—	7.2	—	—	—	—	—	—	—	—	—	7.2	7.2	—
Increase in non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	6.7	6.7
BALANCE, DECEMBER 31, 2020	25,930.3	\$ 259,303.8	\$ 56,347.2	\$ 311,147.0	\$ 42,259.1	\$ 1,220,434.0	\$1,573,840.1	\$(57,001.6)	\$ 2,321.8	\$ —	\$ —	\$(54,679.8)	\$1,834,811.3	\$ 952.5	\$1,835,763.8
Appropriations of earnings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Special capital reserve	—	—	—	—	17,045.1	(17,045.1)	—	—	—	—	—	—	—	—	—
Cash dividends to shareholders	—	—	—	—	—	(278,751.6)	(278,751.6)	—	—	—	—	—	(278,751.6)	—	(278,751.6)
Total	—	—	—	—	17,045.1	(295,796.7)	(278,751.6)	—	—	—	—	—	(278,751.6)	—	(278,751.6)
Net income in 2021	—	—	—	—	—	592,359.2	592,359.2	—	—	—	—	—	592,359.2	521.4	592,880.6
Other comprehensive income (loss) in 2021, net of income tax	—	—	—	—	—	167.5	167.5	(6,301.7)	(1,559.8)	72.1	—	(7,789.4)	(7,621.9)	2.5	(7,619.4)
Total comprehensive income (loss) in 2021	—	—	—	—	—	592,526.7	592,526.7	(6,301.7)	(1,559.8)	72.1	—	(7,789.4)	584,737.3	523.9	585,261.2
Disposal of investments in equity instruments at fair value through other comprehensive income	—	—	—	—	—	187.7	187.7	—	(187.7)	—	—	(187.7)	—	—	—
Basis adjustment for gain on hedging instruments	—	—	—	—	—	—	—	—	—	48.5	—	48.5	48.5	—	48.5
Adjustments to share of changes in equities of associates	—	—	4.8	—	—	—	—	—	—	—	—	—	4.8	4.8	
From difference between the consideration received and the carrying amount of the subsidiaries' net assets during actual disposal	—	—	8,406.3	—	—	—	—	—	—	—	—	—	8,406.3	1,045.5	9,451.8
From share of changes in equities of subsidiaries	—	—	(7.9)	—	—	—	—	—	—	—	—	—	(7.9)	7.9	—
Donation from shareholders	—	—	11.1	—	—	—	—	—	—	—	—	—	11.1	0.1	11.2
Increase in non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	(107.4)	(107.4)
Effect of acquisition of subsidiary	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2	0.2
BALANCE, DECEMBER 31, 2021	25,930.3	\$ 259,303.8	\$ 64,761.5	\$ 311,147.0	\$ 59,304.2	\$ 1,517,351.7	\$1,887,802.9	\$(63,303.3)	\$ 574.3	\$ 120.6	\$ —	\$(62,608.4)	\$2,149,259.8	\$ 2,422.7	\$2,151,682.5
BALANCE, DECEMBER 31, 2021 (IN MILLIONS OF US\$ - Note 3)		\$ 9,347.7	\$ 2,334.6	\$ 11,216.5	\$ 2,137.9	\$ 54,699.0	\$ 68,053.4	\$(2,282.0)	\$ 20.7	\$ 4.3	\$ —	\$(2,257.0)	\$ 77,478.7	\$ 87.3	\$ 77,566.0

The accompanying notes are an integral part of the consolidated financial statements.

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**CONSOLIDATED STATEMENTS OF CASH FLOWS****(In Millions of New Taiwan Dollars or U.S. Dollars)**

	2019	2020	2021	
	NT\$	NT\$	NT\$	US\$ (Note 3)
CASH FLOWS FROM OPERATING ACTIVITIES				
Income before income tax	\$389,862.1	\$584,746.3	\$ 663,036.0	\$23,901.8
Adjustments for:				
Depreciation expense	281,411.8	324,538.4	414,187.7	14,931.1
Amortization expense	5,472.4	7,186.2	8,207.2	295.9
Expected credit losses recognized (reversal) on investments in debt instruments	1.7	3.7	(2.7)	(0.1)
Finance costs	3,250.9	2,081.5	5,414.2	195.2
Share of profits of associates	(2,861.0)	(3,562.0)	(5,512.7)	(198.7)
Interest income	(16,189.4)	(9,018.4)	(5,708.8)	(205.8)
Share-based compensation	2.8	6.6	7.8	0.3
Loss (gain) on disposal or retirement of property, plant and equipment, net	950.0	(188.9)	273.6	9.9
Loss on disposal or retirement of intangible assets, net	2.4	0.6	1.2	—
Impairment loss (reversal of impairment loss) on property, plant and equipment	(301.4)	10.2	274.4	9.9
Loss (gain) on financial instruments at fair value through profit or loss, net	955.7	(3.0)	—	—
Gain on disposal of investments in debt instruments at fair value through other comprehensive income, net	(537.8)	(1,439.4)	(93.2)	(3.4)
Loss from disposal of subsidiaries	4.6	—	—	—
Gain on foreign exchange, net	(5,228.2)	(1,372.6)	(16,115.9)	(581.0)
Dividend income	(417.3)	(637.6)	(362.3)	(13.1)
Gain arising from fair value hedges, net	(13.1)	—	—	—
Others	(5.5)	13.5	(414.2)	(15.0)
Changes in operating assets and liabilities:				
Financial instruments at fair value through profit or loss	848.8	(2,965.2)	2,649.2	95.5
Notes and accounts receivable, net	(18,119.6)	(8,082.7)	(52,105.9)	(1,878.4)
Receivables from related parties	(277.7)	304.0	(157.2)	(5.7)
Other receivables from related parties	13.4	7.6	(10.9)	(0.4)
Inventories	20,249.8	(54,372.2)	(55,748.9)	(2,009.7)
Other financial assets	3,383.5	1,389.5	(8,236.9)	(296.9)
Other current assets	(76.3)	(1,358.1)	(3,899.0)	(140.6)
Accounts payable	5,860.1	404.6	8,298.3	299.2
Payables to related parties	58.4	672.8	(670.5)	(24.2)
Salary and bonus payable	1,800.9	3,798.9	3,730.9	134.5
Accrued profit sharing bonus to employees and compensation to directors and supervisors	(332.2)	12,032.1	843.7	30.4
Accrued expenses and other current liabilities	(2,372.0)	20,617.4	84,322.7	3,039.8
Other noncurrent liabilities	—	—	154,086.0	5,554.7
Net defined benefit liability	(215.0)	(785.2)	(635.2)	(22.9)
Cash generated from operations	667,182.8	874,028.6	1,195,658.6	43,102.3
Income taxes paid	(52,044.1)	(51,362.4)	(83,497.9)	(3,010.0)
Net cash generated by operating activities	615,138.7	822,666.2	1,112,160.7	40,092.3

(Continued)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries**CONSOLIDATED STATEMENTS OF CASH FLOWS****(In Millions of New Taiwan Dollars or U.S. Dollars)**

	<u>2019</u>	<u>2020</u>	<u>2021</u>	
	NT\$	NT\$	NT\$	US\$ (Note 3)
CASH FLOWS FROM INVESTING ACTIVITIES				
Acquisitions of:				
Financial instruments at fair value through profit or loss - debt instruments	\$ (124.7)	\$ —	\$ —	\$ —
Financial assets at fair value through other comprehensive income	(257,558.2)	(262,637.5)	(255,888.7)	(9,224.5)
Financial assets at amortized cost	(313.9)	(4,302.8)	(3,799.7)	(137.0)
Property, plant and equipment	(460,422.2)	(507,238.7)	(839,195.7)	(30,252.2)
Intangible assets	(9,329.9)	(9,542.4)	(9,040.7)	(325.9)
Proceeds from disposal or redemption of:				
Financial instruments at fair value through profit or loss - debt instruments	2,418.2	30.0	—	—
Financial assets at fair value through other comprehensive income	230,444.5	266,931.9	254,604.5	9,178.2
Financial assets at amortized cost	14,349.2	285.2	9,368.3	337.7
Property, plant and equipment	287.3	606.7	390.4	14.1
Proceeds from return of capital of investments in equity instruments at fair value through other comprehensive income	1.1	51.1	115.6	4.2
Derecognition of hedging financial instruments	(436.6)	(308.8)	276.3	10.0
Interest received	16,875.0	9,775.1	5,990.9	216.0
Proceeds from government grants - property, plant and equipment	2,565.3	1,044.3	821.3	29.6
Proceeds from government grants - land use right and others	850.6	25.4	6.6	0.2
Other dividends received	320.2	735.1	362.3	13.1
Dividends received from investments accounted for using equity method	1,719.0	2,752.1	2,136.4	77.0
Increase in prepayments for leases	—	(4,693.4)	(1,200.0)	(43.3)
Refundable deposits paid	(1,465.8)	(726.9)	(1,997.3)	(72.0)
Refundable deposits refunded	1,019.3	1,431.9	683.7	24.6
Net cash used in investing activities	<u>(458,801.6)</u>	<u>(505,781.7)</u>	<u>(836,365.8)</u>	<u>(30,150.2)</u>
CASH FLOWS FROM FINANCING ACTIVITIES				
Increase (decrease) in short-term loans	31,804.3	(31,571.6)	35,668.4	1,285.8
Proceeds from short-term bills payable	—	7,485.3	—	—
Repayments of short-term bills payable	—	(7,500.0)	—	—
Proceeds from issuance of bonds	—	236,725.7	364,592.8	13,143.2
Repayment of bonds	(34,900.0)	(31,800.0)	(2,600.0)	(93.7)
Proceeds from long-term bank loans	—	2,000.0	1,510.0	54.5
Payments for transaction costs attributable to the issuance of bonds	—	(390.7)	(737.7)	(26.6)
Repayment of the principal portion of lease liabilities	(2,930.6)	(2,615.7)	(1,985.3)	(71.6)
Interest paid	(3,597.1)	(1,781.1)	(3,833.6)	(138.2)
Guarantee deposits received	62.2	145.6	469.0	16.9
Guarantee deposits refunded	(701.3)	(16.1)	(36.8)	(1.3)
Cash dividends	(259,303.8)	(259,303.8)	(265,786.4)	(9,581.3)
Disposal of ownership interests in subsidiaries (without losing control)	—	—	9,451.8	340.7
Donation from shareholders	4.0	7.3	11.3	0.4
Decrease in non-controlling interests	(75.9)	—	(115.0)	(4.2)
Net cash generated by (used in) financing activities	<u>(269,638.2)</u>	<u>(88,615.1)</u>	<u>136,608.5</u>	<u>4,924.6</u>

(Continued)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In Millions of New Taiwan Dollars or U.S. Dollars)

	<u>2019</u>	<u>2020</u>	<u>2021</u>	
	NT\$	NT\$	NT\$	US\$ (Note 3)
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	\$ (9,114.2)	\$ (23,498.1)	\$ (7,583.8)	\$ (273.3)
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	(122,415.3)	204,771.3	404,819.6	14,593.4
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	<u>577,814.6</u>	<u>455,399.3</u>	<u>660,170.6</u>	<u>23,798.5</u>
CASH AND CASH EQUIVALENTS, END OF YEAR	<u>\$ 455,399.3</u>	<u>\$ 660,170.6</u>	<u>\$ 1,064,990.2</u>	<u>\$ 38,391.9</u>

The accompanying notes are an integral part of the consolidated financial statements.

(Concluded)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. GENERAL

Taiwan Semiconductor Manufacturing Company Limited (TSMC), a Republic of China (R.O.C.) corporation, was incorporated on February 21, 1987. TSMC is a dedicated foundry in the semiconductor industry which engages mainly in the manufacturing, sales, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing of masks.

On September 5, 1994, TSMC's shares were listed on the Taiwan Stock Exchange (TWSE). On October 8, 1997, TSMC listed some of its shares of stock on the New York Stock Exchange (NYSE) in the form of American Depositary Shares (ADSs).

The address of its registered office and principal place of business is No. 8, Li-Hsin Rd. 6, Hsinchu Science Park, Taiwan. The principal operating activities of TSMC's subsidiaries are described in Note 5.

2. THE AUTHORIZATION OF FINANCIAL STATEMENTS

The accompanying consolidated financial statements were authorized for issue by the management on April 14, 2022.

3. U.S. DOLLAR AMOUNTS

TSMC and its subsidiaries (collectively as the "Company") maintain its accounts and express its consolidated financial statements in New Taiwan dollars. For convenience only, U.S. dollar amounts presented in the accompanying consolidated financial statements have been translated from New Taiwan dollars at the exchange rate as set forth in the statistical release of the Federal Reserve Board of the United States, which was NT\$27.74 to US\$1.00 as of December 30, 2021. The convenience translations should not be construed as representations that the New Taiwan dollar amounts have been, could have been, or could in the future be, converted into U.S. dollars at this or any other rate of exchange.

4. APPLICATION OF NEW AND REVISED INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS), INTERNATIONAL ACCOUNTING STANDARDS (IAS), IFRIC INTERPRETATIONS (IFRIC), AND SIC INTERPRETATIONS (SIC) ISSUED BY THE INTERNATIONAL ACCOUNTING STANDARDS BOARD (IASB) (collectively, "IFRSs").

- a. Amendments to IFRSs and the new interpretation that are mandatorily effective for the current year

<u>New, Revised or Amended Standards and Interpretations</u>	<u>Effective Date Issued by IASB</u>
Amendments to IFRS 9, IAS 39, IFRS 7 and IFRS 16 "Interest Rate Benchmark Reform - Phase 2"	January 1, 2021 (Note 1)
Amendment to IFRS 16 "Covid-19-Related Rent Concessions"	April 1, 2021 (Note 2)

Note 1: The Company shall apply these amendments retrospectively for annual reporting periods beginning on or after January 1, 2021.

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Note 2: The Company shall apply these amendments for annual reporting periods beginning on or after April 1, 2021. The Company has early adopted the amendments on January 1, 2021.

The Company believes that the adoption of aforementioned standards or interpretations did not have a significant effect on the Company's accounting policies.

- b. New and revised standards, amendments and interpretations in issue but not yet effective

New, Revised or Amended Standards and Interpretations	Effective Date Issued by IASB
Annual Improvements to IFRS Standards 2018–2020 Cycle	January 1, 2022
Amendments to IFRS 3 “Reference to the Conceptual Framework”	January 1, 2022
Amendments to IFRS 10 and IAS 28 “Sale or Contribution of Assets between an Investor and its Associate or Joint Venture”	To be determined by IASB
Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”	January 1, 2023
Amendments to IAS 1 “Disclosure of Accounting Policies”	January 1, 2023
Amendments to IAS 8 “Definition of Accounting Estimates”	January 1, 2023
Amendments to IAS 12 “Deferred Tax related to Assets and Liabilities arising from a Single Transaction”	January 1, 2023
Amendments to IAS 16 “Property, Plant and Equipment - Proceeds before Intended Use”	January 1, 2022
Amendments to IAS 37 “Onerous Contracts–Cost of Fulfilling a Contract”	January 1, 2022

As of the date the accompanying consolidated financial statements were authorized for issue, the Company continues in evaluating the impact on its financial position and financial performance from the initial adoption of the aforementioned standards or interpretations and related applicable period. The related impact will be disclosed when the Company completes its evaluation.

5. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Significant accounting policies are summarized as follows:

Statement of Compliance

The accompanying consolidated financial statements have been prepared in accordance with IFRSs.

Basis of Preparation

The accompanying consolidated financial statements have been prepared on the historical cost basis except for financial instruments that are measured at fair values, as explained in the accounting policies below. Historical cost is generally based on the fair value of the consideration given in exchange for the assets.

Basis of Consolidation

The basis for the consolidated financial statements

The consolidated financial statements incorporate the financial statements of TSMC and entities controlled by TSMC (its subsidiaries).

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Income and expenses of subsidiaries acquired or disposed of are included in the consolidated statements of profit or loss and other comprehensive income from the effective date of acquisition and up to the effective date of disposal, as appropriate. Total comprehensive income of subsidiaries is attributed to the shareholders of the parent and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

When necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with those used by the Company.

All intra-group transactions, balances, income and expenses are eliminated in full on consolidation.

Changes in the Company's ownership interests in subsidiaries that do not result in the Company losing control over the subsidiaries are accounted for as equity transactions. The carrying amounts of the Company's interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized directly in equity and attributed to shareholders of the parent.

When the Company loses control of a subsidiary, a gain or loss is recognized in profit or loss and is calculated as the difference between:

- the aggregate of the fair value of consideration received and the fair value of any retained interest at the date when control is lost; and
- the previous carrying amount of the assets (including goodwill), and liabilities of the subsidiary and any non-controlling interest.

The Company shall account for all amounts recognized in other comprehensive income in relation to the subsidiary on the same basis as would be required if the Company had directly disposed of the related assets and liabilities.

The fair value of any investment retained in the former subsidiary at the date when control is lost is regarded as the cost on initial recognition of an investment in an associate.

The subsidiaries in the consolidated financial statements

The detail information of the subsidiaries at the end of reporting period was as follows:

Name of Investor	Name of Investee	Main Businesses and Products	Establishment and Operating Location	Percentage of Ownership		Note
				December 31, 2020	December 31, 2021	
TSMC	TSMC North America	Sales and marketing of integrated circuits and other semiconductor devices	San Jose, California, U.S.A.	100%	100%	—
	TSMC Europe B.V. (TSMC Europe)	Customer service and supporting activities	Amsterdam, the Netherlands	100%	100%	a)
	TSMC Japan Limited (TSMC Japan)	Customer service and supporting activities	Yokohama, Japan	100%	100%	a)
	TSMC Design Technology Japan, Inc. (TSMC JDC)	Engineering support activities	Yokohama, Japan	100%	100%	a)
	TSMC Japan 3DIC R&D Center, Inc. (TSMC 3DIC)	Engineering support activities	Yokohama, Japan	—	100%	a), b)
	TSMC Korea Limited (TSMC Korea)	Customer service and supporting activities	Seoul, Korea	100%	100%	a)
	TSMC Partners, Ltd. (TSMC Partners)	Investing in companies involved in the semiconductor design and manufacturing, and other investment activities	Tortola, British Virgin Islands	100%	100%	a)
	TSMC Global, Ltd. (TSMC Global)	Investment activities	Tortola, British Virgin Islands	100%	100%	—
	TSMC China Company Limited (TSMC China)	Manufacturing, sales, testing and computer-aided design of integrated circuits and other semiconductor devices	Shanghai, China	100%	100%	—
	TSMC Nanjing Company Limited (TSMC Nanjing)	Manufacturing, sales, testing and computer-aided design of integrated circuits and other semiconductor devices	Nanjing, China	100%	100%	—

(Continued)

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Name of Investor	Name of Investee	Main Businesses and Products	Establishment and Operating Location	Percentage of Ownership		
				December 31, 2020	December 31, 2021	Note
TSMC	VisEra Technologies Company Ltd. (VisEra Tech)	Research, design, development, manufacturing, sales, packaging and test of color filter	Hsin-Chu, Taiwan	87%	73%	c)
	TSMC Arizona Corporation (TSMC Arizona)	Manufacturing, sales and testing of integrated circuits and other semiconductor devices	Phoenix, Arizona, U.S.A.	100%	100%	d)
	Japan Advanced Semiconductor Manufacturing, Inc. (JASM)	Manufacturing, sales, testing and computer-aided design of integrated circuits and other semiconductor devices	Kumamoto, Japan	—	100%	a), e)
	VentureTech Alliance Fund II, L.P. (VTAF II)	Investing in technology start-up companies	Cayman Islands	98%	98%	a)
	VentureTech Alliance Fund III, L.P. (VTAF III)	Investing in technology start-up companies	Cayman Islands	98%	98%	a)
	Emerging Fund L.P. (Emerging Fund)	Investing in technology start-up companies	Cayman Islands	—	99.9%	a), f)
TSMC Partners	TSMC Development, Inc. (TSMC Development)	Investing in companies involved in semiconductor manufacturing	Delaware, U.S.A.	100%	100%	—
	TSMC Technology, Inc. (TSMC Technology)	Engineering support activities	Delaware, U.S.A.	100%	100%	a)
	TSMC Design Technology Canada Inc. (TSMC Canada)	Engineering support activities	Ontario, Canada	100%	100%	a)
TSMC Development	WaferTech, LLC (WaferTech)	Manufacturing, sales and testing of integrated circuits and other semiconductor devices	Washington, U.S.A.	100%	100%	—
VTAF III	Growth Fund Limited (Growth Fund)	Investing in technology start-up companies	Cayman Islands	100%	100%	a)

(Concluded)

Note a: This is an immaterial subsidiary for which the consolidated financial statements are not audited by the Company's independent auditors.

