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, 2019

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	**Republic of China**
(Translation of Registrant's Name Into English)	**(Jurisdiction of Incorporation or Organization)**

No. 8, Li-Hsin Road 6
Hsinchu Science Park
Hsinchu, 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, 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:

Title of Each Class	Trading Symbol(s)	Name of Each Exchange on Which Registered
Common Shares, par value NT$10.00 each*	**TSM**	**The New York Stock Exchange, Inc.**

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, 2019, 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 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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Taiwan Semiconductor Manufacturing Company Limited

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. 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:

- the volatility of the semiconductor and electronics industry;
- overcapacity in the semiconductor industry;
- outlook of the major and emerging end markets for our products, such as smartphones, high performance computing, Internet of things (“IoT”), automotive electronics and digital consumer electronics (“DCE”);
- 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;
- our ability to maintain control over expansion and facility modifications;
- our reliance on certain major customers;
- 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;
- 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;
- the political stability of our local region; and
- general local and global economic conditions.

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 5-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. 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.

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

Selected Financial and Operating Data

The selected consolidated statements of profit or loss and other comprehensive income data and other consolidated financial data for the years ended December 31, 2017, 2018 and 2019, and the selected consolidated statements of financial position data as of December 31, 2018 and 2019, set forth below, are derived from our audited consolidated financial statements included herein, and should be read in conjunction with, and are qualified in their entirety by reference to, these consolidated financial statements, including the notes thereto, which have been prepared in accordance with 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"). The selected consolidated statements of profit or loss and other comprehensive income data and other consolidated financial data for the years ended December 31, 2015 and 2016 and the selected consolidated statements of financial position data as of December 31, 2015, 2016 and 2017 set forth below are derived from our audited consolidated financial statements not included herein.

In addition to preparing financial statements in accordance with IFRSs included in this annual report, we also prepare financial statements in accordance with the IFRSs as adopted for use in Taiwan ("Taiwan-IFRSs"), which we are required to file with the Financial Supervisory Commission ("FSC") of the Republic of China ("R.O.C." or "Taiwan") and Taiwan Stock Exchange ("TWSE") under the applicable regulations and listing rules of TWSE. The English translation of such financial statements is furnished to the Securities and Exchange Commission ("SEC") on Form 6-K, which is not incorporated by reference to this or any of our previous annual reports on Form 20-F.

	Year ended and as of December 31,					
	2015	2016	2017	2018	2019	
	NT$	NT$	NT$	NT$	NT$	US$
	(in millions, except for earnings per share and per ADS)					
Consolidated Statements of Profit or Loss and Other Comprehensive Income Data:						
Net revenue	843,497	947,938	977,447	1,031,474	1,069,985	35,774
Cost of revenue	(433,117)	(473,077)	(482,616)	(533,488)	(577,286)	(19,301)
Gross profit before realized (unrealized) gross profit on sales to associates	410,380	474,861	494,831	497,986	492,699	16,473
Realized (unrealized) gross profit on sales to associates	15	(29)	(5)	(112)	3	—
Gross profit	410,395	474,832	494,826	497,874	492,702	16,473
Operating expenses	(88,467)	(96,904)	(107,902)	(112,149)	(119,505)	(3,995)
Other operating income and expenses, net	(1,880)	30	(1,365)	(2,101)	(496)	(17)
Income from operations	320,048	377,958	385,559	383,624	372,701	12,461
Non-operating income and expenses, net	30,430	7,964	10,603	13,919	17,161	574
Income before income tax	350,478	385,922	396,162	397,543	389,862	13,035
Income tax expense	(47,645)	(54,125)	(51,123)	(34,437)	(35,835)	(1,199)
Net income	302,833	331,797	345,039	363,106	354,027	11,836
Other comprehensive income (loss) for the year, net of income tax	(14,714)	(11,067)	(28,822)	9,837	(11,824)	(395)
Total comprehensive income for the year	288,119	320,730	316,217	372,943	342,203	11,441
Net income attributable to shareholders of the parent	302,851	331,714	344,998	363,053	353,948	11,834
Net income (loss) attributable to non-controlling interests	(18)	83	41	53	79	2
Total comprehensive income attributable to shareholders of the parent	288,145	320,653	316,182	372,887	342,125	11,438
Total comprehensive income (loss) attributable to non-controlling interests	(26)	77	35	56	78	3
Basic/Diluted earnings per share	11.68	12.79	13.30	14.00	13.65	0.46
Basic/Diluted earnings per ADS equivalent	58.40	63.96	66.52	70.01	68.25	2.28
Basic/Diluted weighted average shares outstanding	25,930	25,930	25,930	25,930	25,930	25,930

	2015	2016	2017	2018	2019	
	NT$	NT$	NT$	NT$	NT$	US$
	Year ended and as of December 31, (in millions, except for cash dividend per common share)					
Consolidated Statements of Financial Position Data:						
Current assets	746,744	817,729	857,203	951,680	822,614	27,503
Property, plant and equipment	853,470	997,778	1,062,543	1,072,050	1,352,377	45,215
Right-of-use assets(1)	—	—	—	—	17,233	576
Intangible assets	14,066	14,615	14,175	17,002	20,653	691
Deferred income tax assets	6,385	8,271	12,106	16,806	17,928	599
Total assets	1,657,397	1,886,297	1,991,732	2,090,031	2,264,725	75,718
Current liabilities	239,772	348,286	386,890	356,837	598,364	20,005
Guarantee deposits	21,565	14,670	7,587	3,353	177	6
Long-term bonds payable	191,965	153,094	91,800	56,900	25,100	839
Total liabilities	462,427	526,451	497,285	428,926	650,338	21,743
Capital stock	259,304	259,304	259,304	259,304	259,304	8,669
Equity attributable to shareholders of the parent	1,194,008	1,359,051	1,493,747	1,660,429	1,613,706	53,952
Non-controlling interests	962	795	700	676	681	23
Cash dividend paid per common share(2)	4.5	6.0	7.0	8.0	10.0	0.3

	2015	2016	2017	2018	2019	
	NT$	NT$	NT$	NT$	NT$	US$
	Year ended and as of December 31, (in millions, except for percentages and operating data)					
Other Consolidated Financial Data:						
Gross margin	48.7%	50.1%	50.6%	48.3%	46.0%	46.0%
Operating margin	37.9%	39.9%	39.4%	37.2%	34.8%	34.8%
Net margin	35.9%	35.0%	35.3%	35.2%	33.1%	33.1%
Capital expenditures	257,517	328,045	330,588	315,582	460,422	15,394
Depreciation and amortization	222,506	223,828	260,143	292,546	286,884	9,592
Cash generated by operating activities	529,879	539,835	585,318	573,954	615,139	20,566
Cash used in investing activities	(217,246)	(395,440)	(336,165)	(314,269)	(458,802)	(15,339)
Cash used in financing activities	(116,734)	(157,800)	(215,697)	(245,124)	(269,639)	(9,015)
Effect of exchange rate changes and others	8,341	(8,030)	(21,318)	9,862	(9,114)	(305)
Net increase (decrease) in cash	204,240	(21,435)	12,138	24,423	(122,416)	(4,093)
Operating Data:						
Wafer (12-inch equivalent) shipment(3)	8,763	9,606	10,449	10,752	10,068	10,068
Billing utilization rate(4)	93%	92%	91%	87%	81%	81%

(1) Starting from 2019, we applied the guidance of IFRS 16 "Leases" ("IFRS 16") and recognized right-of-use assets for all leases except for low-value asset leases and short-term leases. See note 4 to our consolidated financial statements included herein for further information regarding the initial application of IFRS 16.

(2) Prior to 2019, "Cash dividend paid per common share" was approved at our annual shareholders' meeting. In response to amendments to the Company Act in Taiwan, our shareholders approved amendments to our Articles of Incorporation at the annual shareholders' meeting held on June 5, 2019, authorizing our Board of Directors to distribute cash dividends on a quarterly basis. "Cash dividend paid per common share" in 2019 included cash dividend of NT$8.0 for 2018 and cash dividend of NT$2.0 for the first quarter of 2019. Please see "Item 8. Financial Information – Dividends and Dividend Policy" for a further discussion. The numbers are rounded to one decimal point.

(3) In thousands.

(4) "Billing utilization rate" is equal to annual wafer shipment divided by annual capacity. Annual capacity includes wafers committed by Vanguard International Semiconductor Corporation ("VIS") and Systems on Silicon Manufacturing Company Pte. Ltd. ("SSMC"). Please see "Item 7. Major Shareholders and Related Party Transactions – Related Party Transactions".

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. The translations from NT dollars to U.S. dollars and from U.S. dollars to NT dollars were made by the exchange rate as set forth in the statistical release of the Federal Reserve Board. Unless otherwise noted, all translations for the year 2019 were made at the exchange rate as of December 31, 2019, which was NT$29.91 to US$1.00.

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.

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 Securities and Exchange Commission, 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. Most recently, since 2018, there have been political and trade tensions among a number of the world's major economies. These tensions have resulted in the implementation of tariff and non-tariff trade barriers, including the use of export control restrictions against certain countries and individual companies. These trade barriers have been particularly impactful to the semiconductor industry and related markets. Prolonged or increased use of trade barriers may result in a decrease in the growth of global economy and 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 to target certain countries and companies, any expansion of the extraterritorial jurisdiction of export control laws, or complete or partial ban on semiconductor products sales to certain companies 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.

Any future systemic political, economic or financial crisis or market volatility, including but not limited to, interest rate fluctuation, 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. Thus, further escalation of trade tensions, the use of export control restrictions as a non-tariff trade barrier or any future global systemic crisis could materially and adversely affect our results of operations.

Our global manufacturing, design and sales activities subject us to risks associated with political, economic 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 would have a material impact on our operations, such as intellectual property, antitrust, export control, import restrictions, and trade barriers or disputes, as well as the general political, economic and social conditions, outbreak of war or hostilities, terrorism, security risks, social unrests, protests, strikes, health conditions and possible disruptions in transportation networks, in the various jurisdictions in which we operate, which could result in an adverse effect on our business operations in such jurisdictions and our results of operations as well as the market price and the liquidity of our ADSs and common shares. 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 have resulted in and could escalate trade barriers, including higher tariffs on certain products and other protectionist measures that could reduce overall consumer demand, increase our manufacturing costs and make our pricing less competitive. If and to the extent certain countries adopt further protectionist measures such as import and export controls, our ability to offer our products and services in some markets or source key materials may be limited, which may have adverse effects directly and indirectly on our sales.

Any U.S. law or government policy that encourages our U.S. customers to relocate their manufacturing capacity or supply chain to the U.S. 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 that are in close proximity to each other, 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. If these advantages are impaired or lost as a result of government policy or otherwise, 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 P.R.C. as occasions to depress general market prices of the securities of Taiwanese companies, including our own. Also, the R.O.C. government has not lifted some trade and investment restrictions imposed on Taiwanese companies on the amount and types of certain investments that can be made in P.R.C. Our plans, investment applications and/or any relevant regulatory approvals to establish or possibly expand operations in P.R.C. may be delayed, interrupted, suspended or cancelled due to unforeseeable social and political factors in R.O.C. or 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 electronics, 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 and current 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. If the ASP of end use applications continues decreasing, the pricing pressure on components produced by us may lead to a reduction of our revenue, margin and earnings.

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, 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 concentration of customers and competition (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 the yield problems in 12- 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. We have 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 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 subsidy, 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. 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 these new and aggressive competitors on technology, manufacturing capacity, product quality and customer satisfaction, we risk losing customers to these new contenders.

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. Because market conditions are dynamic, 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 subsequent demand increases rapidly in a short period of time, we may not be able to restore the capacity in a timely manner to take advantage of the upturn.

According to the market demand forecasts, we have recently been adding capacity to meet market needs for our products and services. Expansion of our capacity will increase our costs. For example, we will need to purchase additional equipment, hire additional personnel 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.

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 2017, 2018, and 2019 accounted for approximately 66%, 68%, and 71% of our net revenue in the respective year. Our largest customer in 2017, 2018, and 2019 accounted for 23%, 22%, and 23% of our net revenue in the respective year. Our second largest customer for each particular year accounted for less than 10% of our net revenue in 2017 as well as 2018, and 14% of our net revenue in 2019. 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, in order to respond to the new business model paradigm, we have seen the changes of nature in our customers' business models. For example, there is a growing trend toward the system companies developing their own designs 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 control 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, industry consolidation, changes in applicable regulatory restrictions, product designs, manufacturing sourcing 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 cyber attacks by third parties worldwide, our business and operations may be severely interrupted or even be 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 cyber attacks by any third party to gain unauthorized access to our internal network systems, to sabotage our operations and goodwill or otherwise. In the event of a serious cyber attack, our systems may lose important corporate data or our production lines may be shut down pending the resolution of such attack. 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. These cyber attacks may also attempt to steal our trade secrets and other sensitive information, such as proprietary information of our customers and other stakeholders and personal information of our employees.

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 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, among other things, leakage of employee, customer or third party information which we have an obligation to keep confidential.

We experienced and may be subject to attack onward by malicious software contained in the equipment we purchase and install. The cyber security risk management and solution enhancement actions have been taken continuously, such as building up an automated virus-scan system to prevent fab from installing virus infected tools, strengthening of firewall and network control to prevent computer viruses from spreading among tools and fabs, installation of proper anti-virus solutions for different computers, development and deployment of security monitor application to monitor and alert computer security issues, enhancement of computer vulnerability scan and patch updating, improving phishing email detection, employee awareness testing, external security risk assessments, and the establishment of an integrated and automatic security operation platform. While these ongoing enhancements further improved the cyber security defense solutions, there can be no assurance that we are immune to malicious software attacks.

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. Despite that we require the third party service providers to comply with the confidentiality and/or internet security requirements in our service agreements with them, there is no assurance that each of them will strictly fulfill such obligations, or at all. The on-site network systems of and the off-site cloud computing networks such as servers maintained by such service providers and/or its contractors are also subject to risks associated with cyber attacks. If we or our service providers are not able to timely resolve the respective technical difficulties caused by such cyber attacks, or ensure the integrity and availability of our data (and data belonging to our customers and other third parties) or 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 as a result.

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 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 are 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 as long as six months or more. To better manage our supply chain, we have implemented various business models and risk management contingencies with suppliers to shorten the procurement lead time. Further, the growing complexities especially in advanced lithographic technologies may delay the timely availability of the equipment and parts needed to exploit time sensitive business opportunities and also increase the market price for such equipment and parts. 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.

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 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. 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 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. These assertions have at times resulted in litigation. Because of the nature of the industry and our market position, we may continue to receive such communications in the future. We continue to face a number of assertions made and lawsuits initiated by litigious, well-funded, non-practicing entities who are aggressive in their monetary demand and in seeking court-issued injunctions. We also encounter, from time-to-time, assertions and litigations initiated by semiconductor companies seeking to disrupt our business such as the patent infringement lawsuits in August 2019 filed by GlobalFoundries ("GF") attempting to restrict our and our customers' activities in the United States and Germany. We responded with counter-lawsuits against GF for patent infringement in September 2019 targeting its manufacturing activities in the U.S., Germany, and Singapore. Shortly after, we reached an agreement with GF in October 2019 to dismiss all litigation between the parties, as well as those that involve any of our customers. 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, as we expanded our manufacturing operations into certain non-R.O.C jurisdictions, we have faced increasing challenges to manage 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 contagious diseases, 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, natural disasters and severe weather has been increasing, in part due to climate change or systemic regional geological changes. We have manufacturing and other operations in locations subject to 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 in electricity or water, or interruptions to our operations.

Thus, if one or more natural disasters that 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 and material impact on our operational and financial performance.

The recent 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 global semiconductor supply chains and those of our suppliers, including those in Asia, Europe and North America; (ii) downward pressure on our global customer demand; and (iii) potential production delays for our products due to forced factory or office closures or partial operation. On March 18, 2020, we announced that one of our employees had received a confirmed diagnosis of COVID-19, and has since recovered and been discharged from the hospital but remains under quarantine as of the date of this annual report. The Company has instituted various measures, including disinfection routines, self-quarantine, mandatory hygienic practices and segregated work teams. However, given the uncertainty surrounding the COVID-19 pandemic, we cannot predict that such measures will limit the spread of the virus in our workplace or whether our operations would be materially disrupted by the pandemic. As of the date of this annual report, our current business and results of operations have not been materially affected by the pandemic. However, depending on unfolding developments of the pandemic, we could face various risks, including those identified here and others. As the pandemic is still ongoing and may worsen, there is significant uncertainty surrounding its developments and impacts, including whether the current epidemic or continued spread of COVID-19 will cause an economic slowdown or a global recession, and we cannot predict at this time the impact it will have on our business or results of operations.

The recent COVID-19 pandemic has caused us to modify our business practices, including but not limited to health management of employees, customers and suppliers, management of production inventory, and supply chain risk management. We have formed an “Epidemic Prevention Committee” to identify, implement and monitor such actions as required by the dynamic exigencies arising from the pandemic. There is no certainty that such measures and others will be sufficient to mitigate the risks posed by COVID-19, and our ability to perform critical functions could be materially adversely affected.

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

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.

Future expansions of our operations in the R.O.C. could be limited by shortages in water and electricity, and the limited availability of commercial-use land.

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

The majority of our sales are denominated in U.S. dollar and over one-half of our capital expenditures are denominated in currencies other than NT dollar, primarily in U.S. dollar, Japanese yen and Euro. As a result, any significant fluctuations to our disadvantage in exchange rate of NT dollar against such currencies, in particular a weakening of U.S. dollar against NT dollar, would have an adverse impact on our revenue and operating profit as expressed in NT dollar. For example, every 1% depreciation of the U.S. dollar against the NT dollar would result in approximately 0.4 percentage point decrease in our operating margin based on our 2019 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.

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;
- 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 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 our pending antitrust proceeding or other similar 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 has asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We are cooperating with the European Commission to provide the requested information and documents. In light of the fact that this proceeding is still in its preliminary stage, it is premature to predict how the case will proceed, the outcome of the proceeding or its impact. Any adverse results of such proceeding or other similar proceedings that may arise in other jurisdictions 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.

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 based significantly 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. 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.

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 Taiwan, R.O.C. which owned 6.38% of TSMC's outstanding shares as of February 29, 2020, 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 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.

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 other semiconductors. We estimate that our revenue market segment share among total foundries worldwide was 52% in 2019. We also offer design, mask making, bumping, advanced packaging, and testing services.

We believe that our large 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, Hisilicon Technologies Co., Ltd., Intel Corporation, MediaTek Inc., NVIDIA Corporation, NXP Semiconductors N.V., Qualcomm Inc., Sony Corporation and Xilinx Inc.

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 814,532 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 2020 and December 2039. We have leased from the Central Taiwan Science Park Administration a parcel of land of approximately 564,619 square meters for our Taichung fabs under agreements that will be up for renewal between September 2029 and December 2034. We have leased from the Southern Taiwan Science Park Administration approximately 1,483,119 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 October 2039. 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. 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 with a resolution of 16-nanometer and below, and are one of the leaders in the semiconductor manufacturing industry generally. In 2019, we successfully commenced volume production of 7-nanometer Plus technology, which is an enhanced version of 7-nanometer, entered risk production of 5-nanometer technology, which is on track for volume production in 2020, and continued full development of 3-nanometer technology.

The following table lists our wafer fabs and those of our subsidiaries in operation as of February 29, 2020, 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
10	2004	8-inch	150
11	1998	8-inch	150
12	2001	12-inch	7

Fab[1]	Year of commencement of commercial production	Wafer size	The most advanced technology for volume production[2]
14	2004	12-inch	16
15	2012	12-inch	7
16	2018	12-inch	16

(1) Fabs 2, 3, 5, 8 and Fab 12 are located in Hsinchu Science Park. Fab 6 and Fab 14 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 2019 year-end.

In 2019, our annual capacity (in 12-inch equivalent wafers) was approximately 12.3 million wafers, compared to approximately 12.0 million wafers in 2018. This increase was primarily from the expansion of our 7-nanometer advanced technology.

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 2017, 2018, and 2019 were NT$330,588 million, NT$315,582 million, and NT$460,422 million (US$14,903 million, translated from a weighted average exchange rate of NT$30.90 to US$1.00), respectively. Our capital expenditures in 2020 are expected to be between US$15 billion to US$16 billion, which, depending on market conditions, may be adjusted later. Our capital expenditures for 2017, 2018, and 2019 were funded by operating cash flow. Our capital expenditures for 2020 are expected to be funded primarily by our operating cash flow and partially by the issuance of corporate bonds. In 2020, we anticipate our capital expenditures to focus primarily on the following:

- installing and expanding capacity, mainly for 5-nanometer and 3-nanometer nodes;
- expanding capacity for advanced packaging and mask operations;
- expanding buildings/facilities for Fab 18 in Southern Taiwan Science Park; and
- investing in research and development projects for new process technologies.

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

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 last three years:

	Year ended December 31,					
	2017		2018		2019	
Geography	Net Revenue[3]	Percentage	Net Revenue[3]	Percentage	Net Revenue[3]	Percentage
	(NT$ in millions, except percentages)					
North America	638,895	66%	637,051	62%	640,335	60%
China	110,201	11%	175,794	17%	208,101	20%
Asia Pacific[1]	98,676	10%	89,434	9%	96,512	9%
EMEA[2]	69,047	7%	71,069	7%	67,568	6%
Japan	60,628	6%	58,126	5%	57,469	5%
Total	977,447	100%	1,031,474	100%	1,069,985	100%

(1) China and Japan are excluded from Asia Pacific.
(2) EMEA stands for Europe, Middle East, and Africa.
(3) Commencing in 2018, we broke down our net revenue by geography based on a new method which associates most estimated sales returns and allowances with individual sales transactions, as opposed to the previous method which allocated sales returns and allowances based on gross revenue. We believe the new method provides a more relevant breakdown than the previous one. On a comparable basis, the classification of 2017 has been revised accordingly.

In 2019, our net revenue increased by NT$38,511 million from 2018, which was mainly due to an increase in orders from China of NT$32,307 million, or an 18% year-over-year increase, and from Asia Pacific of NT$7,078 million, or an 8% year-over-year increase. In 2018, our net revenue increased by NT$54,027 million from 2017, which was mainly due to an increase in orders from China of NT$65,593 million, or a 60% year-over-year increase, and from EMEA of NT$2,022 million, or a 3% year-over-year increase. The increase was partially offset by a decrease in orders from Asia Pacific of NT$9,242 million, or a 9% year-over-year decrease, and from Japan of NT$2,502 million, or a 4% year-over-year decrease.

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.

Commitments 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, we would engage in discussions with customers regarding their expected manufacturing requirements in advance of the placement of purchase orders.

Some of our customers have entered into arrangements with us to ensure that they have access to specified capacity. These arrangements are mostly in the form of deposit agreements, and advanced cash deposits are made by customers for specified capacity at our fabs. Deposits are generally refunded when the terms and conditions set forth in the deposit agreements are satisfied and shipments have been made. As of December 31, 2019, we held approximately US$50 million of deposit from customers to reserve future capacity. See note 22 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 all 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 using the CMOS and the BiCMOS processes. The CMOS process is currently the dominant semiconductor manufacturing process. The BiCMOS process combines the high speed of the bipolar circuitry and the low power consumption and high density of the CMOS circuitry. 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. The BiCMOS process is used to make high-end mixed-signal and other types of semiconductors.

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 principle platforms include:

Smartphone Platform: We offer leading process technologies such as 5-nanometer Fin Field-Effect Transistor ("FinFET"), 6-nanometer FinFET, 7-nanometer FinFET Plus, and 7-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 leading process technologies such as 12-nanometer FinFET compact technology ("12FFC"), 16-nanometer FinFET compact technology ("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, high-end, mid-end, and low-end product applications, we also offer the most competitive, leading-edge specialty technologies, including RF, embedded flash memory, emerging memory technologies, power management, sensors, and display chips as well as advanced packaging technologies such as the leading integrated fan-out ("InFO") technology.