Note b: TSMC 3DIC is established in March 2021.

Note c: To facilitate VisEra's IPO in Taiwan, 39.5 million common shares of VisEra at a price of NT\$240 were sold by TSMC and an increase of NT\$8,406.3 million in capital surplus was recognized. TSMC's shareholding in VisEra decreased from 87% to 73%. This disposal was accounted for as an equity transaction since the transaction did not change TSMC's control over VisEra.

Note d: Under the terms of the development agreement entered into between TSMC Arizona and the City of Phoenix, the City of Phoenix commits approximately US\$205 million toward various public infrastructure projects in the area of the proposed manufacturing facility, conditioned on TSMC Arizona's achieving a minimum project scale with defined spending and job-creation thresholds.

Note e: JASM is established in December 2021 and has increased its capital in January 2022. After the increase in capital, TSMC's shareholding in JASM decreased from 100% to 81%. This transaction was accounted for as an equity transaction since the transaction did not change TSMC's control over JASM.

Note f: Emerging fund is established in January 2021.

Foreign Currencies

The financial statements of each individual consolidated entity were expressed in the currency which reflected its primary economic environment (functional currency). The functional currency of TSMC and presentation currency of the consolidated financial statements are both New Taiwan Dollars (NT\$). In preparing the consolidated financial statements, the operating results and financial positions of each consolidated entity are translated into NT\$.

In preparing the financial statements of each individual consolidated entity, transactions in currencies other than the entity's functional currency (foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Such exchange differences are recognized in profit or loss in the year in which they arise. Non-monetary items measured at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Exchange differences arising on the retranslation of non-monetary items are included in profit or loss for the year except for exchange differences arising on the retranslation of non-monetary items in respect of which gains and losses are recognized directly in other comprehensive income, in which case, the exchange differences are also recognized directly in other comprehensive income. Non-monetary items that are measured in terms of historical cost in foreign currencies are not retranslated.

For the purposes of presenting consolidated financial statements, the assets and liabilities of the Company's foreign operations are translated into NT\$ using exchange rates prevailing at the end of each reporting period. Income and expense items are translated at the average exchange rates for the period. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in equity (attributed to non-controlling interests as appropriate).

Classification of Current and Noncurrent Assets and Liabilities

Current assets are assets held for trading purposes and assets expected to be converted to cash, sold or consumed within one year from the end of the reporting period. Current liabilities are obligations incurred for trading purposes and obligations expected to be settled within one year from the end of the reporting period. Assets and liabilities that are not classified as current are noncurrent assets and liabilities, respectively.

Cash Equivalents

Cash equivalents, for the purpose of meeting short-term cash commitments, consist of highly liquid time deposits and investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.

Financial Instruments

Financial assets and liabilities shall be recognized when the Company becomes a party to the contractual provisions of the instruments.

Financial assets and liabilities are initially recognized at fair values. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognized immediately in profit or loss.

Financial Assets

The classification of financial assets depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Regular way purchases or sales of financial assets are recognized and derecognized on a trade date or settlement date basis for which financial assets were classified in the same way, respectively. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

a. Category of financial assets and measurement

Financial assets are classified into the following categories: financial assets at FVTPL, investments in debt instruments and equity instruments at FVTOCI, and financial assets at amortized cost.

1) Financial asset at FVTPL

For certain financial assets which include debt instruments that do not meet the criteria of amortized cost or FVTOCI, it is mandatorily required to measure them at FVTPL. Any gain or loss arising from remeasurement is recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any interest earned on the financial asset.

2) Investments in debt instruments at FVTOCI

Debt instruments with contractual terms specifying that cash flows are solely payments of principal and interest on the principal amount outstanding, together with objective of collecting contractual cash flows and selling the financial assets, are measured at FVTOCI.

Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment gains or losses on investments in debt instruments at FVTOCI are recognized in profit or loss. Other changes in the carrying amount of these debt instruments are recognized in other comprehensive income and will be reclassified to profit or loss when these debt instruments are disposed.

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3) Investments in equity instruments at FVTOCI

On initial recognition, the Company may irrevocably designate investments in equity investments that is not held for trading as at FVTOCI.

Investments in equity instruments at FVTOCI are subsequently measured at fair value with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in other equity.

Dividends on these investments in equity instruments at FVTOCI are recognized in profit or loss when the Company's right to receive the dividends is established, unless the Company's rights clearly represent a recovery of part of the cost of the investment.

4) Measured at amortized cost

Cash and cash equivalents, debt instrument investments, notes and accounts receivable (including related parties), other receivables and refundable deposits are measured at amortized cost.

Debt instruments with contractual terms specifying that cash flows are solely payments of principal and interest on the principal amount outstanding, together with objective of holding financial assets in order to collect contractual cash flows, are measured at amortized cost.

Subsequent to initial recognition, financial assets measured at amortized cost are measured at amortized cost, which equals to carrying amount determined by the effective interest method less any impairment loss.

b. Impairment of financial assets

At the end of each reporting period, a loss allowance for expected credit loss is recognized for financial assets at amortized cost (including accounts receivable) and for investments in debt instruments that are measured at FVTOCI.

The loss allowance for accounts receivable is measured at an amount equal to lifetime expected credit losses. For financial assets at amortized cost and investments in debt instruments that are measured at FVTOCI, when the credit risk on the financial instrument has not increased significantly since initial recognition, a loss allowance is recognized at an amount equal to expected credit loss resulting from possible default events of a financial instrument within 12 months after the reporting date. If, on the other hand, there has been a significant increase in credit risk since initial recognition, a loss allowance is recognized at an amount equal to expected credit loss resulting from all possible default events over the expected life of a financial instrument.

The Company recognizes an impairment loss in profit or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for investments in debt instruments that are measured at FVTOCI, for which the loss allowance is recognized in other comprehensive income and does not reduce the carrying amount of the financial asset.

c. Derecognition of financial assets

The Company derecognizes a financial asset only when the contractual rights to the cash flows from the financial asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the financial asset to another entity.

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On derecognition of a financial asset at amortized cost in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. On derecognition of an investment in a debt instrument at FVTOCI, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognized in other comprehensive income is recognized in profit or loss. However, on derecognition of an investment in an equity instrument at FVTOCI, the cumulative gain or loss that had been recognized in other comprehensive income is transferred directly to retained earnings, without recycling through profit or loss.

Financial Liabilities and Equity Instruments

Classification as debt or equity

Debt and equity instruments issued by the Company are classified as either financial liabilities or as equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and an equity instrument.

Equity instruments

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities. Equity instruments issued by the Company are recognized at the proceeds received, net of direct issue costs.

Financial liabilities

Financial liabilities are subsequently measured either at amortized cost using effective interest method or at FVTPL.

Financial liabilities are classified as at fair value through profit or loss when the financial liability is either held for trading or is designated as at fair value through profit or loss.

Financial liabilities at fair value through profit or loss are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss.

Financial liabilities other than those held for trading purposes and designated as at FVTPL are subsequently measured at amortized cost at the end of each reporting period.

Derecognition of financial liabilities

The Company derecognizes financial liabilities when, and only when, the Company's obligations are discharged, cancelled or they expire. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

Derivative Financial Instruments

Derivative financial instruments are initially recognized at fair value at the date the derivative contracts are entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately unless the derivative financial instrument is designated and effective as a hedging instrument, in which event the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

Hedge Accounting

a. Fair value hedge

The Company designates certain hedging instruments, such as interest rate futures contracts, to partially hedge against the fair value change caused by interest rates fluctuation in the Company's fixed income investments. Changes in the fair value of hedging instruments that are designated and qualify as fair value hedges are recognized in profit or loss immediately, together with any changes in the fair value of the hedged items that are attributable to the hedged risk.

b. Cash flow hedge

The Company designates certain hedging instruments, such as forward contracts, to partially hedge its foreign exchange rate risks or interest rate risks associated with certain highly probable forecast transactions (capital expenditures or issuance of debts). The effective portion of changes in the fair value of hedging instruments is recognized in other comprehensive income. When forecast transactions actually take place, the accumulated gains or losses that were recognized in other comprehensive income are removed from equity and included in the initial cost of the hedged items, or reclassified to finance costs of hedged items in the same period or periods during which the hedged expected future cash flows affect profit or loss. The gains or losses from hedging instruments relating to the ineffective portion are recognized immediately in profit or loss.

The Company prospectively discontinues hedge accounting only when the hedging relationship ceases to meet the qualifying criteria; for instance, when the hedging instrument expires or is sold, terminated or exercised.

Inventories

Inventories are stated at the lower of cost or net realizable value. Inventories are recorded at standard cost and adjusted to approximate weighted-average cost at the end of the reporting period. Net realizable value represents the estimated selling price of inventories less all estimated costs of completion and costs necessary to make the sale.

Investments Accounted for Using Equity Method

Investments accounted for using the equity method are investments in associates.

An associate is an entity over which the Company has significant influence and that is neither a subsidiary nor a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

The operating results and assets and liabilities of associates are incorporated in these consolidated financial statements using the equity method of accounting. Under the equity method, an investment in an associate is initially recognized in the consolidated statements of financial position at cost and adjusted thereafter to recognize the Company's share of profit or loss and other comprehensive income of the associate as well as the distribution received. The Company also recognizes its share in the changes in the equities of associates.

Any excess of the cost of acquisition over the Company's share of the net fair value of the identifiable assets, liabilities and contingent liabilities of an associate recognized at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment. Any excess of the Company's share of the net fair value of the identifiable assets, liabilities and contingent liabilities over the cost of acquisition, after reassessment, is recognized immediately in profit or loss.

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When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment as a single asset by comparing its recoverable amount (higher of value in use and fair value less costs to sell) with its carrying amount. Any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized to the extent that the recoverable amount of the investment subsequently increases.

When the Company subscribes to additional shares in an associate at a percentage different from its existing ownership percentage, the resulting carrying amount of the investment differs from the amount of the Company's proportionate interest in the net assets of the associate. The Company records such a difference as an adjustment to investments with the corresponding amount charged or credited to capital surplus. If the Company's ownership interest is reduced due to the additional subscription to the shares of associate by other investors, the proportionate amount of the gains or losses previously recognized in other comprehensive income in relation to that associate shall be reclassified to profit or loss on the same basis as would be required if the associate had directly disposed of the related assets or liabilities.

When a consolidated entity transacts with an associate, profits and losses resulting from the transactions with the associate are recognized in the Company's consolidated financial statements only to the extent of interests in the associate that are not owned by the Company.

Property, Plant and Equipment

Property, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment. Costs include any incremental costs that are directly attributable to the construction, acquisition of the item of property, plant and equipment or borrowing costs eligible for capitalization.

Property, plant and equipment in the course of construction for production, supply or administrative purposes are carried at cost, less any recognized impairment loss. Such assets are classified to the appropriate categories of property, plant and equipment when completed and ready for intended use. Depreciation of these assets, on the same basis as other identical categories of property, plant and equipment, commences when the assets are available for their intended use.

Depreciation is recognized so as to write off the cost of the assets less their residual values over their useful lives, and it is computed using the straight-line method mainly over the following estimated useful lives: land improvements—20 years; buildings (assets used by the Company and assets subject to operating leases)—10 to 20 years; machinery and equipment (assets used by the Company and assets subject to operating leases) - 5 years; and office equipment—5 years. The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimates accounted for on a prospective basis. Land is not depreciated.

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the assets. Any gain or loss arising on the disposal or retirement of an item of property, plant and equipment is determined as the difference between the sales proceeds and the carrying amount of the asset and is recognized in profit or loss.

Leases

For a contract that contains a lease component and non-lease component, the Company may elect to account for the lease and non-lease components as a single lease component.

The Company as lessor

Rental income from operating lease is recognized on a straight-line basis over the term of the lease.

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The Company as lessee

Except for payments for low-value asset leases and short-term leases (leases of machinery and equipment and others) which are recognized as expenses on a straight-line basis, the Company recognizes right-of-use assets and lease liabilities for all leases at the commencement date of the lease.

Right-of-use assets are measured at cost. The cost of right-of-use assets comprises the initial measurement of lease liabilities adjusted for lease payments and initial direct costs made at or before the commencement date, plus an estimate of costs needed to restore the underlying assets. Subsequent measurement is calculated as cost less accumulated depreciation and accumulated impairment loss and adjusted for changes in lease liabilities as a result of lease term modifications or other related factors. Right-of-use assets are presented separately in the consolidated statements of financial position.

Right-of-use assets are depreciated using the straight-line method from the commencement dates to the earlier of the end of the useful lives of the right-of-use assets or the end of the lease terms. If the lease transfers ownership of the underlying assets to the Company by the end of the lease terms or if the cost of right-of-use assets reflects that the Company will exercise a purchase option, the Company depreciates the right-of-use assets from the commencement dates to the end of the useful lives of the underlying assets.

Lease liabilities are measured at the present value of the lease payments. Lease payments comprise fixed payments, variable lease payments which depend on an index or a rate and the exercise price of a purchase option if the Company is reasonably certain to exercise that option. The lease payments are discounted using the lessee's incremental borrowing rates.

Subsequently, lease liabilities are measured at amortized cost using the effective interest method, with interest expense recognized over the lease terms. When there is a change in a lease term, a change in future lease payments resulting from a change in an index or a rate used to determine those payments, or a change in the assessment of an option to purchase an underlying asset, the Company remeasures the lease liabilities with a corresponding adjustment to the right-of-use assets. Lease liabilities are presented on a separate line in the consolidated statements of financial position.

Variable lease payments that do not depend on an index or a rate are recognized as expenses in the periods in which they are incurred.

Intangible Assets

Goodwill

Goodwill arising on an acquisition of a business is carried at cost as established at the date of acquisition of the business less accumulated impairment losses, if any.

Other intangible assets

Other separately acquired intangible assets with finite useful lives are carried at cost less accumulated amortization and accumulated impairment losses. Amortization is recognized using the straight-line method over the following estimated useful lives: Technology license fees - the estimated life of the technology or the term of the technology transfer contract; software and system design costs - 3 years or contract period; patent and others - the economic life or contract period. The estimated useful life and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis.

Impairment of Tangible Assets, Right-of-use Assets and Intangible Assets

Goodwill

Goodwill is not amortized and instead is tested for impairment annually, or more frequently when there is an indication that the cash generating unit may be impaired. For the purpose of impairment testing, goodwill is allocated to each of the Company's cash-generating units or groups of cash-generating units that are expected to benefit from the synergies of the combination. If the recoverable amount of a cash-generating unit is less than its carrying amount, the difference is allocated first to reduce the carrying amount of any goodwill allocated to such cash generating unit and then to the other assets of the cash generating unit pro rata based on the carrying amount of each asset in the cash generating unit. Any impairment loss for goodwill is recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.

Tangible assets, right-of-use assets and other intangible assets

At the end of each reporting period, the Company reviews the carrying amounts of its tangible assets (property, plant and equipment), right-of-use assets and other intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss. When it is not possible to estimate the recoverable amount of an individual asset, the Company estimates the recoverable amount of the cash-generating unit to which the asset belongs. When a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual cash-generating units, or otherwise they are allocated to the smallest group of cash-generating units for which a reasonable and consistent allocation basis can be identified.

Recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset or cash-generating unit is estimated to be less than its carrying amount, the carrying amount of the asset or cash-generating unit is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss.

When an impairment loss subsequently reverses, the carrying amount of the asset or a cash-generating unit is increased to the revised estimate of its recoverable amount, but the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset or cash-generating unit in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

Revenue Recognition

The Company recognizes revenue when performance obligations are satisfied. The performance obligations are satisfied when customers obtain control of the promised goods, which is generally when the goods are delivered to the customers' specified locations.

Revenue from sale of goods is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and other similar allowances. Estimated sales returns and other allowances is generally made and adjusted based on historical experience and the consideration of varying contractual terms to recognize refund liabilities, which is classified under accrued expenses and other current liabilities.

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In principle, payment term granted to customers is due 30 days from the invoice date or 30 days from the end of the month of when the invoice is issued. Due to the short term nature of the receivables from sale of goods with the immaterial discounted effect, the Company measures them at the original invoice amounts without discounting.

Employee Benefits

Short-term employee benefits

Liabilities recognized in respect of short-term employee benefits are measured at the undiscounted amount of the benefits expected to be paid in exchange for service rendered by employees.

Retirement benefits

For defined contribution retirement benefit plans, payments to the benefit plan are recognized as an expense when the employees have rendered service entitling them to the contribution. For defined benefit retirement benefit plans, the cost of providing benefit is recognized based on actuarial calculations.

Defined benefit costs (including service cost, net interest and remeasurement) under the defined benefit retirement benefit plans are determined using the Projected Unit Credit Method. Service cost (including current service cost), and net interest on the net defined benefit liability (asset) are recognized as employee benefits expense in the period they occur. Remeasurement, comprising actuarial gains and losses and the return on plan assets (excluding interest), is recognized in other comprehensive income in the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss.

Net defined benefit liability represents the actual deficit in the Company's defined benefit plan.

Taxation

Income tax expense represents the sum of the tax currently payable and deferred tax.

Current tax

Income tax on unappropriated earnings (excluding earnings from foreign consolidated subsidiaries) is expensed in the year the earnings arise and adjusted to the extent that distributions are approved by the shareholders in the following year.

Adjustments of prior years' tax liabilities are added to or deducted from the current year's tax provision.

Deferred tax

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences, net operating loss carryforwards and tax credits for research and development expenses to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilized.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries and associates, except where the Company is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments are only recognized to the extent that it is probable that there will be sufficient taxable profits against which to utilize the benefits of the temporary differences and they are expected to reverse in the foreseeable future.

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The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the deferred tax asset to be recovered. The deferred tax assets which originally not recognized is also reviewed at the end of each reporting period and recognized to the extent that it is probable that sufficient taxable profits will be available to allow all or part of the deferred tax asset to be recovered.

Deferred tax liabilities and assets are measured at the tax rates that are expected to apply in the year in which the liability is settled or the asset is realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

Current and deferred tax for the year

Current and deferred tax are recognized in profit or loss, except when they relate to items that are recognized in other comprehensive income or directly in equity, in which case, the current and deferred tax are also recognized in other comprehensive income or directly in equity, respectively.

Government Grants

Government grants are not recognized until there is reasonable assurance that the Company will comply with the conditions attaching to them and that the grants will be received.

Government grants whose primary condition is that the Company should purchase, construct or otherwise acquire noncurrent assets (mainly including land use right and depreciable assets) are recognized as a deduction from the carrying amount of the related assets and recognized as a reduced depreciation or amortization charge in profit or loss over the contract period or useful lives of the related assets. Government grants that are receivables as compensation for expenses already incurred are deducted from incurred expenses in the period in which they become receivables.

6. CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION AND UNCERTAINTY

The Company has considered the economic implications of COVID-19 on critical accounting estimates and will continue evaluating the impact on its financial position and financial performance as a result of the pandemic.

In the application of the aforementioned Company's accounting policies, the Company is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the year in which the estimate is revised if the revision affects only that year, or in the year of the revision and future years if the revision affects both current and future years.

Critical Accounting Judgments

Revenue Recognition

The Company recognizes revenue when the conditions described in Note 5 are satisfied.

Commencement of Depreciation Related to Property, Plant and Equipment Classified as Equipment under Installation and Construction in Progress (EUI/CIP)

As described in Note 5, commencement of depreciation related to EUI/CIP involves determining when the assets are available for their intended use. The criteria the Company uses to determine whether EUI/CIP are available for their intended use involves subjective judgments and assumptions about the conditions necessary for the assets to be capable of operating in the intended manner.

Judgments on Lease Terms

In determining a lease term, the Company considers all facts and circumstances that create an economic incentive to exercise or not to exercise an option, including any expected changes in facts and circumstances from the commencement date until the exercise date of the option. Main factors considered include contractual terms and conditions covered by the optional periods, and the importance of the underlying asset to the lessee's operations, etc. The lease term is reassessed if a significant change in circumstances that are within the control of the Company occurs.

Key Sources of Estimation and Uncertainty

Estimation of Sales Returns and Allowances

Sales returns and other allowance is estimated and recorded based on historical experience and in consideration of different contractual terms. The amount is deducted from revenue in the same period the related revenue is recorded. The Company periodically reviews the reasonableness of the estimates.

Valuation of Inventory

Inventories are stated at the lower of cost or net realizable value, and the Company uses estimate to determine the net realizable value of inventory at the end of each reporting period.

The Company estimates the net realizable value of inventory for normal waste, obsolescence and unmarketable items at the end of reporting period and then writes down the cost of inventories to net realizable value. The net realizable value of the inventory is determined mainly based on assumptions of future demand within a specific time horizon.

Impairment of Tangible Assets, Right-of-use Assets and Intangible Assets Other than Goodwill

In the process of evaluating the potential impairment of tangible assets, right-of-use assets and intangible assets other than goodwill, the Company determines the independent cash flows, useful lives, expected future revenue and expenses related to the specific asset groups with the consideration of the nature of semiconductor industry. Any change in these estimates based on changed economic conditions or business strategies could result in significant impairment charges or reversal in future years.

Realization of Deferred Income Tax Assets

Deferred tax assets are recognized to the extent that it is probable that future taxable profits will be available against which those deferred tax assets can be utilized. Assessment of the realization of the deferred tax assets requires subjective judgment and estimate, including the future revenue growth and profitability, tax holidays, the amount of tax credits can be utilized and feasible tax planning strategies. Any changes in the global economic environment, the industry trends and relevant laws and regulations could result in significant adjustments to the deferred tax assets.

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Determination of Lessees' Incremental Borrowing Rates

In determining a lessee's incremental borrowing rate used in discounting lease payments, the Company mainly takes into account the market risk-free rates, the estimated lessee's credit spreads and secured status in a similar economic environment.

7. CASH AND CASH EQUIVALENTS

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Cash and deposits in banks	\$ 653,580.6	\$ 1,058,808.1
Repurchase agreements	1,750.4	5,275.3
Government bonds	3,716.1	906.8
Commercial paper	1,123.5	—
	<u>\$ 660,170.6</u>	<u>\$ 1,064,990.2</u>

Deposits in banks consisted of highly liquid time deposits that were readily convertible to known amounts of cash and were subject to an insignificant risk of changes in value.

8. FINANCIAL ASSETS AND LIABILITIES AT FAIR VALUE THROUGH PROFIT OR LOSS

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Financial assets</u>		
Mandatorily measured at FVTPL		
Forward exchange contracts	<u>\$ 2,259.4</u>	<u>\$ 159.0</u>
<u>Financial liabilities</u>		
Held for trading		
Forward exchange contracts	<u>\$ 94.1</u>	<u>\$ 681.9</u>

The Company entered into forward exchange contracts to manage exposures due to fluctuations of foreign exchange rates. These forward exchange contracts did not meet the criteria for hedge accounting. Therefore, the Company did not apply hedge accounting treatment for these forward exchange contracts.

Outstanding forward exchange contracts consisted of the following:

	Maturity Date	Contract Amount (In Millions)
<u>December 31, 2020</u>		
Sell NT\$	January 2021 to March 2021	NT\$144,698.0
Sell US\$	January 2021 to March 2021	US\$1,176.9
<u>December 31, 2021</u>		
Sell NT\$	January 2022 to March 2022	NT\$132,734.5
Sell US\$	January 2022 to March 2022	US\$2,009.1

[Table of Contents](#)**9. FINANCIAL ASSETS AT FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME**

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Investments in debt instruments at FVTOCI		
Corporate bonds	\$ 56,593.6	\$ 57,253.2
Agency bonds/Agency mortgage-backed securities	43,977.1	32,070.1
Government bonds	13,459.5	21,345.8
Asset-backed securities	8,368.3	8,660.4
	<u>122,398.5</u>	<u>119,329.5</u>
Investments in equity instruments at FVTOCI		
Non-publicly traded equity investments	4,514.9	5,887.9
Publicly traded stocks	50.0	189.8
	<u>4,564.9</u>	<u>6,077.7</u>
	<u>\$ 126,963.4</u>	<u>\$ 125,407.2</u>
Current	\$ 122,448.5	\$ 119,519.3
Noncurrent	4,514.9	5,887.9
	<u>\$ 126,963.4</u>	<u>\$ 125,407.2</u>

These investments in equity instruments are held for medium to long-term purposes and therefore are accounted for as FVTOCI. For dividends recognized from these investments, please refer to consolidated statements of cash flows. All of the dividends are from investments held at the end of the reporting period.

For the years ended December 31, 2019, 2020 and 2021, as the Company adjusted its investment portfolio and the non-publicly traded investees were acquired, equity investments designated at FVTOCI were divested for NT\$873.5 million, NT\$0.01 million and NT\$628.7 million, respectively. For the year ended December 31, 2019 and 2021, the related other equity-unrealized gain/loss on financial assets at FVTOCI of NT\$156.8 million and NT\$ 186.0 million were transferred to increase retained earnings, respectively. For the years ended December 31, 2020, the related other equity-unrealized gain/loss on financial assets at FVTOCI of NT\$109.0 million was transferred to decrease retained earnings.

As of December 31, 2020 and 2021, the cumulative loss allowance for expected credit loss of NT\$32.5 million and NT\$33.2 million was recognized under investments in debt instruments at FVTOCI, respectively. Refer to Note 33 for information relating to the credit risk management and expected credit loss.

[Table of Contents](#)**10. FINANCIAL ASSETS AT AMORTIZED COST**

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Corporate bonds	\$ 10,977.3	\$ 5,310.1
Less: Allowance for impairment loss	(7.1)	(3.1)
	<u>\$ 10,970.2</u>	<u>\$ 5,307.0</u>
Current	\$ 6,598.0	\$ 3,773.6
Noncurrent	4,372.2	1,533.4
	<u>\$ 10,970.2</u>	<u>\$ 5,307.0</u>

Refer to Note 33 for information relating to credit risk management and expected credit loss for financial assets at amortized cost.

11. HEDGING FINANCIAL INSTRUMENTS

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Financial assets- current</u>		
Fair value hedges		
Interest rate futures contracts	\$ 0.1	\$ —
Cash flow hedges		
Forward interest rate contracts	—	13.5
	<u>\$ 0.1</u>	<u>\$ 13.5</u>
<u>Financial liabilities- current</u>		
Fair value hedges		
Interest rate futures contracts	\$ 1.2	\$ 9.6

Fair value hedge

The Company entered into interest rate futures contracts, which are used to partially hedge against the fair value changes caused by interest rate fluctuation in the Company's fixed income investments. The hedge ratio is adjusted in response to the changes in the financial market and capped at 100%.

On the basis of economic relationships, the value of the interest rate futures contracts and the value of the hedged financial assets change in opposite directions in response to movements in interest rates.

The main source of hedge ineffectiveness in these hedging relationships is the credit risk of the hedged financial assets, which is not reflected in the fair value of the interest rate futures contracts. No other sources of ineffectiveness emerged from these hedging relationships during the hedging period. Amount of hedge ineffectiveness recognized in profit or loss is classified under other gains and losses, net.

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The following tables summarize the information relating to the hedges of interest rate risks.

December 31, 2020

Hedging Instruments	Contract Amount (US\$ in Millions)	Maturity
Interest rate futures contracts - US Treasury futures	US\$88.7	March 2021
Hedged Items	Asset Carrying Amount NT\$ (In Millions)	Accumulated Amount of Fair Value Hedge Adjustments NT\$ (In Millions)
Financial assets at FVTOCI	\$ 6,198.7	\$ 1.1

December 31, 2021

Hedging Instruments	Contract Amount (US\$ in Millions)	Maturity
Interest rate futures contracts - US Treasury futures	US\$53.9	March 2022
Hedged Items	Asset Carrying Amount NT\$ (In Millions)	Accumulated Amount of Fair Value Hedge Adjustments NT\$ (In Millions)
Financial assets at FVTOCI	\$ 4,079.3	\$ 9.6

The effect for the years ended December 31, 2019, 2020 and 2021 is detailed below:

Hedging Instruments/Hedged Items	Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness		
	Years Ended December 31		
	2019 NT\$ (In Millions)	2020 NT\$ (In Millions)	2021 NT\$ (In Millions)
Hedging Instruments			
Interest rate futures contracts - US Treasury futures	\$ (164.7)	\$ (353.6)	\$ 148.8
Hedged Items			
Financial assets at FVTOCI	177.8	353.6	(148.8)
	<u>\$ 13.1</u>	<u>\$ —</u>	<u>\$ —</u>

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Cash flow hedge

The Company entered into forward contracts to partially hedge foreign exchange rate risks or interest rate risks associated with certain highly probable forecast transactions (capital expenditures or issuance of debts). The hedge ratio is adjusted in response to the changes in the financial market and capped at 100%. The forward contracts have maturities of 12 months or less.

On the basis of economic relationships, the Company expects that the value of forward contracts and the value of hedged transactions will change in opposite directions in response to movements in foreign exchange rates or interest rates.

The main source of hedge ineffectiveness in these hedging relationships is driven by the effect of the counterparty's own credit risk on the fair value of forward contracts. No other sources of ineffectiveness emerged from these hedging relationships. For the years ended December 31, 2019, 2020 and 2021, refer to Note 22(d) for gain or loss arising from changes in the fair value of hedging instruments, the amount transferred to initial carrying amount of hedged items and the amount reclassified to finance costs of hedged items.

The following tables summarize the information relating to the hedges of interest rate risks.

December 31, 2021

Hedging Instruments	Contract Amount (In Millions)	Maturity	Balance in Other Equity (Continuing Hedges) NT\$ (In Millions)
Forward interest rate contracts	US\$ 328.0	January 2022	\$ 128.2

The effect for the years ended December 31, 2019, 2020 and 2021 is detailed below:

Hedging Instruments/Hedged Items	Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness		
	Years Ended December 31		
	2019 NT\$ (In Millions)	2020 NT\$ (In Millions)	2021 NT\$ (In Millions)
Hedging Instruments			
Forward exchange contracts (capital expenditures)	\$ (109.6)	\$ 24.1	\$ (41.4)
Forward interest rate contracts (issuance of debts)	\$ —	\$ —	\$ 132.5
Hedged Items			
Forecast transaction (capital expenditures)	\$ 109.6	\$ (24.1)	\$ 41.4
Forecast transaction (issuance of debts)	\$ —	\$ —	\$ (132.5)

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12. NOTES AND ACCOUNTS RECEIVABLE, NET

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
At amortized cost		
Notes and accounts receivable	\$ 142,771.6	\$ 193,733.2
Less: Loss allowance	(246.6)	(347.0)
	142,525.0	193,386.2
At FVTOCI	2,955.3	4,199.9
	<u>\$ 145,480.3</u>	<u>\$ 197,586.1</u>

The Company signed a contract with the bank to sell certain accounts receivable without recourse and transaction cost required. These accounts receivable are classified as at FVTOCI because they are held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets.

In principle, the payment term granted to customers is due 30 days from the invoice date or 30 days from the end of the month when the invoice is issued. Aside from recognizing impairment loss for credit-impaired accounts receivable, the Company recognizes loss allowance based on the expected credit loss ratio of customers by different risk levels with consideration of factors of historical loss ratios and customers' financial conditions, competitiveness and business outlook. For accounts receivable past due over 90 days without collaterals or guarantees, the Company recognizes loss allowance at full amount.

Aging analysis of notes and accounts receivable

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Not past due	\$ 140,933.6	\$ 191,740.0
Past due		
Past due within 30 days	4,784.4	6,186.8
Past due 31-60 days	8.7	6.2
Past due 61-120 days	0.1	0.1
Past due over 121 days	0.1	—
Less: Loss allowance	(246.6)	(347.0)
	<u>\$ 145,480.3</u>	<u>\$ 197,586.1</u>

All of the Company's accounts receivable classified as at FVTOCI were not past due.

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Movements of the loss allowance for accounts receivable

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Balance, beginning of year	\$ 7.3	\$ 325.3	\$ 246.6
Provision (Reversal)	318.2	(78.5)	100.4
Effect of exchange rate changes	(0.2)	(0.2)	—
Balance, end of year	<u>\$ 325.3</u>	<u>\$ 246.6</u>	<u>\$ 347.0</u>

For the years ended December 31, 2019, 2020 and 2021, the changes in loss allowance were mainly due to the variations in the balance of accounts receivable of different risk levels.

13. INVENTORIES

	December 31,	December 31,
	2020	2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Finished goods	\$ 21,705.6	\$ 32,562.8
Work in process	91,672.9	137,700.4
Raw materials	14,716.0	11,111.1
Supplies and spare parts	9,258.9	11,728.0
	<u>\$ 137,353.4</u>	<u>\$ 193,102.3</u>

Write-down of inventories to net realizable value and reversal of write-down of inventories resulting from the increase in net realizable value were included in the cost of revenue during reporting period. The amounts are illustrated below:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Inventory losses (reversal of write-down of inventories)	<u>\$ (1,983.0)</u>	<u>\$ 3,664.5</u>	<u>\$ 533.0</u>

The aforementioned inventory losses (reversal of write-down of inventories) for the years ended December 31, 2019 excluded wafer contamination losses. Please refer to related losses in Note 37.

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14. INVESTMENTS ACCOUNTED FOR USING EQUITY METHOD

Associates consisted of the following:

Name of Associate	Principal Activities	Place of Incorporation and Operation	Carrying Amount		% of Ownership and Voting Rights Held by the Company	
			December 31, 2020	December 31, 2021	December 31, 2020	December 31, 2021
			NT\$ (In Millions)	NT\$ (In Millions)		
Vanguard International Semiconductor Corporation (VIS)	Manufacturing, sales, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing and design service of masks	Hsinchu, Taiwan	\$ 8,964.1	\$ 10,469.2	28%	28%
Systems on Silicon Manufacturing Company Pte Ltd. (SSMC)	Manufacturing and sales of integrated circuits and other semiconductor devices	Singapore	5,900.2	6,795.7	39%	39%
Xintec Inc. (Xintec)	Wafer level chip size packaging and wafer level post passivation interconnection service	Taoyuan, Taiwan	2,522.3	3,012.3	41%	41%
Global Unichip Corporation (GUC)	Researching, developing, manufacturing, testing and marketing of integrated circuits	Hsinchu, Taiwan	1,315.4	1,462.1	35%	35%
Mutual-Pak Technology Co., Ltd. (Mutual-Pak)	Manufacturing of electronic parts, wholesaling and retailing of electronic materials, and researching, developing and testing of RFID	New Taipei, Taiwan	28.2	22.9	28%	28%
			<u>\$ 18,730.2</u>	<u>\$ 21,762.2</u>		

As of December 31, 2020 and 2021, no investments in associates are individually material to the Company. Please refer to the consolidated statements of profit or loss and other comprehensive income for recognition of share of both profit (loss) and other comprehensive income (loss) of associates that are not individually material.

The market prices of the associates' ownership held by the Company in publicly traded stocks calculated by the closing price at the end of the reporting period are summarized as follows. The closing price represents the quoted price in active markets, the level 1 fair value measurement.