High Performance Computing Platform: We provide customers with leading process technologies such as 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' high performance computing and communication requirements. We also offer multiple advanced packaging technologies such as chip on wafer on substrate ("CoWoS®"), InFO, and three-dimensional integrated circuits technologies to enable homogeneous and heterogeneous chip integration to meet customers' performance, power, and system footprint requirements. We will continue to optimize our High Performance Computing Platform offerings to help customers capture market growth driven by data explosion and application innovation.

Internet of Things ("IoT") Platform: We provide leading, comprehensive, and highly integrated ultra-low power ("ULP") technology platform to support innovations for IoT and wearable applications. Our industry-leading offerings, including 55-nanometer ULP, 40-nanometer ULP, 28-nanometer ULP, 22-nanometer ULP/ultra-low leakage ("ULL"), have been widely adopted by various IoT and wearable applications. We also extend our low Vdd (low operating voltage) offerings for extreme low-power applications. To support the ever-increasing demand in IoT edge computing and wireless connectivity, we also offer the most competitive and comprehensive leading-edge specialty technologies in RF, enhanced analog devices, embedded flash memory, emerging memory, sensors, and display chips, as well as multiple advanced packaging technologies including leading InFO technology.

Automotive Electronics Platform: We offer leading automotive technology to support the three megatrends – safer, smarter and greener – in the automotive industry. We are also the industry leader in providing a robust automotive IP ecosystem, which covers 16-nanometer FinFET first and extends to 7-nanometer FinFET and 5-nanometer FinFET, for advanced driver-assistance systems (ADAS) and advanced in-vehicle infotainment ("IVI"), the two most computationally demanding systems in the automotive industry. In addition to the advanced logic technology platform, we offer broad and competitive specialty technologies, including 28-nanometer embedded flash memory, 28-nanometer, 22-nanometer, and 16-nanometer millimeter wave RF, high sensitivity CMOS Image/Lidar (light detection and ranging) sensors, and power management IC technologies. Magnetic random access memory ("MRAM"), an emerging technology, is being developed with good progress to meet automotive Grade-1 requirements. All these automotive technologies are applied to our automotive process qualification standards based on AEC-Q100 standards.

Digital Consumer Electronics ("DCE") Platform: We provide customers with leading and comprehensive technologies to unleash innovation and enable advancement for DCE applications, including digital TV ("DTV"), set-top box ("STB"), digital still camera and associated wireless local area network ("WLAN"), power IC, timing controller ("T-CON") and so on. Our leading 16FFC/12FFC, 22ULP/22ULL and 28HPC+ technologies have been widely adopted by global leading 8K/4K DTV, 4K streaming STB and digital single-lens reflex ("DSLR") camera makers and so on. We will continue to drive more cost competitive technologies through die size shrink for customers' digital intensive chip designs, and to drive lower power consumption technologies for more cost-effective packaging.

The following table presents a breakdown of our net revenue by platform during the last three years:

	Year ended December 31,					
	2017		2018		2019	
Platform	**Net Revenue**	**Percentage**	**Net Revenue**	**Percentage**	**Net Revenue**	**Percentage**
	(NT$ in millions, except percentages)					
Smartphone	504,175	52%	466,452	45%	523,613	49%
High Performance Computing	265,394	27%	341,910	33%	315,822	30%
Internet of Things	51,776	5%	65,092	6%	86,343	8%
Automotive	43,871	5%	51,710	5%	47,914	4%

Platform	2017 Net Revenue	2017 Percentage	2018 Net Revenue	2018 Percentage	2019 Net Revenue	2019 Percentage
	Year ended December 31,					
	(NT$ in millions, except percentages)					
Digital Consumer Electronics	63,097	6%	58,470	6%	53,733	5%
Others	49,134	5%	47,840	5%	42,560	4%
Total	977,447	100%	1,031,474	100%	1,069,985	100%

(1) Commencing in 2019, we reported our net revenue breakdown by platform, instead of by application. We believe this change better represents our results. On a comparable basis, net revenue breakdowns of 2017 and 2018 by platform were provided accordingly.

The increase in our net revenue from 2018 to 2019 mainly came from the Smartphone Platform of NT$57,161 million, or a 12% year-over-year increase, and from the IoT Platform of NT$21,251 million, or a 33% year-over-year increase. The increase was partially offset by a decrease from the High Performance Computing Platform of NT$26,088 million, or an 8% year-over-year decrease. The increase in our net revenue from 2017 to 2018 mainly came from the High Performance Computing Platform of NT$76,516 million, or a 29% year-over-year increase, and from the IoT Platform of NT$13,316 million, or a 26% year-over-year increase. The increase was partially offset by a decrease from the Smartphone Platform of NT$37,723 million, or a 7% year-over-year decrease.

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 ("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 2019. In the design methodology area, we announced EDA and IP readiness of 5-nanometer, as well as continuous development of solutions to enhance power, performance and area ("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 covering a wide range of applications.

Multi-project Wafers 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 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 system-on-chip 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 system-on-chip supplier can enjoy reduced prototyping costs and greater confidence that the design will be successful.

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 customer's 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 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$80,733 million, NT$85,895 million and NT$91,419 million (US$3,056 million) in 2017, 2018 and 2019, respectively, on research and development, which represented 8.2%, 8.3% and 8.6% of our net revenue, respectively. We plan to continue to invest significant amounts on research and development in 2020, 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- and 7-nanometer technology for volume production, prior to the implementation of those advanced process technologies by many integrated device manufacturers and our competitors. In addition, we expect to advance our process technologies further down to 5- and 3-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, system-on-chip ("SoC"), derivatives and package/system-in-package ("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-related 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 continuously 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.

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, sputterers, 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. Raw materials costs constituted 12.0%, 12.4%, and 12.1% of our net revenue in 2017, 2018 and 2019, respectively. 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, and SUMCO Corporation of Japan. Together they supplied approximately 92.9%, 91.7%, and 91.5% of our total wafer needs in 2017, 2018 and 2019, 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 and the State Environmental Protection Administration of China, and local environmental protection authorities in Taiwan, the U.S. and China.

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. and China. 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.

Electricity and Water

We use electricity supplied by the Taiwan Power Company in our manufacturing process in Taiwan. We have occasionally suffered power outages or surges caused by difficulties encountered by the Taiwan Power Company, which have led 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 shortage 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 cyber attacks or epidemic 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 29, 2020, 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 29, 2020, 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 29, 2020, 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 29, 2020, 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. On November 20, 2015, we obtained an additional 42.7% beneficial equity interest in VisEra Technologies from OVT when OVT was acquired by a Chinese consortium. As of February 29, 2020, we owned approximately 86.9% of the equity interest in VisEra Technologies.

TSMC Global. In July 2006, we established TSMC Global in the British Virgin Islands. TSMC Global is a wholly-owned subsidiary primarily engaged in corporate treasury investment activities.

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 29, 2020, 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.

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, 2019 and 2018. For the discussion covering items for the fiscal year ended December 31, 2017 and a comparison between the fiscal years ended December 31, 2018 and 2017, please refer to "Item 5" of our annual report on Form 20-F for the fiscal year ended December 31, 2018 filed with the 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$1,031,474 million and NT$363,053 million in 2018, and NT$1,069,985 million (US$35,774 million) and NT$353,948 million (US$11,834 million) in 2019, respectively. Our net revenue in 2019 increased by 3.7% compared to 2018, mainly attributed to the growing demand for 7-nanometer products and the depreciation of NT dollar against the US dollar on a weighted average basis from 2018 to 2019, partially offset by the decline in demand for most mature technology products.

The principal source of our revenue is wafer fabrication, which accounted for approximately 87% of our net revenue in 2019. 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 migration; and
- fluctuation in foreign currency exchange rate.

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. The aggregate production capacity had been expanded to approximately 12 million 12-inch equivalent wafers in 2018 and 2019.

Technology Migration. 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 7-nanometer circuit resolutions. The table below presents a breakdown of wafer revenue by circuit resolution during the last three years:

	Year ended December 31,		
	2017	**2018**	**2019**
Resolution	**Percentage of total wafer revenue(1)**	**Percentage of total wafer revenue(1)**	**Percentage of total wafer revenue(1)**
7-nanometer	—	9%	27%
10-nanometer	10%	11%	3%
16-nanometer	22%	21%	20%
20-nanometer	3%	2%	1%
28-nanometer	23%	20%	16%
40/45-nanometer	12%	11%	10%
65-nanometer	10%	8%	8%
90-nanometer	4%	4%	3%
0.11/0.13 micron	3%	2%	2%
0.15/0.18 micron	10%	9%	8%
≥0.25 micron	3%	3%	2%
Total	100%	100%	100%

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

In 2019, the 7-nanometer revenue reached 27% of total wafer revenue. The 10-nanometer revenue was 3% and the 16-nanometer revenue represented 20% of total wafer revenue. Advanced technologies (16-nanometer and below) accounted for 50% of total wafer revenue, up from 41% in 2018.

In 2018, the 7-nanometer revenue reached 9% of total wafer revenue. The 10-nanometer revenue was 11% and the 16-nanometer revenue represented 21% of total wafer revenue. Advanced technologies (16-nanometer and below) accounted for 41% of total wafer revenue, up from 32% in 2017.

Foreign Currency Exchange Rate. The majority 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 NT dollar against U.S. dollar would have a significant impact on our reported revenue. NT dollar depreciation in 2019 had a favorable effect on our revenue, with weighted average exchange rates of NT dollar per U.S. dollar depreciating from NT$30.16 in 2018 to NT$30.90 in 2019.

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. 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. With the initial application of IFRS 15 “Revenue from Contracts with Customers” (“IFRS 15”) in 2018, 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. The initial application of IFRS 15 had no material impact on our revenue in 2018. See note 4 to our 2018 consolidated financial statements for further information regarding the initial application of IFRS 15.

Prior to 2018, we recognized revenue from the sale of goods when the goods are delivered and titles have passed, at which time all the following conditions are satisfied:

- We have transferred to the buyer the significant risks and rewards of ownership of the goods;
- We retain neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- The amount of revenue can be measured reliably;

- It is probable that the economic benefits associated with the transaction will flow to us; and
- The costs incurred or to be incurred in respect of the transaction can be measured reliably.

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. See note 4 to our consolidated financial statements included herein for further information regarding the initial application of IFRS 16.

Critical Accounting Policies and 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. 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 19 and note 24 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.

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 2018, we recognized an impairment loss of NT$423 million for certain machinery and equipment that was assessed to have no future use, and the recoverable amount of which was nil. In 2019, we recognized a reversal of impairment loss of NT$301 million (US$10 million) due to redeployment of certain idle machinery and equipment. As of December 31, 2018 and 2019, net tangible assets, right-of-use assets and intangible assets amounted to NT$1,083,257 million and NT$1,384,569 million (US$46,291 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, 2019, 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, 2018 and 2019, deferred tax assets were NT$16,806 million and NT$17,928 million (US$599 million), respectively. Deferred tax assets increased by NT$1,122 million in 2019, 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. See note 4 to our consolidated financial statements included herein for further information regarding the initial application of IFRS 16.

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,		
	2017	2018	2019
Net revenue	100.0%	100.0%	100.0%
Cost of revenue	(49.4)%	(51.7)%	(54.0)%
Gross profit	50.6%	48.3%	46.0%

	For the year ended December 31,		
	2017	2018	2019
Operating expenses			
Research and development	(8.2)%	(8.3)%	(8.6)%
General and administrative	(2.2)%	(2.0)%	(2.0)%
Marketing	(0.6)%	(0.6)%	(0.6)%
Total operating expenses	(11.0)%	(10.9)%	(11.2)%
Other operating income and expenses, net	(0.2)%	(0.2)%	0.0%
Income from operations	39.4%	37.2%	34.8%
Income before income tax	40.5%	38.5%	36.4%
Income tax expense	(5.2)%	(3.3)%	(3.3)%
Net income	35.3%	35.2%	33.1%
Other comprehensive income (loss) for the year, net of income tax	(2.9)%	1.0%	(1.1)%
Total comprehensive income for the year	32.4%	36.2%	32.0%
Net income attributable to shareholders of the parent	35.3%	35.2%	33.1%
Net income attributable to non-controlling interests	0.0%	0.0%	0.0%

Year to Year Comparisons

Net Revenue and Gross Margin

	For the year ended December 31,					
	2017	2018	% Change in NT$ from 2017	2019		% Change in NT$ from 2018
	NT$	NT$		NT$	US$	
	(in millions, except percentages)					
Net revenue	977,447	1,031,474	5.5%	1,069,985	35,774	3.7%
Cost of revenue	(482,616)	(533,488)	10.5%	(577,286)	(19,301)	8.2%
Gross profit before realized (unrealized) gross profit on sales to associates	494,831	497,986	0.6%	492,699	16,473	(1.1)%
Realized (unrealized) gross profit on sales to associates	(5)	(112)	2,140.0%	3	—	—
Gross profit	494,826	497,874	0.6%	492,702	16,473	(1.0)%
Gross margin percentage	50.6%	48.3%	—	46.0%	46.0%	—

Net Revenue

Our net revenue in 2019 increased by 3.7% from 2018, which was mainly attributed to 6.9% increase in average selling price due to higher advanced technology revenue weighting and 2.4% depreciation in NT dollar against US dollar, partially offset by 6.4% decrease in wafer shipments. We shipped approximately 10.1 million 12-inch equivalent wafers in 2019 compared to 10.8 million in 2018. Meanwhile, 7-nanometer accounted for 27% of our total wafer revenue in 2019 compared to 9% in 2018.

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 2019, our gross margin declined to 46.0% of net revenue from 48.3% in 2018, mainly attributed to lower capacity utilization, partially offset by a favorable exchange rate.

Operating Expenses

	For the year ended December 31,					
	2017	2018	% Change in NT$ from 2017	2019		% Change in NT$ from 2018
	NT$	NT$		NT$	US$	
	(in millions, except percentages)					
Research and development	80,733	85,895	6.4%	91,419	3,056	6.4%
General and administrative	21,197	20,266	(4.4)%	21,737	727	7.3%
Marketing	5,972	5,988	0.3%	6,349	212	6.0%
Total operating expenses	107,902	112,149	3.9%	119,505	3,995	6.6%
Percentage of net revenue	11.0%	10.9%	—	11.2%	11.2%	—
Other operating income and expenses, net	(1,365)	(2,101)	(53.9)%	(496)	(17)	76.4%
Income from operations	385,559	383,624	(0.5)%	372,701	12,461	(2.8)%
Operating Margin	39.4%	37.2%	—	34.8%	34.8%	—

Operating expenses increased by NT$7,356 million in 2019, or 6.6%, from NT$112,149 million in 2018.

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 expenditures increased by NT$5,524 million in 2019, or 6.4%, from NT$85,895 million in 2018. The increases in 2019 were mainly attributed to a higher level of research activities for 3-nanometer and 5-nanometer process technologies, as we continued to advance to smaller processing nodes, partially offset by a lower level of research activities for 7-nanometer compared to 2018. We plan to continue our investment in technology research and development in 2020.

General and Administrative and Marketing Expenses

General and administrative expenses in 2019 increased by NT$1,471 million, or 7.3%, from 2018, mainly reflecting higher fab opening expenses for 5-nanometer.

Other Operating Income and Expenses

Net loss from other operating income and expenses in 2019 narrowed by NT$1,605 million from 2018 to a net loss of NT$496 million, primarily attributed to the absence of NT$423 million impairment losses on property, plant and equipment recorded in 2018 and reversal of impairment losses on property, plant and equipment previously recognized of NT$301 million due to redeployment of certain idle machinery and equipment.

Non-Operating Income and Expenses

	For the year ended December 31,					
	2017	2018	% Change in NT$ from 2017	2019		% Change in NT$ from 2018
	NT$	NT$		NT$	US$	
	(in millions, except percentages)					
Share of profits of associates	3,015	3,091	2.5%	2,861	96	(7.4)%
Other income	9,610	14,853	54.6%	16,607	555	11.8%
Foreign exchange gain (loss), net	(1,509)	2,438	—	2,095	70	(14.1)%
Finance costs	(3,330)	(3,052)	(8.3)%	(3,251)	(109)	6.5%
Other gains and losses, net	2,817	(3,411)	(221.1)%	(1,151)	(38)	66.3%
Net non-operating income	10,603	13,919	31.3%	17,161	574	23.3%

Net non-operating income in 2019 increased by NT$3,242 million, or 23.3%, from NT$13,919 million in 2018, mainly due to a gain on disposal of financial assets of NT$538 million compared to a loss on disposal of financial assets of NT$989 million in 2018 and higher interest income of NT$1,495 million compared to 2018.

Income Tax Expense

	For the year ended December 31,					
	2017	2018	% Change in NT$ from 2017	2019		% Change in NT$ from 2018
	NT$	NT$		NT$	US$	
	(in millions, except percentages)					
Income tax expense	(51,123)	(34,437)	(32.6)%	(35,835)	(1,199)	4.1%
Net income	345,039	363,106	5.2%	354,027	11,836	(2.5)%
Net income attributable to shareholders of the parent	344,998	363,053	5.2%	353,948	11,834	(2.5)%
Net margin attributable to shareholders of the parent	35.3%	35.2%	—	33.1%	33.1%	—

Income tax expenses increased by NT$1,398 million in 2019, or 4.1%, from 2018. The increase was mainly related to lower income tax adjusting benefit for prior year in 2019, which resulted from reduction in the statutory rate of surtax imposed on unappropriated earnings from 10% to 5%. The increase was partially offset by lower surtax on 2019 unappropriated earnings, which was attributed to the new corporate policy to distribute cash dividends on a quarterly basis starting from 2019.

Liquidity and Capital Resources

Our sources of liquidity include cash flow from operations, cash and cash equivalents, and current portion of marketable financial assets. Issuance of corporate bonds is another source of fund as well.

Our primary source of liquidity is cash flow from operations. Cash flow from operations for 2019 was NT$615,139 million (US$20,566 million), an increase of NT$41,185 million from 2018.

Our cash, cash equivalents and current portion of marketable financial assets decreased to NT$583,449 million (US$19,507 million) as of December 31, 2019 from NT$695,182 million as of December 31, 2018. The current portion of marketable financial assets primarily consisted of fixed income securities.

We believe that our cash generated from operations, cash and cash equivalents, current portion of marketable financial assets, 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,			
	2017	2018	2019	
	NT$	NT$	NT$	US$
	(in millions)			
Net cash generated by operating activities	585,318	573,954	615,139	20,566
Net cash used in investing activities	(336,165)	(314,269)	(458,802)	(15,339)
Net cash used in financing activities	(215,697)	(245,124)	(269,639)	(9,015)
Effect of exchange rate changes on cash and cash equivalents	(21,318)	9,862	(9,114)	(305)
Net increase (decrease) in cash and cash equivalents	12,138	24,423	(122,416)	(4,093)

Cash and cash equivalents decreased by NT$122,416 million in 2019, following an increase of NT$24,423 million in 2018.

Operating Activities

In 2019, we generated NT$615,139 million (US$20,566 million) net cash from operating activities, as compared to NT$573,954 million in 2018. The net cash generated from operating activities was primarily from NT$389,862 million in income before income tax and NT$286,884 million in non-cash depreciation and amortization expenses, partially offset by income tax payment, change in working capital and others of NT$61,607 million. The decrease in depreciation and amortization expenses in 2019 was mainly related to the increment of fully depreciated investment in production capacity for previous technologies.

In 2018, net cash generated from operating activities was primarily from NT$397,543 million in income before income tax and NT$292,546 million in non-cash depreciation and amortization expenses, partially offset by income tax payment, change in working capital and others of NT$116,135 million. The increase in depreciation and amortization expenses in 2018 was mainly related to our investment in production capacity for advanced technologies.

Investing Activities

In 2019, net cash used in investing activities was NT$458,802 million (US$15,339 million), as compared to NT$314,269 million in 2018. The primary use of cash in investing activities in 2019 was for capital expenditures of NT$460,422 million.

In 2018, net cash used in investing activities was primarily for capital expenditures of NT$315,582 million.

Our capital expenditures for 2019 were primarily related to:

- installing and expanding capacity, mainly for 7-nanometer and 5-nanometer nodes;
- expanding capacity for advanced packaging and mask operations;
- establishing Fab 18 in Southern Taiwan Science Park; and
- investing in research and development projects for new process technologies.

Our capital expenditures for 2018 and 2019 were funded by operating cash flow. The capital expenditures for 2020 are expected to be funded mainly by our operating cash flow and partially by the issuance of corporate bonds. 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 2019, net cash used by financing activities was NT$269,639 million (US$9,015 million), as compared to net cash used of NT$245,124 million in 2018. The net cash used by financing activities in 2019 and 2018 were mainly for cash dividend payments and repayments of corporate bonds, partially offset by the increases in short-term loans.

As of December 31, 2019, our short-term loans were NT$118,522 million (US$3,963 million). A majority of the short-term loans were denominated in U.S. dollars. As a substantial portion of our receivables was denominated in U.S. dollars, we used short-term loans denominated in U.S. dollars to naturally hedge the fluctuation of foreign exchanges rates. See "Item 11. Quantitative and Qualitative Disclosures about Market Risks" for a discussion of the hedging instruments used. Our aggregate long-term debt was NT$56,900 million (US$1,902 million), of which NT$31,800 million (US$1,063 million) was classified as current. The long-term debt was NT dollar corporate bonds with fixed interest rates ranging from 1.35% to 2.10% and remaining maturity ranging from less than 1 year to 4 years.

Cash Requirements

The following table sets forth the maturity of our long-term debt, including relevant interest payments outstanding as of December 31, 2019:

	Long-term debt (in NT$ millions)
During 2020	32,339
During 2021	3,002
During 2022	4,776
During 2023	18,203
During 2024 and thereafter	—

The following table sets forth information on our material contractually obligated payments (including principals and interests) for the periods indicated as of December 31, 2019:

	Payments Due by Period				
Contractual Obligations	**Total**	**Less than 1 Year**	**1-3 Years**	**3-5 Years**	**More than 5 Years**
			(in NT$ millions)		
Short-Term Loans(1)	118,563	118,563	—	—	—
Long-Term Debt(2)	58,320	32,339	7,778	18,203	—
Capital Leases(3)	18,690	2,475	2,783	2,484	10,948
Non-Capital Leases(4)	1,534	1,534	—	—	—
Other Obligations(5)	1,499	1,499	—	—	—
Capital Purchase or Other Purchase Obligations(6)	314,726	307,898	6,828	—	—
Total Contractual Cash Obligations	513,332	464,308	17,389	20,687	10,948

(1) The maximum amount and average amount of short-term loans outstanding during the year ended December 31, 2019 were NT$119,232 million and NT$80,537 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. See 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 4, note 6, note 16, note 32 and note 34 to our consolidated financial statements.

(4) Non-capital leases represent short-term leases and low-value asset leases. See note 4 and note 16 to our consolidated financial statements for further information.

(5) Other obligations represent refundable customer deposit. See "Item 4. Information on The Company – Commitments by Customers" and note 22 to our consolidated financial statements for further information regarding deposit.

(6) 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, 2019, as we had not received related goods or taken title of the property.

During 2019, we used derivative financial instruments to partially hedge the currency exchange rate risk related to foreign-currency denominated receivables and payables and interest rate risk related to our fixed income investments. 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 34 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 2020 are expected to be between US$15 billion to US$16 billion, which, depending on market conditions, may be adjusted later.

Taxation

Effective from 2018, the R.O.C. Income Tax Law was amended, which abolished the imputation system, raised the corporate income tax rate from 17% to 20%, and reduced the rate of surtax imposed on unappropriated earnings from 10% to 5%. Effective from 2020, the R.O.C. Statute for Industrial Innovation was amended, which extends the tax incentive by 10 years for research and development ("R&D") expenditure. In addition, if a company uses its undistributed earnings to construct or purchase buildings, software or hardware equipment, or technology for use in production or operation, such investment amounts may be deducted from the undistributed earnings in calculation of the current year's undistributed earnings for assessment of surtax imposed on undistributed earnings from the year 2018. Pursuant to the regulation changes on R&D tax credit and undistributed earnings, we are eligible for a 10%~15% R&D tax credit. In addition, our capital expenditures could be deducted from the undistributed earnings 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.

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 12 (Phase IV) and part of Fab 14 (Phase III to VI) in 2014, part of Fab 12 (Phase IV to V) and part of Fab 14 (Phase III to IV) in 2015, and 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 2018 and 2019 were NT$33,088 million and NT$29,440 million (US$984 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.

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" became effective on July 1, 2015. Although certain of its relevant regulations have been promulgated since then, we expect to see more of its relevant regulations be 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 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 nine directors. Of our current nine directors, five are independent directors: Sir Peter L. Bonfield, Mr. Stan Shih, Ms. Kok-Choo Chen, Mr. Michael R. Splinter, and Mr. Moshe N. Gavrielov (who was elected as independent director at our 2019 annual general meeting of shareholders). We plan to elect a new independent director at the 2020 annual general meeting of shareholders. Our board of directors approved at its meeting in the first quarter of 2020 the nomination of Mr. Yancey Hai as a candidate for independent director. 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 R.O.C. Securities and Exchange Law, 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 Law, the R.O.C. Company Act and other laws applicable to the supervisors are also applicable to the audit committee. Pursuant to R.O.C. Securities and Exchange Law, 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). The Audit Committee is now composed entirely of independent directors. The Compensation Committee now comprises all five independent directors and one independent non-director member.

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 Taiwan, 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. Ms. Mei-ling Chen has been the representative of the National Development Fund since November 7, 2017.

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 29, 2020. 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	2021	26
C.C. Wei	Vice Chairman/ Chief Executive Officer	2021 / —	22
Mei-ling Chen	Director (Representative of the National Development Fund)	2021	3
F.C. Tseng	Director	2021	33
Sir Peter L. Bonfield	Independent Director	2021	18
Stan Shih	Independent Director	2021	20
Kok-Choo Chen	Independent Director	2021	9
Michael R. Splinter	Independent Director	2021	5
Moshe N. Gavrielov(1)	Independent Director	2021	1
Lora Ho	Senior Vice President, Europe & Asia Sales	—	21
Wei-Jen Lo	Senior Vice President, Research & Development/ Technology Development	—	16
Rick Cassidy	Senior Vice President, Corporate Strategy Office	—	23
Y.P. Chin	Senior Vice President, Operations/ Product Development	—	33
Y.J. Mii	Senior Vice President, Research & Development/ Technology Development	—	26
J.K. Lin	Senior Vice President, Information Technology and Materials Management & Risk Management	—	33
J.K. Wang	Senior Vice President, Operations/ Fab Operations	—	33
Cliff Hou	Vice President, Research & Development/ Technology Development	—	23
Sylvia Fang	Vice President, Legal and General Counsel/ Corporate Governance Officer	—	25
Connie Ma	Vice President, Human Resources	—	6
Y.L. Wang	Vice President, Operations/ Fab Operations	—	28
Doug Yu	Vice President, Research & Development/ Integrated Interconnect & Packaging	—	26
Alexander Kalnitsky	Vice President & TSMC Fellow, More-than-Moore Technologies	—	11
Kevin Zhang	Vice President, Business Development	—	4
T.S. Chang	Vice President & TSMC Fellow, Operations/ Product Development	—	25
Michael Wu	Vice President, Research & Development/ Platform Development	—	23
Min Cao	Vice President, Research & Development/ Pathfinding	—	18
H.-S. Philip Wong(2)	Vice President, Research & Development/ Corporate Research	—	2
Marvin Liao	Vice President, Operations/ Advanced Packaging Technology and Service	—	18
Y.H. Liaw	Vice President, Operations/ Fab Operations	—	32
Simon Jang	Vice President, Research & Development/ Advanced Tool and Module Development	—	27
Wendell Huang	Vice President, Finance and Chief Financial Officer/ Spokesperson	—	21

(1) Mr. Moshe N. Gavrielov was elected as our independent director at our 2019 annual general meeting of shareholders held on June 5, 2019.
(2) H.-S. Philip Wong resigned on April 1, 2020 and became a special consultant to TSMC.

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.

Mei-ling Chen, the representative of the National Development Fund, is a director. Dr. Mei-ling Chen is the Minister without Portfolio, R.O.C. Executive Yuan and concurrently Minister, National Development Council. She served as the Secretary-General of Executive Yuan from May 2016 to September 2017, the Secretary-General of Tainan City Government from 2010 to 2016, the Deputy Secretary-General of Executive Yuan from 2006 to 2008, the Chairperson of Legal Affairs Commission and concurrently Chairperson of Petition Reviewing Commission, Executive Yuan from 2002 to 2006, and the Director-General of Department of Legal Affairs, Ministry of Justice from 2000 to 2002. Dr. Chen was also an Associate Professor of Law at Chinese Culture University from 2008 to 2010. Dr. Chen holds a Ph.D. in Law from National Chengchi University.

F.C. Tseng is a director. Previously Dr. F.C. Tseng 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 also serves as an independent director, Chairman of Audit Committee and a member of Compensation Committee of Acer Inc. He formerly 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 48 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. He is currently the Chairman of the Board of Directors of NXP Semiconductor N.V. in the Netherlands. He is also a member of the Longreach Group Advisory Board. He also serves as a board mentor of CMi, a senior advisor to Alix Partners in London and a board member of EastWest Institute in New York. He is a fellow of The Royal Academy of Engineering and the Chair of Council and Senior Pro-Chancellor at Loughborough University in UK. He holds an honors degree in engineering from Loughborough University.

Stan Shih is an independent director. He is the co-founder and Chairman Emeritus of the Acer Group. He served as the Chairman and Chief Executive Officer of the Acer Group from 1976 to 2004. He is currently the Director and Honorary Chairman of Acer Inc., the Chairman of StanShih Foundation and Ambi Investment and Consulting Inc., and a director of Nan Shan Life Insurance Co., Ltd., Egis Technology Inc., Digitimes Inc. and Chinese Television System Inc. Mr. Shih holds a bachelor's degree, a master's degree and an honorary Ph.D. in electrical engineering from National Chiao Tung University. He also holds an honorary doctoral degree in technology from the Hong Kong Polytechnic University, an honorary fellowship from the University of Wales and an honorary doctoral degree in international law from the Thunderbird, American Graduate School of International Management.

Kok-Choo Chen is an independent director. Ms. 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. 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. 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. and Director of Pica8, Inc., Gogoro Inc. and Tigo Energy, Inc. He is also a General Partner of WISC Partners LP. and 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. 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. and Director of Foretellix, Ltd. Mr. Gavrielov holds a bachelor degree in electrical engineering and a master degree in computer science from Technion—Israel Institute of Technology.

Lora Ho is our Senior Vice President of Europe & Asia Sales. 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/ Technology 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, Corporate Strategy Office. 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 February 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/ Product Development. 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/ Technology 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 Operations/ Fab Operations. He was promoted to Senior Vice President of Operations in November 2018. Prior to that, 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.

Cliff Hou is our Vice President of Research & Development/ Technology Development. He was promoted to Vice President of Research & Development/ Design and Technology Platform in August 2011 and led the organization until his transfer to Technology Development. Prior to that, he was 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.

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. Prior to that, he was Vice President of Research & Development/ Technology Development from February 2016 to April 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 Research & Development/ Integrated Interconnect & Packaging. He was promoted to Vice President of Research & Development in November 2016. 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.

Alexander Kalnitsky is our Vice President & TSMC Fellow of More-than-Moore Technologies. Prior to that, he was Vice President of Research & Development from 2016 to 2018 since his promotion to the position in November 2016. He joined us in 2009 and was in charge of HV/Power/Analog/RF/CIS/MEMS processes development. He holds a Ph.D. in electrical engineering from Carleton University.

Kevin Zhang is our Vice President of Business Development. 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.

T.S. Chang is our Vice President & TSMC Fellow of Operations/ Product Development. He was promoted to Vice President of Operations/ Fab 12B in February 2018 and held the position until his transfer to Product Development in November 2018. Prior to that, he was our Senior Director of Fab 12B. 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.

H.-S. Philip Wong is our Vice President of Research & Development/ Corporate Research. Prior to joining us in 2018 as Vice President, he had served as Willard R. and Inez Kerr Bell Professor in the School of Engineering, Stanford University and Senior Manager at IBM Research. He holds a Ph.D. in Electrical Engineering from Lehigh 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. He was promoted to Vice President of Operations/ Fab 15B in February 2019 and held the position until his transfer to Fab Operations in June 2019. 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.

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.

There is no family relationship between any of the persons named above. Other than that one of our Directors, Ms. Mei-Ling Chen, 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.

Share Ownership

The following table sets forth certain information as of February 29, 2020 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	7,179,207	0.03%
Mei-Ling Chen, Director (Representative of the National Development Fund)[3]	1,653,709,980	6.38%
F.C. Tseng, Director	34,472,675	0.13%
Stan Shih, Independent Director	1,480,286	0.01%
Sir Peter L. Bonfield, Independent Director	—	—
Kok-Choo Chen, Independent Director	—	—
Michael R. Splinter, Independent Director	—	—
Moshe N. Gavrielov, Independent Director	—	—
Lora Ho, Senior Vice President	4,531,080	0.02%
Wei-Jen Lo, Senior Vice President	1,441,127	0.01%
Rick Cassidy, Senior Vice President	—	—
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	12,518,018	0.05%
J.K. Wang, Senior Vice President	2,553,947	0.01%
Cliff Hou, Vice President	366,351	0.00%
Sylvia Fang, Vice President & General Counsel/ Corporate Governance Officer	700,285	0.00%
Connie Ma, Vice President	139,000	0.00%
Y.L. Wang, Vice President	218,535	0.00%
Doug Yu, Vice President	225,000	0.00%
Alexander Kalnitsky, Vice President & TSMC Fellow	—	—
Kevin Zhang, Vice President	—	—
T.S. Chang, Vice President & TSMC Fellow	173,781	0.00%
Michael Wu, Vice President	478,501	0.00%

Name of Shareholders[1]	Number of Common Shares Owned[2]	Percentage of Outstanding Common Shares[2]
Min Cao, Vice President	363,152	0.00%
H.-S. Philip Wong, Vice President[4]	—	—
Marvin Liao, Vice President	50,485	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	1,651,418	0.01%

(1) None of our directors and executive officers owned any stock option as of February 29, 2020.

(2) Except for the number of shares held by the National Development Fund, Executive Yuan, 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 share owned by the directors and executive officers also did not include shares owned by their related parties. Each of these individuals owned less than one percent of all common shares outstanding as of February 29, 2020.

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

(4) H.-S. Philip Wong resigned on April 1, 2020 and became a special consultant to TSMC.

Compensation

According to our Articles of Incorporation, not more than 0.3 percent of our annual profits (defined under local law), 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 31 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 2019:

Name/Title	Fees Earned or Paid in Cash	Stock Awards	All Other Compensation[3]	Total	
	NT$	NT$	NT$	NT$	US$
		(in millions)			
Mark Liu, Chairman	291.9	—	1.6	293.4	9.8
F.C. Tseng, Director[1]	9.6	—	1.7	11.3	0.4
Mei-ling Chen, Director (Representative of National Development Fund, Executive Yuan)	9.6	—	—	9.6	0.3
Sir Peter L. Bonfield, Independent Director	14.8	—	—	14.8	0.5
Stan Shih, Independent Director	12.0	—	—	12.0	0.4
Kok-Choo Chen, Independent Director	12.0	—	—	12.0	0.4
Michael R. Splinter, Independent Director	14.8	—	—	14.8	0.5
Moshe N. Gavrielov, Independent Director[2]	8.5	—	—	8.5	0.3
Total	373.2	—	3.3	376.4	12.6

(1) In addition to the above, F.C. Tseng received NT$8.9 million of compensation from non-consolidated affiliates and NT$14.4 million of Advisor Fee from TSMC.

(2) Mr. Moshe N. Gavrielov was elected as TSMC's independent director at TSMC's Annual Shareholders' Meeting on June 5, 2019.

(3) 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.

Compensation Paid to Executive Officers[1]

The following table presents the compensation paid and benefits in kind granted to our executive officers in 2019:

Name/Title	Salary NT$	Bonus[4] NT$	Stock Awards NT$	All Other Compensation[5] NT$	Total NT$	Total US$
			(in millions)			
C.C. Wei, Chief Executive Officer	10.2	279.1	—	4.1	293.4	9.8
Wendell Huang, Vice President & Chief Financial Officer/ Spokesperson[2]	1.3	14.6	—	1.0	16.9	0.6
Lora Ho, Senior Vice President Wei-Jen Lo, Senior Vice President Rick Cassidy, 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 N.S. Tsai, Vice President[3] Irene Sun, Vice President[3] Cliff Hou, Vice President Sylvia Fang, Vice President & General Counsel/ Corporate Governance Officer Connie Ma, Vice President Y.L. Wang, Vice President Doug Yu, Vice President Alexander Kalnitsky, Vice President & TSMC Fellow Kevin Zhang, Vice President T.S. Chang, Vice President & TSMC Fellow Michael Wu, Vice President Min Cao, Vice President H.-S. Philip Wong, Vice President[3] Marvin Liao, Vice President Y.H. Liaw, Vice President[2] Simon Jang, Vice President[2]	99.4	1,094.3	—	41.6	1,235.4	41.3[6]
Total	111.0	1,388.0	—	46.8	1,545.7	51.7

(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) Wendell Huang, Y.H. Liaw and Simon Jang were promoted to Vice President in 2019. These amounts did not include compensation for the period before their promotion.

(3) N.S. Tsai and Irene Sun retired in 2019. H.-S. Philip Wong resigned on April 1, 2020 and became a special consultant to TSMC.

(4) Included cash bonus and profit sharing bonus.

(5) Included pensions funded according to applicable law and expenses for company cars. In accordance with TSMC Procedure of Retirement, we made the pension payment of NT$28 million to N.S. Tsai and Irene Sun.

(6) 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 five members comprising all of our independent directors. The members of the Audit Committee are Sir Peter L. Bonfield, the Chairman of our Audit Committee, Mr. Stan Shih, Ms. Kok-Choo Chen, Mr. Michael R. Splinter, and Mr. Moshe N. Gavrielov. 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, and personnel, as well as our 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 Law.

The Audit Committee convened four regular meetings and one special meeting in 2019. In addition to these meetings, the Audit Committee members and consultant participated in four 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 our IT operations 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 our IT operations, 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.

The members of the Compensation Committee are appointed by the Board as required by R.O.C. law. 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 five independent directors and Mr. Yancey Hai, the Chairman of Delta Electronics, Inc., an independent non-director member who was appointed pursuant to R.O.C. law. The members of the Compensation Committee are Mr. Michael R. Splinter, the Chairman of our Compensation Committee, Sir Peter L. Bonfield, Mr. Stan Shih, Ms. Kok-Choo Chen, Mr. Moshe N. Gavrielov and Mr. Yancey Hai.

The Compensation Committee convened four regular meetings in 2019.

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, 2017	2018	2019
Managers	5,107	5,294	5,364
Professionals	21,895	22,285	24,416
Assistant Engineers/Clericals	4,082	4,109	4,357
Technicians	17,518	17,064	17,160
Total	48,602	48,752	51,297

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, 2017	2018	2019
Hsinchu Science Park, Taiwan	24,488	23,998	24,442
Southern Taiwan Science Park, Taiwan	10,276	11,157	12,771
Central Taiwan Science Park, Taiwan	6,825	6,868	7,333
Taoyuan County, Taiwan	1,804	1,482	1,475
China	3,598	3,634	3,679
North America	1,522	1,522	1,513
Europe	54	55	50
Japan	32	33	32
Korea	3	3	2
Total	48,602	48,752	51,297

As of December 31, 2019, our total employee population was 51,297 with an educational makeup of 4.5% Ph.Ds, 44.7% masters, 25.3% university bachelors, 10.6% college degrees and 14.8% others. Among this employee population, 58.1% 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 2018 and 2019, we distributed an employees' cash bonus of NT$23,570 million and an annual employees' cash profit sharing bonus of NT$23,570 million to our employees in relation to year 2018 profits. In 2019 and 2020, we distributed an employees' cash bonus of NT$23,166 million (US$775 million) to our employees in relation to year 2019 profits. Annual employees' cash profit sharing bonus of NT$23,166 million (US$775 million) in relation to year 2019 profits will be distributed in July 2020.

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.

ITEM 7. MAJOR SHAREHOLDERS AND RELATED PARTY TRANSACTIONS

Major Shareholders

The following table sets forth certain information as of February 29, 2020, 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.

Names of Shareholders	Number of Common Shares Owned	Percentage of Total Outstanding Common Shares
National Development Fund, Executive Yuan	1,653,709,980	6.38%
Capital World Investors[(1)]	1,336,913,550	5.16%
BlackRock, Inc.[(2)]	1,335,216,856	5.15%
Directors and executive officers as a group[(3)]	90,097,198	0.35%

(1) According to the Schedule 13G of Capital World Investors filed with the Securities and Exchange Commission on February 14, 2020, Capital World Investors divisions of Capital Research and Management Company and Capital International Limited collectively provide investment management services under the name Capital World Investors. Capital World Investors is deemed to be the beneficial owner of the number of common shares listed above. We do not have further information with respect to Capital World Investors' ownership in us subsequent to its Schedule 13G filed on February 14, 2020.

(2) According to the Schedule 13G of BlackRock, Inc. filed with the Securities and Exchange Commission on February 6, 2020, 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 6, 2020.

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

As of February 29, 2020, a total of 25,930,380,458 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 29, 2020, 5,325,454,093 common shares were registered in the name of a nominee of Citibank, N.A., the depositary under our ADS deposit agreement. Citibank, N.A., advised us that, as of February 29, 2020, 1,065,090,813 ADSs, representing 5,325,454,093 common shares, were held of record by Cede & Co. and 169 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 29, 2020, we owned approximately 28.3% of the equity interest in VIS.

On April 1, 2004, we entered into an agreement with VIS with an initial term of two years. During the term of this agreement, 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 within a specified range of wafers per month. Pursuant to its terms, upon expiration of its initial two-year term, this agreement is to be automatically renewed for additional one year periods unless earlier terminated by the parties. This Agreement has been so renewed per its terms. We pay VIS at a fixed discount to the actual selling price as mutually agreed between the parties in respect of each purchase order. In 2019, we had total purchases of NT$3,093 million (US$103 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. In 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.

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 2019, we had total purchases of NT$3,209 million (US$107 million) from SSMC, representing 0.6% 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 29, 2020, we owned approximately 34.8% of the equity interest in GUC.

In 2019, we had total sales of NT$5,654 million (US$189 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 29, 2020, we owned approximately 41.0% of the equity interest in Xintec.

In 2019, we incurred total manufacturing expenses of NT$2,823 million (US$94 million) from Xintec, representing 0.5% 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

As is the case with many companies in the semiconductor industry, we have received from time to time communications from third parties asserting that our technologies, our manufacturing processes, or the design of the semiconductors made by us or the use of those semiconductors by our customers may infringe upon their patents or other intellectual property rights. These assertions have at times resulted in litigation by or against us and settlement payments by us. Irrespective of the validity of these claims, we could incur significant costs in the defense thereof or could suffer adverse effects on our operations. We are also subject to antitrust compliance requirements and scrutiny by governmental regulators in multiple jurisdictions. Any adverse results of such proceeding or other similar proceedings that may arise in those jurisdictions 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.

On September 28, 2017, we were contacted by the European Commission, which has asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We are cooperating with the European Commission to provide the requested information and documents. In light of the fact that this proceeding is still in its preliminary stage, it is premature to predict how the case will proceed, the outcome of the proceeding or its impact.

In February 2019, Innovative Foundry Technologies LLC ("IFT") filed a complaint in the U.S. District Court for the District of Delaware alleging that TSMC and TSMC Technology Inc. infringe five U.S. patents. IFT also filed a complaint in the U.S. International Trade Commission (the "ITC") alleging that TSMC, TSMC North America, TSMC Technology Inc., and other companies infringe the same patents. The ITC instituted an investigation in March 2019. Both parties agreed to end the dispute and the ITC terminated the investigation in October 2019. The pending litigation in the U.S. District Court for the District of Delaware was dismissed at the same time.

Other than the matters described above, we were not a party to any other material litigation as of December 31, 2019 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. law, we will not pay dividends or make other distributions to shareholders when there are no earnings. The R.O.C. Company Act also requires that 10% of annual net income (less prior years' losses and outstanding taxes) be set aside as legal reserve until the accumulated legal reserve equals our paid-in capital. Our profits may be distributed by way of cash dividend, stock dividend, or a combination of cash and stock. Pursuant to our Articles of Incorporations, 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.

On February 19, 2019, our board of directors adopted a proposal recommending distribution of a 2018 cash dividend of NT$8 per common share, which was approved by the annual general meeting of shareholders on June 5, 2019. In the same meeting, shareholders also approved the amendments to our Articles of Incorporation to authorize our board of directors to approve quarterly cash dividends after the close of each quarter, after which the dividend will be distributed within six months. In the subsequent board meetings, our board of directors approved quarterly cash dividends, of which the respective amounts and payment dates are demonstrated in the table below.

Period	Approved Date	Payment Date	Cash Dividends Per Share (NT$)	Total Amount (NT$)
2018	June 5, 2019	July 18, 2019	8.00	207,443,043,664
First quarter of 2019	June 5, 2019	October 17, 2019	2.00	51,860,760,916
Second quarter of 2019	August 13, 2019	January 16, 2020	2.50	64,825,951,145
Third quarter of 2019	November 12, 2019	April 16, 2020	2.50	64,825,951,145
Fourth quarter of 2019	February 11, 2020	July 16, 2020	2.50	64,825,951,145

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 New York Stock Exchange 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 Law 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 both as of December 31, 2019 and February 29, 2020. No employee stock options were outstanding as of December 31, 2019 and February 29, 2020.

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 Law 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.

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 Law 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 Law, 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, 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.

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 or (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.

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 Law, 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 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; and (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, managers 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 Law (i) requires each director, supervisor, manager or shareholder, together with its/his/her spouse, minor children or 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 its/his/her spouse, minor children or 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 its/his/her respective spouse, minor children or nominees, per day. The above sale and transfer of shares can be made only after that person (as well as its/his/her respective spouse, minor children or 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.

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 and recognized 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 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.

Depositary 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 depositary receipts. Depositary 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 depositary 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 New York Stock Exchange, 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 depositary 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 depositary 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 depositary receipt facility the shares represented by the depositary receipts to the extent permitted under the deposit agreement (for depositary receipts representing existing shares, immediately after the issuance of the depositary receipts; and for depositary receipts representing new shares, in practice four to seven business days after the issuance of the depositary receipts) and transfer the shares to the holder.

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

- dividends or free distributions of shares;

- the exercise by holders of existing depositary 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 depositary bank on the Taiwan Stock Exchange or the Taipei Exchange (as applicable) or held by such person for deposit in the depositary 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 depositary receipts created under the circumstances described in the first two clauses above. Issuances of additional depositary receipts under the circumstances described in the third clause above will be permitted to the extent that previously issued depositary receipts have been canceled and the underlying shares have been withdrawn from the depositary 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.

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 depositary 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 depositary receipts, proceeds of the sale of shares received as stock dividends and deposited into the depositary receipt facility and any cash dividends or cash distributions received. In addition, a depositary, also without any of these approvals, may convert inward remittances of payments into NT dollars for purchases of underlying shares for deposit into the depositary receipt facility against the creation of additional depositary receipts. A depositary 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 depositary receipts withdrawn from the depositary receipt facility may be converted into other currencies without obtaining Central Bank of the Republic of China (Taiwan) approval. Proceeds from the sale of the underlying shares withdrawn from the depositary 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 depositary receipt facility) overseas.

Overseas Corporate Bonds

Since 1989, the R.O.C. FSC has approved a series of overseas 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 depositary 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 to register medium- and long-term foreign debt with the Central Bank of the Republic of China (Taiwan).

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.

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 depositary 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 depositary 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 Securities Exchange Commission 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 depositary 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 depositary bank, in the form required by the depositary 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 depositary 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 depositary 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.

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 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 and Poland 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 to U.S. holders (as defined below) 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
- persons whose functional currency is not the U.S. dollar.

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.

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.

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 New York Stock Exchange or another established securities market in the United States. Our ADSs are listed on the New York Stock Exchange, 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.

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,
- 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.

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.