Name of Associate	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
VIS	\$ 53,849.9	\$ 73,347.3
GUC	\$ 15,827.2	\$ 27,359.1
Xintec	\$ 20,420.2	\$ 15,913.3

15. PROPERTY, PLANT AND EQUIPMENT

	December 31, 2019	December 31, 2020	December 31, 2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Assets used by the Company	\$ 1,352,313.9	\$ 1,554,585.9	\$ 1,975,114.0
Assets subject to operating leases	63.5	1,003.2	4.7
	<u>\$ 1,352,377.4</u>	<u>\$ 1,555,589.1</u>	<u>\$ 1,975,118.7</u>

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a. Assets used by the Company

	Land and Land Improvements	Buildings	Machinery and Equipment	Office Equipment	Equipment under Installation and Construction in Progress	Total
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Cost						
Balance at January 1, 2019	\$ 4,011.4	\$ 418,151.7	\$ 2,728,760.2	\$ 48,382.2	\$ 172,911.0	\$ 3,372,216.5
Additions	—	21,448.5	179,798.4	7,415.0	355,621.1	564,283.0
Disposals or retirements	—	(159.0)	(17,381.6)	(1,043.3)	—	(18,583.9)
Transfers from right-of-use assets	—	—	619.8	—	—	619.8
Effect of disposal of subsidiary	—	—	—	(0.5)	—	(0.5)
Effect of exchange rate changes	(19.6)	(1,366.2)	(5,173.8)	(142.0)	(237.0)	(6,938.6)
Balance at December 31, 2019	<u>\$ 3,991.8</u>	<u>\$ 438,075.0</u>	<u>\$ 2,886,623.0</u>	<u>\$ 54,611.4</u>	<u>\$ 528,295.1</u>	<u>\$ 3,911,596.3</u>
Accumulated depreciation and impairment						
Balance at January 1, 2019	\$ 550.6	\$ 217,899.2	\$ 2,049,279.0	\$ 32,525.1	\$ —	\$ 2,300,253.9
Additions	1.6	26,026.6	246,724.2	6,012.5	—	278,764.9
Disposals or retirements	—	(144.4)	(12,880.8)	(1,042.1)	—	(14,067.3)
Transfers from right-of-use assets	—	—	20.7	—	—	20.7
Reversal of impairment	—	—	(301.4)	—	—	(301.4)
Effect of disposal of subsidiary	—	—	—	(0.5)	—	(0.5)
Effect of exchange rate changes	(13.5)	(722.1)	(4,575.7)	(76.6)	—	(5,387.9)
Balance at December 31, 2019	<u>\$ 538.7</u>	<u>\$ 243,059.3</u>	<u>\$ 2,278,266.0</u>	<u>\$ 37,418.4</u>	<u>\$ —</u>	<u>\$ 2,559,282.4</u>
Carrying amounts at December 31, 2019	<u>\$ 3,453.1</u>	<u>\$ 195,015.7</u>	<u>\$ 608,357.0</u>	<u>\$ 17,193.0</u>	<u>\$ 528,295.1</u>	<u>\$ 1,352,313.9</u>
Cost						
Balance at January 1, 2020	\$ 3,991.8	\$ 438,075.0	\$ 2,886,623.0	\$ 54,611.4	\$ 528,295.1	\$ 3,911,596.3
Additions (deductions)	—	84,882.5	729,943.3	15,112.9	(304,218.0)	525,720.7
Disposals or retirements	—	(41.5)	(6,397.3)	(734.1)	—	(7,172.9)
Transfers from assets subject to operating leases	—	23.1	—	—	—	23.1
Transfers to assets subject to operating leases	—	—	(1,199.0)	—	—	(1,199.0)
Effect of exchange rate changes	(49.2)	(491.7)	(1,964.3)	(127.5)	(111.7)	(2,744.4)
Balance at December 31, 2020	<u>\$ 3,942.6</u>	<u>\$ 522,447.4</u>	<u>\$ 3,607,005.7</u>	<u>\$ 68,862.7</u>	<u>\$ 223,965.4</u>	<u>\$ 4,426,223.8</u>
Accumulated depreciation and impairment						
Balance at January 1, 2020	\$ 538.7	\$ 243,059.3	\$ 2,278,266.0	\$ 37,418.4	\$ —	\$ 2,559,282.4
Additions	1.5	29,209.1	285,393.6	7,216.9	—	321,821.1
Disposals or retirements	—	(27.9)	(6,012.9)	(732.4)	—	(6,773.2)
Transfers from assets subject to operating leases	—	8.2	—	—	—	8.2
Transfers to assets subject to operating leases	—	—	(202.6)	—	—	(202.6)
Impairment	—	—	10.2	—	—	10.2
Effect of exchange rate changes	(34.1)	(449.2)	(1,924.3)	(100.6)	—	(2,508.2)
Balance at December 31, 2020	<u>\$ 506.1</u>	<u>\$ 271,799.5</u>	<u>\$ 2,555,530.0</u>	<u>\$ 43,802.3</u>	<u>\$ —</u>	<u>\$ 2,871,637.9</u>
Carrying amounts at December 31, 2020	<u>\$ 3,436.5</u>	<u>\$ 250,647.9</u>	<u>\$ 1,051,475.7</u>	<u>\$ 25,060.4</u>	<u>\$ 223,965.4</u>	<u>\$ 1,554,585.9</u>

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	<u>Land and Land Improvements</u>	<u>Buildings</u>	<u>Machinery and Equipment</u>	<u>Office Equipment</u>	<u>Equipment under Installation and Construction in Progress</u>	<u>Total</u>
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
Cost						
Balance at January 1, 2021	\$ 3,942.6	\$ 522,447.4	\$ 3,607,005.7	\$ 68,862.7	\$ 223,965.4	\$ 4,426,223.8
Additions	2,587.2	53,971.3	401,659.0	7,643.0	369,545.8	835,406.3
Disposals or retirements	—	(41.1)	(26,192.2)	(333.4)	—	(26,566.7)
Transfers from assets subject to operating leases	—	35.5	1,443.6	—	—	1,479.1
Transfers to assets subject to operating leases	—	—	(244.6)	—	—	(244.6)
Effect of exchange rate changes	(41.6)	184.7	1,077.7	(18.1)	(355.5)	847.2
Balance at December 31, 2021	<u>\$ 6,488.2</u>	<u>\$ 576,597.8</u>	<u>\$ 3,984,749.2</u>	<u>\$ 76,154.2</u>	<u>\$ 593,155.7</u>	<u>\$ 5,237,145.1</u>
Accumulated depreciation and impairment						
Balance at January 1, 2021	\$ 506.1	\$ 271,799.5	\$ 2,555,530.0	\$ 43,802.3	\$ —	\$ 2,871,637.9
Additions	1.3	34,331.6	368,777.7	8,373.3	—	411,483.9
Disposals or retirements	—	(36.5)	(22,230.1)	(332.6)	—	(22,599.2)
Transfers from assets subject to operating leases	—	15.1	436.8	—	—	451.9
Transfers to assets subject to operating leases	—	—	(68.3)	—	—	(68.3)
Impairment	—	—	274.4	—	—	274.4
Effect of exchange rate changes	(7.6)	55.6	818.9	(16.4)	—	850.5
Balance at December 31, 2021	<u>\$ 499.8</u>	<u>\$ 306,165.3</u>	<u>\$ 2,903,539.4</u>	<u>\$ 51,826.6</u>	<u>\$ —</u>	<u>\$ 3,262,031.1</u>
Carrying amounts at December 31, 2021	<u>\$ 5,988.4</u>	<u>\$ 270,432.5</u>	<u>\$ 1,081,209.8</u>	<u>\$ 24,327.6</u>	<u>\$ 593,155.7</u>	<u>\$ 1,975,114.0</u>

(Concluded)

The significant part of the Company's buildings includes main plants, mechanical and electrical power equipment and clean rooms, and the related depreciation is calculated using the estimated useful lives of 20 years, 10 years and 10 years, respectively.

In the first quarter of 2019, the Company recognized a reversal of impairment loss of NT\$301.4 million due to redeployment of certain idle machinery and equipment. Such reversal of impairment loss was recognized in other operating income and expenses.

In the first quarter of 2021, the Company recognized an impairment loss of NT\$274.4 million for certain machinery and equipment that was assessed to have no future use, and the recoverable amount of certain machinery and equipment was nil. Such impairment loss was recognized in other operating income and expenses.

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b. Assets subject to operating leases

	<u>Buildings</u> NTS (In Millions)	<u>Machinery and Equipment</u> NTS (In Millions)	<u>Total</u> NTS (In Millions)
<u>Cost</u>			
Balance at January 1, 2019	\$ 562.6	\$ —	\$ 562.6
Balance at December 31, 2019	<u>\$ 562.6</u>	<u>\$ —</u>	<u>\$ 562.6</u>
<u>Accumulated depreciation</u>			
Balance at January 1, 2019	\$ 474.9	\$ —	\$ 474.9
Additions	24.2	—	24.2
Balance at December 31, 2019	<u>\$ 499.1</u>	<u>\$ —</u>	<u>\$ 499.1</u>
Carrying amounts at December 31, 2019	<u>\$ 63.5</u>	<u>\$ —</u>	<u>\$ 63.5</u>
<u>Cost</u>			
Balance at January 1, 2020	\$ 562.6	\$ —	\$ 562.6
Disposals or retirements	(311.9)	—	(311.9)
Transfers to assets used by the Company	(23.1)	—	(23.1)
Transfers from assets used by the Company	—	1,199.0	1,199.0
Balance at December 31, 2020	<u>\$ 227.6</u>	<u>\$ 1,199.0</u>	<u>\$ 1,426.6</u>
<u>Accumulated depreciation</u>			
Balance at January 1, 2020	\$ 499.1	\$ —	\$ 499.1
Additions	16.3	19.4	35.7
Disposals or retirements	(305.8)	—	(305.8)
Transfers to assets used by the Company	(8.2)	—	(8.2)
Transfers from assets used by the Company	—	202.6	202.6
Balance at December 31, 2020	<u>\$ 201.4</u>	<u>\$ 222.0</u>	<u>\$ 423.4</u>
Carrying amounts at December 31, 2020	<u>\$ 26.2</u>	<u>\$ 977.0</u>	<u>\$ 1,003.2</u>
<u>Cost</u>			
Balance at January 1, 2021	\$ 227.6	\$ 1,199.0	\$ 1,426.6
Transfers to assets used by the Company	(35.5)	(1,443.6)	(1,479.1)
Transfers from assets used by the Company	—	244.6	244.6
Balance at December 31, 2021	<u>\$ 192.1</u>	<u>\$ —</u>	<u>\$ 192.1</u>
<u>Accumulated depreciation</u>			
Balance at January 1, 2021	\$ 201.4	\$ 222.0	\$ 423.4
Additions	1.1	146.5	147.6
Transfers to assets used by the Company	(15.1)	(436.8)	(451.9)
Transfers from assets used by the Company	—	68.3	68.3
Balance at December 31, 2021	<u>\$ 187.4</u>	<u>\$ —</u>	<u>\$ 187.4</u>
Carrying amounts at December 31, 2021	<u>\$ 4.7</u>	<u>\$ —</u>	<u>\$ 4.7</u>

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Operating leases relate to leases of buildings and leases of machinery and equipment with lease terms ranging between approximately 1 to 5 years. The lessees do not have purchase options to acquire the assets at the expiration of the lease periods.

The maturity analysis of operating lease payments receivable from the buildings and machinery and equipment is as follows:

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Year 1	\$ 149.1	\$ 18.0
Year 2	17.0	—
	<u>\$ 166.1</u>	<u>\$ 18.0</u>

16. LEASE ARRANGEMENTS

a. Right-of-use assets

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Carrying amounts</u>		
Land	\$ 25,141.9	\$ 29,778.6
Buildings	2,544.8	2,918.1
Machinery and equipment	—	3.4
Office equipment	41.8	34.3
	<u>\$ 27,728.5</u>	<u>\$ 32,734.4</u>

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Additions to right-of-use assets	<u>\$ 1,033.0</u>	<u>\$ 13,481.2</u>	<u>\$ 7,769.8</u>
Depreciation of right-of-use assets			
Land	\$ 957.1	\$ 1,312.9	\$ 1,825.7
Buildings	458.8	569.5	707.9
Machinery and equipment	1,184.4	775.8	0.5
Office equipment	22.4	23.4	22.1
	<u>\$ 2,622.7</u>	<u>\$ 2,681.6</u>	<u>\$ 2,556.2</u>
Income from subleasing right-of-use assets (classified under other operating income and expenses, net)	<u>\$ 55.0</u>	<u>\$ 79.6</u>	<u>\$ 82.0</u>

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b. Lease liabilities

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Carrying amounts</u>		
Current portion (classified under accrued expenses and other current liabilities)	\$ 1,828.0	\$ 2,176.5
Noncurrent portion	20,560.6	20,764.2
	<u>\$ 22,388.6</u>	<u>\$ 22,940.7</u>

Ranges of discount rates for lease liabilities are as follows:

	December 31, 2020	December 31, 2021
Land	0.48%-2.14%	0.39%-2.14%
Buildings	0.54%-3.88%	0.39%-3.88%
Machinery and equipment	—	0.71%
Office equipment	0.28%-3.88%	0.28%-3.88%

c. Material terms of right-of-use assets

The Company leases land and buildings mainly for the use of plants and offices with lease terms of 1 to 36 years. The lease contracts for land located in the R.O.C. specify that lease payments will be adjusted every 2 years on the basis of changes in announced land value prices. The Company does not have purchase options to acquire the leasehold land and buildings at the end of the lease terms.

d. Subleases

The Company subleases the right to use its buildings and machinery and equipment under operating leases with lease terms of 1 to 6 years.

The maturity analysis of lease payments receivable under operating subleases is as follows:

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Year 1	<u>\$ 144.1</u>	<u>\$ 60.8</u>

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e. Other lease information

	Years Ended December 31		
	2019	2020	2021
	NTS (In Millions)	NTS (In Millions)	NTS (In Millions)
Expenses relating to short-term leases	\$ 5,007.1	\$ 3,153.5	\$ 5,250.3
Expenses relating to variable lease payments not included in the measurement of lease liabilities	\$ 195.1	\$ 257.0	\$ 168.7

	Years Ended December 31		
	2019	2020	2021
	NTS (In Millions)	NTS (In Millions)	NTS (In Millions)
Total cash outflow for leases	\$ 7,724.4	\$ 6,354.6	\$ 7,510.8

17. INTANGIBLE ASSETS

	Goodwill NTS (In Millions)	Technology License Fees NTS (In Millions)	Software and System Design Costs NTS (In Millions)	Patent and Others NTS (In Millions)	Total NTS (In Millions)
<u>Cost</u>					
Balance at January 1, 2019	\$ 5,795.5	\$ 10,974.5	\$ 29,594.6	\$ 7,656.3	\$ 54,020.9
Additions	—	4,879.6	3,710.4	647.8	9,237.8
Disposals or retirements	—	—	(260.9)	—	(260.9)
Effect of exchange rate changes	(102.1)	0.9	(20.1)	(1.2)	(122.5)
Balance at December 31, 2019	\$ 5,693.4	\$ 15,855.0	\$ 33,024.0	\$ 8,302.9	\$ 62,875.3
<u>Accumulated amortization and impairment</u>					
Balance at January 1, 2019	\$ —	\$ 8,756.0	\$ 23,023.7	\$ 5,239.1	\$ 37,018.8
Additions	—	1,066.9	3,747.3	658.2	5,472.4
Disposals or retirements	—	—	(258.6)	—	(258.6)
Effect of exchange rate changes	—	0.9	(10.3)	(0.9)	(10.3)
Balance at December 31, 2019	\$ —	\$ 9,823.8	\$ 26,502.1	\$ 5,896.4	\$ 42,222.3
Carrying amounts at December 31, 2019	\$ 5,693.4	\$ 6,031.2	\$ 6,521.9	\$ 2,406.5	\$ 20,653.0
<u>Cost</u>					
Balance at January 1, 2020	\$ 5,693.4	\$ 15,855.0	\$ 33,024.0	\$ 8,302.9	\$ 62,875.3
Additions	—	6,308.9	3,275.8	2,974.8	12,559.5
Disposals or retirements	—	—	(60.5)	—	(60.5)
Effect of exchange rate changes	(256.8)	(2.2)	(0.3)	(0.1)	(259.4)
Balance at December 31, 2020	\$ 5,436.6	\$ 22,161.7	\$ 36,239.0	\$ 11,277.6	\$ 75,114.9
<u>Accumulated amortization and impairment</u>					
Balance at January 1, 2020	\$ —	\$ 9,823.8	\$ 26,502.1	\$ 5,896.4	\$ 42,222.3
Additions	—	2,404.5	3,669.2	1,112.5	7,186.2
Disposals or retirements	—	—	(59.9)	—	(59.9)
Effect of exchange rate changes	—	(2.1)	0.3	—	(1.8)
Balance at December 31, 2020	\$ —	\$ 12,226.2	\$ 30,111.7	\$ 7,008.9	\$ 49,346.8
Carrying amounts at December 31, 2020	\$ 5,436.6	\$ 9,935.5	\$ 6,127.3	\$ 4,268.7	\$ 25,768.1

(Continued)

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	<u>Goodwill</u>	<u>Technology</u>	<u>Software and</u>	<u>Patent and</u>	<u>Total</u>
	<u>NT\$</u>	<u>License Fees</u>	<u>System Design</u>	<u>Others</u>	<u>NTS</u>
	<u>(In Millions)</u>	<u>NTS</u>	<u>Costs</u>	<u>NTS</u>	<u>(In Millions)</u>
		<u>(In Millions)</u>	<u>NTS</u>	<u>(In Millions)</u>	<u>(In Millions)</u>
Cost					
Balance at January 1, 2021	\$ 5,436.6	\$ 22,161.7	\$ 36,239.0	\$ 11,277.6	\$ 75,114.9
Additions	—	1,372.8	7,726.2	219.5	9,318.5
Disposals or retirements	—	—	(318.7)	—	(318.7)
Effect of exchange rate changes	(57.4)	(0.5)	4.5	0.1	(53.3)
Balance at December 31, 2021	<u>\$ 5,379.2</u>	<u>\$ 23,534.0</u>	<u>\$ 43,651.0</u>	<u>\$ 11,497.2</u>	<u>\$ 84,061.4</u>
Accumulated amortization and impairment					
Balance at January 1, 2021	\$ —	\$ 12,226.2	\$ 30,111.7	\$ 7,008.9	\$ 49,346.8
Additions	—	2,686.8	4,323.9	1,196.5	8,207.2
Disposals or retirements	—	—	(317.5)	—	(317.5)
Effect of exchange rate changes	—	(0.6)	3.5	0.3	3.2
Balance at December 31, 2021	<u>\$ —</u>	<u>\$ 14,912.4</u>	<u>\$ 34,121.6</u>	<u>\$ 8,205.7</u>	<u>\$ 57,239.7</u>
Carrying amounts at December 31, 2021	<u>\$ 5,379.2</u>	<u>\$ 8,621.6</u>	<u>\$ 9,529.4</u>	<u>\$ 3,291.5</u>	<u>\$ 26,821.7</u>

(Concluded)

The Company's goodwill has been tested for impairment at the end of the annual reporting period and the recoverable amount is determined based on the value in use. The value in use was calculated based on the cash flow forecast from the financial budgets covering the future five-year period, and the Company used annual discount rates of 8.0% in both years in its test of impairment as of December 31, 2020 and 2021, to reflect the relevant specific risk in the cash-generating unit.

For the years ended December 31, 2019, 2020 and 2021, the Company did not recognize any impairment loss on goodwill.