Information with Respect to Foreign Financial Assets

Individuals that own "specified foreign financial assets" with an aggregate value in excess of US$50,000 will generally 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 that are individuals should consult their tax advisors regarding the application of these rules to their ownership of common shares or ADSs.

Documents on Display

The 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 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: The majority of our revenue is denominated in U.S. dollar and over one-half of our capital expenditures are denominated in currencies other than NT dollar, primarily in U.S. dollar, Japanese yen and Euro. As a result, any significant fluctuations to our disadvantage in exchange rate of NT dollar against such currencies, in particular a weakening of U.S. dollar against NT dollar, would have an adverse impact on our revenue and operating profit as expressed in NT dollar.

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. We also utilize U.S. dollar-denominated debt to partially offset currency risk arising from U.S. dollar-denominated receivables for balance sheet hedges. 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 on December 31, 2019, a hypothetical adverse foreign currency exchange rate change of 10% would have decreased our net income by NT$2,137 million (US$71 million) and decreased our other comprehensive income by NT$108 million (US$4 million), after taking into account hedges and offsetting positions. For further information, please refer to note 8, note 11 and note 34 to the consolidated financial statements.

Interest Rate Risks: We are exposed to interest rate risks primarily related 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 interest paid on our debt.

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 securities to be investment grade 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 and 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, while cash and cash equivalents as well as floating-rate securities may generate less interest income than predicted if interest rates fall.

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

Based on a sensitivity analysis performed on our fixed income investments with an aggregate carrying amount of NT$135,086 million (US$4,516 million) as of December 31, 2019, a hypothetical adverse interest rate change of 100 basis points across all maturities would have decreased our net income by approximately NT$1 million (US$0.03 million) and our other comprehensive income by NT$3,517 million (US$118 million), after taking into account interest rate hedges. For further information, please refer to note 8, note 9, note 10, note 11 and note 34 to the consolidated financial statements.

As of December 31, 2019, we had outstanding floating- and fixed-rate debt with varying maturities for an aggregate carrying amount of NT$175,422 million (US$5,865 million). All of our short-term debt are floating-rate, hence a rise in interest rates may incur higher interest expense than predicted; all of our long-term debt are fixed-rate and measured at amortized cost. As such, changes in interest rates would not affect the future cash flows and the fair value. For further information, please refer to note 18, note 20 and note 34 to the consolidated financial statements.

Certain of our fixed income investments and short-term debt are primarily based on the London Interbank Offered Rate ("LIBOR"), which is expected to be replaced by other benchmark rate after 2021. We cannot predict the consequences and timing of these developments, and if such transition may cause a reduction in our interest income and/or an increase in our interest expense.

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, 2019, we had investments in private equity securities mostly through a number of investment funds with a carrying value of NT$4,124 million (US$138 million). Based on a sensitivity analysis performed on our equity investments as of December 31, 2019, a hypothetical adverse price change of 10% would have decreased our other comprehensive income by approximately NT$402 million (US$13 million). The actual disposal value of these investments may be significantly different from their carrying value. For further information, please refer to note 34 to the consolidated financial statements.

ITEM 12D. DESCRIPTION OF SECURITIES OTHER THAN EQUITY SECURITIES

Depositary 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 depositary 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

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

Depositary Payment

In 2019, we received reimbursement of proxy related expenses (printing, postage and distribution) of US$118,462 from Citibank, N.A., the Depositary 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 Securities Exchange Act of 1934, 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, 2019.

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 2019, 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, 2019 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 2019, 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, 2019, 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, 2019, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

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, 2019, of the Company and our report dated April 15, 2020, expressed an unqualified opinion on those 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 the 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
The Republic of China
April 15, 2020

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.

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 and its affiliated firms (the "Deloitte Entities") for the years ended December 31, 2018 and 2019.

	2018	2019
	NT$	NT$
	(In thousands)	
Audit Fees	55,323	63,920
All Other Fees	—	83
Total	55,323	64,003

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 FSC of the R.O.C.

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 2018 and 2019 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

Not applicable.

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 Law, and also TSMC's Articles of Incorporation. Also, because TSMC securities are registered with the U.S. Securities and Exchange Commission ("U.S. SEC") and are listed on the New York Stock Exchange ("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
NYSE Section 303A.01 requires a NYSE-listed company to have a majority of independent directors on its board of directors.	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.
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).	Taiwan law establishes comparable standards to evaluate director independence. For further information, please consult TSMC's Taiwan annual report for the relevant year.
NYSE Section 303A.03 requires non-management directors to meet at regularly scheduled executive meetings that are not attended by management.	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.
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.	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.
NYSE Section 303A.05(a) requires listed companies to have a compensation committee comprised entirely of independent directors.	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.

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.	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.
NYSE Section 303A.06 requires listed companies to have an audit committee that satisfies the requirements of Rule 10A-3 under the Securities Exchange Act of 1934 (the Exchange Act). Foreign private issuers must satisfy the requirements of Rule 10A-3 under the Exchange Act by July 31, 2005.	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.
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.	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.
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 SEC.	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.
NYSE Section 303A.07(a) All members of the audit committee are required to be independent.	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.
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.	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.
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.	TSMC's written audit committee charter establishes the same audit committee objectives.
NYSE Section 303A.07(b)(iii)(G) requires an audit committee to establish clear policies for hiring external auditor's employees.	Taiwan law does not contain such requirement.

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.	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).
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.	Taiwan law imposes a similar requirement. TSMC currently does not have any equity based compensation plan. 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.
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.)	Taiwan law does not contain such requirement. Under Taiwan law, if a listed company has voluntarily adopted corporate governance guidelines, it must inform investors how to access such guidelines.
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.	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 will comply with TWSE's new requirement accordingly.
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.	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.
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.	Taiwan law does not contain such a requirement. But, in order to comply with relevant 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.
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.	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).
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.	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).

ITEM 16H. MINE SAFETY DISCLOSURE

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 on page F-1.

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	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 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[(1)]	Rules for Election of Directors, as amended and restated on June 12, 2012.
3.2	Rules and Procedures of Board of Directors Meetings, as amended and restated on May 14, 2019.
3.3[(2)]	Rules and Procedures of Shareholders' Meetings, as amended and restated on May 7, 2002. (P)
4.1[(10)]	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[(11)]	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	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[(4)]	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[(5)]	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[(9)]	Land Lease with Hsinchu Science Park Administration relating to Fab 8 (effective March 15, 2017 to March 14, 2037) (English summary).
4.7	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[(6)]	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[(4)]	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[(4)]	Land Lease with Hsinchu Science Park Administration relating to Fabs 3 (effective May 16, 2013 to December 31, 2032) (English summary).
4.12[(7)]	Land Lease with Hsinchu Science Park Administration relating to Fab 12 and Corporate Headquarters (Phase II) (effective May 1, 2001 to December 31, 2020) (English summary).

4.13[1] 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[4] 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[4] 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[4] 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[4] 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[4] 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[4] 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[4] 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[4] Land Lease with Hsinchu Science Park Administration relating to Fab 12 (Phase IV and Phase V) (effective November 10, 2007 to December 31, 2026) (English summary).

4.23[4] Land Lease with Hsinchu Science Park Administration relating to Fab 12 (Phase VI) (effective August 20, 2010 to December 31, 2028) (English summary).

4.24[4] Land Lease with Hsinchu Science Park Administration relating to Fab 12 (Phase VII) (effective March 17, 2011 to December 31, 2027) (English summary).

4.25[4] 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[4] 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 Land Lease with Hsinchu Science Park Administration relating to Fab 8 (effective May 15, 2019 to December 31, 2038) (English summary).

4.28[8] Land Lease with Hsinchu Science Park Administration relating to Fab 12 (effective December 1, 2014 to December 31, 2033) (English summary).

4.29[8] 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[8] 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[5] 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[5] 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[5]	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[5]	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[10]	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[10]	Land Lease with Hsinchu Science Park Administration relating to F12(Phase VII) (effective February 1, 2017 to January 31, 2037) (English summary)
4.37[11]	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)
4.38	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)
4.39	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)
4.40	Land Lease with Hsinchu Science Park Administration relating to new R&D Center (effective February 5, 2020 to December 31, 2039) (English summary)
8.1	Subsidiaries of Taiwan Semiconductor Manufacturing Company Ltd.
12.1	Certification of Chief Executive Officer required by Rule 13a-14(a) under the Exchange Act.
12.2	Certification of Chief Financial Officer required by Rule 13a-14(a) under the Exchange Act.
13.1	Certification of Chief Executive Officer required by Rule 13a-14(b) under the Exchange Act.
13.2	Certification of Chief Financial Officer required by Rule 13a-14(b) under the Exchange Act.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

(1) 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.
(2) 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.
(3) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 1999, filed by TSMC on June 29, 2000.
(4) 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.
(5) 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.
(6) 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.
(7) Previously filed in TSMC's annual report on Form 20-F for the fiscal year ended December 31, 2003, filed by TSMC on May 28, 2004.
(8) 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.
(9) 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.
(10) 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.
(11) 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.
(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 15, 2020

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED

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

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

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, 2018 and 2019, 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, 2019, 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, 2018 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, 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, 2019, 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 15, 2020, 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.

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 understand 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 EUI/CIP at year end 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 at year end.
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
The Republic of China

April 15, 2020

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)

	Notes	December 31, 2018	December 31, 2019	
		NT$	NT$	US$ (Note 3)
ASSETS				
CURRENT ASSETS				
Cash and cash equivalents	7	$ 577,814.6	$ 455,399.3	$ 15,225.7
Financial assets at fair value through profit or loss	8	3,504.6	326.8	10.9
Financial assets at fair value through other comprehensive income	9	99,561.7	127,396.6	4,259.3
Financial assets at amortized cost	10	14,277.6	299.9	10.0
Hedging financial assets	11	23.5	25.9	0.9
Notes and accounts receivable, net	12	128,613.4	138,908.6	4,644.2
Receivables from related parties	35	584.4	862.1	28.8
Other receivables from related parties	35	65.0	51.6	1.7
Inventories	6, 13, 38	103,231.0	82,981.2	2,774.4
Other financial assets	36	18,597.5	11,041.1	369.2
Other current assets		5,406.4	5,320.8	177.9
Total current assets		951,679.7	822,613.9	27,503.0
NONCURRENT ASSETS				
Financial assets at fair value through other comprehensive income	9	3,910.7	4,124.3	137.9
Financial assets at amortized cost	10	7,528.3	7,348.9	245.7
Investments accounted for using equity method	14	17,769.0	18,618.8	622.5
Property, plant and equipment	6, 15	1,072,050.3	1,352,377.4	45,214.9
Right-of-use assets	6, 16	—	17,232.4	576.1
Intangible assets	6, 17	17,002.1	20,653.0	690.5
Deferred income tax assets	6, 29	16,806.4	17,928.4	599.4
Refundable deposits		1,700.1	2,085.0	69.7
Other noncurrent assets		1,584.6	1,742.9	58.3
Total noncurrent assets		1,138,351.5	1,442,111.1	48,215.0
TOTAL		$ 2,090,031.2	$ 2,264,725.0	$ 75,718.0

(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, 2018	December 31, 2019	
		NT$	NT$	US$ (Note 3)
LIABILITIES AND EQUITY				
CURRENT LIABILITIES				
Short-term loans	18, 32	$ 88,754.7	$ 118,522.3	$ 3,962.6
Financial liabilities at fair value through profit or loss	8	40.8	982.3	32.8
Hedging financial liabilities	11	155.8	1.8	0.1
Accounts payable		32,980.9	38,771.1	1,296.3
Payables to related parties	35	1,376.5	1,434.9	48.0
Salary and bonus payable		14,471.4	16,272.3	544.0
Accrued profit sharing bonus to employees and compensation to directors and supervisors	31	23,981.1	23,648.9	790.7
Payables to contractors and equipment suppliers		43,133.7	140,810.7	4,707.8
Cash dividends payable	23	—	129,652.0	4,334.7
Income tax payable	6, 29	55,281.6	40,094.3	1,340.5
Long-term liabilities - current portion	20, 32	34,900.0	31,800.0	1,063.2
Accrued expenses and other current liabilities	6, 16, 22, 24, 32	61,760.6	56,373.2	1,884.8
Total current liabilities		356,837.1	598,363.8	20,005.5
NONCURRENT LIABILITIES				
Bonds payable	20, 32	56,900.0	25,100.0	839.2
Deferred income tax liabilities	6, 29	233.3	344.4	11.5
Lease liabilities	6, 16, 32	—	15,041.8	502.9
Net defined benefit liability	21	9,651.4	9,182.5	307.0
Guarantee deposits	22, 32	3,353.3	176.9	5.9
Others		1,951.0	2,128.3	71.2
Total noncurrent liabilities		72,089.0	51,973.9	1,737.7
Total liabilities		428,926.1	650,337.7	21,743.2
EQUITY ATTRIBUTABLE TO SHAREHOLDERS OF THE PARENT				
Capital stock	23	259,303.8	259,303.8	8,669.5
Capital surplus	23	56,316.0	56,339.7	1,883.6
Retained earnings	23			
Appropriated as legal capital reserve		276,033.9	311,147.0	10,402.8
Appropriated as special capital reserve		26,907.5	10,675.1	356.9
Unappropriated earnings		1,057,317.5	1,003,808.3	33,560.9
		1,360,258.9	1,325,630.4	44,320.6
Others	23	(15,449.9)	(27,568.3)	(921.7)
Equity attributable to shareholders of the parent		1,660,428.8	1,613,705.6	53,952.0
NON - CONTROLLING INTERESTS		676.3	681.7	22.8
Total equity		1,661,105.1	1,614,387.3	53,974.8
TOTAL		$ 2,090,031.2	$ 2,264,725.0	$ 75,718.0

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)

	Notes	2017	2018	2019	
		NT$	NT$	NT$	US$ (Note 3)
NET REVENUE	6, 24, 35, 39	$977,447.2	$1,031,473.6	$1,069,985.4	$35,773.5
COST OF REVENUE	6, 13, 31, 35, 38	482,616.2	533,487.5	577,286.9	19,300.8
GROSS PROFIT BEFORE REALIZED (UNREALIZED) GROSS PROFIT ON SALES TO ASSOCIATES		494,831.0	497,986.1	492,698.5	16,472.7
REALIZED (UNREALIZED) GROSS PROFIT ON SALES TO ASSOCIATES		(4.6)	(111.8)	3.4	0.1
GROSS PROFIT		494,826.4	497,874.3	492,701.9	16,472.8
OPERATING EXPENSES	6, 31, 35				
Research and development		80,732.5	85,895.6	91,418.7	3,056.5
General and administrative		21,196.7	20,265.9	21,737.2	726.7
Marketing		5,972.5	5,987.8	6,348.6	212.2
Total operating expenses		107,901.7	112,149.3	119,504.5	3,995.4
OTHER OPERATING INCOME AND EXPENSES, NET	15, 16, 17, 25, 31	(1,365.5)	(2,101.5)	(496.3)	(16.6)
INCOME FROM OPERATIONS	39	385,559.2	383,623.5	372,701.1	12,460.8
NON-OPERATING INCOME AND EXPENSES					
Share of profits of associates		3,014.8	3,090.6	2,861.0	95.7
Other income	26	9,610.3	14,852.8	16,606.7	555.2
Foreign exchange gain (loss), net		(1,509.5)	2,438.2	2,095.2	70.0
Finance costs	27	(3,330.3)	(3,051.2)	(3,250.9)	(108.7)
Other gains and losses, net	28	2,817.4	(3,410.8)	(1,151.0)	(38.5)
Total non-operating income and expenses		10,602.7	13,919.6	17,161.0	573.7
INCOME BEFORE INCOME TAX		396,161.9	397,543.1	389,862.1	13,034.5
INCOME TAX EXPENSE	6, 29	51,122.9	34,436.9	35,835.1	1,198.1
NET INCOME		345,039.0	363,106.2	354,027.0	11,836.4
OTHER COMPREHENSIVE INCOME (LOSS)	6, 21, 23, 29				
Items that will not be reclassified subsequently to profit or loss:					
Remeasurement of defined benefit obligation		(254.7)	(861.2)	253.9	8.5
Unrealized loss on investments in equity instruments at fair value through other comprehensive income		—	(3,309.1)	334.3	11.2
Gain (loss) on hedging instruments		—	41.0	(109.6)	(3.7)
Share of other comprehensive loss of associates		(20.9)	(14.2)	(18.2)	(0.6)
Income tax benefit (expense) related to items that will not be reclassified subsequently		30.6	195.7	(21.0)	(0.7)
		(245.0)	(3,947.8)	439.4	14.7

(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)

	Notes	2017	2018	2019	
		NT$	NT$	NT$	US$ (Note 3)
Items that may be reclassified subsequently to profit or loss:					
Exchange differences arising on translation of foreign operations		$ (28,259.6)	$ 14,562.4	$ (14,689.1)	$ (491.1)
Changes in fair value of available-for-sale financial assets		(218.8)	—	—	—
Cash flow hedges		4.7	—	—	—
Unrealized loss on investments in debt instruments at fair value through other comprehensive income		—	(870.9)	2,566.4	85.8
Share of other comprehensive income (loss) of associates		(99.4)	93.3	(140.2)	(4.7)
Income tax expense related to items that may be reclassified subsequently		(3.5)	—	—	—
		(28,576.6)	13,784.8	(12,262.9)	(410.0)
Other comprehensive income (loss) for the year, net of income tax		(28,821.6)	9,837.0	(11,823.5)	(395.3)
TOTAL COMPREHENSIVE INCOME FOR THE YEAR		$ 316,217.4	$ 372,943.2	$342,203.5	$11,441.1
NET INCOME ATTRIBUTABLE TO:					
Shareholders of the parent		$ 344,998.3	$ 363,052.7	$353,948.0	$11,833.8
Non-controlling interests		40.7	53.5	79.0	2.6
		$ 345,039.0	$ 363,106.2	$354,027.0	$11,836.4
TOTAL COMPREHENSIVE INCOME ATTRIBUTABLE TO:					
Shareholders of the parent		$ 316,181.8	$ 372,886.8	$342,124.9	$11,438.5
Non-controlling interests		35.6	56.4	78.6	2.6
		$ 316,217.4	$ 372,943.2	$342,203.5	$11,441.1

	Notes	2017 Income Attributable to Shareholders of the Parent	2018 Income Attributable to Shareholders of the Parent	2019 Income Attributable to Shareholders of the Parent	
		NT$	NT$	NT$	US$ (Note 3)
EARNINGS PER SHARE	30				
Basic earnings per share		$ 13.30	$ 14.00	$ 13.65	$ 0.46
Diluted earnings per share		$ 13.30	$ 14.00	$ 13.65	$ 0.46
EARNINGS PER EQUIVALENT ADS					
Basic earnings per share		$ 66.52	$ 70.01	$ 68.25	$ 2.28
Diluted earnings per share		$ 66.52	$ 70.01	$ 68.25	$ 2.28

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

(Concluded)

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

	Capital Stock - Common Stock: Shares (In Millions)	Capital Stock - Common Stock: Amount	Capital Surplus	Retained Earnings: Legal Capital Reserve	Retained Earnings: Special Capital Reserve	Retained Earnings: Unappropriated Earnings	Retained Earnings: Total	Others: Foreign Currency Translation Reserve	Others: Unrealized Gain/Loss from Available-for-sale Financial Assets	Others: Unrealized Gain/Loss on Financial Assets at Fair Value Through Other Comprehensive Income	Others: Cash Flow Hedges Reserve	Others: Gain (Loss) on Hedging Instruments	Others: Stock - Based Employee Compensation	Others: Total	Total	Non-controlling Interests	Total Equity
BALANCE, JANUARY 1, 2017	25,930.3	$ 259,303.8	$56,272.3	$ 208,298.0	$ —	$ 833,512.7	$1,041,810.7	$ 1,661.2	$ 2.6	$ —	$ 0.1	$ —	$ —	$ 1,663.9	$1,359,050.7	$ 795.1	$1,359,845.8
Appropriations of earnings																	
Legal capital reserve	—	—	—	33,424.7	—	(33,424.7)	—	—	—	—	—	—	—	—	—	—	—
Cash dividends to shareholders	—	—	—	—	—	(181,512.7)	(181,512.7)	—	—	—	—	—	—	—	(181,512.7)	—	(181,512.7)
Total	—	—	—	33,424.7	—	(214,937.4)	(181,512.7)	—	—	—	—	—	—	—	(181,512.7)	—	(181,512.7)
Net income in 2017	—	—	—	—	—	344,998.3	344,998.3	—	—	—	—	—	—	—	344,998.3	40.7	345,039.0
Other comprehensive income (loss) in 2017, net of income tax	—	—	—	—	—	(245.0)	(245.0)	(28,358.9)	(216.7)	—	4.1	—	—	(28,571.5)	(28,816.5)	(5.1)	(28,821.6)
Total comprehensive income (loss) in 2017	—	—	—	—	—	344,753.3	344,753.3	(28,358.9)	(216.7)	—	4.1	—	—	(28,571.5)	316,181.8	35.6	316,217.4
Adjustments to share of changes in equities of associates	—	—	7.1	—	—	—	—	—	—	—	—	—	(10.3)	(10.3)	(3.2)	—	(3.2)
From share of changes in equities of subsidiaries	—	—	11.0	—	—	—	—	—	—	—	—	—	—	—	11.0	(11.0)	—
Donation from shareholders	—	—	19.2	—	—	—	—	—	—	—	—	—	—	—	19.2	1.7	20.9
Decrease in non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(113.7)	(113.7)
Effect of disposal of subsidiary	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(8.0)	(8.0)
BALANCE, DECEMBER 31, 2017	25,930.3	259,303.8	56,309.6	241,722.7	—	963,328.6	1,205,051.3	(26,697.7)	(214.1)	—	4.2	—	(10.3)	(26,917.9)	1,493,746.8	699.7	1,494,446.5
Effect of retrospective application	—	—	—	—	—	1,556.3	1,556.3	—	214.1	(524.9)	(4.2)	4.2	—	(310.8)	1,245.5	0.3	1,245.8
ADJUSTED BALANCE, JANUARY 1, 2018	25,930.3	$ 259,303.8	$56,309.6	$ 241,722.7	$ —	$ 964,884.9	$1,206,607.6	$(26,697.7)	$ —	$ (524.9)	$ —	$ 4.2	$ (10.3)	$(27,228.7)	$1,494,992.3	$ 700.0	$1,495,692.3
Appropriations of earnings																	
Legal capital reserve	—	—	—	34,311.2	—	(34,311.2)	—	—	—	—	—	—	—	—	—	—	—
Special capital reserve	—	—	—	—	26,907.5	(26,907.5)	—	—	—	—	—	—	—	—	—	—	—
Cash dividends to shareholders	—	—	—	—	—	(207,443.0)	(207,443.0)	—	—	—	—	—	—	—	(207,443.0)	—	(207,443.0)
Total	—	—	—	34,311.2	26,907.5	(268,661.7)	(207,443.0)	—	—	—	—	—	—	—	(207,443.0)	—	(207,443.0)
Net income in 2018	—	—	—	—	—	363,052.7	363,052.7	—	—	—	—	—	—	—	363,052.7	53.5	363,106.2
Other comprehensive income (loss) in 2018, net of income tax	—	—	—	—	—	(765.3)	(765.3)	14,655.3	—	(4,097.5)	—	41.6	—	10,599.4	9,834.1	2.9	9,837.0
Total comprehensive income (loss) in 2018	—	—	—	—	—	362,287.4	362,287.4	14,655.3	—	(4,097.5)	—	41.6	—	10,599.4	372,886.8	56.4	372,943.2
Disposal of investments in equity instruments at fair value through other comprehensive income	—	—	—	—	—	(1,193.1)	(1,193.1)	—	—	1,193.1	—	—	—	1,193.1	—	—	—
Basis adjustment for loss on hedging instruments	—	—	—	—	—	—	—	—	—	—	—	(22.2)	—	(22.2)	(22.2)	—	(22.2)
Adjustments to share of changes in equities of associates	—	—	(6.4)	—	—	—	—	—	—	—	—	—	8.5	8.5	2.1	—	2.1
From share of changes in equities of subsidiaries	—	—	2.7	—	—	—	—	—	—	—	—	—	—	—	2.7	(2.7)	—
Donation from shareholders	—	—	10.1	—	—	—	—	—	—	—	—	—	—	—	10.1	—	10.1
Decrease in non-controlling interests	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(77.4)	(77.4)
BALANCE, DECEMBER 31, 2018	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	$1,614,387.3
BALANCE, DECEMBER 31, 2019 (IN MILLIONS OF US$ - Note 3)		$ 8,669.5	$ 1,883.6	$ 10,402.8	$ 356.9	$ 33,560.9	$ 44,320.6	$ (898.4)	$ —	$ (23.2)	$ —	$ (0.1)	$ —	$ (921.7)	$ 53,952.0	$ 22.8	$ 53,974.8

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)

	2017	2018	2019	
	NT$	NT$	NT$	US$ (Note 3)
CASH FLOWS FROM OPERATING ACTIVITIES				
Income before income tax	$396,161.9	$397,543.1	$389,862.1	$13,034.5
Adjustments for:				
Depreciation expense	255,796.0	288,124.9	281,411.8	9,408.6
Amortization expense	4,346.7	4,421.4	5,472.4	183.0
Expected credit losses recognized (reversal) on investments in debt instruments	—	(2.4)	1.7	0.1
Finance costs	3,330.3	3,051.2	3,250.9	108.7
Share of profits of associates	(3,014.8)	(3,090.6)	(2,861.0)	(95.7)
Interest income	(9,464.7)	(14,694.4)	(16,189.4)	(541.2)
Share-based compensation	—	—	2.8	0.1
Loss on disposal or retirement of property, plant and equipment, net	1,097.9	1,005.6	950.0	31.8
Loss (gain) on disposal of intangible assets, net	—	(0.4)	2.4	0.1
Impairment loss (reversal of impairment loss) on property, plant and equipment	—	423.5	(301.4)	(10.1)
Impairment loss on intangible assets	13.5	—	—	—
Impairment loss on financial assets	29.6	—	—	—
Loss on financial instruments at fair value through profit or loss, net	—	358.2	955.7	32.0
Loss (gain) on disposal of investments in debt instruments at fair value through other comprehensive income, net	—	989.1	(537.8)	(18.0)
Gain on disposal of available-for-sale financial assets, net	(89.8)	—	—	—
Loss (gain) from disposal of subsidiaries	(17.3)	—	4.6	0.2
Unrealized (realized) gross profit on sales to associates	4.6	111.8	(3.4)	(0.1)
Loss (gain) on foreign exchange, net	(9,118.6)	2,916.7	(5,228.2)	(174.8)
Dividend income	(145.6)	(158.4)	(417.3)	(14.0)
Loss (gain) arising from fair value hedges, net	30.3	2.3	(13.1)	(0.4)
Gain on lease modification	—	—	(2.1)	(0.1)
Changes in operating assets and liabilities:				
Financial instruments at fair value through profit or loss	5,645.1	480.1	848.8	28.4
Notes and accounts receivable, net	1,061.8	(13,271.3)	(18,119.6)	(605.8)
Receivables from related parties	(214.6)	599.7	(277.7)	(9.3)
Other receivables from related parties	(13.9)	106.1	13.4	0.4
Inventories	(25,229.1)	(29,370.0)	20,249.8	677.0
Other financial assets	(502.3)	(4,601.3)	3,383.5	113.1
Other current assets	12.1	(513.0)	(76.3)	(2.6)
Other noncurrent assets	(1,276.1)	152.6	—	—
Accounts payable	2,572.1	4,540.6	5,860.1	195.9
Payables to related parties	394.2	(279.9)	58.4	2.0
Salary and bonus payable	582.1	216.5	1,800.9	60.2
Accrued profit sharing bonus to employees and compensation to directors and supervisors	525.1	562.0	(332.2)	(11.1)
Accrued expenses and other current liabilities	30,435.4	(20,226.4)	(2,372.0)	(79.3)

(Continued)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

CONSOLIDATED STATEMENTS OF CASH FLOWS
(In Millions of New Taiwan Dollars or U.S. Dollars)

	2017	2018	2019	
	NT$	NT$	NT$	US$ (Note 3)
Provisions	$ (4,057.9)	$ —	$ —	$ —
Net defined benefit liability	44.6	(60.5)	(215.0)	(7.2)
Cash generated from operations	648,938.6	619,336.8	667,182.8	22,306.4
Income taxes paid	(63,620.4)	(45,382.5)	(52,044.1)	(1,740.0)
Net cash generated by operating activities	585,318.2	573,954.3	615,138.7	20,566.4
CASH FLOWS FROM INVESTING ACTIVITIES				
Acquisitions of:				
Financial instruments at fair value through profit or loss	—	(310.5)	(124.7)	(4.2)
Financial assets at fair value through other comprehensive income	—	(96,412.8)	(257,558.2)	(8,611.1)
Available-for-sale financial assets	(101,824.0)	—	—	—
Held-to maturity financial assets	(1,997.1)	—	—	—
Financial assets at amortized cost	—	(2,294.1)	(313.9)	(10.5)
Property, plant and equipment	(330,588.2)	(315,581.9)	(460,422.2)	(15,393.6)
Intangible assets	(4,480.6)	(7,100.3)	(9,329.9)	(311.9)
Land use right	(819.7)	—	—	—
Proceeds from disposal or redemption of:				
Financial instruments at fair value through profit or loss - debt instruments	—	487.2	2,418.2	80.9
Financial assets at fair value through other comprehensive income	—	86,639.3	230,444.5	7,704.6
Available-for-sale financial assets	69,538.9	—	—	—
Held-to maturity financial assets	17,980.6	—	—	—
Financial assets at amortized cost	—	2,032.4	14,349.2	479.7
Property, plant and equipment	326.2	181.5	287.3	9.6
Intangible assets	—	0.5	—	—
Proceeds from return of capital of investments in equity instruments at fair value through other comprehensive income	—	127.9	1.1	—
Proceeds from return of capital of available-for-sale financial assets	14.8	—	—	—
Derecognition of hedging derivative financial instruments	33.0	—	—	—
Derecognition of hedging financial instruments	—	250.5	(436.6)	(14.6)
Interest received	9,526.3	14,660.4	16,875.0	564.2
Proceeds from government grants - property, plant and equipment	2,629.8	—	2,565.3	85.8
Proceeds from government grants - land use right and others	1.8	—	850.6	28.4
Cash outflow from disposal of subsidiary	(4.1)	—	—	—
Other dividends received	145.6	158.4	320.2	10.7
Dividends received from investments accounted for using equity method	4,245.8	3,262.9	1,719.0	57.5
Refundable deposits paid	(1,327.0)	(2,227.5)	(1,465.8)	(49.0)
Refundable deposits refunded	433.0	1,857.2	1,019.3	34.1
Net cash used in investing activities	(336,164.9)	(314,268.9)	(458,801.6)	(15,339.4)

(Continued)

Taiwan Semiconductor Manufacturing Company Limited and Subsidiaries

CONSOLIDATED STATEMENTS OF CASH FLOWS
(In Millions of New Taiwan Dollars or U.S. Dollars)

	2017	2018	2019	
	NT$	NT$	NT$	US$ (Note 3)
CASH FLOWS FROM FINANCING ACTIVITIES				
Increase in short-term loans	$ 10,394.3	$ 23,923.0	$ 31,804.3	$ 1,063.3
Repayment of bonds	(38,100.0)	(58,024.9)	(34,900.0)	(1,166.8)
Repayment of long-term bank loans	(31.4)	—	—	—
Repayment of the principal portion of lease liabilities	—	—	(2,930.6)	(98.0)
Interest paid	(3,482.7)	(3,233.4)	(3,597.1)	(120.3)
Guarantee deposits received	950.9	1,668.9	62.2	2.1
Guarantee deposits refunded	(3,823.2)	(1,948.1)	(701.3)	(23.4)
Cash dividends	(181,512.7)	(207,443.0)	(259,303.8)	(8,669.5)
Donation from shareholders	20.9	10.1	4.0	0.1
Decrease in non-controlling interests	(113.7)	(77.4)	(75.9)	(2.5)
Net cash used in financing activities	(215,697.6)	(245,124.8)	(269,638.2)	(9,015.0)
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	(21,317.8)	9,862.3	(9,114.2)	(304.7)
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	12,137.9	24,422.9	(122,415.3)	(4,092.7)
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	541,253.8	553,391.7	577,814.6	19,318.4
CASH AND CASH EQUIVALENTS, END OF YEAR	$ 553,391.7	$ 577,814.6	$ 455,399.3	$15,225.7

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

(Concluded)

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, selling, 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 15, 2020.

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 Unites States, which was NT$29.91 to US$1.00 as of December 31, 2019. 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

New, Revised or Amended Standards and Interpretations	Effective Date Issued by IASB
Annual Improvements to IFRSs 2015-2017 Cycle	January 1, 2019
Amendments to IFRS 9 "Prepayment Features with Negative Compensation"	January 1, 2019
IFRS 16 "Leases"	January 1, 2019
Amendments to IAS 19 "Plan Amendment, Curtailment or Settlement"	January 1, 2019 (Note)
Amendments to IAS 28 "Long-term Interests in Associates and Joint Ventures"	January 1, 2019
IFRIC 23 "Uncertainty over Income Tax Treatments"	January 1, 2019

Note: The Company shall apply these amendments to plan amendments, curtailments or settlements occurring on or after January 1, 2019.

Except for the following, the Company believes that the adoption of aforementioned standards or interpretations did not have a significant effect on the Company's accounting policies:

1) IFRS 16 "Leases"

IFRS 16 sets out the accounting standards for leases that supersedes IAS 17 "Leases", IFRIC 4 "Determining whether an Arrangement contains a Lease", and a number of related interpretations. Refer to Note 5 for information relating to the relevant accounting policies.

Definition of a lease

The Company applies the guidance of IFRS 16 in determining whether contracts are, or contain, a lease only to contracts entered into (or changed) on or after January 1, 2019. Contracts identified as containing a lease under IAS 17 and IFRIC 4 are not reassessed and are accounted for in accordance with the transitional provisions under IFRS 16.

The Company as lessee

Except for payments for short-term leases which are recognized as expenses on a straight-line basis, the Company recognizes right-of-use assets and lease liabilities for all leases on the consolidated statements of financial position. On the consolidated statements of profit or loss and other comprehensive income, the Company presents the depreciation expense charged on right-of-use assets separately from the interest expense accrued on lease liabilities, which is computed using the effective interest method. On the consolidated statements of cash flows, cash payments for both the principal portion and the interest portion of lease liabilities are classified within financing activities.

The Company applies IFRS 16 retrospectively with the cumulative effect of the initial application recognized at the date of initial application but does not restate comparative information.

Leases agreements classified as operating leases under IAS 17, except for short-term leases, are measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate on January 1, 2019. Right-of-use assets are measured at an amount equal to the lease liabilities, adjusted by the amount of any prepaid or accrued lease payments. Right-of-use assets are subject to impairment testing under IAS 36.

The Company applied the following practical expedients to measure right-of-use assets and lease liabilities on January 1, 2019 :

a) The Company applied a single discount rate to a portfolio of leases with reasonably similar characteristics to measure lease liabilities.

b) The Company accounted for those leases for which the lease term ends on or before December 31, 2019 as short-term leases.

c) Except for lease payments, the Company excluded incremental costs of obtaining the lease from right-of-use assets on January 1, 2019.

d) The Company determined lease terms (e.g. lease periods) based on the projected status on January 1, 2019, to measure lease liabilities.

The weighted average lessee's incremental borrowing rate used by the Company to calculate lease liabilities recognized on January 1, 2019 is 1.46%. The reconciliation between the lease liabilities recognized and the future minimum lease payments of non-cancellable operating lease on December 31, 2018 is presented as follows:

	NT$ (In Millions)
The future minimum lease payments of non-cancellable operating lease on December 31, 2018	$ 20,849.6
Less: Recognition exemption for short-term leases	(3,189.8)
Undiscounted gross amounts on January 1, 2019	$ 17,659.8
Discounted using the incremental borrowing rate on January 1, 2019	$ 16,465.6
Add: Adjustments as a result of a different treatment of extension and purchase options	3,438.0
Lease liabilities recognized on January 1, 2019	$ 19,903.6

The Company as lessor

Except for sublease transactions, the Company does not make any adjustments for leases in which it is a lessor, and accounts for those leases under IFRS 16 starting from January 1, 2019. On the basis of the remaining contractual terms and conditions on January 1, 2019, all of the Company's subleases are classified as operating leases.

Impact on assets, liabilities and equity on January 1, 2019

	Carrying Amount as of December 31, 2018	Adjustments Arising from Initial Application	Adjusted Carrying Amount as of January 1, 2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Other current assets	$ 5,406.4	$ (118.2)	$ 5,288.2
Right-of-use assets	—	20,082.9	20,082.9
Other noncurrent assets	1,584.6	(77.2)	1,507.4
Total effect on assets		$ 19,887.5	
Accrued expenses and other current liabilities	61,760.6	$ 2,627.4	64,388.0
Lease liabilities - noncurrent	—	17,269.3	17,269.3
Other noncurrent liabilities	1,951.0	(9.2)	1,941.8
Total effect on liabilities		$ 19,887.5	
Total effect on equity		$ —	

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
Amendments to IFRS 3 “Definition of a Business”	January 1, 2020 (Note 1)
Amendments to IFRS 9, IAS 39 and IFRS 7 “Interest Rate Benchmark Reform”	January 1, 2020 (Note 2)
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 and IAS 8 “Definition of Material”	January 1, 2020 (Note 3)
Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”	January 1, 2022

Note 1: The Company shall apply these amendments to business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2020 and to asset acquisitions that occur on or after the beginning of that period.

Note 2: The Company shall apply these amendments retrospectively for annual reporting periods beginning on or after January 1, 2020.

Note 3: The Company shall apply these amendments prospectively for annual reporting periods beginning on or after January 1, 2020.

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 as a result of the initial adoption of the aforementioned standards or interpretations. The related impact will be disclosed when the Company completes the 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).

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:

a. 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

b. 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.

<u>The subsidiaries in the consolidated financial statements</u>

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 December 31, 2018	Percentage of Ownership December 31, 2019	Note
TSMC	TSMC North America	Selling 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 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 design, manufacture, and other related business in the semiconductor industry 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, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	Shanghai, China	100%	100%	—
	TSMC Nanjing Company Limited (TSMC Nanjing)	Manufacturing, selling, testing and computer-aided design of integrated circuits and other semiconductor devices	Nanjing, China	100%	100%	b)
	VisEra Technologies Company Ltd. (VisEra Tech)	Engaged in manufacturing electronic spare parts and in researching, developing, designing, manufacturing, selling, packaging and testing of color filter	Hsin-Chu, Taiwan	87%	87%	—
	VentureTech Alliance Fund II, L.P. (VTAF II)	Investing in new start-up technology companies	Cayman Islands	98%	98%	a)
	VentureTech Alliance Fund III, L.P. (VTAF III)	Investing in new start-up technology companies	Cayman Islands	98%	98%	a)
	TSMC Solar Europe GmbH	Selling of solar related products and providing customer service	Hamburg, Germany	100%	—	a) , c)

(Continued)

Name of Investor	Name of Investee	Main Businesses and Products	Establishment and Operating Location	Percentage of Ownership December 31, 2018	Percentage of Ownership December 31, 2019	Note
TSMC Partners	TSMC Development, Inc. (TSMC Development)	Investing in companies involved in the manufacturing related business in the semiconductor industry	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)
	InveStar Semiconductor Development Fund, Inc. (ISDF)	Investing in new start-up technology companies	Cayman Islands	97%	97%	a) , d)
	InveStar Semiconductor Development Fund, Inc. (II) LDC. (ISDF II)	Investing in new start-up technology companies	Cayman Islands	97%	97%	a) , d)
TSMC Development	WaferTech, LLC (WaferTech)	Manufacturing, selling and testing of integrated circuits and other semiconductor devices	Washington, U.S.A.	100%	100%	—
VTAF III	Growth Fund Limited (Growth Fund)	Investing in new start-up technology 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: Under the investment agreement entered into with the municipal government of Nanjing, China, the Company will make an investment in Nanjing in the amount of approximately US$3 billion to establish a subsidiary operating a 300mm wafer fab with the capacity of 20,000 12-inch wafers per month, and a design service center.

Note c: TSMC Solar Europe GmbH has completed the liquidation procedures in March 2019.

Note d: The subsidiary is under liquidation procedures.

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

   <u>2017</u>

   Financial assets are classified into the following specified categories: Financial assets at FVTPL, available-for-sale financial assets, held-to-maturity financial assets and loans and receivables.

   1) Financial asset at FVTPL

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

      Financial assets 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.

   2) Available-for-sale financial assets

      Available-for-sale financial assets are non-derivative financial assets that are either designated as available-for-sale or are not classified as (a) loans and receivables, (b) held-to-maturity financial assets or (c) financial assets at fair value through profit or loss.

      Available-for-sale financial assets are measured at fair value. Interest income from available-for-sale monetary financial assets and dividends on available-for-sale equity investments are recognized in profit or loss. Other changes in the carrying amount of available-for-sale financial assets are recognized in other comprehensive income. When the investment is disposed of or is determined to be impaired, the cumulative gain or loss previously recognized in other comprehensive income is reclassified to profit or loss.

      Dividends on available-for-sale equity instruments are recognized in profit or loss when the Company’s right to receive the dividends is established.

Available-for-sale equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured are measured at cost less any identified impairment losses at the end of each reporting period. Such equity instruments are subsequently remeasured at fair value when their fair value can be reliably measured, and the difference between the carrying amount and fair value is recognized in profit or loss or other comprehensive income.

3) Held-to-maturity financial assets

Held-to-maturity investments are non-derivative financial assets with fixed or determinable payments and fixed maturity dates that the Company has the positive intent and ability to hold to maturity. Subsequent to initial recognition, held-to-maturity financial assets are measured at amortized cost using the effective interest method less any impairment.

4) Loans and receivables

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Loans and receivables including cash and cash equivalents, notes and accounts receivable and other receivables are measured at amortized cost using the effective interest method, less any impairment, except for those loans and receivables with immaterial discounted effect.

2018 and 2019

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.

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

2017

Financial assets, other than those carried at FVTPL, are assessed for indicators of impairment at the end of each reporting period. Those financial assets are considered to be impaired when there is objective evidence that, as a result of one or more events that occurred after the initial recognition of the financial assets, their estimated future cash flows have been affected.

For financial assets carried at amortized cost, such as trade receivables, assets that are assessed not to be impaired individually are, in addition, assessed for impairment on a collective basis. The Company assesses the collectability of receivables by performing the account aging analysis and examining current trends in the credit quality of its customers.

For financial assets carried at amortized cost, the amount of the impairment loss is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate.

For financial assets measured at amortized cost, if, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment loss was recognized, the previously recognized impairment loss is reversed through profit or loss to the extent that the carrying amount of the financial assets at the date the impairment loss is reversed does not exceed what the amortized cost would have been had the impairment loss not been recognized.

When an available-for-sale financial asset is considered to be impaired, cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss in the year.

In respect of available-for-sale equity instruments, impairment losses previously recognized in profit or loss are not reversed through profit or loss. Any increase in fair value subsequent to the recognition of an impairment loss is recognized in other comprehensive income and accumulated under the heading of unrealized gains or losses from available-for-sale financial assets.

The carrying amount of the financial asset is reduced by the impairment loss directly for all financial assets with the exception of trade receivables, where the carrying amount is reduced through the use of an allowance account. When a trade receivable is considered uncollectible, it is written off against the allowance account. Subsequent recoveries of amounts previously written off are credited against the allowance account.

2018 and 2019

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

2017

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.

On derecognition of a financial asset in its entirety, the difference between the financial 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 and accumulated in equity is recognized in profit or loss.

2018 and 2019

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.

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.

Financial Instruments Designated as at Fair Value through Profit or Loss

A financial instrument may be designated as at FVTPL upon initial recognition. The financial instrument forms part of a group of financial assets or financial liabilities or both, which is managed and its performance is evaluated on a fair value basis, in accordance with the Company's documented risk management or investment strategy, and information about the grouping is provided internally on that basis.

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 instrument 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 exchange contracts and foreign currency deposits, to partially hedge its foreign exchange rate risks associated with certain highly probable forecast transactions (capital expenditures). The effective portion of changes in the fair value of hedging instruments is recognized in other comprehensive income. When the forecast transactions actually take place, the associated gains or losses that were recognized in other comprehensive income are removed from equity and included in the initial cost of the hedged items. The gains or losses from hedging instruments relating to the ineffective portion are recognized immediately in profit or loss.

2017

Hedge accounting was discontinued prospectively when the Company revoked the designated hedging relationship, when the hedging instrument expired or was sold, terminated, or exercised; or no longer met the criteria for hedge accounting.

2018 and 2019

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.

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.

The Company discontinues the use of the equity method from the date when the Company ceases to have significant influence over an associate. When the Company retains an interest in the former associate, the Company measures the retained interest at fair value at that date. The difference between the carrying amount of the associate at the date the equity method was discontinued, and the fair value of any retained interest and any proceeds from disposing of a part interest in the associate is included in the determination of the gain or loss on disposal of the associate. In addition, the Company shall account for all amounts recognized in other comprehensive income in relation to that associate on the same basis as would be required if the associate had directly disposed of the related assets or liabilities. If the Company's ownership interest in an associate is reduced as a result of disposal, but the investment continues to be an associate, the Company should reclassify to profit or loss only a proportionate amount of the gain or loss previously recognized in other comprehensive income.

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 or acquisition of the item of property, plant and equipment.

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 - 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

2017 and 2018

Leases are classified as finance lease whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

The Company as lessor

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

The Company as lessee

Operating lease payments are recognized as an expense on a straight-line basis over the lease term.

2019

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.

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 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.

Provision

Provisions are recognized when the Company has a present obligation (legal or constructive) as a result of a past event, it is probable that the Company will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation.

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows.

Guarantee Deposit

Guarantee deposit mainly consists of cash received under deposit agreements with customers to ensure they have access to the Company's specified capacity; and as guarantee of accounts receivable to ensure payment from customers. Cash received from customers is recorded as guarantee deposit upon receipt. Guarantee deposits are refunded to customers when terms and conditions set forth in the deposit agreements have been satisfied.

Revenue Recognition

2017

Revenue is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and other similar allowances.

Sale of goods

Revenue from the sale of goods is recognized when the goods are delivered and titles have passed, at which time all the following conditions are satisfied:

- The Company has transferred to the buyer the significant risks and rewards of ownership of the goods;
- The Company retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- The amount of revenue can be measured reliably;
- It is probable that the economic benefits associated with the transaction will flow to the Company; and
- The costs incurred or to be incurred in respect of the transaction can be measured reliably.

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.

Dividend and interest income

Dividend income from investments is recognized when the shareholder's right to receive payment has been established, provided that it is probable that the economic benefits will flow to the Company and the amount of income can be measured reliably.

Interest income from a financial asset is recognized when it is probable that the economic benefits will flow to the Company and the amount of income can be measured reliably. Interest income is accrued on a time basis, by reference to the principal outstanding and at the effective interest rate applicable.

2018 and 2019

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.

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.

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

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.