18. SHORT-TERM LOANS

	<u>December 31,</u>	<u>December 31,</u>
	<u>2020</u>	<u>2021</u>
	<u>NTS</u>	<u>NTS</u>
	<u>(In Millions)</u>	<u>(In Millions)</u>
Unsecured loans		
Amount	<u>\$ 88,559.0</u>	<u>\$ 114,921.3</u>
Loan content		
US\$ (in millions)	\$ 200.0	\$ —
EUR (in millions)	2,398.0	3,652.9
Annual interest rate	(0.54)%-0.33%	(0.73)%-0%
Maturity date	Due by February 2021	Due by June 2022

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19. BONDS PAYABLE

	December 31, 2020	December 31, 2021
	NTS	NTS
	(In Millions)	(In Millions)
Domestic unsecured bonds	\$ 173,197.0	\$ 312,448.0
Overseas unsecured bonds	84,291.0	304,414.0
Less: Discounts on bonds payable	(782.9)	(2,391.4)
Less: Current portion	(2,600.0)	(4,400.0)
	<u>\$ 254,105.1</u>	<u>\$ 610,070.6</u>

The major terms of domestic unsecured bonds are as follows:

Issuance	Tranche	Issuance Period	Total Amount NTS (In Millions)	Coupon Rate	Repayment and Interest Payment
<u>NTS</u>					
<u>unsecured</u>					
<u>bonds</u>					
101-3	—	October 2012 to October 2022	\$ 4,400.0	1.53%	Bullet repayment; interest payable annually
101-4	B	January 2013 to January 2020	10,000.0	1.35%	The same as above
	C	January 2013 to January 2023	3,000.0	1.49%	The same as above
102-1	B	February 2013 to February 2020	11,600.0	1.38%	The same as above
	C	February 2013 to February 2023	3,600.0	1.50%	The same as above
102-2	A	July 2013 to July 2020	10,200.0	1.50%	The same as above
	B	July 2013 to July 2023	3,500.0	1.70%	The same as above
102-4	D	September 2013 to March 2021	2,600.0	1.85%	Bullet repayment; interest payable annually (interest for the six months prior to maturity will accrue on the basis of actual days and be repayable at maturity)
	E	September 2013 to March 2023	5,400.0	2.05%	The same as above
	F	September 2013 to September 2023	2,600.0	2.10%	Bullet repayment; interest payable annually
109-1	A	March 2020 to March 2025	3,000.0	0.58%	The same as above
	B	March 2020 to March 2027	10,500.0	0.62%	The same as above
	C	March 2020 to March 2030	10,500.0	0.64%	The same as above

(Continued)

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Issuance	Tranche	Issuance Period	Total Amount NT\$ (In Millions)	Coupon Rate	Repayment and Interest Payment
109-2	A	April 2020 to April 2025	\$ 5,900.0	0.52%	Bullet repayment; interest payable annually
	B	April 2020 to April 2027	10,400.0	0.58%	The same as above
	C	April 2020 to April 2030	5,300.0	0.60%	The same as above
109-3	A	May 2020 to May 2025	4,500.0	0.55%	The same as above
	B	May 2020 to May 2027	7,500.0	0.60%	The same as above
	C	May 2020 to May 2030	2,400.0	0.64%	The same as above
109-4	A	July 2020 to July 2025	5,700.0	0.58%	Two equal installments in last two years; interest payable annually
	B	July 2020 to July 2027	6,300.0	0.65%	The same as above
	C	July 2020 to July 2030	1,900.0	0.67%	The same as above
109-5	A	September 2020 to September 2025	4,800.0	0.50%	The same as above
	B	September 2020 to September 2027	8,000.0	0.58%	The same as above
	C	September 2020 to September 2030	2,800.0	0.60%	The same as above
109-6 (green bond)	A	December 2020 to December 2025	1,600.0	0.40%	The same as above
	B	December 2020 to December 2027	5,600.0	0.44%	The same as above
	C	December 2020 to December 2030	4,800.0	0.48%	The same as above
109-7	A	December 2020 to December 2025	1,900.0	0.36%	The same as above
	B	December 2020 to December 2027	10,200.0	0.41%	The same as above
	C	December 2020 to December 2030	6,400.0	0.45%	The same as above
110-1	A	March 2021 to March 2026	4,800.0	0.50%	Bullet repayment; interest payable annually
	B	March 2021 to March 2028	11,400.0	0.55%	The same as above
	C	March 2021 to March 2031	4,900.0	0.60%	The same as above
110-2	A	May 2021 to May 2026	5,200.0	0.50%	The same as above
	B	May 2021 to May 2028	8,400.0	0.58%	The same as above
	C	May 2021 to May 2031	5,600.0	0.65%	The same as above

(Continued)

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Issuance	Tranche	Issuance Period	Total Amount NT\$ (In Millions)	Coupon Rate	Repayment and Interest Payment
110-3	A	June 2021 to June 2026	\$ 6,900.0	0.52%	Bullet repayment; interest payable annually
	B	June 2021 to June 2028	7,900.0	0.58%	The same as above
	C	June 2021 to June 2031	4,900.0	0.65%	The same as above
110-4	A	August 2021 to August 2025	4,000.0	0.485%	The same as above
	B	August 2021 to August 2026	8,000.0	0.50%	The same as above
	C	August 2021 to August 2028	5,400.0	0.55%	The same as above
	D	August 2021 to August 2031	4,200.0	0.62%	The same as above
110-6	A	October 2021 to April 2026	3,200.0	0.535%	The same as above
	B	October 2021 to October 2026	6,900.0	0.54%	The same as above
	C	October 2021 to October 2028	4,600.0	0.60%	The same as above
	D	October 2021 to October 2031	1,600.0	0.62%	The same as above
110-7	A	December 2021 to December 2026	7,700.0	0.65%	The same as above
	B	December 2021 to June 2027	3,500.0	0.675%	The same as above
	C	December 2021 to December 2028	5,500.0	0.72%	The same as above

(Concluded)

Issuance	Tranche	Issuance Period	Total Amount US\$ (In Millions)	Coupon Rate	Repayment and Interest Payment
<u>US\$</u> <u>unsecured</u> <u>bonds</u>					
109-1	—	September 2020 to September 2060	US\$ 1,000.0	2.70%	Bullet repayment (callable on the 5th anniversary of the issue date and every anniversary thereafter); interest payable annually
110-5	—	September 2021 to September 2051	1,000.0	3.10%	The same as above

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The major terms of overseas unsecured bonds are as follows:

Issuance Period	Total Amount US\$ (In Millions)	Coupon Rate	Repayment and Interest Payment
September 2020 to September 2025	US\$ 1,000.0	0.75%	Bullet repayment (callable at any time, in whole or in part, at the relevant redemption price according to relevant agreements); interest payable semi-annually
September 2020 to September 2027	750.0	1.00%	The same as above
September 2020 to September 2030	1,250.0	1.375%	The same as above
April 2021 to April 2026	1,100.0	1.25%	The same as above
April 2021 to April 2028	900.0	1.75%	The same as above
April 2021 to April 2031	1,500.0	2.25%	The same as above
October 2021 to October 2026	1,250.0	1.75%	The same as above
October 2021 to October 2031	1,250.0	2.50%	The same as above
October 2021 to October 2041	1,000.0	3.125%	The same as above
October 2021 to October 2051	1,000.0	3.25%	The same as above

The Company issued domestic unsecured bonds during the period from January 1, 2022 to April 14, 2022, the major terms are as follows:

Issuance	Tranche	Issuance Period	Total Amount NT\$ (In Millions)	Coupon Rate	Repayment and Interest Payment
<u>NT\$</u>					
<u>unsecured</u>					
<u>bonds</u>					
111-1 (green bond)	A	January 2022 to January 2027	\$ 2,100.0	0.63%	Bullet repayment; interest payable annually
	B	January 2022 to January 2029	3,300.0	0.72%	The same as above
111-2	A	March 2022 to September 2026	3,000.0	0.84%	The same as above
	B	March 2022 to March 2027	9,600.0	0.85%	The same as above
	C	March 2022 to March 2029	1,600.0	0.90%	The same as above

20. LONG-TERM BANK LOANS

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Unsecured loans	\$ 2,000.0	\$ 3,510.0
Less: Discounts on government grants	(32.4)	(34.2)
Less: Current portion	—	(166.7)
	<u>\$ 1,967.6</u>	<u>\$ 3,309.1</u>
Loan content		
Annual interest rate	0.4%	0.4%-0.9%
Maturity date	Due by September 2025	Due by September 2026

The long-term bank loans of the Company are with preferential interest rates subsidized by the government, and the loans are used to fund capital expenditure qualifying for the subsidy.

21. RETIREMENT BENEFIT PLANS**a. Defined contribution plans**

The plan under the R.O.C. Labor Pension Act (the “Act”) is deemed a defined contribution plan. Pursuant to the Act, TSMC and VisEra Tech have made monthly contributions equal to 6% of each employee’s monthly salary to employees’ pension accounts. Furthermore, TSMC North America, TSMC Arizona, TSMC China, TSMC Nanjing, TSMC Europe, TSMC Canada and TSMC Technology also make monthly contributions at certain percentages of the basic salary of their employees. Accordingly, the Company recognized expenses of NT\$2,609.7 million, NT\$2,809.5 million and NT\$3,711.0 million for the years ended December 31, 2019, 2020 and 2021, respectively.

b. Defined benefit plans

TSMC has defined benefit plans under the R.O.C. Labor Standards Law that provide benefits based on an employee’s length of service and average monthly salary for the six-month period prior to retirement. The Company contributes an amount equal to 2% of salaries paid each month to their respective pension funds (the Funds), which are administered by the Labor Pension Fund Supervisory Committee (the Committee) and deposited in the Committee’s name in the Bank of Taiwan. Before the end of each year, the Company assesses the balance in the Funds. If the amount of the balance in the Funds is inadequate to pay retirement benefits for employees who conform to retirement requirements in the next year, the Company is required to fund the difference in one appropriation that should be made before the end of March of the next year. The Funds are operated and managed by the government’s designated authorities; as such, the Company does not have any right to intervene in the investments of the Funds.

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Amounts recognized in respect of these defined benefit plans were as follows:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Current service cost	\$ 135.6	\$ 123.3	\$ 145.3
Net interest expense	124.0	81.6	47.2
Components of defined benefit costs recognized in profit or loss	259.6	204.9	192.5
Remeasurement on the net defined benefit liability:			
Return on plan assets (excluding amounts included in net interest expense)	(124.4)	(139.2)	(73.3)
Actuarial loss (gain) arising from experience adjustments	(438.0)	494.1	94.3
Actuarial loss (gain) arising from changes in demographic assumptions	(233.2)	—	277.4
Actuarial loss (gain) arising from changes in financial assumptions	541.7	3,161.9	(540.5)
Components of defined benefit costs recognized in other comprehensive income	(253.9)	3,516.8	(242.1)
Total	\$ 5.7	\$ 3,721.7	\$ (49.6)

The pension costs of the aforementioned defined benefit plans were recognized in profit or loss by the following categories:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Cost of revenue	\$ 157.8	\$ 126.3	\$ 124.5
Research and development expenses	72.7	57.3	52.8
General and administrative expenses	25.1	18.2	12.5
Marketing expenses	4.0	3.1	2.7
	\$ 259.6	\$ 204.9	\$ 192.5

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The amounts arising from the defined benefit obligation of the Company were as follows:

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Present value of defined benefit obligation	\$ 16,980.3	\$ 16,585.5
Fair value of plan assets	(5,066.2)	(5,548.6)
Net defined benefit liability	<u>\$ 11,914.1</u>	<u>\$ 11,036.9</u>

Movements in the present value of the defined benefit obligation were as follows:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Balance, beginning of year	\$ 13,662.7	\$ 13,484.1	\$ 16,980.3
Current service cost	135.6	123.3	145.3
Interest expense	175.4	118.8	66.7
Remeasurement:			
Actuarial loss (gain) arising from experience adjustments	(438.0)	494.1	94.3
Actuarial loss (gain) arising from changes in demographic assumptions	(233.2)	—	277.4
Actuarial loss (gain) arising from changes in financial assumptions	541.7	3,161.9	(540.5)
Benefits paid from plan assets	(344.1)	(399.0)	(431.8)
Benefits paid directly by the Company	(16.0)	(2.9)	(6.2)
Balance, end of year	<u>\$ 13,484.1</u>	<u>\$ 16,980.3</u>	<u>\$ 16,585.5</u>

Movements in the fair value of the plan assets were as follows:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Balance, beginning of year	\$ 4,011.3	\$ 4,301.6	\$ 5,066.2
Interest income	51.4	37.2	19.5
Remeasurement:			
Return on plan assets (excluding amounts included in net interest expense)	124.4	139.2	73.3
Contributions from employer	458.6	987.2	821.4
Benefits paid from plan assets	(344.1)	(399.0)	(431.8)
Balance, end of year	<u>\$ 4,301.6</u>	<u>\$ 5,066.2</u>	<u>\$ 5,548.6</u>

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The fair value of the plan assets by major categories at the end of reporting period was as follows:

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Cash	\$ 632.8	\$ 1,001.0
Equity instruments	2,926.7	2,951.8
Debt instruments	1,506.7	1,595.8
	<u>\$ 5,066.2</u>	<u>\$ 5,548.6</u>

The actuarial valuations of the present value of the defined benefit obligation were carried out by qualified actuaries. The principal assumptions of the actuarial valuation were as follows:

	Measurement Date	
	December 31, 2020	December 31, 2021
Discount rate	0.40%	0.75%
Future salary increase rate	3.00% (Note)	3.00%

Note: The Company has an additional 20 percent pay raise in 2021.

Through the defined benefit plans under the R.O.C. Labor Standards Law, the Company is exposed to the following risks:

- 1) **Investment risk:** The pension funds are invested in equity and debt securities, bank deposits, etc. The investment is conducted at the discretion of the government's designated authorities or under the mandated management. However, under the R.O.C. Labor Standards Law, the rate of return on assets shall not be less than the average interest rate on a two-year time deposit published by the local banks and the government is responsible for any shortfall in the event that the rate of return is less than the required rate of return.
- 2) **Interest risk:** A decrease in the government bond interest rate will increase the present value of the defined benefit obligation; however, this will be partially offset by an increase in the return on the debt investments of the plan assets.

Assuming a hypothetical decrease in interest rate at the end of the reporting period contributed to a decrease of 0.5% (and not below 0.0%) in the discount rate and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT\$694.7 million and NT\$780.5 million as of December 31, 2020 and 2021, respectively.

- 3) **Salary risk:** The present value of the defined benefit obligation is calculated by reference to the future salaries of plan participants. As such, an increase in the salary of the plan participants will increase the present value of the defined benefit obligation.

Assuming the expected salary rate increases by 0.5% at the end of the reporting period and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT\$836.0 million and NT\$759.5 million as of December 31, 2020 and 2021 respectively.

The sensitivity analysis presented above may not be representative of the actual change in the defined benefit obligation as it is unlikely that the change in assumptions would occur in isolation of one another as some of the assumptions may be correlated.

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Furthermore, in presenting the above sensitivity analysis, the present value of the defined benefit obligation has been calculated using the projected unit credit method at the end of the reporting period, which is the same as that applied in calculating the defined benefit obligation liability.

The Company expects to make contributions of NT\$2,269.9 million to the defined benefit plans in the next year starting from December 31, 2021. The weighted average duration of the defined benefit obligation is 9 years.

22. EQUITY

a. Capital stock

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Authorized shares	28,050.0	28,050.0
Authorized capital	\$ 280,500.0	\$ 280,500.0
Issued and paid shares	25,930.3	25,930.3
Issued capital	\$ 259,303.8	\$ 259,303.8

A holder of issued common shares with par value of NT\$10 per share is entitled to vote and to receive dividends.

The authorized shares include 500.0 million shares allocated for the exercise of employee stock options.

As of December 31, 2021, 1,064.2 million ADSs of TSMC were traded on the NYSE. The number of common shares represented by the ADSs was 5,321.2 million shares (one ADS represents five common shares).

b. Capital surplus

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Additional paid-in capital	\$ 24,185.0	\$ 24,185.0
From merger	22,804.5	22,804.5
From convertible bonds	8,892.9	8,892.9
From difference between the consideration received and the carrying amount of the subsidiaries' net assets during actual disposal	—	8,406.3
From share of changes in equities of subsidiaries	121.8	113.9
From share of changes in equities of associates	302.5	307.2
Donations	40.5	51.7
	\$ 56,347.2	\$ 64,761.5

Under the R.O.C. relevant laws, the capital surplus generated from the excess of the issuance price over the par value of capital stock (including the stock issued for new capital, mergers and convertible bonds), the difference between the consideration received and the carrying amount of the subsidiaries' net assets during actual disposal and donations may be used to offset a deficit; in addition, when the Company has no deficit, such capital surplus may be distributed as cash dividends or stock dividends up to a certain percentage of TSMC's paid-in capital. The capital surplus from share of changes in equities of subsidiaries and associates and dividend of a claim extinguished by a prescription may be used to offset a deficit.

c. Retained earnings and dividend policy

TSMC's Articles of Incorporation provide that, earnings distribution may be made on a quarterly basis after the close of each quarter. Distribution of earnings by way of cash dividends should be approved by TSMC's Board of Directors and reported to TSMC's shareholders in its meeting. When allocating earnings, TSMC shall first estimate and reserve the taxes to be paid, offset its losses, set aside a legal capital reserve at 10% of the remaining earnings (until the accumulated legal capital reserve equals TSMC's paid-in capital), then set aside a special capital reserve in accordance with relevant laws or regulations or as requested by the authorities in charge. Any balance left over shall be allocated according to relevant laws and the TSMC's Articles of Incorporation.

TSMC's Articles of Incorporation also provide that profits of TSMC may be distributed by way of cash dividend and/or stock dividend. However, distribution of earnings shall be made preferably by way of cash dividend. Distribution of earnings may also be made by way of stock dividend, provided that the ratio for stock dividend shall not exceed 50% of the total distribution.

The legal capital reserve may be used to offset a deficit, or be distributed as dividends in cash or stocks for the portion in excess of 25% of the paid-in capital if the Company incurs no loss.

Pursuant to existing regulations, the Company is required to set aside additional special capital reserve equivalent to the net debit balance of the other components of stockholders' equity, such as the accumulated balance of foreign currency translation reserve, unrealized valuation gain or loss from fair value through other comprehensive income financial assets, gain or loss from changes in fair value of hedging instruments in cash flow hedges, etc. For the subsequent decrease in the deduction amount to stockholders' equity, any special reserve appropriated may be reversed to the extent that the net debit balance reverses.