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, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Cash and deposits in banks	$ 575,825.5	$ 452,734.4
Government bonds	—	2,188.1
Commercial paper	759.5	476.8
Repurchase agreements collateralized by corporate bonds	1,229.6	—
	$ 577,814.6	$ 455,399.3

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, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Financial assets		
Mandatorily measured at FVTPL		
Forward exchange contracts	$ 85.3	$ 162.1
Convertible bonds	—	123.8
Agency mortgage-backed securities	3,419.3	40.9
	$ 3,504.6	$ 326.8
Financial liabilities		
Held for trading		
Forward exchange contracts	$ 40.8	$ 982.3

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)**
December 31, 2018		
Sell NT$/Buy EUR	January 2019 to March 2019	NT$18,545.9/EUR527.0
Sell NT$/Buy JPY	January 2019 to March 2019	NT$4,757.9/JPY17,200.0
Sell US$/Buy EUR	January 2019	US$0.5/EUR0.4
Sell US$/Buy JPY	January 2019	US$175.6/JPY19,389.0
Sell US$/Buy RMB	January 2019	US$318.0/RMB2,188.7
Sell US$/Buy NT$	January 2019 to February 2019	US$127.0/NT$3,908.6
Sell RMB/Buy US$	January 2019	RMB667.5/ US$97.0
December 31, 2019		
Sell NT$/Buy EUR	January 2020 to June 2020	NT$84,690.4/EUR2,509.0
Sell NT$/Buy JPY	January 2020 to March 2020	NT$23,737.6/JPY85,600.0
Sell US$/Buy JPY	January 2020	US$6.2 /JPY678.0
Sell US$/Buy RMB	January 2020	US$497.0/RMB3,493.9
Sell US$/Buy NT$	January 2020 to March 2020	US$26.0/NT$787.0
Sell JPY/Buy US$	January 2020 to February 2020	JPY57,471.6/US$526.4

9. FINANCIAL ASSETS AT FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME

	December 31, 2018 NT$ (In Millions)	**December 31, 2019 NT$ (In Millions)**
Investments in debt instruments at FVTOCI		
Agency bonds/Agency mortgage-backed securities	$ 31,288.8	$ 51,966.5
Corporate bonds	40,753.6	51,790.0
Government bonds	11,151.3	12,824.2
Asset-backed securities	15,670.3	10,815.9
Commercial paper	107.6	—
	98,971.6	127,396.6
Investments in equity instruments at FVTOCI		
Non-publicly traded equity investments	3,910.7	4,124.3
Publicly traded stocks	590.1	—
	4,500.8	4,124.3
	$ 103,472.4	$ 131,520.9
Current	$ 99,561.7	$ 127,396.6
Noncurrent	3,910.7	4,124.3
	$ 103,472.4	$ 131,520.9

These investments in equity instruments are held for medium to long-term purposes and therefore are accounted for as FVTOCI.

For the years ended December 31, 2018 and 2019, as the Company adjusted its investment portfolio or the non-publicly traded investee was merged, equity investments designated at FVTOCI were divested for NT$840.6 million and NT$873.5 million, respectively. The related other equity-unrealized gain/loss on financial assets at FVTOCI of NT$1,193.1 million and NT$156.8 million were transferred to decrease and increase retained earnings, respectively.

For dividends from equity investments designated as at FVTOCI recognized, please refer to Note 26. All the dividends are from investments held at the end of the reporting period.

As of December 31, 2018 and 2019, the cumulative loss allowance for expected credit loss of NT$29.7 million and NT$35.6 million are recognized under investments in debt instruments at FVTOCI, respectively. Refer to Note 34 for information relating to their credit risk management and expected credit loss.

10. FINANCIAL ASSETS AT AMORTIZED COST

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Corporate bonds	$ 19,520.0	$ 7,651.7
Commercial paper	2,294.1	—
Less: Allowance for impairment loss	(8.2)	(2.9)
	$ 21,805.9	$ 7,648.8
Current	$ 14,277.6	$ 299.9
Noncurrent	7,528.3	7,348.9
	$ 21,805.9	$ 7,648.8

Refer to Note 34 for information relating to credit risk management and expected credit loss for financial assets at amortized cost.

11. HEDGING FINANCIAL INSTRUMENTS

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Financial assets - current		
Fair value hedges		
Interest rate futures contracts	$ —	$ 22.4
Cash flow hedges		
Forward exchange contracts	23.5	3.5
	$ 23.5	$ 25.9

(Continued)

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Financial liabilities - current		
Fair value hedges		
Interest rate futures contracts	$ 153.9	$ —
Cash flow hedges		
Forward exchange contracts	1.9	1.8
	$ 155.8	$ 1.8

(Concluded)

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 rates 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 Company expects that the value of the interest rate futures contracts and the value of the hedged financial assets will 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. Amount of hedge ineffectiveness recognized in profit or loss is classified under other gains and losses.

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

December 31, 2018

Hedging Instruments	Contract Amount (US$ in Millions)	Maturity
US treasury bonds interest rate futures contracts	US$330.3	March 2019

Hedged Items	Asset Carrying Amount NT$ (In Millions)	Accumulated Amount of Fair Value Hedge Adjustments NT$ (In Millions)
Financial assets at FVTOCI	$23,229.5	$ (13.5)

December 31, 2019

Hedging Instruments	Contract Amount (US$ in Millions)	Maturity
US treasury bonds interest rate futures contracts	US$122.2	March 2020

Hedged Items	Asset Carrying Amount NT$ (In Millions)	Accumulated Amount of Fair Value Hedge Adjustments NT$ (In Millions)
Financial assets at FVTOCI	$ 7,364.7	$ (22.4)

The effect for the years ended December 31, 2018 and 2019 is detailed below:

Hedging Instruments/Hedged Items	Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness	
	Years Ended December 31	
	2018	2019
	NT$ (In Millions)	NT$ (In Millions)
Hedging Instruments		
US treasury bonds interest rate futures contracts	$ 11.5	$ (164.7)
Hedged Items		
Financial assets at FVTOCI	(13.8)	177.8
	$ (2.3)	$ 13.1

Cash flow hedge

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

On the basis of economic relationships, the Company expects that the value of forward exchange contracts and foreign currency deposits and the value of hedged transactions will change in opposite directions in response to movements in foreign exchange 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 exchange contracts and foreign currency deposits. No other sources of ineffectiveness emerged from these hedging relationships. For the years ended December 31, 2018 and 2019, refer to Note 23(d) for gain or loss arising from changes in the fair value of hedging instruments and the amount transferred to initial carrying amount of hedged items.

The following tables summarize the information relating to the hedges for foreign currency risk.

December 31, 2018

Hedging Instruments	Contract Amount (In Millions)	Maturity	Balance in Other Equity (Continuing Hedges) NT$ (In Millions)
Forward exchange contracts	NT$3,917.7/EUR112.0	February 2019 to April 2019	$ 23.6

December 31, 2019

Hedging Instruments	Contract Amount (In Millions)	Maturity	Balance in Other Equity (Continuing Hedges) NT$ (In Millions)
Forward exchange contracts	NT$1,342.4/EUR40.0	January 2020	$ (3.8)

The effect for the years ended December 31, 2018 and 2019 is detailed below:

Hedging Instruments/Hedged Items	Increase (Decrease) in Value Used for Calculating Hedge Ineffectiveness	
	Years Ended December 31	
	2018	2019
	NT$ (In Millions)	NT$ (In Millions)
Hedging Instruments		
Forward exchange contracts	$ 34.6	$ (109.6)
Foreign currency deposits	6.4	—
	$ 41.0	$ (109.6)
Hedged Items		
Forecast transaction (capital expenditures)	$ (41.0)	$ 109.6

12. NOTES AND ACCOUNTS RECEIVABLE, NET

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
At amortized cost		
Notes and accounts receivable	$ 125,025.6	$ 135,978.0
Less: Loss allowance	(7.3)	(325.3)
	125,018.3	135,652.7
At FVTOCI	3,595.1	3,255.9
	$ 128,613.4	$ 138,908.6

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.

2017

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 of when the invoice is issued. The allowance for doubtful receivables is assessed by reference to the collectability of receivables by performing the account aging analysis, historical experience and current financial condition of customers.

Except for those impaired, for the rest of the notes and accounts receivable, the account aging analysis at the end of the reporting period is summarized in the following table. There was no impairment concern for the accounts receivable that were past due without recognizing a specific allowance for doubtful receivables since there was no significant change in the credit quality of its customers after the assessment and the Company has obtained guarantee against certain receivables.

Movements of the allowance for doubtful receivables

	Individually Assessed for Impairment NT$ (In Millions)	Collectively Assessed for Impairment NT$ (In Millions)	Total NT$ (In Millions)
Balance at January 1, 2017	$ 1.8	$ 478.3	$ 480.1
Reversal/Write-off	(1.8)	(6.3)	(8.1)
Effect of exchange rate changes	—	(0.2)	(0.2)
Balance at December 31, 2017	$ —	$ 471.8	$ 471.8

2018 and 2019

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, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Not past due	$ 113,126.5	$ 126,134.8
Past due		
Past due within 30 days	15,006.5	13,082.1
Past due 31-60 days	472.8	12.8
Past due 61-120 days	9.5	1.0
Past due over 121 days	5.4	3.2
Less: Loss allowance	(7.3)	(325.3)
	$ 128,613.4	$ 138,908.6

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

Movements of the loss allowance for accounts receivable

	Years Ended December 31	
	2018 NT$ (In Millions)	2019 NT$ (In Millions)
Balance, beginning of year	$ 227.0	$ 7.3
Provision (Reversal)	(219.7)	318.2
Effect of exchange rate changes	—	(0.2)
Balance, end of year	$ 7.3	$ 325.3

For the years ended December 31, 2018 and 2019, the changes in loss allowance were mainly due to the variations in the expected credit loss ratios and the balance of accounts receivable of different risk levels.

13. INVENTORIES

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Finished goods	$ 11,329.8	$ 8,924.5
Work in process	72,071.9	51,969.1
Raw materials	15,233.9	16,552.3
Supplies and spare parts	4,595.4	5,535.3
	$ 103,231.0	$ 82,981.2

Reversal of write-down of inventories resulting from the increase in net realizable value and write-down of inventories to net realizable value were included in the cost of revenue, as illustrated below:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Inventory losses (reversal of write-down of inventories)	$ (840.9)	$ 1,259.5	$ (1,983.0)

The aforementioned inventory losses (reversal of write-down of inventories) exclude computer virus outbreak losses and wafer contamination losses. Please refer to related losses in Note 38.

14. INVESTMENTS ACCOUNTED FOR USING EQUITY METHOD

Associates consisted of the following:

Name of Associate	Principal Activities	Place of Incorporation and Operation	Carrying Amount December 31, 2018 NT$ (In Millions)	Carrying Amount December 31, 2019 NT$ (In Millions)	% of Ownership and Voting Rights Held by the Company December 31, 2018	% of Ownership and Voting Rights Held by the Company December 31, 2019
Vanguard International Semiconductor Corporation (VIS)	Manufacturing, selling, packaging, testing and computer-aided design of integrated circuits and other semiconductor devices and the manufacturing and design service of masks	Hsinchu, Taiwan	$ 8,924.8	$ 8,960.5	28%	28%
Systems on Silicon Manufacturing Company Pte Ltd. (SSMC)	Manufacturing and selling of integrated circuits and other semiconductor devices	Singapore	5,772.8	6,502.2	39%	39%
Xintec Inc. (Xintec)	Wafer level chip size packaging and wafer level post passivation interconnection service	Taoyuan, Taiwan	1,764.6	1,842.8	41%	41%
Global Unichip Corporation (GUC)	Researching, developing, manufacturing, testing and marketing of integrated circuits	Hsinchu, Taiwan	1,283.9	1,274.8	35%	35%
Mutual-Pak	Manufacturing of electronic parts, wholesaling and retailing of electronic materials, and researching, developing and testing of RFID	New Taipei, Taiwan	22.9	38.5	39%	28%
			$ 17,769.0	$ 18,618.8		

As of December 31, 2018 and 2019, 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 investments accounted for using the equity method 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, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
VIS	$ 27,621.3	$ 36,812.9
GUC	$ 9,617.7	$ 11,251.8
Xintec	$ 3,783.6	$ 8,958.2

15. PROPERTY, PLANT AND EQUIPMENT

2017 and 2018

	Land and Land Improvements NT$ (In Millions)	Buildings NT$ (In Millions)	Machinery and Equipment NT$ (In Millions)	Office Equipment NT$ (In Millions)	Equipment under Installation and Construction in Progress NT$ (In Millions)	Total NT$ (In Millions)
Cost						
Balance at January 1, 2017	$ 4,049.3	$ 304,404.5	$ 2,042,867.7	$ 34,729.6	$ 387,199.7	$2,773,250.8
Additions (Deductions)	—	75,594.7	458,605.8	8,195.9	(219,902.5)	322,493.9
Disposals or retirements	—	(37.0)	(9,553.0)	(377.8)	—	(9,967.8)
Reclassification	—	—	8.8	1.5	—	10.3
Effect of disposal of subsidiary	—	—	(51.2)	(14.8)	(0.5)	(66.5)
Effect of exchange rate changes	(66.1)	(827.6)	(4,125.8)	(142.9)	56.8	(5,105.6)
Balance at December 31, 2017	$ 3,983.2	$ 379,134.6	$ 2,487,752.3	$ 42,391.5	$ 167,353.5	$3,080,615.1
Accumulated depreciation and impairment						
Balance at January 1, 2017	$ 524.8	$ 174,349.1	$ 1,577,377.5	$ 23,221.7	$ —	$1,775,473.1
Additions	27.8	20,844.6	229,985.6	4,938.0	—	255,796.0
Disposals or retirements	—	(28.8)	(8,114.3)	(377.5)	—	(8,520.6)
Reclassification	—	—	8.2	1.5	—	9.7
Effect of disposal of subsidiary	—	—	(42.8)	(13.9)	—	(56.7)
Effect of exchange rate changes	(42.1)	(718.4)	(3,765.3)	(102.9)	—	(4,628.7)
Balance at December 31, 2017	$ 510.5	$ 194,446.5	$ 1,795,448.9	$ 27,666.9	$ —	$2,018,072.8
Carrying amounts at December 31, 2017	$ 3,472.7	$ 184,688.1	$ 692,303.4	$ 14,724.6	$ 167,353.5	$1,062,542.3
Cost						
Balance at January 1, 2018	$ 3,983.2	$ 379,134.6	$ 2,487,752.3	$ 42,391.5	$ 167,353.5	$3,080,615.1
Additions	—	40,396.4	247,042.3	6,773.4	5,812.3	300,024.4
Disposals or retirements	—	(410.9)	(5,972.5)	(790.8)	—	(7,174.2)
Effect of exchange rate changes	28.2	(405.8)	(61.9)	8.1	(254.8)	(686.2)
Balance at December 31, 2018	$ 4,011.4	$ 418,714.3	$ 2,728,760.2	$ 48,382.2	$ 172,911.0	$3,372,779.1
Accumulated depreciation and impairment						
Balance at January 1, 2018	$ 510.5	$ 194,446.5	$ 1,795,448.9	$ 27,666.9	$ —	$2,018,072.8
Additions	20.9	24,293.4	258,195.3	5,615.3	—	288,124.9
Disposals or retirements	—	(399.0)	(4,773.6)	(790.0)	—	(5,962.6)
Impairment	—	—	423.5	—	—	423.5
Effect of exchange rate changes	19.2	33.2	(15.1)	32.9	—	70.2
Balance at December 31, 2018	$ 550.6	$ 218,374.1	$ 2,049,279.0	$ 32,525.1	$ —	$2,300,728.8
Carrying amounts at December 31, 2018	$ 3,460.8	$ 200,340.2	$ 679,481.2	$ 15,857.1	$ 172,911.0	$1,072,050.3

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.

For the year ended December 31, 2018, the Company recognized an impairment loss of NT$423.5 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.

2019

	December 31, 2019
	NT$ (In Millions)
Assets used by the Company	$ 1,352,313.9
Assets subject to operating leases	63.5
	$ 1,352,377.4

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	$ 3,991.8	$ 438,075.0	$ 2,886,623.0	$ 54,611.4	$ 528,295.1	$3,911,596.3
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	$ 538.7	$ 243,059.3	$ 2,278,266.0	$ 37,418.4	$ —	$2,559,282.4
Carrying amounts at December 31, 2019	$ 3,453.1	$ 195,015.7	$ 608,357.0	$ 17,193.0	$ 528,295.1	$1,352,313.9

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.

b. Assets subject to operating leases

	Buildings NT$ (In Millions)
Cost	
Balance at January 1, 2019	$ 562.6
Balance at December 31, 2019	$ 562.6
Accumulated depreciation	
Balance at January 1, 2019	$ 474.9
Additions	24.2
Balance at December 31, 2019	$ 499.1
Carrying amounts at December 31, 2019	$ 63.5

Operating leases relate to leases of buildings with lease terms between 1 to 5 years. The lessees do not have purchase options to acquire the assets at the expiry of the lease periods.

The maturity analysis of operating lease payments receivable for the buildings is as follows:

	December 31, 2019 NT$ (In Millions)
Year 1	$ 18.4
Year 2	17.0
Year 3	17.0
	$ 52.4

16. LEASE ARRANGEMENTS

2017 and 2018

The Company's major operating leases are arrangements on several parcels of land, machinery and equipment and office premises.

The Company expensed the lease payments as follows:

	Years Ended December 31	
	2017 NT$ (In Millions)	2018 NT$ (In Millions)
Minimum lease payments	$ 2,178.1	$ 4,243.1

Future minimum lease payments under the above non-cancellable operating leases are as follows:

		December 31, 2018
		NT$ (In Millions)
Not later than 1 year	$	5,824.1
Later than 1 year and not later than 5 years		5,834.9
Later than 5 years		9,190.6
	$	20,849.6

2019

a. Right-of-use assets

		December 31, 2019
		NT$ (In Millions)
Carrying amounts		
Land	$	14,064.0
Buildings		2,351.8
Machinery and equipment		775.8
Office equipment		40.8
	$	17,232.4

		Year Ended December 31, 2019
		NT$ (In Millions)
Additions to right-of-use assets	$	1,033.0

		Year Ended December 31, 2019
		NT$ (In Millions)
Depreciation of right-of-use assets		
Land	$	957.1
Buildings		458.8
Machinery and equipment		1,184.4
Office equipment		22.4
	$	2,622.7
Income from subleasing right-of-use assets (classified under other operating income and expenses, net)	$	55.0

b. Lease liabilities

	December 31, 2019
	NT$ (In Millions)
Carrying amounts	
Current portion (classified under accrued expenses and other current liabilities)	$ 2,275.1
Noncurrent portion	15,041.8
	$ 17,316.9

Ranges of discount rates for lease liabilities are as follows:

	December 31, 2019
Land	0.67%-2.14%
Buildings	0.67%-3.88%
Machinery and equipment	3.24%
Office equipment	0.64%-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.

The Company leases machinery and equipment for use in operation with lease terms of 2 years. The Company has purchase options to acquire leasehold machinery and equipment at the end of the lease terms.

d. Subleases of right-of-use assets

The Company subleases its right-of-use assets for buildings under operating leases with lease terms of 1 to 5 years.

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

	December 31, 2019
	NT$ (In Millions)
Year 1	$ 58.6
Year 2	1.9
	$ 60.5

e. Other lease information

	Year Ended December 31, 2019
	NT$ (In Millions)
Expenses relating to short-term leases	$ 5,007.1
Expenses relating to low-value asset leases	$ 0.5
Expenses relating to variable lease payments not included in the measurement of lease liabilities	$ 195.1

	Year Ended December 31, 2019
	NT$ (In Millions)
Total cash outflow for leases	$ 7,724.4

17. INTANGIBLE ASSETS

	Goodwill	Technology License Fees	Software and System Design Costs	Patent and Others	Total
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Cost					
Balance at January 1, 2017	$ 6,008.0	$ 9,546.0	$ 22,243.6	$ 5,386.4	$ 43,184.0
Additions	—	897.9	3,021.1	349.2	4,268.2
Retirements	—	—	(75.2)	—	(75.2)
Reclassification	—	—	7.7	(18.0)	(10.3)
Effect of disposal of subsidiary	(13.5)	—	(7.7)	—	(21.2)
Effect of exchange rate changes	(345.8)	(0.6)	(3.2)	(1.6)	(351.2)
Balance at December 31, 2017	$ 5,648.7	$ 10,443.3	$ 25,186.3	$ 5,716.0	$ 46,994.3
Accumulated amortization and impairment					
Balance at January 1, 2017	$ —	$ 6,147.2	$ 18,144.5	$ 4,277.5	$ 28,569.2
Additions	—	1,548.3	2,310.7	487.7	4,346.7
Retirements	—	—	(75.2)	—	(75.2)
Reclassification	—	—	7.4	(17.1)	(9.7)
Impairment	13.5	—	—	—	13.5
Effect of disposal of subsidiary	(13.5)	—	(7.6)	—	(21.1)
Effect of exchange rate changes	—	(0.6)	(3.1)	(0.6)	(4.3)
Balance at December 31, 2017	$ —	$ 7,694.9	$ 20,376.7	$ 4,747.5	$ 32,819.1
Carrying amounts at December 31, 2017	$ 5,648.7	$ 2,748.4	$ 4,809.6	$ 968.5	$ 14,175.2

(Continued)

	Goodwill	Technology License Fees	Software and System Design Costs	Patent and Others	Total
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Cost					
Balance at January 1, 2018	$ 5,648.7	$ 10,443.3	$ 25,186.3	$ 5,716.0	$ 46,994.3
Additions	—	533.7	4,601.9	1,969.4	7,105.0
Disposals or retirements	—	—	(186.7)	(31.2)	(217.9)
Effect of exchange rate changes	146.8	(2.5)	(6.9)	2.1	139.5
Balance at December 31, 2018	$ 5,795.5	$ 10,974.5	$ 29,594.6	$ 7,656.3	$ 54,020.9
Accumulated amortization and impairment					
Balance at January 1, 2018	$ —	$ 7,694.9	$ 20,376.7	$ 4,747.5	$ 32,819.1
Additions	—	1,063.6	2,835.3	522.5	4,421.4
Disposals or retirements	—	—	(186.6)	(31.2)	(217.8)
Effect of exchange rate changes	—	(2.5)	(1.7)	0.3	(3.9)
Balance at December 31, 2018	$ —	$ 8,756.0	$ 23,023.7	$ 5,239.1	$ 37,018.8
Carrying amounts at December 31, 2018	$ 5,795.5	$ 2,218.5	$ 6,570.9	$ 2,417.2	$ 17,002.1
Cost					
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
Accumulated amortization and impairment					
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

(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 9.0% and 8.0% in its test of impairment as of December 31, 2018 and 2019, respectively, to reflect the relevant specific risk in the cash-generating unit.

For the year ended December 31, 2017, the Company assessed goodwill impairment and recognized an impairment loss of NT$13.5 million related to a subsidiary since the operating result of this cash generating unit was not as expected and the recoverable amount of goodwill was nil. Such impairment loss was recognized in other operating income and expenses. For the years ended December 31, 2018 and 2019, the Company did not recognize any impairment loss on goodwill.

18. SHORT-TERM LOANS

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Unsecured loans		
Amount	$ 88,754.7	$ 118,522.3
Original loan content		
US$ (in millions)	$ 2,610.0	$ 2,370.0
EUR (in millions)	242.0	1,410.0
Annual interest rate	0.01%-3.22%	0.01%-2.22%
Maturity date	Due by January 2019	Due by May 2020

19. PROVISIONS

The Company's current provisions were provisions for sales returns and allowances.

	Sales Returns and Allowances NT$ (In Millions)
Year Ended December 31, 2017	
Balance, beginning of year	$ 18,037.8
Provision	44,833.6
Payment	(48,884.7)
Effect of exchange rate changes	(24.9)
Balance, end of year	$ 13,961.8

Provisions for sales returns and allowances are estimated based on historical experience and the consideration of varying contractual terms, and are recognized as a reduction of revenue in the same year of the related product sales.

Starting from 2018, the Company recognizes the estimation of sales returns and allowance as refund liability (classified under accrued expenses and other current liabilities) upon initial application of IFRS 15.

20. BONDS PAYABLE

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Domestic unsecured bonds	$ 91,800.0	$ 56,900.0
Less: Current portion	(34,900.0)	(31,800.0)
	$ 56,900.0	$ 25,100.0

The major terms of domestic unsecured bonds are as follows:

Issuance	Tranche	Issuance Period	Total Amount NT$ (In Millions)	Coupon Rate	Repayment and Interest Payment
100-1	B	September 2011 to September 2018	$ 7,500.0	1.63%	Bullet repayment; interest payable annually
100-2	B	January 2012 to January 2019	7,000.0	1.46%	The same as above
101-1	B	August 2012 to August 2019	9,000.0	1.40%	The same as above
101-2	B	September 2012 to September 2019	9,000.0	1.39%	The same as above
101-3	—	October 2012 to October 2022	4,400.0	1.53%	The same as above
101-4	A	January 2013 to January 2018	10,600.0	1.23%	The same as above
	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	A	February 2013 to February 2018	6,200.0	1.23%	The same as above
	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
102-3	B	August 2013 to August 2019	8,500.0	1.52%	The same as above
102-4	C	September 2013 to March 2019	1,400.0	1.60%	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)
	D	September 2013 to March 2021	2,600.0	1.85%	The same as above
	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

The major terms of overseas unsecured bonds are as follows:

Issuance Period	Total Amount US$ (In Millions)	Coupon Rate	Repayment and Interest Payment
April 2013 to April 2018	$ 1,150.0	1.625%	Bullet repayment; interest payable semi-annually

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, Mutual-Pak 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 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$2,369.9 million, NT$2,568.9 million and NT$2,609.7 million for the years ended December 31, 2017, 2018 and 2019, 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.

Amounts recognized in respect of these defined benefit plans were as follows:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Current service cost	$ 145.0	$ 137.7	$ 135.6
Net interest expense	126.5	144.1	124.0
Components of defined benefit costs recognized in profit or loss	271.5	281.8	259.6

(Continued)

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Remeasurement on the net defined benefit liability:			
Return on plan assets (excluding amounts included in net interest expense)	$ 29.3	$ (71.3)	$ (124.4)
Actuarial loss (gain) arising from experience adjustments	483.9	334.7	(438.0)
Actuarial gain arising from changes in demographic assumptions	—	—	(233.2)
Actuarial loss (gain) arising from changes in financial assumptions	(258.5)	597.8	541.7
Components of defined benefit costs recognized in other comprehensive income	254.7	861.2	(253.9)
Total	$ 526.2	$ 1,143.0	$ 5.7

(Concluded)

The pension costs of the aforementioned defined benefit plans were recognized in profit or loss by the following categories:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Cost of revenue	$ 175.3	$ 177.8	$ 157.8
Research and development expenses	75.3	79.1	72.7
General and administrative expenses	16.7	20.6	25.1
Marketing expenses	4.2	4.3	4.0
	$ 271.5	$ 281.8	$ 259.6

The amounts arising from the defined benefit obligation of the Company were as follows:

	December 31, 2018	December 31, 2019
	NT$ (In Millions)	NT$ (In Millions)
Present value of defined benefit obligation	$ 13,662.7	$ 13,484.1
Fair value of plan assets	(4,011.3)	(4,301.6)
Net defined benefit liability	$ 9,651.4	$ 9,182.5

Movements in the present value of the defined benefit obligation were as follows:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Balance, beginning of year	$ 12,480.5	$ 12,774.6	$ 13,662.7
Current service cost	145.0	137.7	135.6
Interest expense	185.6	207.8	175.4
Remeasurement:			
Actuarial loss (gain) arising from experience adjustments	483.9	334.7	(438.0)
Actuarial gain arising from changes in demographic assumptions	—	—	(233.2)
Actuarial loss (gain) arising from changes in financial assumptions	(258.5)	597.8	541.7
Benefits paid from plan assets	(261.9)	(274.3)	(344.1)
Benefits paid directly by the Company	—	(115.6)	(16.0)
Balance, end of year	$ 12,774.6	$ 13,662.7	$ 13,484.1

Movements in the fair value of the plan assets were as follows:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Balance, beginning of year	$ 3,929.1	$ 3,923.9	$ 4,011.3
Interest income	59.1	63.7	51.4
Remeasurement:			
Return on plan assets (excluding amounts included in net interest expense)	(29.3)	71.3	124.4
Contributions from employer	226.9	226.7	458.6
Benefits paid from plan assets	(261.9)	(274.3)	(344.1)
Balance, end of year	$ 3,923.9	$ 4,011.3	$ 4,301.6

The fair value of the plan assets by major categories at the end of reporting period was as follows:

	December 31, 2018	December 31, 2019
	NT$ (In Millions)	NT$ (In Millions)
Cash	$ 756.1	$ 713.2
Equity instruments	2,148.1	2,313.8
Debt instruments	1,107.1	1,274.6
	$ 4,011.3	$ 4,301.6

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, 2018	**December 31, 2019**
Discount rate	1.30%	0.90%
Future salary increase rate	3.00%	3.00%

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% in the discount rate and all other assumptions were held constant, the present value of the defined benefit obligation would increase by NT$921.8 million and NT$725.0 million as of December 31, 2018 and 2019, 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$901.6 million and NT$706.5 million as of December 31, 2018 and 2019 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.

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$230.9 million to the defined benefit plans in the next year starting from December 31, 2019. The weighted average duration of the defined benefit obligation is 10 years.

22. GUARANTEE DEPOSITS

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Capacity guarantee	$ 9,289.6	$ 1,499.4
Receivables guarantee	653.7	—
Others	245.7	230.5
	$ 10,189.0	$ 1,729.9
Current portion (classified under accrued expenses and other current liabilities)	$ 6,835.7	$ 1,553.0
Noncurrent portion	3,353.3	176.9
	$ 10,189.0	$ 1,729.9

Some of guarantee deposits were refunded to customers by offsetting related accounts receivable.

23. EQUITY

a. Capital stock

	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (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, 2019, 1,065.1 million ADSs of TSMC were traded on the NYSE. The number of common shares represented by the ADSs was 5,325.6 million shares (one ADS represents five common shares).

b. Capital surplus

	December 31, 2018	December 31, 2019
	NT$ (In Millions)	NT$ (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 share of changes in equities of subsidiaries	121.5	121.8
From share of changes in equities of associates	282.8	302.2
Donations	29.3	33.3
	$ 56,316.0	$ 56,339.7

Under the R.O.C. relevant laws, the capital surplus generated from donations and the excess of the issuance price over the par value of capital stock (including the stock issued for new capital, mergers and convertible bonds) 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; however, when generated from issuance of restricted shares for employees, such capital surplus may not be used for any purpose.

c. Retained earnings and dividend policy

The amendments to TSMC's Articles of Incorporation had been approved by TSMC's shareholders in its meeting held on June 5, 2019, which stipulate 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.

TSMC's amended Articles of Incorporation provide that, 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 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, unrealized valuation gain or loss from available-for-sale 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 2017 and 2018 earnings have been approved by TSMC's shareholders in its meetings held on June 5, 2018 and June 5, 2019, respectively. The appropriations and cash dividends per share were as follows:

	Appropriation of Earnings		Cash Dividends Per Share (NT$)	
	For Fiscal Year 2017 NT$ (In Millions)	For Fiscal Year 2018 NT$ (In Millions)	For Fiscal Year 2017	For Fiscal Year 2018
Legal capital reserve	$ 34,311.2	$ 35,113.1		
Special capital reserve	$ 26,907.5	$ (11,459.5)		
Cash dividends to shareholders	$ 207,443.0	$ 207,443.0	$8.0	$8.0

The appropriations of 2019 earnings for each quarter have been approved by TSMC's Board of Directors in its meeting. The appropriations and cash dividends per share were as follows:

	First Quarter of 2019 NT$ (In Millions)	Second Quarter of 2019 NT$ (In Millions)	Third Quarter of 2019 NT$ (In Millions)	Fourth Quarter of 2019 NT$ (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

The special capital reserve for 2019 is to be presented for approval in the TSMC's shareholders' meeting to be held on June 9, 2020 (expected).

d. Others

Changes in others were as follows:

	Year Ended December 31, 2017				
	Foreign Currency Translation Reserve NT$ (In Millions)	Unrealized Gain (Loss) from Available-for-sale Financial Assets NT$ (In Millions)	Cash Flow Hedges Reserve NT$ (In Millions)	Unearned Stock-Based Employee Compensation NT$ (In Millions)	Total NT$ (In Millions)
Balance, beginning of year	$ 1,661.2	$ 2.6	$ 0.1	$ —	$ 1,663.9
Exchange differences arising on translation of foreign operations	(28,257.4)	—	—	—	(28,257.4)
Changes in fair value of available-for-sale financial assets	—	(154.7)	—	—	(154.7)
Cumulative (gain)/loss reclassified to profit or loss upon disposal of available-for-sale financial assets	—	(61.2)	—	—	(61.2)
Gain/(loss) arising on changes in the fair value of hedging instruments	—	—	99.6	—	99.6
Transferred to initial carrying amount of hedged items	—	—	(94.9)	—	(94.9)
Share of other comprehensive income (loss) of associates	(101.5)	2.1	—	—	(99.4)
Share of unearned stock-based employee compensation of associates	—	—	—	(10.3)	(10.3)
Income tax effect	—	(2.9)	(0.6)	—	(3.5)
Balance, end of year	$ (26,697.7)	$ (214.1)	$ 4.2	$ (10.3)	$ (26,917.9)

	Year Ended December 31, 2018				
	Foreign Currency Translation Reserve	Unrealized Gain (Loss) on Financial Assets at FVTOCI	Gain (Loss) on Hedging Instruments	Unearned Stock-Based Employee Compensation	Total
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Balance, beginning of year(IFRS 9)	$ (26,697.7)	$ (524.9)	$ 4.2	$ (10.3)	$ (27,228.7)
Exchange differences arising on translation of foreign operations	14,562.0	—	—	—	14,562.0
Unrealized gain (loss) on financial assets at FVTOCI					
Equity instruments	—	(3,311.6)	—	—	(3,311.6)
Debt instruments	—	(1,858.0)	—	—	(1,858.0)
Cumulative unrealized gain (loss) of equity instruments transferred to retained earnings due to disposal	—	1,193.1	—	—	1,193.1
Cumulative unrealized gain (loss) of debt instruments transferred to profit or loss due to disposal	—	989.1	—	—	989.1
Loss allowance adjustments from debt instruments	—	(2.0)	—	—	(2.0)
Gain (loss) arising on changes in the fair value of hedging instruments	—	—	41.0	—	41.0
Transferred to initial carrying amount of hedged items	—	—	(22.2)	—	(22.2)
Share of other comprehensive income (loss) of associates	93.3	(6.8)	—	—	86.5
Share of unearned stock-based employee compensation of associates	—	—	—	8.5	8.5
Income tax effect	—	91.8	0.6	—	92.4
Balance, end of year	$ (12,042.4)	$ (3,429.3)	$ 23.6	$ (1.8)	$ (15,449.9)

	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$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (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)

The aforementioned other equity includes the changes in other equities of TSMC and TSMC's share of its subsidiaries and associates.

24. NET REVENUE

a. Disaggregation of revenue from contracts with customers

	Years Ended December 31	
	2018	2019
Product	NT$ (In Millions)	NT$ (In Millions)
Wafer	$ 911,296.4	$ 927,317.3
Others	120,177.2	142,668.1
	$ 1,031,473.6	$ 1,069,985.4

	Years Ended December 31	
	2018	2019
Geography	NT$ (In Millions)	NT$ (In Millions)
Taiwan	$ 78,260.8	$ 84,255.2
United States	632,821.5	634,713.0
China	175,794.2	208,101.4
Europe, the Middle East and Africa	71,068.5	67,568.2
Japan	58,125.9	57,468.6
Others	15,402.7	17,879.0
	$ 1,031,473.6	$ 1,069,985.4

The Company categorized the net revenue mainly based on the countries where the customers are headquartered.

	Years Ended December 31	
	2018	2019
Platform	NT$ (In Millions)	NT$ (In Millions)
Smartphone	$ 466,452.3	$ 523,612.9
High Performance Computing	341,910.2	315,822.3
Internet of Things	65,091.3	86,342.7
Automotive	51,709.8	47,914.5
Digital Consumer Electronics	58,470.2	53,733.4
Others	47,839.8	42,559.6
	$ 1,031,473.6	$ 1,069,985.4

Resolution	Years Ended December 31 2018 NT$ (In Millions)	Years Ended December 31 2019 NT$ (In Millions)
7-nanometer	$ 81,680.7	$ 249,548.1
10-nanometer	96,989.5	23,266.4
16-nanometer	187,370.6	186,700.9
20-nanometer	23,618.4	9,535.8
28-nanometer	178,440.4	149,578.7
40/45-nanometer	101,801.0	93,366.3
65-nanometer	76,122.3	69,250.0
90-nanometer	36,652.1	25,624.2
0.11/0.13 micron	20,677.7	22,947.3
0.15/0.18 micron	81,182.6	77,564.5
0.25 micron and above	26,761.1	19,935.1
Wafer revenue	$ 911,296.4	$ 927,317.3

Starting the first quarter of 2019, the Company reported its net revenue breakdown by platform, instead of by application. The Company believes this change better represents the Company's results.

b. Contract balances

	January 1, 2018 NT$ (In Millions)	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Contract liabilities (classified under accrued expenses and other current liabilities)	$ 32,434.8	$ 4,684.0	$ 6,784.3

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$31,770.0 million and NT$3,876.6 million for the years ended December 31, 2018 and 2019, respectively.

c. Refund liabilities

Estimated sales returns and other allowances is made and adjusted based on historical experience and the consideration of varying contractual terms, which amounted to NT$55,406.0 million and NT$36,211.4 million for the years ended December 31, 2018 and 2019, respectively. As of December 31, 2018 and 2019, the aforementioned refund liabilities amounted to NT$22,672.6 million and NT$19,620.2 million (classified under accrued expenses and other current liabilities), respectively.

25. OTHER OPERATING INCOME AND EXPENSES, NET

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Loss on disposal or retirement of property, plant and equipment, net	$ (1,097.9)	$ (1,005.6)	$ (950.0)
Reversal of impairment loss (impairment loss) on property, plant and equipment	—	(423.5)	301.4
Others	(267.6)	(672.4)	152.3
	$ (1,365.5)	$ (2,101.5)	$ (496.3)

26. OTHER INCOME

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Interest income			
Bank deposits	$ 6,412.8	$ 10,310.7	$ 11,454.0
Financial assets at FVTPL	—	382.7	339.5
Financial assets at FVTOCI	—	3,078.6	3,476.2
Financial assets at amortized cost	—	922.4	919.7
Available-for-sale financial assets	2,091.4	—	—
Held-to-maturity financial assets	568.6	—	—
Structured product	391.9	—	—
	9,464.7	14,694.4	16,189.4
Dividend income	145.6	158.4	417.3
	$ 9,610.3	$ 14,852.8	$ 16,606.7

27. FINANCE COSTS

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Interest expense			
Bank loans	$ 766.6	$ 1,417.3	$ 1,869.4
Corporate bonds	2,563.6	1,633.8	1,139.9
Lease liabilities	—	—	240.9
Others	0.1	0.1	0.7
	$ 3,330.3	$ 3,051.2	$ 3,250.9

28. OTHER GAINS AND LOSSES, NET

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Gain (loss) on disposal of financial assets, net			
Investments in debt instruments at FVTOCI	$ —	$ (989.1)	$ 537.8
Available-for-sale financial assets	89.8	—	—
Gain (loss) from disposal of subsidiaries	17.3	—	(4.6)
Net gain (loss) on financial instruments at FVTPL			
Mandatorily measured at FVTPL	—	(2,293.9)	(2,360.7)
Held for trading	2,253.7	—	—
Designated as at FVTPL	131.0	—	—
Gain (loss) arising from fair value hedges, net	(30.3)	(2.3)	13.1
Impairment loss on financial assets			
Available-for-sale financial assets	(29.6)	—	—
The reversal (accrual) of expected credit loss of financial assets			
Investments in debt instruments at FVTOCI	—	2.0	(6.9)
Financial assets at amortized cost	—	0.4	5.2
Other gains (losses), net	385.5	(127.9)	665.1
	$ 2,817.4	$ (3,410.8)	$ (1,151.0)

29. INCOME TAX

a. Income tax expense recognized in profit or loss

Income tax expense consisted of the following:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Current income tax expense			
Current tax expense recognized in the current year	$ 73,851.4	$ 60,584.3	$ 47,135.5
Income tax adjustments on prior years	(19,107.0)	(21,753.0)	(10,193.8)
Other income tax adjustments	152.8	152.9	(41.5)
	54,897.2	38,984.2	36,900.2
Deferred income tax expense (benefit)			
Effect of tax rate changes	561.8	(1,474.8)	—
The origination and reversal of temporary differences	(4,336.1)	(3,072.5)	(1,065.1)
	(3,774.3)	(4,547.3)	(1,065.1)
Income tax expense recognized in profit or loss	$ 51,122.9	$ 34,436.9	$ 35,835.1

A reconciliation of income before income tax and income tax expense recognized in profit or loss was as follows:

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Income before tax	$ 396,161.9	$ 397,543.1	$ 389,862.1
Income tax expense at the statutory rate	$ 69,613.5	$ 80,872.5	$ 79,056.5
Tax effect of adjusting items:			
Nondeductible (deductible) items in determining taxable income	(1,415.9)	2,533.4	(4,183.5)
Tax-exempt income	(16,901.1)	(54,543.5)	(39,808.1)
Additional income tax under the Alternative Minimum Tax Act	—	21,455.9	10,367.9
Additional income tax on unappropriated earnings	28,183.5	16,294.5	7,628.1
Effect of tax rate changes on deferred income tax	561.8	(1,474.8)	—
The origination and reversal of temporary differences	(4,336.1)	(3,072.6)	(1,065.1)
Income tax credits	(5,628.6)	(6,028.4)	(5,925.4)
	70,077.1	56,037.0	46,070.4
Income tax adjustments on prior years	(19,107.0)	(21,753.0)	(10,193.8)
Other income tax adjustments	152.8	152.9	(41.5)
Income tax expense recognized in profit or loss	$ 51,122.9	$ 34,436.9	$ 35,835.1

For the year ended December 31, 2017, the Company applied a tax rate of 17% for entities subject to the R.O.C. Income Tax Law. In 2018, the Income Tax Law in the R.O.C. was amended and, starting from 2018, the corporate income tax rate was adjusted from 17% to 20%. In addition, the tax rate for 2018 unappropriated earnings was reduced from 10% to 5%.

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.

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		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Deferred income tax benefit (expense)			
Related to remeasurement of defined benefit obligation	$ 30.6	$ 103.3	$ (30.4)
Related to unrealized gain/loss on investments in equity instruments at FVTOCI	—	91.8	9.4
Related to gain/loss on cash flow hedges	(0.6)	0.6	—
Related to unrealized gain/loss on available-for-sale financial assets	(2.9)	—	—
	$ 27.1	$ 195.7	$ (21.0)

c. Deferred income tax balance

The analysis of deferred income tax assets and liabilities was as follows:

	December 31, 2018	December 31, 2019
	NT$ (In Millions)	NT$ (In Millions)
Deferred income tax assets		
Temporary differences		
Depreciation	$ 11,839.2	$ 13,547.2
Refund liability	2,594.0	2,150.4
Net defined benefit liability	1,084.9	1,016.3
Unrealized loss on inventories	751.0	469.4
Deferred compensation cost	271.7	323.1
Investments in equity instruments at FVTOCI	56.2	65.7
Others	209.4	356.3
	$ 16,806.4	$ 17,928.4
Deferred income tax liabilities		
Temporary differences		
Unrealized exchange gains	$ (61.7)	$ (333.6)
Others	(171.6)	(10.8)
	$ (233.3)	$ (344.4)

	Year Ended December 31, 2017					
		Recognized in				
	Balance, Beginning of Year	Profit or Loss	Other Comprehensive Income	Effect of Disposal of Subsidiary	Effect of Exchange Rate Changes	Balance, End of Year
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Deferred income tax assets						
Temporary differences						
Depreciation	$ 4,244.2	$ 4,207.2	$ —	$ —	$ (50.1)	$ 8,401.3
Provision for sales returns and allowance	1,512.1	130.0	—	—	(4.4)	1,637.7
Net defined benefit liability	939.5	5.2	30.6	—	—	975.3
Unrealized loss on inventories	737.3	(105.1)	—	—	(2.7)	629.5
Deferred compensation cost	378.7	(83.1)	—	—	(29.1)	266.5
Others	445.1	(222.4)	—	—	(27.5)	195.2
Operating loss carryforward	14.5	—	—	(14.5)	—	—
	$ 8,271.4	$ 3,931.8	$ 30.6	$ (14.5)	$ (113.8)	$ 12,105.5
Deferred income tax liabilities						
Temporary differences						
Unrealized exchange gains	$ (48.7)	$ (120.8)	$ —	$ —	$ —	$ (169.5)
Available-for-sale financial assets	(92.5)	—	(2.9)	—	—	(95.4)
Others	—	(36.7)	(0.6)	—	—	(37.3)
	$ (141.2)	$ (157.5)	$ (3.5)	$ —	$ —	$ (302.2)

	Year Ended December 31, 2018				
		Recognized in			
	Balance, Beginning of Year	Profit or Loss	Other Comprehensive Income	Effect of Exchange Rate Changes	Balance, End of Year
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Deferred income tax assets					
Temporary differences					
Depreciation	$ 8,401.3	$ 3,430.4	$ —	$ 7.5	$ 11,839.2
Refund liability	1,637.7	955.0	—	1.3	2,594.0
Net defined benefit liability	975.3	6.3	103.3	—	1,084.9
Unrealized loss on inventories	629.5	120.5	—	1.0	751.0
Deferred compensation cost	266.5	(4.7)	—	9.9	271.7
Investments in equity instruments at FVTOCI	—	—	56.2	—	56.2
Others	195.2	7.1	—	7.1	209.4
	$ 12,105.5	$ 4,514.6	$ 159.5	$ 26.8	$ 16,806.4
Deferred income tax liabilities					
Temporary differences					
Unrealized exchange gains	$ (169.5)	$ 107.8	$ —	$ —	$ (61.7)
Investments in equity instruments at FVTOCI	(95.4)	—	95.4	—	—
Others	(37.3)	(75.1)	(59.2)	—	(171.6)
	$ (302.2)	$ 32.7	$ 36.2	$ —	$ (233.3)

	Year Ended December 31, 2019				
		Recognized in			
	Balance, Beginning of Year	Profit or Loss	Other Comprehensive Income	Effect of Exchange Rate Changes	Balance, End of Year
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Deferred income tax assets					
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
	$ 16,806.4	$ 1,176.2	$ (21.0)	$ (33.2)	$ 17,928.4

(Continued)

	Year Ended December 31, 2019				
		Recognized in			
	Balance, Beginning of Year NT$ (In Millions)	Profit or Loss NT$ (In Millions)	Other Comprehensive Income NT$ (In Millions)	Effect of Exchange Rate Changes NT$ (In Millions)	Balance, End of Year NT$ (In Millions)
Deferred income tax liabilities					
Temporary differences					
Unrealized exchange gains	$ (61.7)	$ (271.9)	$ —	$ —	$ (333.6)
Others	(171.6)	160.8	—	—	(10.8)
	$ (233.3)	$ (111.1)	$ —	$ —	$ (344.4)

(Concluded)

d. The deductible temporary differences for which no deferred income tax assets have been recognized

As of December 31, 2018 and 2019, the aggregate deductible temporary differences for which no deferred income tax assets have been recognized amounted to NT$20,060.9 million and NT$33,445.5 million, respectively.

e. Unused tax-exemption information

As of December 31, 2019, the profits generated from the following projects of TSMC are exempt from income tax for a five-year period:

	Tax-exemption Period
Construction and expansion of 2009 by TSMC	2018 to 2022

f. The information of unrecognized deferred income tax liabilities associated with investments

As of December 31, 2018 and 2019, the aggregate taxable temporary differences associated with investments in subsidiaries not recognized as deferred income tax liabilities amounted to NT$112,893.0 million and NT$131,085.7 million, respectively.

g. Income tax examination

The tax authorities have examined income tax returns of TSMC through 2018. All investment tax credit adjustments assessed by the tax authorities have been recognized accordingly.