The appropriations of 2019, 2020 and 2021 quarterly earnings have been approved by TSMC's Board of Directors in its meeting, respectively. The appropriations and cash dividends per share were as follows:

	First Quarter of 2019	Second Quarter of 2019	Third Quarter of 2019	Fourth Quarter of 2019
	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)
Resolution date of TSMC's Board of Directors in its meeting	June 5, 2019	August 13, 2019	November 12, 2019	February 11, 2020
Special capital reserve	\$ (4,724.0)	\$ (3,338.2)	\$ 3,289.2	\$ 16,893.0
Cash dividends to shareholders	\$ 51,860.8	\$ 64,826.0	\$ 64,826.0	\$ 64,826.0
Cash dividends per share (NT\$)	\$ 2.0	\$ 2.5	\$ 2.5	\$ 2.5

	First Quarter of 2020	Second Quarter of 2020	Third Quarter of 2020	Fourth Quarter of 2020
	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)
Resolution date of TSMC's Board of Directors in its meeting	May 12, 2020	August 11, 2020	November 10, 2020	February 9, 2021
Special capital reserve	\$ (2,694.8)	\$ 11,884.5	\$ 5,501.3	\$ 12,420.7
Cash dividends to shareholders	\$ 64,826.0	\$ 64,826.0	\$ 64,826.0	\$ 64,826.0
Cash dividends per share (NT\$)	\$ 2.5	\$ 2.5	\$ 2.5	\$ 2.5

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	First Quarter of 2021	Second Quarter of 2021	Third Quarter of 2021	Fourth Quarter of 2021
	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)
Resolution date of TSMC's Board of Directors in its meeting	June 9, 2021	August 10, 2021	November 9, 2021	February 15, 2022
Special capital reserve	\$ (6,287.0)	\$ 10,201.2	\$ 710.2	\$ 3,304.3
Cash dividends to shareholders	\$ 71,308.5	\$ 71,308.5	\$ 71,308.5	\$ 71,308.5
Cash dividends per share (NT\$)	\$ 2.75	\$ 2.75	\$ 2.75	\$ 2.75

The special capital reserve for 2021 is to be presented for approval in the TSMC's shareholders' meeting to be held on June 8, 2022 (expected).

d. Others

Changes in others were as follows:

	Year Ended December 31, 2019				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
Balance, beginning of year	\$ (12,042.4)	\$ (3,429.3)	\$ 23.6	\$ (1.8)	\$ (15,449.9)
Exchange differences arising on translation of foreign operations	(14,693.5)	—	—	—	(14,693.5)
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	—	334.5	—	—	334.5
Debt instruments	—	3,097.3	—	—	3,097.3
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	—	(162.1)	—	—	(162.1)
Cumulative unrealized gain (loss) of debt instruments transferred to profit or loss due to disposal	—	(537.8)	—	—	(537.8)
Loss allowance adjustments from debt instruments	—	6.9	—	—	6.9
Gain (loss) arising on changes in the fair value of hedging instruments	—	—	(109.6)	—	(109.6)
Other comprehensive income transferred to profit or loss due to disposal of subsidiary	4.6	—	—	—	4.6
Transferred to initial carrying amount of hedged items	—	—	82.3	—	82.3
Share of other comprehensive income (loss) of associates	(140.1)	(11.8)	(0.1)	—	(152.0)
Share of unearned stock-based employee compensation of associates	—	—	—	1.6	1.6
Income tax effect	—	9.4	—	—	9.4
Balance, end of year	\$ (26,871.4)	\$ (692.9)	\$ (3.8)	\$ (0.2)	\$ (27,568.3)

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	Year Ended December 31, 2020				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
	\$	\$	\$	\$	\$
Balance, beginning of year	\$ (26,871.4)	\$ (692.9)	\$ (3.8)	\$ (0.2)	\$ (27,568.3)
Exchange differences arising on translation of foreign operations	(29,846.8)	—	—	—	(29,846.8)
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	—	423.2	—	—	423.2
Debt instruments	—	3,907.0	—	—	3,907.0
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	—	108.7	—	—	108.7
Cumulative unrealized gain (loss) of debt instruments transferred to profit or loss due to disposal	—	(1,439.4)	—	—	(1,439.4)
Loss allowance adjustments from debt instruments	—	(0.9)	—	—	(0.9)
Gain (loss) arising on changes in the fair value of hedging instruments	—	—	24.1	—	24.1
Transferred to initial carrying amount of hedged items	—	—	(20.3)	—	(20.3)
Share of other comprehensive income (loss) of associates	(283.4)	15.5	—	—	(267.9)
Share of unearned stock-based employee compensation of associates	—	—	—	0.2	0.2
Income tax effect	—	0.6	—	—	0.6
Balance, end of year	<u>\$ (57,001.6)</u>	<u>\$ 2,321.8</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ (54,679.8)</u>
	Year Ended December 31, 2021				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
	\$	\$	\$	\$	\$
Balance, beginning of year	\$ (57,001.6)	\$ 2,321.8	\$ —	\$ —	\$ (54,679.8)
Exchange differences arising on translation of foreign operations	(6,181.7)	—	—	—	(6,181.7)
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	—	1,898.2	—	—	1,898.2
Debt instruments	—	(3,339.9)	—	—	(3,339.9)
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	—	(187.7)	—	—	(187.7)
Cumulative unrealized gain (loss) of debt instruments transferred to profit or loss due to disposal	—	(93.2)	—	—	(93.2)
Loss allowance adjustments from debt instruments	—	1.3	—	—	1.3
Gain (loss) arising on changes in the fair value of hedging instruments	—	—	90.2	—	90.2
Transferred to initial carrying amount of hedged items	—	—	48.5	—	48.5
Share of other comprehensive income (loss) of associates	(120.0)	30.0	(14.7)	—	(104.7)
Income tax effect	—	(56.2)	(3.4)	—	(59.6)
Balance, end of year	<u>\$ (63,303.3)</u>	<u>\$ 574.3</u>	<u>\$ 120.6</u>	<u>\$ —</u>	<u>\$ (62,608.4)</u>

The aforementioned other equity includes the changes in other equities of TSMC and TSMC's share of its subsidiaries and associates.

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e. Treasury stock

For TSMC's shareholders' interests, TSMC's Board of Directors approved a share buyback plan on February 15, 2022 to repurchase 1.4 million shares during the period from February 16, 2022 to April 15, 2022. The shares purchased will be cancelled subsequently.

23. NET REVENUE

a. Disaggregation of revenue from contracts with customers

Product	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Wafer	\$ 927,317.3	\$ 1,178,456.3	\$ 1,405,300.3
Others	142,668.1	160,798.5	182,114.7
	<u>\$1,069,985.4</u>	<u>\$ 1,339,254.8</u>	<u>\$ 1,587,415.0</u>

Geography	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Taiwan	\$ 84,255.2	\$ 129,082.9	\$ 203,963.7
United States	634,713.0	817,911.0	1,015,996.4
China	208,101.4	233,783.3	164,552.1
Europe, the Middle East and Africa	67,568.2	70,213.4	89,010.1
Japan	57,468.6	63,299.2	71,920.8
Others	17,879.0	24,965.0	41,971.9
	<u>\$1,069,985.4</u>	<u>\$ 1,339,254.8</u>	<u>\$ 1,587,415.0</u>

The Company categorized the net revenue mainly based on the countries where the customers are headquartered.

Platform	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Smartphone	\$ 523,612.9	\$ 645,303.6	\$ 695,091.2
High Performance Computing	315,822.3	439,810.0	587,780.1
Internet of Things	86,342.7	110,355.2	133,006.0
Automotive	47,914.5	44,367.5	67,076.4
Digital Consumer Electronics	53,733.4	54,555.7	55,577.2
Others	42,559.6	44,862.8	48,884.1
	<u>\$1,069,985.4</u>	<u>\$ 1,339,254.8</u>	<u>\$ 1,587,415.0</u>

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Resolution	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
5-nanometer	\$ —	\$ 90,934.5	\$ 262,327.4
7-nanometer	249,548.1	394,837.0	440,383.1
10-nanometer	23,266.4	3,403.1	660.0
16-nanometer	186,700.9	197,959.0	191,058.9
20-nanometer	9,535.8	8,450.9	5,668.8
28-nanometer	149,578.7	149,367.7	153,066.6
40/45-nanometer	93,366.3	103,176.5	103,413.6
65-nanometer	69,250.0	61,226.7	66,467.9
90-nanometer	25,624.2	29,380.4	32,260.3
0.11/0.13 micron	22,947.3	33,197.1	40,558.5
0.15/0.18 micron	77,564.5	86,008.5	86,700.3
0.25 micron and above	19,935.1	20,514.9	22,734.9
Wafer revenue	<u>\$ 927,317.3</u>	<u>\$ 1,178,456.3</u>	<u>\$ 1,405,300.3</u>

b. Contract balances

	January 1,	December 31,	December 31,
	2020	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Contract liabilities (classified under accrued expenses and other current liabilities)	<u>\$ 6,784.3</u>	<u>\$ 13,775.1</u>	<u>\$ 39,762.6</u>

The changes in the contract liability balances primarily result from the timing difference between the satisfaction of performance obligation and the customer's payment.

The Company recognized revenue from the beginning balance of contract liability, which amounted to NT\$3,876.6 million, NT\$4,737.9 million and NT\$11,590.4 million for the years ended December 31, 2019, 2020 and 2021, respectively.

c. Temporary receipts from customers

	December 31,
	2021
	NT\$ (In Millions)
Current portion (classified under accrued expenses and other current liabilities)	\$ 30,612.7
Noncurrent portion (classified under other noncurrent liabilities)	155,381.5
	<u>\$ 185,994.2</u>

The Company's temporary receipts from customer are payments made by customers to the Company to retain the Company's capacity. When the terms and conditions set forth in the agreements are subsequently satisfied, the treatment of temporary receipts will be determined by mutual consent.

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d. Refund liabilities

Estimated sales returns and other allowances is made and adjusted based on historical experience and the consideration of varying contractual terms. As of December 31, 2020 and 2021, the aforementioned refund liabilities amounted to NT\$33,194.8 million and NT\$41,038.0 million (classified under accrued expenses and other current liabilities), respectively.

24. INTEREST INCOME

	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Interest income			
Bank deposits	\$ 11,454.0	\$ 5,139.1	\$ 2,834.8
Financial assets at FVTPL	339.5	2.5	—
Financial assets at FVTOCI	3,476.2	3,121.9	2,192.5
Financial assets at amortized cost	919.7	754.9	681.5
	<u>\$ 16,189.4</u>	<u>\$ 9,018.4</u>	<u>\$ 5,708.8</u>

25. FINANCE COSTS

	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Interest expense			
Corporate bonds	\$ 1,139.9	\$ 1,337.3	\$ 5,203.0
Lease liabilities	240.9	227.8	193.3
Bank loans	1,869.4	500.9	17.6
Others	0.7	15.5	0.3
	<u>\$ 3,250.9</u>	<u>\$ 2,081.5</u>	<u>\$ 5,414.2</u>

26. OTHER GAINS AND LOSSES, NET

	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Gain on disposal of financial assets, net			
Investments in debt instruments at FVTOCI	\$ 537.8	\$ 1,439.4	\$ 93.2
Loss on disposal of subsidiaries	(4.6)	—	—
Gain (loss) on financial instruments at FVTPL, net			
Mandatorily measured at FVTPL	(2,360.7)	8,244.5	(7,973.6)
Gain arising from fair value hedges, net	13.1	—	—

(Continued)

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	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
The reversal (accrual) of expected credit loss of financial assets			
Investments in debt instruments at FVTOCI	\$ (6.9)	\$ 0.9	\$ (1.3)
Financial assets at amortized cost	5.2	(4.6)	4.0
Other gains, net	665.1	426.2	489.7
	<u>\$ (1,151.0)</u>	<u>\$ 10,106.4</u>	<u>\$ (7,388.0)</u>

(Concluded)

27. INCOME TAX

- a. Income tax expense recognized in profit or loss

Income tax expense consisted of the following:

	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Current income tax expense			
Current tax expense recognized in the current year	\$ 47,135.5	\$ 87,452.7	\$ 107,694.4
Income tax adjustments on prior years	(10,193.8)	(7,589.4)	(14,539.5)
Other income tax adjustments	(41.5)	150.2	152.2
	<u>36,900.2</u>	<u>80,013.5</u>	<u>93,307.1</u>
Deferred income tax benefit			
The origination and reversal of temporary differences	(1,065.1)	(6,275.2)	(17,530.0)
Investment tax credits	—	—	(5,621.7)
	<u>(1,065.1)</u>	<u>(6,275.2)</u>	<u>(23,151.7)</u>
Income tax expense recognized in profit or loss	<u>\$ 35,835.1</u>	<u>\$ 73,738.3</u>	<u>\$ 70,155.4</u>

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A reconciliation of income before income tax and income tax expense recognized in profit or loss was as follows:

	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Income before tax	\$ 389,862.1	\$ 584,746.3	\$ 663,036.0
Income tax expense at the statutory rate	\$ 79,056.5	\$ 118,831.3	\$ 134,595.2
Tax effect of adjusting items:			
Nondeductible (deductible) items in determining taxable income	(4,183.5)	1,015.9	11,279.5
Tax-exempt income	(39,808.1)	(65,988.1)	(89,852.9)
Additional income tax under the Alternative Minimum Tax Act	10,367.9	18,872.8	32,852.7
Additional income tax on unappropriated earnings	7,628.1	14,747.3	18,849.5
The origination and reversal of temporary differences	(1,065.1)	(6,275.2)	(17,530.0)
Income tax credits	(5,925.4)	(26.5)	(5,651.3)
	46,070.4	81,177.5	84,542.7
Income tax adjustments on prior years	(10,193.8)	(7,589.4)	(14,539.5)
Other income tax adjustments	(41.5)	150.2	152.2
Income tax expense recognized in profit or loss	<u>\$ 35,835.1</u>	<u>\$ 73,738.3</u>	<u>\$ 70,155.4</u>

Under the amendment to the R.O.C Statute of Industrial Innovation in 2019, the amounts of unappropriated earnings in 2018 and thereafter used for building or purchasing specific assets or technologies can qualify for deduction when computing the income tax on unappropriated earnings.

The income tax adjustments on prior years were primarily due to the difference between the actual and estimated income tax on unappropriated earnings.

For the years ended December 31, 2019, 2020 and 2021, the Company applied a tax rate of 20% for entities subject to the R.O.C. Income Tax Law; for other jurisdictions, taxes are calculated using the applicable tax rate for each individual jurisdiction.

b. Income tax expense recognized in other comprehensive income

	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Deferred income tax benefit (expense)			
Related to remeasurement of defined benefit obligation	\$ (30.4)	\$ 422.1	\$ (29.1)
Related to unrealized gain/loss on investments in equity instruments at FVTOCI	9.4	0.6	(56.2)
Related to gain/loss on cash flow hedges	—	—	(3.4)
	<u>\$ (21.0)</u>	<u>\$ 422.7</u>	<u>\$ (88.7)</u>

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c. Deferred income tax balance

The analysis of deferred income tax assets and liabilities was as follows:

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Deferred income tax assets</u>		
Temporary differences		
Depreciation	\$ 19,354.4	\$ 34,720.7
Refund liability	3,755.1	5,986.2
Investment tax credits	—	5,621.7
Net defined benefit liability	1,342.1	1,237.1
Unrealized loss on inventories	858.5	899.0
Deferred compensation cost	330.3	374.0
Investments in equity instruments at FVTOCI	66.3	10.1
Others	251.5	305.1
	<u>\$ 25,958.2</u>	<u>\$ 49,153.9</u>
<u>Deferred income tax liabilities</u>		
Temporary differences		
Unrealized exchange gains	\$ (866.5)	\$ (706.3)
Others	(863.4)	(1,167.6)
	<u>\$ (1,729.9)</u>	<u>\$ (1,873.9)</u>

	Year Ended December 31, 2019				
	Balance, Beginning of Year	Recognized in			Balance, End of Year
	NT\$	Profit or Loss	Other Comprehensive Income	Effect of Exchange Rate Changes	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
<u>Deferred income tax assets</u>					
Temporary differences					
Depreciation	\$ 11,839.2	\$ 1,727.8	\$ —	\$ (19.8)	\$ 13,547.2
Refund liability	2,594.0	(443.2)	—	(0.4)	2,150.4
Net defined benefit liability	1,084.9	(38.2)	(30.4)	—	1,016.3
Unrealized loss on inventories	751.0	(280.8)	—	(0.8)	469.4
Deferred compensation cost	271.7	59.4	—	(8.0)	323.1
Investments in equity instruments at FVTOCI	56.2	0.1	9.4	—	65.7
Others	209.4	151.1	—	(4.2)	356.3
	<u>\$ 16,806.4</u>	<u>\$ 1,176.2</u>	<u>\$ (21.0)</u>	<u>\$ (33.2)</u>	<u>\$ 17,928.4</u>
<u>Deferred income tax liabilities</u>					
Temporary differences					
Unrealized exchange gains	\$ (61.7)	\$ (271.9)	\$ —	\$ —	\$ (333.6)
Others	(171.6)	160.8	—	—	(10.8)
	<u>\$ (233.3)</u>	<u>\$ (111.1)</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ (344.4)</u>

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	Year Ended December 31, 2020					
	Balance, Beginning of Year NTS (In Millions)	Recognized in			Effect of Exchange Rate Changes NTS (In Millions)	Balance, End of Year NTS (In Millions)
		Profit or Loss	Other	Comprehensive		
		NTS	Income	Income		
		(In Millions)	NTS (In Millions)	NTS (In Millions)		
Deferred income tax assets						
Temporary differences						
Depreciation	\$ 13,547.2	\$ 5,824.0	\$ —	\$ (16.8)	\$ 19,354.4	
Refund liability	2,150.4	1,606.1	—	(1.4)	3,755.1	
Net defined benefit liability	1,016.3	(96.3)	422.1	—	1,342.1	
Unrealized loss on inventories	469.4	391.1	—	(2.0)	858.5	
Deferred compensation cost	323.1	27.4	—	(20.2)	330.3	
Investments in equity instruments at FVTOCI	65.7	—	0.6	—	66.3	
Others	356.3	(91.6)	—	(13.2)	251.5	
	<u>\$ 17,928.4</u>	<u>\$ 7,660.7</u>	<u>\$ 422.7</u>	<u>\$ (53.6)</u>	<u>\$ 25,958.2</u>	
Deferred income tax liabilities						
Temporary differences						
Unrealized exchange gains	\$ (333.6)	\$ (532.9)	\$ —	\$ —	\$ (866.5)	
Others	(10.8)	(852.6)	—	—	(863.4)	
	<u>\$ (344.4)</u>	<u>\$ (1,385.5)</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ (1,729.9)</u>	
Year Ended December 31, 2021						
	Recognized in					
	Balance, Beginning of Year NTS (In Millions)	Recognized in			Effect of Exchange Rate Changes NTS (In Millions)	Balance, End of Year NTS (In Millions)
		Profit or Loss	Other	Comprehensive		
		NTS	Income	Income		
		(In Millions)	NTS (In Millions)	NTS (In Millions)		
Deferred income tax assets						
Temporary differences						
Depreciation	\$ 19,354.4	\$ 15,365.7	\$ —	\$ 0.6	\$ 34,720.7	
Refund liability	3,755.1	2,231.5	—	(0.4)	5,986.2	
Investment tax credits	—	5,621.7	—	—	5,621.7	
Net defined benefit liability	1,342.1	(75.9)	(29.1)	—	1,237.1	
Unrealized loss on inventories	858.5	41.0	—	(0.5)	899.0	
Deferred compensation cost	330.3	49.2	—	(5.5)	374.0	
Investments in equity instruments at FVTOCI	66.3	—	(56.2)	—	10.1	
Others	251.5	59.1	—	(5.5)	305.1	
	<u>\$ 25,958.2</u>	<u>\$ 23,292.3</u>	<u>\$ (85.3)</u>	<u>\$ (11.3)</u>	<u>\$ 49,153.9</u>	
Deferred income tax liabilities						
Temporary differences						
Unrealized exchange gains	\$ (866.5)	\$ 160.2	\$ —	\$ —	\$ (706.3)	
Others	(863.4)	(300.8)	(3.4)	—	(1,167.6)	
	<u>\$ (1,729.9)</u>	<u>\$ (140.6)</u>	<u>\$ (3.4)</u>	<u>\$ —</u>	<u>\$ (1,873.9)</u>	

- d. The deductible temporary differences for which no deferred income tax assets have been recognized

As of December 31, 2020 and 2021, the aggregate deductible temporary differences for which no deferred income tax assets have been recognized amounted to NT\$55,521.0 million and NT\$66,431.3 million, respectively.

- e. Unused tax-exemption information

As of December 31, 2021, the profits generated from the following project of TSMC are exempt from income tax for a five-year period:

Construction and expansion of 2009 by TSMC	Tax-exemption Period 2018 to 2022

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- f. The information of unrecognized deferred income tax liabilities associated with investments

As of December 31, 2020 and 2021, the aggregate taxable temporary differences associated with investments in subsidiaries not recognized as deferred income tax liabilities amounted to NT\$152,827.4 million and NT\$177,552.8 million, respectively.

- g. Income tax examination

The tax authorities have examined income tax returns of TSMC through 2019. All investment tax credit adjustments assessed by the tax authorities have been recognized accordingly.

28. EARNINGS PER SHARE

	Years Ended December 31		
	2019 (NT\$)	2020 (NT\$)	2021 (NT\$)
Basic EPS	\$ 13.65	\$ 19.70	\$ 22.84
Diluted EPS	\$ 13.65	\$ 19.70	\$ 22.84

EPS is computed as follows:

	Amounts (Numerator) NT\$ (In Millions)	Number of Shares (Denominator) (In Millions)	EPS (NT\$)
<u>Year Ended December 31, 2019</u>			
Basic/Diluted EPS			
Net income available to common shareholders of the parent	\$ 353,948.0	25,930.3	\$ 13.65
<u>Year Ended December 31, 2020</u>			
Basic/Diluted EPS			
Net income available to common shareholders of the parent	\$ 510,744.0	25,930.3	\$ 19.70
<u>Year Ended December 31, 2021</u>			
Basic/Diluted EPS			
Net income available to common shareholders of the parent	\$ 592,359.2	25,930.3	\$ 22.84

29. SHARE-BASED PAYMENT ARRANGEMENTS

- a. Employee restricted stock awards

The issuance of employee restricted stock awards (RSAs) for year 2021 of no more than 2.6 million common shares has been approved by TSMC's shareholders' meeting held on July 26, 2021. The grants will be made free of charge. Under the aforementioned resolution, TSMC's Board of Directors approved the issuance of RSAs of 1.4 million shares. The grant date and the issuance date will be on March 1, 2022.

Vesting conditions of the aforementioned arrangement are as follow:

- 1) The RSAs granted to a key management personnel can only be vested if
 - the key management personnel remains employed by TSMC on the last date of each vesting period;
 - during the vesting period, the key management personnel may not breach any agreement with the TSMC or violate the TSMC's work rules; and
 - certain key management personnel performance metrics and the TSMC's business performance metrics are met.
- 2) The maximum percentage of granted RSAs that may be vested each year shall be as follows: one-year anniversary of the grant: 50%; two-year anniversary of the grant: 25%; and three-year anniversary of the grant: 25%; provided that the actual percentage and number of the RSAs to be vested in each year will be calculated based on the achievement of the TSMC's business performance metrics.
- 3) The maximum number of RSAs that may be vested in each year will be set as 110%, among which 100% will be subject to a calculation based on the TSMC's relative Total Shareholder Return ("TSR", including capital gains and dividends) achievement to determine the number of RSAs to be vested; this number will be further subject to a modifier to increase or decrease up to 10% based on the Compensation Committee's evaluation of the TSMC's Environmental, Social, and Governance ("ESG") achievements. The number of shares so calculated should be rounded down to the nearest integral.

TSMC's TSR relative to the TSR of S&P 500 IT Index	Ratio of Shares to be Vested
Above the Index by X percentage points	$50\% + X * 2.5\%$, with the maximum of 100%
Equal to the Index	50%
Below the Index by X percentage points	$50\% - X * 2.5\%$, with the minimum of 0%

Restrictions imposed on the key management personnel's rights in the RSAs before the vesting conditions are fulfilled:

- 1) During each vesting period, no key management personnel granted RSAs, except for inheritance, may sell, pledge, transfer, give to another person, create any encumbrance on, or otherwise dispose of, any shares under the unvested RSAs.
- 2) Before the vesting conditions are fulfilled, the attendance, proposal rights, speech rights, voting rights and etc. shall be exercised by the engaged trustee/custodian on the key management personnel's behalf. Any other shareholder rights including but not limited to the entitlement to any distribution regarding dividends, bonuses and capital reserve, and the subscription right of the new shares issued for any capital increase, are the same as those of holders of common shares of TSMC.
- 3) Granted RSAs shall be deposited in a trust/custody account.

In April 2022, TSMC's Board of Directors approved the issuance of RSAs for year 2022 of no more than 3.1 million common shares. The grants will be made free of charge. The actual number of shares to be issued will be resolved by the Board of Directors after the RSAs is approved at the shareholders' meeting and by the competent authority.

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b. Cash-settled share-based payment arrangements

In February 2022, TSMC executed a compensation plan to grant no more than 0.3 million units of employee cash-settled share-based payment arrangement without consideration. One unit of the right represents a right to the market value of one TSMC's common share when vested. The vesting conditions and the ratio of units to be vested for key management personnel of the plan are the same as the aforementioned RSAs for year 2021.

30. ADDITIONAL INFORMATION OF EXPENSES BY NATURE

	Years Ended December 31		
	2019	2020	2021
	NTS (In Millions)	NTS (In Millions)	NTS (In Millions)
a. Depreciation of property, plant and equipment and right-of-use assets			
Recognized in cost of revenue	\$ 256,530.9	\$ 299,311.4	\$ 386,103.9
Recognized in operating expenses	24,856.7	25,191.3	27,936.2
Recognized in other operating income and expenses	24.2	35.7	147.6
	<u>\$ 281,411.8</u>	<u>\$ 324,538.4</u>	<u>\$ 414,187.7</u>
b. Amortization of intangible assets			
Recognized in cost of revenue	\$ 3,069.9	\$ 4,837.7	\$ 5,574.3
Recognized in operating expenses	2,402.5	2,348.5	2,632.9
	<u>\$ 5,472.4</u>	<u>\$ 7,186.2</u>	<u>\$ 8,207.2</u>
c. Employee benefits expenses			
Post-employment benefits			
Defined contribution plans	\$ 2,609.7	\$ 2,809.5	\$ 3,711.0
Defined benefit plans	259.6	204.9	192.5
	2,869.3	3,014.4	3,903.5
Other employee benefits	107,115.3	137,803.0	161,043.6
	<u>\$ 109,984.6</u>	<u>\$ 140,817.4</u>	<u>\$ 164,947.1</u>
Employee benefits expense summarized by function			
Recognized in cost of revenue	\$ 64,702.0	\$ 83,099.0	\$ 98,012.8
Recognized in operating expenses	45,282.6	57,718.4	66,934.3
	<u>\$ 109,984.6</u>	<u>\$ 140,817.4</u>	<u>\$ 164,947.1</u>

According to TSMC's Articles of Incorporation, TSMC shall allocate compensation to directors and profit sharing bonus to employees of TSMC not more than 0.3% and not less than 1% of annual profits during the period, respectively.

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TSMC accrued profit sharing bonus to employees based on a percentage of net income before income tax, profit sharing bonus to employees and compensation to directors during the period; compensation to directors was expensed based on estimated amount payable. If there is a change in the proposed amounts after the annual consolidated financial statements are authorized for issue, the differences are recorded as a change in accounting estimate. Accrued profit sharing bonus to employees is illustrated below:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Profit sharing bonus to employees	\$ 23,165.7	\$ 34,753.2	\$ 35,601.5

TSMC's profit sharing bonus to employees and compensation to directors for 2019, 2020 and 2021 had been approved by the Board of Directors of TSMC, as illustrated below:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
	February 11, 2020	February 9, 2021	February 15, 2022
Resolution Date of TSMC's Board of Directors in its meeting			
Profit sharing bonus to employees	\$ 23,165.7	\$ 34,753.2	\$ 35,601.5
Compensation to directors	\$ 360.4	\$ 509.8	\$ 487.5

There is no significant difference between the aforementioned approved amounts and the amounts charged against earnings of 2019, 2020 and 2021, respectively

31. CASH FLOW INFORMATION

a. Non-cash transactions

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Additions of financial assets at FVTOCI	\$ 257,824.5	\$ 268,653.5	\$ 253,613.9
Conversion of convertible bonds into equity securities	—	(120.5)	—
Exchange of equity instruments	—	—	(106.2)
Changes in accrued expenses and other current liabilities	(266.3)	(5,895.5)	2,381.0
Payments for acquisition of financial assets at FVTOCI	\$ 257,558.2	\$ 262,637.5	\$ 255,888.7
Disposal of financial assets at FVTOCI	\$ 229,525.1	\$ 269,011.8	\$ 251,201.4
Changes in other financial assets	919.4	(2,079.9)	3,509.3
Exchange of equity instruments	—	—	(106.2)
Proceeds from disposal of financial assets at FVTOCI	\$ 230,444.5	\$ 266,931.9	\$ 254,604.5

(Continued)

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	Years Ended December 31		
	2019	2020	2021
	NT\$ (In Millions)	NT\$ (In Millions)	NT\$ (In Millions)
Additions of property, plant and equipment	\$ 564,283.0	\$ 525,720.7	\$ 835,406.3
Changes in other financial assets	472.5	584.7	1,934.0
Exchange of assets	(3,287.1)	(1.1)	(3,256.5)
Changes in payables to contractors and equipment suppliers	(100,963.9)	(19,085.9)	5,153.3
Transferred to initial carrying amount of hedged items	(82.3)	20.3	(41.4)
Payments for acquisition of property, plant and equipment	<u>\$ 460,422.2</u>	<u>\$ 507,238.7</u>	<u>\$ 839,195.7</u>
Additions of intangible assets	\$ 9,237.7	\$ 12,559.5	\$ 9,318.5
Changes in other financial assets	22.2	10.5	2.9
Changes in account payable	70.0	191.4	—
Changes in accrued expenses and other current liabilities	—	(3,219.0)	(280.7)
Payments for acquisition of intangible assets	<u>\$ 9,329.9</u>	<u>\$ 9,542.4</u>	<u>\$ 9,040.7</u>

(Concluded)

b. Reconciliation of liabilities arising from financing activities

	Balance as of January 1, 2019 NT\$ (In Millions)	Financing Cash Flow NT\$ (In Millions)	Non-cash changes			Balance as of December 31, 2019 NT\$ (In Millions)
			Foreign Exchange Movement NT\$ (In Millions)	Leases Modifications NT\$ (In Millions)	Other Changes (Note) NT\$ (In Millions)	
			Short-term loans	\$ 88,754.7	\$ 31,804.3	
Bonds payable	91,800.0	(34,900.0)	—	—	—	56,900.0
Lease liabilities	19,903.6	(3,174.0)	(73.3)	419.7	240.9	17,316.9
Total	<u>\$ 200,458.3</u>	<u>\$ (6,269.7)</u>	<u>\$ (2,110.0)</u>	<u>\$ 419.7</u>	<u>\$ 240.9</u>	<u>\$ 192,739.2</u>

	Balance as of January 1, 2020 NT\$ (In Millions)	Financing Cash Flow NT\$ (In Millions)	Non-cash changes			Balance as of December 31, 2020 NT\$ (In Millions)
			Foreign Exchange Movement NT\$ (In Millions)	Leases Modifications NT\$ (In Millions)	Other Changes (Note) NT\$ (In Millions)	
			Short-term loans	\$ 118,522.3	\$ (31,571.6)	
Bonds payable	56,900.0	204,535.0	(4,758.6)	—	28.7	256,705.1
Long-term bank loans	—	2,000.0	—	—	(32.4)	1,967.6
Lease liabilities	17,316.9	(2,819.7)	(78.5)	7,742.2	227.7	22,388.6
Total	<u>\$ 192,739.2</u>	<u>\$ 172,143.7</u>	<u>\$ (3,228.8)</u>	<u>\$ 7,742.2</u>	<u>\$ 224.0</u>	<u>\$ 369,620.3</u>

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	Non-cash changes					Balance as of December 31, 2021
	Balance as of January 1, 2021	Financing Cash Flow	Foreign Exchange Movement	Leases Modifications	Other Changes (Note)	
	NT\$	NT\$	NT\$	NT\$	NT\$	
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)	
Short-term loans	\$ 88,559.0	\$ 35,668.4	\$ (8,777.5)	\$ —	\$ (528.6)	\$ 114,921.3
Bonds payable	256,705.1	361,255.1	(3,646.9)	—	157.3	614,470.6
Long-term bank loans	1,967.6	1,510.0	—	—	(1.8)	3,475.8
Lease liabilities	22,388.6	(2,178.3)	(82.3)	2,619.4	193.3	22,940.7
Total	\$ 369,620.3	\$ 396,255.2	\$ (12,506.7)	\$ 2,619.4	\$ (179.8)	\$ 755,808.4

Note: Other changes include discounts on short-term loans, amortization of bonds payable, amortization of long-term bank loan interest subsidy and financial cost of lease liabilities.

32. CAPITAL MANAGEMENT

The Company requires significant amounts of capital to build and expand its production facilities and acquire additional equipment. In consideration of the industry dynamics, the Company manages its capital in a manner to ensure that it has sufficient and necessary financial resources to fund its working capital needs, capital asset purchases, research and development activities, dividend payments, debt service requirements and other business requirements associated with its existing operations over the next 12 months.

33. FINANCIAL INSTRUMENTS

a. Categories of financial instruments

	December 31, 2020	December 31, 2021
	NT\$	NT\$
	(In Millions)	(In Millions)
Financial assets		
FVTPL (Note 1)	\$ 2,259.4	\$ 159.0
FVTOCI (Note 2)	129,918.7	129,607.1
Hedging financial assets	0.1	13.5
Amortized cost (Note 3)	826,293.6	1,283,715.7
	<u>\$ 958,471.8</u>	<u>\$ 1,413,495.3</u>
Financial liabilities		
FVTPL (Note 4)	\$ 94.1	\$ 681.9
Hedging financial liabilities	1.2	9.6
Amortized cost (Note 5)	748,129.3	1,355,957.2
	<u>\$ 748,224.6</u>	<u>\$ 1,356,648.7</u>

Note 1: Financial assets mandatorily measured at FVTPL.

Note 2: Including notes and accounts receivable (net), equity and debt investments.

Note 3: Including cash and cash equivalents, financial assets at amortized cost, notes and accounts receivable (including related parties), other receivables and refundable deposits.

Note 4: Held for trading.

Note 5: Including short-term loans, accounts payable (including related parties), payables to contractors and equipment suppliers, cash dividends payable, accrued expenses and other current liabilities, bonds payable, long-term bank loans, guarantee deposits and other noncurrent liabilities.

b. Financial risk management objectives

The Company manages its exposure to foreign currency risk, interest rate risk, equity price risk, credit risk and liquidity risk with the objective to reduce the potentially adverse effects the market uncertainties may have on its financial performance.

The plans for material treasury activities are reviewed by the Audit Committees and/or Board of Directors in accordance with procedures required by relevant regulations or internal controls. During the implementation of such plans, the Company must comply with certain treasury procedures that provide guiding principles for overall financial risk management and segregation of duties.

c. Market risk

The Company is exposed to the financial market risks, primarily changes in foreign currency exchange rates, interest rates and equity investment prices. A portion of these risks is hedged.

Foreign currency risk

Substantially all the Company's sales are denominated in U.S. dollars and over half of its capital expenditures are denominated in currencies other than NT dollars, primarily in U.S. dollars, Japanese yen and Euros. As a result, any significant fluctuations to its disadvantage in the exchanges rate of NT dollar against such currencies, in particular a weakening of U.S. dollar against NT dollar, would have an adverse impact on the revenue and operating profit as expressed in NT dollars. The Company uses foreign currency derivative contracts, such as currency forwards or currency swaps, to protect against currency exchange rate risks associated with non-NT dollar-denominated assets and liabilities and certain forecasted transactions. These hedges reduce, but do not entirely eliminate, the effect of foreign currency exchange rate movements on the assets and liabilities.

Based on a sensitivity analysis performed on the Company's total monetary assets and liabilities for the years ended December 31, 2019, 2020 and 2021, a hypothetical adverse foreign currency exchange rate change of 10% would have decreased its net income by NT\$2,137.3 million, NT\$897.7 million and NT\$1,435.3 million, respectively, and decreased its other comprehensive income by NT\$107.7 million for the year ended December 2019, after taking into account hedges and offsetting positions.

Interest rate risk

The Company is exposed to interest rate risks primarily related to its investment portfolio and outstanding debt. Changes in interest rates affect the interest earned on the Company's cash and cash equivalents and fixed income securities, the fair value of those securities, as well as the interest paid on its debt.

The Company's cash and cash equivalents as well as fixed income investments in both fixed- and floating-rate securities carry a degree of interest rate risk. The majority of the Company's fixed income investments are fixed-rate securities, which are classified as financial assets at FVTOCI, and may have their fair value adversely affected due to a rise in interest rates. At the same time, if interest rates fall, cash and cash equivalents as well as floating-rate securities may generate less interest income than expected. The Company has entered and may in the future enter into interest rate futures to partially hedge the interest rate risk on its fixed income investments. However, these hedges can offset only a small portion of the financial impact from movements in interest rates.

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Based on a sensitivity analysis performed on the Company's fixed income investments at the end of the reporting period, interest rates increase of 100 basis points (1.00%) across all maturities would have decreased the Company's other comprehensive income by NT\$3,516.6 million, NT\$3,143.6 million and NT\$3,767.1 million for the years ended December 31, 2019, 2020, and 2021, respectively.

All of the Company's short-term debt is floating-rate, hence a rise in interest rates may result in higher interest expense than expected. The majority of the Company's long-term debt is fixed-rate and measured at amortized cost and as such, changes in interest rates would not affect the future cash flows and the carrying amount.

Other price risk

The Company is exposed to equity price risk arising from financial assets at FVTOCI.

Assuming a hypothetical decrease of 10% in prices of the equity investments at the end of the reporting period for the years ended December 31, 2019, 2020 and 2021, the other comprehensive income would have decreased by NT\$401.9 million, NT\$446.5 million and NT\$595.8 million, respectively.

d. Credit risk management

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in financial losses to the Company. The Company is exposed to credit risks from operating activities, primarily accounts receivable, and from investing activities, primarily deposits, fixed-income investments and other financial instruments with banks. Credit risk is managed separately for business related and financial related exposures. As of the end of the reporting period, the Company's maximum credit risk exposure is equal to the carrying amount of financial assets.

Business related credit risk

The Company's accounts receivable are from its customers worldwide. The majority of the Company's outstanding accounts receivable are not covered by collaterals or guarantees. While the Company has procedures to monitor and manage credit risk exposure on accounts receivable, there is no assurance such procedures will effectively eliminate losses resulting from its credit risk. This risk is heightened during periods when economic conditions worsen.

As of December 31, 2021 and 2020, the Company's ten largest customers accounted for 79% of accounts receivable in both years. The Company considers the concentration of credit risk for the remaining accounts receivable not material.

Financial credit risk

The Company mitigates its financial credit risk by selecting counterparties with investment grade credit ratings and by limiting the exposure to any individual counterparty. The Company regularly monitors and reviews the limit applied to counterparties and adjusts the limit according to market conditions and the credit standing of the counterparties.

The objective of the Company's investment policy is to achieve a return that will allow the Company to preserve principal and support liquidity requirements. The policy generally requires securities to be investment grade and limits the amount of credit exposure to any one issuer. The Company assesses whether there has been a significant increase in credit risk in the invested securities since initial recognition by reviewing changes in external credit ratings, financial market conditions and material information of the issuers.

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The Company assesses the 12-month expected credit loss and lifetime expected credit loss based on the probability of default and loss given default provided by external credit rating agencies. The current credit risk assessment policies are as follows:

Category	Description	Basis for Recognizing Expected Credit Loss	Expected Credit Loss Ratio
Performing	Credit rating is investment grade on valuation date	12 months expected credit loss	0—0.1%
Doubtful	Credit rating is non-investment grade on valuation date	Lifetime expected credit loss-not credit impaired	—
In default	Credit rating is CC or below on valuation date	Lifetime expected credit loss-credit impaired	—
Write-off	There is evidence indicating that the debtor is in severe financial difficulty and the Company has no realistic prospect of recovery	Amount is written off	—

For the years ended December 31, 2019, 2020 and 2021, the expected credit loss increased NT\$0.6 million, increased NT\$1.1 million and decreased NT\$3.3 million, respectively. The changes were mainly due to investment portfolio adjustment.

e. Liquidity risk management

The objective of liquidity risk management is to ensure the Company has sufficient liquidity to fund its business operations over the next 12 months. The Company manages its liquidity risk by maintaining adequate cash and cash equivalents, financial assets at FVTOCI-current, financial assets at amortized cost-current and sufficient cost-efficient funding.

The table below summarizes the maturity profile of the Company's financial liabilities based on contractual undiscounted payments, including principal and interest.

	Less Than 1 Year NT\$ (In Millions)	1-3 Years NT\$ (In Millions)	3-5 Years NT\$ (In Millions)	More Than 5 Years NT\$ (In Millions)	Total NT\$ (In Millions)
December 31, 2020					
Non-derivative financial liabilities					
Short-term loans	\$ 88,557.5	\$ —	\$ —	\$ —	\$ 88,557.5
Accounts payable (including related parties)	41,095.0	—	—	—	41,095.0
Payables to contractors and equipment suppliers	157,805.0	—	—	—	157,805.0
Accrued expenses and other current liabilities	71,995.7	—	—	—	71,995.7
Bonds payable	5,328.0	27,631.6	59,986.8	207,152.1	300,098.5
Long-term bank loans	8.0	847.4	1,170.9	—	2,026.3
Lease liabilities (including those classified under accrued expenses and other current liabilities) (Note)	2,024.2	3,566.7	3,198.8	15,067.9	23,857.6
	<u>366,813.4</u>	<u>32,045.7</u>	<u>64,356.5</u>	<u>222,220.0</u>	<u>685,435.6</u>
Derivative financial instruments					
Forward exchange contracts					
Outflows	177,764.2	—	—	—	177,764.2
Inflows	(181,458.0)	—	—	—	(181,458.0)
	<u>(3,693.8)</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>(3,693.8)</u>
	<u>\$ 363,119.6</u>	<u>\$ 32,045.7</u>	<u>\$ 64,356.5</u>	<u>\$ 222,220.0</u>	<u>\$ 681,741.8</u>

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	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
December 31, 2021					
Non-derivative financial liabilities					
Short-term loans	\$ 114,767.0	\$ —	\$ —	\$ —	\$ 114,767.0
Accounts payable (including related parties)	48,722.8	—	—	—	48,722.8
Payables to contractors and equipment suppliers	145,742.2	—	—	—	145,742.2
Accrued expenses and other current liabilities	120,240.4	—	—	—	120,240.4
Bonds payable	13,580.6	42,801.4	191,458.1	506,505.0	754,345.1
Long-term bank loans	183.7	2,217.1	1,153.9	—	3,554.7
Lease liabilities (including those classified under accrued expenses and other current liabilities) (Note)	2,371.6	3,896.2	3,385.3	14,649.2	24,302.3
Others	—	164,991.9	—	—	164,991.9
	<u>445,608.3</u>	<u>213,906.6</u>	<u>195,997.3</u>	<u>521,154.2</u>	<u>1,376,666.4</u>
Derivative financial instruments					
Forward exchange contracts					
Outflows	187,708.0	—	—	—	187,708.0
Inflows	(187,631.9)	—	—	—	(187,631.9)
	<u>76.1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>76.1</u>
	<u>\$ 445,684.4</u>	<u>\$ 213,906.6</u>	<u>\$ 195,997.3</u>	<u>\$ 521,154.2</u>	<u>\$ 1,376,742.5</u>

Note: Information about the maturity analysis for lease liabilities more than 5 years:

	5-10 Years	10-15 Years	15-20 Years	More Than 20 Years	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)	(In Millions)
December 31, 2020					
Lease liabilities	<u>\$ 7,402.0</u>	<u>\$ 5,253.9</u>	<u>\$ 2,255.2</u>	<u>\$ 156.8</u>	<u>\$ 15,067.9</u>
December 31, 2021					
Lease liabilities	<u>\$ 7,513.9</u>	<u>\$ 5,043.1</u>	<u>\$ 1,972.7</u>	<u>\$ 119.5</u>	<u>\$ 14,649.2</u>

f. Fair value of financial instruments

1) Fair value measurements recognized in the consolidated statements of financial position

Fair value measurements are grouped into Levels 1 to 3 based on the degree to which the fair value is observable:

- Level 1 fair value measurements are those derived from quoted prices (unadjusted) in active markets for identical assets or liabilities;
- Level 2 fair value measurements are those derived from inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices); and
- Level 3 fair value measurements are those derived from valuation techniques that include inputs for the asset or liability that are not based on observable market data (unobservable inputs).

The timing of transfers between levels within the fair value hierarchy is at the end of reporting period.

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2) Fair value of financial instruments that are measured at fair value on a recurring basis

Fair value hierarchy

The following table presents the Company's financial assets and liabilities measured at fair value on a recurring basis:

	December 31, 2020			
	Level 1	Level 2	Level 3	Total
	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)
<u>Financial assets at FVTPL</u>				
Mandatorily measured at FVTPL				
Forward exchange contracts	\$ —	\$ 2,259.4	\$ —	\$ 2,259.4
<u>Financial assets at FVTOCI</u>				
Investments in debt instruments				
Corporate bonds	\$ —	\$ 56,593.6	\$ —	\$ 56,593.6
Agency bonds/Agency mortgage-backed securities	—	43,977.1	—	43,977.1
Government bonds	13,279.2	180.3	—	13,459.5
Asset-backed securities	—	8,368.3	—	8,368.3
Investments in equity instruments				
Non-publicly traded equity investments	—	—	4,514.9	4,514.9
Publicly traded stocks	50.0	—	—	50.0
Notes and accounts receivable, net	—	2,955.3	—	2,955.3
	<u>\$ 13,329.2</u>	<u>\$ 112,074.6</u>	<u>\$ 4,514.9</u>	<u>\$ 129,918.7</u>
<u>Hedging financial assets</u>				
Fair value hedges				
Interest rate futures contracts	\$ 0.1	\$ —	\$ —	\$ 0.1
<u>Financial liabilities at FVTPL</u>				
Held for trading				
Forward exchange contracts	\$ —	\$ 94.1	\$ —	\$ 94.1
<u>Hedging financial liabilities</u>				
Fair value hedges				
Interest rate futures contracts	\$ 1.2	\$ —	\$ —	\$ 1.2

Because certain equity investment's quoted price (unadjusted) in active markets became available in the fourth quarter of 2020, its fair value hierarchy was transferred from Level 2 to Level 1.

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)
<u>Financial assets at FVTPL</u>				
Mandatorily measured at FVTPL				
Forward exchange contracts	\$ —	\$ 159.0	\$ —	\$ 159.0

(Continued)

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
	NT\$	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)	(In Millions)
<u>Financial assets at FVTOCI</u>				
Investments in debt instruments				
Corporate bonds	\$ —	\$ 57,253.2	\$ —	\$ 57,253.2
Agency bonds/Agency mortgage-backed securities	—	32,070.1	—	32,070.1
Government bonds	21,267.0	78.8	—	21,345.8
Asset-backed securities	—	8,660.4	—	8,660.4
Investments in equity instruments				
Non-publicly traded equity investments	—	—	5,887.9	5,887.9
Publicly traded stocks	189.8	—	—	189.8
Notes and accounts receivable, net	—	4,199.9	—	4,199.9
	<u>\$ 21,456.8</u>	<u>\$ 102,262.4</u>	<u>\$ 5,887.9</u>	<u>\$ 129,607.1</u>
<u>Hedging financial assets</u>				
Cash flow hedges				
Forward interest rate contracts	\$ —	\$ 13.5	\$ —	\$ 13.5
<u>Financial liabilities at FVTPL</u>				
Held for trading				
Forward exchange contracts	\$ —	\$ 681.9	\$ —	\$ 681.9
<u>Hedging financial liabilities</u>				
Fair value hedges				
Interest rate futures contracts	\$ 9.6	\$ —	\$ —	\$ 9.6

(Concluded)

Reconciliation of Level 3 fair value measurements of financial assets

The financial assets measured at Level 3 fair value were equity investments classified as financial assets at FVTOCI and financial assets at FVTPL. Reconciliations for the years ended December 31, 2019, 2020 and 2021 are as follows:

	Years Ended December 31		
	2019	2020	2021
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Balance, beginning of year	\$ 3,910.7	\$ 4,208.9	\$ 4,514.9
Additions	372.3	175.2	319.2
Recognized in profit or loss	—	(3.8)	—
Recognized in other comprehensive income or loss	129.5	409.0	1,821.8
Disposals and proceeds from return of capital of investments	(76.5)	(51.1)	(700.2)
Transfers out of level 3 (Note)	(43.6)	—	—
Effect of exchange rate changes	(83.5)	(223.3)	(67.8)
Balance, end of year	<u>\$ 4,208.9</u>	<u>\$ 4,514.9</u>	<u>\$ 5,887.9</u>

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Note: The transfer from Level 3 to Level 2 is because observable market data became available for such equity investment.

Valuation techniques and assumptions used in Level 2 fair value measurement

The fair values of financial assets and financial liabilities are determined as follows:

- The fair values of corporate bonds, agency bonds, agency mortgage-backed securities, asset-backed securities and government bonds are determined by quoted market prices provided by third party pricing services.
- The fair values of forward contracts are measured using forward rates and discount rates derived from quoted market prices.
- The fair value of accounts receivable classified as at FVTOCI is determined by the present value of future cash flows based on the discount rate that reflects the credit risk of counterparties.

Valuation techniques and assumptions used in Level 3 fair value measurement

The fair values of non-publicly traded equity investments (excluding those trading on the Emerging Stock Board) are mainly determined by using the asset approach and market approach.

The asset approach takes into account the net asset value measured at the fair value by independent parties. On December 31, 2020 and 2021, the Company uses unobservable inputs derived from discount for lack of marketability of 10%. When other inputs remain equal, the fair value will decrease by NT\$39.0 million and NT\$51.4 million, respectively, if discounts for lack of marketability increase by 1%.

For the remaining few investments, the market approach is used to arrive at their fair values, for which the recent financing activities of investees, the market transaction prices of the similar companies and market conditions are considered.

3) Fair value of financial instruments that are not measured at fair value

Except as detailed in the following table, the Company considers that the carrying amounts of financial instruments in the consolidated financial statements that are not measured at fair value approximate their fair values.

Fair value hierarchy

The table below sets out the fair value hierarchy for the Company's financial assets and liabilities which are not required to be measured at fair value:

	December 31, 2020	
	Carrying Amount	Level 2 Fair Value
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Financial assets</u>		
Financial assets at amortized costs		
Corporate bonds	\$ 10,970.2	\$ 11,053.6
<u>Financial liabilities</u>		
Financial liabilities at amortized costs		
Bonds payable	\$ 256,705.1	\$ 257,551.2

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	December 31, 2021	
	Carrying Amount	Level 2 Fair Value
	NT\$	NT\$
	(In Millions)	(In Millions)
<u>Financial assets</u>		
Financial assets at amortized costs		
Corporate bonds	\$ 5,307.0	\$ 5,318.0
<u>Financial liabilities</u>		
Financial liabilities at amortized costs		
Bonds payable	\$ 614,470.7	\$ 613,514.7

Valuation techniques and assumptions used in Level 2 fair value measurement

The fair values of corporate bonds and the Company's bonds payable are determined by quoted market prices provided by third party pricing services.

34. RELATED PARTY TRANSACTIONS

Intercompany balances and transactions between TSMC and its subsidiaries, which are related parties of TSMC, have been eliminated upon consolidation; therefore, those items are not disclosed in this note. The following is a summary of significant transactions between the Company and other related parties:

a. Related party name and categories

Related Party Name	Related Party Categories
GUC	Associates
VIS	Associates
SSMC	Associates
Xintec	Associates
TSMC Education and Culture Foundation	Other related parties
TSMC Charity Foundation	Other related parties

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b. Net revenue

		Years Ended December 31		
		2019	2020	2021
		NT\$	NT\$	NT\$
		(In Millions)	(In Millions)	(In Millions)
<u>Item</u>	<u>Related Party Categories</u>			
Net revenue from sale of goods	Associates	\$ 6,253.9	\$ 8,129.8	\$ 8,475.9

c. Purchases

		Years Ended December 31		
		2019	2020	2021
		NT\$	NT\$	NT\$
		(In Millions)	(In Millions)	(In Millions)
<u>Related Party Categories</u>				
Associates		\$ 6,301.4	\$ 7,606.4	\$ 7,569.8

d. Receivables from related parties

		December 31,	December 31,
		2020	2021
		NT\$	NT\$
		(In Millions)	(In Millions)
<u>Item</u>	<u>Related Party Name/Categories</u>		
Receivables from related parties	GUC	\$ 370.6	\$ 597.8
	Xintec	187.5	117.5
		<u>\$ 558.1</u>	<u>\$ 715.3</u>
Other receivables from related parties	SSMC	\$ 45.3	\$ 50.4
	VIS	4.3	11.1
	Other associates	1.0	—
		<u>\$ 50.6</u>	<u>\$ 61.5</u>

e. Payables to related parties

		December 31,	December 31,
		2020	2021
		NT\$	NT\$
		(In Millions)	(In Millions)
<u>Item</u>	<u>Related Party Name/Categories</u>		
Payables to related parties	Xintec	\$ 1,358.6	\$ 725.3
	VIS	311.4	357.2
	SSMC	400.8	349.2
	Other associates	36.9	5.5
		<u>\$ 2,107.7</u>	<u>\$ 1,437.2</u>

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f. Accrued expenses and other current liabilities

		<u>December 31,</u> <u>2020</u>	<u>December 31,</u> <u>2021</u>
		NT\$	NT\$
		(In Millions)	(In Millions)
<u>Item</u>	<u>Related Party Categories</u>		
Contract liabilities	Associates	\$ —	\$ 726.4

g. Others

		<u>Years Ended December 31</u>		
		<u>2019</u>	<u>2020</u>	<u>2021</u>
		NT\$	NT\$	NT\$
		(In Millions)	(In Millions)	(In Millions)
<u>Item</u>	<u>Related Party Categories</u>			
Manufacturing expenses	Associates	\$ 2,823.0	\$ 5,440.0	\$ 5,459.9

The sales prices and payment terms to related parties were not significantly different from those of sales to third parties. For other related party transactions, price and terms were determined in accordance with mutual agreements.

The Company leased factory and office from associates. The lease terms and prices were both determined in accordance with mutual agreements. The rental expenses were paid to associates monthly; the related expenses were both classified under manufacturing expenses.

h. Compensation of key management personnel

The compensation to directors and other key management personnel were as follows:

	<u>Years Ended December 31</u>		
	<u>2019</u>	<u>2020</u>	<u>2021</u>
	NT\$	NT\$	NT\$
	(In Millions)	(In Millions)	(In Millions)
Short-term employee benefits	\$ 1,922.2	\$ 2,666.7	\$ 2,886.8
Post-employment benefits	2.7	2.3	2.9
	<u>\$ 1,924.9</u>	<u>\$ 2,669.0</u>	<u>\$ 2,889.7</u>

The compensation to directors and other key management personnel were determined by the Compensation Committee of TSMC in accordance with the individual performance and market trends.

35. PLEDGED ASSETS

The Company provided certificate of deposits recorded in other financial assets as collateral mainly for building construction, building lease agreements and energy purchase agreements. As of December 31, 2020 and 2021, the aforementioned other financial assets amounted to NT\$135.4 million and NT\$210.2 million, respectively.

36. SIGNIFICANT CONTINGENT LIABILITIES AND UNRECOGNIZED COMMITMENTS

Significant contingent liabilities and unrecognized commitments of the Company as of the end of the reporting period, excluding those disclosed in other notes, were as follows:

- a. Under a technical cooperation agreement with Industrial Technology Research Institute, the R.O.C. Government or its designee approved by TSMC can use up to 35% of TSMC's capacity provided TSMC's outstanding commitments to its customers are not prejudiced. The term of this agreement is for five years beginning from January 1, 1987 and is automatically renewed for successive periods of five years unless otherwise terminated by either party with one year prior notice. As of December 31, 2021, the R.O.C. Government did not invoke such right.
- b. Under a Shareholders Agreement entered into with Philips and EDB Investments Pte Ltd. on March 30, 1999, the parties formed a joint venture company, SSMC, which is an integrated circuit foundry in Singapore. TSMC's equity interest in SSMC was 32%. Nevertheless, in September 2006, Philips spun-off its semiconductor subsidiary which was renamed as NXP B.V. Further, TSMC and NXP B.V. purchased all the SSMC shares owned by EDB Investments Pte Ltd. pro rata according to the Shareholders Agreement on November 15, 2006. After the purchase, TSMC and NXP B.V. currently own approximately 39% and 61% of the SSMC shares, respectively. TSMC and NXP B.V. are required, in the aggregate, to purchase at least 70% of SSMC's capacity, but TSMC alone is not required to purchase more than 28% of the capacity. If any party defaults on the commitment and the capacity utilization of SSMC falls below a specific percentage of its capacity, the defaulting party is required to compensate SSMC for all related unavoidable costs. There was no default from the aforementioned commitment as of December 31, 2021.
- c. TSMC entered into long-term purchase agreements of materials and supplies and agreements of waste disposal with multiple suppliers. The relative minimum fulfillment quantity and price are specified in the agreements.
- d. TSMC entered into a long-term purchase agreement of equipment. The relative fulfillment quantity and price are specified in the agreement.
- e. TSMC entered into long-term energy purchase agreements with multiple suppliers. The relative fulfillment period, quantity and price are specified in the agreements.
- f. Amounts available under unused letters of credit as of December 31, 2020 and 2021 were NT\$56.2 million and NT\$136.7 million, respectively.

37. SIGNIFICANT OPERATION LOSSES

On January 19, 2019, the Company discovered a wafer contamination issue in a fab in Taiwan caused by a batch of unqualified photoresist materials. After investigation, the Company immediately stopped using the unqualified materials. An estimated loss of NT\$3,400.0 million related to this event was recognized in cost of revenue for the three months ended March 31, 2019.

38. OPERATING SEGMENTS INFORMATION

a. Operating segments, segment revenue and operating results

TSMC's chief operating decision makers periodically review operating results, focusing on operating income generated by foundry segment. Operating results are used for resource allocation and/or performance assessment. As a result, the Company has only one operating segment, the foundry segment. The foundry segment engages mainly in the manufacturing, sales, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing of masks.

The basis for the measurement of income from operations is the same as that for the preparation of financial statements. Please refer to the consolidated statements of comprehensive income for the related segment revenue and operating results.

b. Geographic and major customers' information were as follows:

1) Geographic information

	December 31,	December 31,
	2020	2021
	NT\$	NT\$
Noncurrent Assets	(In Millions)	(In Millions)
Taiwan	\$ 1,569,080.4	\$ 1,953,007.7
United States	9,455.5	41,208.7
China	34,456.4	41,895.2
Europe, the Middle East and Africa	174.2	143.9
Japan	327.2	1,011.0
Others	3.0	0.5
	<u>\$ 1,613,496.7</u>	<u>\$ 2,037,267.0</u>

Noncurrent assets include property, plant and equipment, right-of-use assets, intangible assets and other noncurrent assets.

2) Major customers representing at least 10% of net revenue

	Years Ended December 31					
	2019		2020		2021	
	Amount	%	Amount	%	Amount	%
	NT\$		NT\$		NT\$	
	(In Millions)		(In Millions)		(In Millions)	
Customer A	\$ 247,213.3	23	\$ 336,775.5	25	\$ 405,403.0	26
Customer B	NA (Note)	NA	NA	NA	153,740.8	10
Customer C	152,876.9	14	167,390.8	12	NA	NA

Note: Revenue less than 10% of the Company's net revenue.