30. EARNINGS PER SHARE

	Years Ended December 31		
	2017 (NT$)	2018 (NT$)	2019 (NT$)
Basic EPS	$ 13.30	$ 14.00	$ 13.65
Diluted EPS	$ 13.30	$ 14.00	$ 13.65

EPS is computed as follows:

	Amounts (Numerator) NT$ (In Millions)	Number of Shares (Denominator) (In Millions)	EPS (NT$)
Year Ended December 31, 2017			
Basic/Diluted EPS			
Net income available to common shareholders of the parent	$ 344,998.3	25,930.3	$ 13.30
Year Ended December 31, 2018			
Basic/Diluted EPS			
Net income available to common shareholders of the parent	$ 363,052.7	25,930.3	$ 14.00
Year Ended December 31, 2019			
Basic/Diluted EPS			
Net income available to common shareholders of the parent	$ 353,948.0	25,930.3	$ 13.65

31. ADDITIONAL INFORMATION OF EXPENSES BY NATURE

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
a. Depreciation of property, plant and equipment and right-of-use assets			
Recognized in cost of revenue	$ 235,985.2	$ 264,804.7	$ 256,530.9
Recognized in operating expenses	19,746.3	23,292.3	24,856.7
Recognized in other operating income and expenses	64.5	27.9	24.2
	$ 255,796.0	$ 288,124.9	$ 281,411.8
b. Amortization of intangible assets			
Recognized in cost of revenue	$ 2,135.5	$ 2,073.5	$ 3,069.9
Recognized in operating expenses	2,211.2	2,347.9	2,402.5
	$ 4,346.7	$ 4,421.4	$ 5,472.4
c. Research and development costs expensed as incurred	$ 80,732.5	$ 85,895.6	$ 91,418.7

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
d. Employee benefits expenses			
Post-employment benefits			
Defined contribution plans	$ 2,369.9	$ 2,568.9	$ 2,609.7
Defined benefit plans	271.5	281.8	259.6
	2,641.4	2,850.7	2,869.3
Other employee benefits	101,488.7	105,364.2	107,115.3
	$ 104,130.1	$ 108,214.9	$ 109,984.6
Employee benefits expense summarized by function			
Recognized in cost of revenue	$ 61,026.1	$ 63,597.7	$ 64,702.0
Recognized in operating expenses	43,104.0	44,617.2	45,282.6
	$ 104,130.1	$ 108,214.9	$ 109,984.6

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.

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, which amounted to NT$23,019.1 million, NT$23,570.0 million and NT$23,165.7 million for the years ended December 31, 2017, 2018 and 2019, respectively; 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.

TSMC's profit sharing bonus to employees and compensation to directors in the amounts of NT$23,019.1 million and NT$368.9 million in cash for 2017; respectively, profit sharing bonus to employees and compensation to directors in the amounts of NT$23,570.0 million and NT$349.3 million in cash for 2018, respectively, and profit sharing bonus to employees and compensation to directors in the amounts of NT$23,165.7 million and NT$360.4 million in cash for 2019, respectively, had been approved by the Board of Directors of TSMC held on February 13, 2018 and February 19, 2019 and February 11, 2020, respectively. There is no significant difference between the aforementioned approved amounts and the amounts charged against earnings of 2017, 2018 and 2019, respectively.

32. CASH FLOW INFORMATION

a. Non-cash transaction

2017

	Year Ended December 31, 2017
	NT$ (In Millions)
Additions of property, plant and equipment	$ 322,493.9
Changes in other financial assets	3,634.9
Changes in payables to contractors and equipment suppliers	4,364.5
Transferred to initial carrying amount of hedged items	94.9
Payments for acquisition of property, plant and equipment	$ 330,588.2
Acquisition of available-for-sale financial assets	$ 104,086.8
Changes in accrued expenses and other current liabilities	(2,262.8)
Payments for acquisition of available-for-sale financial assets	$ 101,824.0
Disposal of available-for-sale financial assets	$ 70,862.9
Changes in other financial assets	(1,324.0)
Proceeds from disposal of available-for-sale financial assets	$ 69,538.9

2018 and 2019

	Years Ended December 31	
	2018	2019
	NT$ (In Millions)	NT$ (In Millions)
Additions of property, plant and equipment	$ 300,024.4	$ 564,283.0
Changes in other financial assets	1,555.4	472.5
Exchange of assets	—	(3,287.1)
Changes in payables to contractors and equipment suppliers	13,979.9	(100,963.9)
Transferred to initial carrying amount of hedged items	22.2	(82.3)
Payments for acquisition of property, plant and equipment	$ 315,581.9	$ 460,422.2
Acquisition of financial assets at FVTOCI	$ 100,759.6	$ 257,824.5
Changes in other financial assets	(23.8)	—
Changes in accrued expenses and other current liabilities	(4,323.0)	(266.3)
Payments for acquisition of financial assets at FVTOCI	$ 96,412.8	$ 257,558.2

(Continued)

	Years Ended December 31	
	2018	2019
	NT$ (In Millions)	NT$ (In Millions)
Disposal of financial assets at FVTOCI	$ 90,545.1	$ 229,525.1
Changes in other financial assets	(3,905.8)	919.4
Proceeds from disposal of financial assets at FVTOCI	$ 86,639.3	$ 230,444.5

(Concluded)

b. Reconciliation of liabilities arising from financing activities

	Balance as of January 1, 2017	Financing Cash Flow	Non-cash changes: Foreign Exchange Movement	Non-cash changes: Other Changes (Note)	Balance as of December 31, 2017
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Short-term loans	$ 57,958.2	$ 10,394.3	$ (4,585.7)	$ —	$ 63,766.8
Guarantee deposits	26,670.6	(2,872.3)	(1,609.0)	(6,108.7)	16,080.6
Bonds payable	191,193.6	(38,100.0)	(2,918.9)	26.4	150,201.1
Total	$ 275,822.4	$ (30,578.0)	$ (9,113.6)	$ (6,082.3)	$ 230,048.5

	Balance as of January 1, 2018	Financing Cash Flow	Non-cash changes: Foreign Exchange Movement	Non-cash changes: Other Changes (Note)	Balance as of December 31, 2018
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Short-term loans	$ 63,766.8	$ 23,923.0	$ 1,064.9	$ —	$ 88,754.7
Guarantee deposits	16,080.6	(279.2)	423.5	(6,035.9)	10,189.0
Bonds payable	150,201.1	(58,024.9)	(382.9)	6.7	91,800.0
Total	$ 230,048.5	$ (34,381.1)	$ 1,105.5	$ (6,029.2)	$ 190,743.7

	Balance as of January 1, 2019	Financing Cash Flow	Non-cash changes: Foreign Exchange Movement	Non-cash changes: Leases Modifications	Non-cash changes: Other Changes (Note)	Balance as of December 31, 2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Short-term loans	$ 88,754.7	$ 31,804.3	$ (2,036.7)	$ —	$ —	$ 118,522.3
Guarantee deposits	10,189.0	(639.1)	4.5	—	(7,824.5)	1,729.9
Lease liabilities	19,903.6	(3,174.0)	(73.3)	419.7	240.9	17,316.9
Bonds payable	91,800.0	(34,900.0)	—	—	—	56,900.0
Total	$ 210,647.3	$ (6,908.8)	$ (2,105.5)	$ 419.7	$ (7,583.6)	$ 194,469.1

Note: Other changes include guarantee deposits refunded to customers by offsetting related accounts receivable, amortization of bonds payable and financial cost of lease liabilities.

33 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.

34. FINANCIAL INSTRUMENTS

a. Categories of financial instruments

	December 31, 2018	December 31, 2019
	NT$ (In Millions)	NT$ (In Millions)
Financial assets		
FVTPL (Note 1)	$ 3,504.6	$ 326.8
FVTOCI (Note 2)	107,067.5	134,776.8
Hedging financial assets	23.5	25.9
Amortized cost (Note 3)	745,585.8	612,740.6
	$ 856,181.4	$ 747,870.1
Financial liabilities		
FVTPL (Note 4)	$ 40.8	$ 982.3
Hedging financial liabilities	155.8	1.8
Amortized cost (Note 5)	318,475.8	533,581.7
	$ 318,672.4	$ 534,565.8

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 and guarantee deposits.

b. Financial risk management objectives

The Company seeks to ensure that sufficient cost-efficient funding is readily available when needed. 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 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 corporate treasury function 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

The majority of the Company's revenue is denominated in U.S. dollar and over one-half of its capital expenditures are denominated in currencies other than NT dollar, primarily in U.S. dollar, Japanese yen and Euro. As a result, any significant fluctuations to its disadvantage in 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 dollar. 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. The Company utilizes U.S. dollar denominated debt to partially offset currency risk arising from U.S. dollar denominated receivables for statements of financial position hedges. These hedges reduce, but do not entirely eliminate, the financial impact on the Company caused by 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, 2017, 2018 and 2019, a hypothetical adverse foreign currency exchange rate change of 10% would have decreased its net income by NT$867.9 million, NT$506.4 million and NT$2,137.3 million, respectively, and decreased its other comprehensive income by NT$265.9 million, NT$315.6 million and NT$107.7 million, respectively, 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 bank loans. Changes in interest rates affect the interest earned on the Company's cash and cash equivalents as well as fixed income securities and the fair value of those securities, as well as the interest paid on its bank loans. Because all of the Company's bonds issued are fixed-rate and measured at amortized cost, changes in interest rates would not affect the cash flows and the fair value.

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 and classified as FVTOCI, and may have their fair value adversely affected due to a rise in interest rates, while cash and cash equivalents as well as floating-rate securities may generate less interest income than predicted if interest rates fall. The Company has entered, and may enter in the future, into interest rate futures to partially hedge the fair value change in its fixed income investments. However, these hedges can offset only a small portion of the financial impact from movements in interest rates.

The Company classified its investments in fixed income securities as available-for-sale and held-to-maturity financial assets in 2017; as financial assets at FVTPL, financial assets at FVTOCI and financial assets at amortized costs starting from 2018. Because held-to-maturity fixed income securities and financial assets at amortized costs are measured at amortized cost, changes in interest rates would not affect the fair value. On the other hand, available-for-sale fixed income securities, financial assets at FVTPL and financial assets at FVTOCI are exposed to fair value fluctuations caused by changes in interest rates. The Company utilized interest rate futures to partially hedge the interest rate risk on its available-for-sale fixed income investments, financial assets at FVTPL and financial assets at FVTOCI. These hedges may offset only a small portion of the financial impact from movements in interest rates.

Based on a sensitivity analysis performed on fixed income investments at the end of the reporting period, an interest rate increase of 100 basis points (1.00%) across all maturities would have decreased the fair value by NT$2,119.7 million, NT$2,697.8 million and NT$3,517.4 million for the years ended, 2017, 2018 and 2019, respectively. The decreases were composed of NT$2,119.7 million decrease, NT$2,450.0 million decrease and NT$3,516.6 million decrease in other comprehensive income for the years ended, 2017, 2018 and 2019, and NT$247.8 million decrease and NT$0.8 million decrease in net income for the years ended, 2018 and 2019, respectively.

As for the Company's bank loans, all of them are floating-rate loans. A rise in interest rates may incur higher interest expense than predicted.

Other price risk

The Company is exposed to equity price risk arising from available-for-sale equity investments for 2017 and financial assets at FVTOCI for both 2018 and 2019.

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, 2017, 2018 and 2019, the other comprehensive income would have decreased by NT$703.0 million, NT$427.1 million and NT$401.9 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 trade receivables, 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 trade receivables are from its customers worldwide. The majority of the Company's outstanding trade receivables are not covered by collaterals or guarantees. While the Company has procedures to monitor and manage credit risk exposure on trade receivables, 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, 2018 and 2019, 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 risk management of expected credit loss for financial assets at amortized cost and investments in debt instruments at FVTOCI is as follows:

The Company only invests in debt instruments that are rated as investment grade or higher. The credit rating information is supplied by external rating agencies. The Company assesses whether there has been a significant increase in credit risk since initial recognition by reviewing changes in external credit ratings, financial market conditions and material information of the bond issuers.

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 on trade date and valuation date: (1) Within investment grade (2) Between BB+ and BB-	12 months expected credit loss	0—0.1%
Doubtful	Credit rating on trade date and valuation date: (1) From investment grade to non-investment grade (2) From BB+~BB— to B+~CCC-	Lifetime expected credit loss-not credit impaired	—
In default	Credit rating CC or below	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, 2018 and 2019, the expected credit loss decreases NT$1.1 million and increases NT$0.6 million, respectively. The changes are 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 equivalent, debt investment at FVTPL, financial assets at FVTOCI-current, and financial assets amortized at cost-current.

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	1-3 Years	3-5 Years	More Than 5 Years	Total
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
December 31, 2018					
Non-derivative financial liabilities					
Short-term loans	$ 88,810.7	$ —	$ —	$ —	$ 88,810.7
Accounts payable (including related parties)	34,357.4	—	—	—	34,357.4
Payables to contractors and equipment suppliers	43,133.7	—	—	—	43,133.7
Accrued expenses and other current liabilities	50,241.0	—	—	—	50,241.0
Bonds payable	36,039.9	35,340.8	22,979.4	—	94,360.1
Guarantee deposits (including those classified under accrued expenses and other current liabilities)	6,835.7	2,891.6	461.7	—	10,189.0
	259,418.4	38,232.4	23,441.1	—	321,091.9
Derivative financial instruments					
Forward exchange contracts					
Outflows	49,302.3	—	—	—	49,302.3
Inflows	(49,393.7)	—	—	—	(49,393.7)
	(91.4)	—	—	—	(91.4)
	$ 259,327.0	$ 38,232.4	$ 23,441.1	$ —	$ 321,000.5

(Continued)

	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, 2019					
Non-derivative financial liabilities					
Short-term loans	$ 118,562.6	$ —	$ —	$ —	$ 118,562.6
Accounts payable (including related parties)	40,206.0	—	—	—	40,206.0
Payables to contractors and equipment suppliers	140,810.7	—	—	—	140,810.7
Accrued expenses and other current liabilities	45,760.9	—	—	—	45,760.9
Bonds payable	32,338.9	7,777.7	18,203.6	—	58,320.2
Lease liabilities (including those classified under accrued expenses and other current liabilities)	2,475.1	2,782.9	2,484.5	10,947.7	18,690.2
Guarantee deposits (including those classified under accrued expenses and other current liabilities)	1,553.0	121.0	55.5	0.4	1,729.9
	381,707.2	10,681.6	20,743.6	10,948.1	424,080.5
Derivative financial instruments					
Forward exchange contracts					
Outflows	141,450.8	—	—	—	141,450.8
Inflows	(141,128.9)	—	—	—	(141,128.9)
	321.9	—	—	—	321.9
	$ 382,029.1	$ 10,681.6	$ 20,743.6	$ 10,948.1	$ 424,402.4

(Concluded)

Additional information about the maturity analysis for lease liabilities:

	Less than 5 Years NT$ (In Millions)	5-10 Years NT$ (In Millions)	10-15 Years NT$ (In Millions)	15-20 Years NT$ (In Millions)	More Than 20 Years NT$ (In Millions)
Lease liabilities	$ 7,742.5	$ 5,581.1	$ 3,691.3	$ 1,600.9	$ 74.4

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.

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, 2018			
	Level 1 NT$ (In Millions)	Level 2 NT$ (In Millions)	Level 3 NT$ (In Millions)	Total NT$ (In Millions)
Financial assets at FVTPL				
Mandatorily measured at FVTPL				
Agency mortgage-backed securities	$ —	$ 3,419.3	$ —	$ 3,419.3
Forward exchange contracts	—	85.3	—	85.3
	$ —	$ 3,504.6	$ —	$ 3,504.6
Financial assets at FVTOCI				
Investments in debt instruments				
Corporate bonds	$ —	$ 40,753.6	$ —	$ 40,753.6
Agency bonds/Agency mortgage-backed securities	—	31,288.8	—	31,288.8
Asset-backed securities	—	15,670.3	—	15,670.3
Government bonds	11,006.2	145.1	—	11,151.3
Commercial paper	—	107.6	—	107.6
Investments in equity instruments				
Non-publicly traded equity investments	—	—	3,910.7	3,910.7
Publicly traded stocks	590.1	—	—	590.1
Notes and accounts receivable, net	—	3,595.1	—	3,595.1
	$ 11,596.3	$ 91,560.5	$ 3,910.7	$ 107,067.5
Hedging financial assets				
Cash flow hedges				
Forward exchange contracts	$ —	$ 23.5	$ —	$ 23.5
Financial liabilities at FVTPL				
Held for trading				
Forward exchange contracts	$ —	$ 40.8	$ —	$ 40.8
Hedging financial liabilities				
Fair value hedges				
Interest rate futures contracts	$ 153.9	$ —	$ —	$ 153.9
Cash flow hedges				
Forward exchange contracts	—	1.9	—	1.9
	$ 153.9	$ 1.9	$ —	$ 155.8

	December 31, 2019			
	Level 1	Level 2	Level 3	Total
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Financial assets at FVTPL				
Mandatorily measured at FVTPL				
Forward exchange contracts	$ —	$ 162.1	$ —	$ 162.1
Convertible bonds	—	—	123.8	123.8
Agency mortgage-backed securities	—	40.9	—	40.9
	$ —	$ 203.0	$ 123.8	$ 326.8
Financial assets at FVTOCI				
Investments in debt instruments				
Agency bonds/Agency mortgage-backed securities	$ —	$ 51,966.5	$ —	$ 51,966.5
Corporate bonds	—	51,790.0	—	51,790.0
Government bonds	12,678.1	146.1	—	12,824.2
Asset-backed securities	—	10,815.9	—	10,815.9
Investments in equity instruments				
Non-publicly traded equity investments	—	39.2	4,085.1	4,124.3
Notes and accounts receivable, net	—	3,255.9	—	3,255.9
	$ 12,678.1	$ 118,013.6	$ 4,085.1	$ 134,776.8
Hedging financial assets				
Fair value hedges				
Interest rate futures contracts	$ 22.4	$ —	$ —	$ 22.4
Cash flow hedges				
Forward exchange contracts	—	3.5	—	3.5
	$ 22.4	$ 3.5	$ —	$ 25.9
Financial liabilities at FVTPL				
Held for trading				
Forward exchange contracts	$ —	$ 982.3	$ —	$ 982.3
Hedging financial liabilities				
Cash flow hedges				
Forward exchange contracts	$ —	$ 1.8	$ —	$ 1.8

Reconciliation of Level 3 fair value measurements of financial assets

The financial assets measured at Level 3 fair value were financial assets at FVTPL and equity investments classified as financial assets at FVTOCI. Reconciliations for the years ended December 31, 2018 and 2019 were as follows:

	Years Ended December 31	
	2018	2019
	NT$ (In Millions)	NT$ (In Millions)
Balance, beginning of year	$ 5,841.4	$ 3,910.7
Additions	212.5	372.3
Recognized in other comprehensive income	(2,141.4)	129.5
Disposals and proceeds from return of capital of investments	(175.8)	(76.5)
Transfers out of level 3 (Note)	—	(43.6)
Effect of exchange rate changes	174.0	(83.5)
Balance, end of year	$ 3,910.7	$ 4,208.9

Note: The transfer from level 3 to level 2 is because observable market data became available for the equity investments.

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, government bonds, commercial papers and non-publicly traded equity investments are determined by quoted market prices provided by third party pricing services.
- Forward exchange contracts are measured using forward exchange rates and the discounted curves that are derived from quoted market prices.
- The fair value of accounts receivables classified as at FVTOCI are 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 are mainly determined by using the asset approach, income 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, 2018 and 2019, the Company uses unobservable inputs derived from discount for lack of marketability by 10%. When other inputs remain equal, the fair value will decrease by NT$31.4 million and NT$34.8 million if discounts for lack of marketability increase by 1%.

The income approach utilizes discounted cash flows to determine the present value of the expected future economic benefits that will be derived from the investment. On December 31, 2018 and 2019, the Company uses unobservable inputs, which include expected returns, discount rate of 10%, discount for lack of marketability of 10%, and discounts for lack of control of 10%.

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.

In addition, the fair values of convertible bonds are determined by the present value of future cash flow based on a discount rate reflecting issuer's credit spread and market conditions, combined with the fair value of conversion option estimated by the option pricing model considering recent financing activities of the investee and market transaction prices of the similar companies.

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 assets and liabilities which are not required to measure at fair value:

	December 31, 2018	
	Carrying Amount	**Level 2 Fair Value**
	NT$ (In Millions)	**NT$ (In Millions)**
Financial assets		
Financial assets at amortized costs		
Corporate bonds	$ 19,511.8	$ 19,554.5
Commercial paper	2,294.1	2,296.2
	$ 21,805.9	$ 21,850.7
Financial liabilities		
Financial liabilities at amortized costs		
Bonds payable	$ 91,800.0	$ 93,171.3

	December 31, 2019	
	Carrying Amount	**Level 2 Fair Value**
	NT$ (In Millions)	**NT$ (In Millions)**
Financial assets		
Financial assets at amortized costs		
Corporate bonds	$ 7,648.8	$ 7,718.7
Financial liabilities		
Financial liabilities at amortized costs		
Bonds payable	$ 56,900.0	$ 57,739.1

Valuation techniques and assumptions used in Level 2 fair value measurement

The fair value of corporate bonds is determined by quoted market prices provided by third party pricing services.

The fair value of commercial paper is determined by the present value of future cash flows based on the discounted curves that are derived from the quoted market prices.

The fair value of the Company's bonds payable is determined by quoted market prices provided by third party pricing services.

35. 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
Mutual-Pak	Associates
TSMC Education and Culture Foundation	Other related parties
TSMC Charity Foundation	Other related parties

b. Net revenue

		Years Ended December 31		
		2017	2018	2019
		NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Item	Related Party Categories			
Net revenue from sale of goods	Associates	$ 8,496.0	$ 8,980.1	$ 6,253.9
	Other related parties	0.1	0.3	—
		$ 8,496.1	$ 8,980.4	$ 6,253.9
Net revenue from royalties	Associates	$ 482.5	$ 362.3	$ 183.6

c. Purchases

	Years Ended December 31		
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Related Party Categories			
Associates	$ 9,904.6	$ 8,809.5	$ 6,301.4

d. Receivables from related parties

Item	Related Party Name/Categories	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Receivables from related parties	GUC	$ 481.9	$ 741.9
	Xintec	102.5	120.2
		$ 584.4	$ 862.1
Other receivables from related parties	SSMC	$ 53.8	$ 46.5
	VIS	10.4	3.9
	Other associates	0.8	1.2
		$ 65.0	$ 51.6

e. Payables to related parties

Item	Related Party Name/Categories	December 31, 2018 NT$ (In Millions)	December 31, 2019 NT$ (In Millions)
Payables to related parties	Xintec	$ 649.8	$ 736.9
	SSMC	362.6	487.9
	VIS	357.1	154.0
	Others	7.0	56.1
		$ 1,376.5	$ 1,434.9

f. Others

		Years Ended December 31		
Item	Related Party Categories	2017 NT$ (In Millions)	2018 NT$ (In Millions)	2019 NT$ (In Millions)
Manufacturing expenses	Associates	$ 2,196.1	$ 2,974.6	$ 2,823.0
Research and development expenses	Associates	$ 69.8	$ 83.1	$ 163.4
General and administrative expenses	Other related parties	$ 101.5	$ 120.8	$ 120.0

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.

g. Compensation of key management personnel

The compensation to directors and other key management personnel for the years ended December 31, 2017, 2018 and 2019 were as follows:

	Years Ended December 31		
	2017	**2018**	**2019**
	NT$ (In Millions)	**NT$ (In Millions)**	**NT$ (In Millions)**
Short-term employee benefits	$ 2,170.3	$ 2,004.9	$ 1,922.2
Post-employment benefits	3.7	3.4	2.7
	$ 2,174.0	$ 2,008.3	$ 1,924.9

The compensation to directors and other key management personnel were determined by the Compensation Committee of TSMC in accordance with the individual performance and the market trends.

36. PLEDGED ASSETS

The Company provided certificate of deposits recorded in other financial assets as collateral mainly for building lease agreements. As of December 31, 2018 and 2019, the aforementioned other financial assets amounted to NT$124.2 million and NT$114.5 million, respectively.

37. 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, 2019, 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, 2019.

c. In February 2019, Innovative Foundry Technologies LLC (“IFT”) filed a complaint in the U.S. District Court for the District of Delaware alleging that TSMC and TSMC Technology Inc. infringe five U.S. patents. IFT also filed a complaint in the U.S. International Trade Commission (the “ITC”) alleging that TSMC, TSMC North America, TSMC Technology Inc., and other companies infringe the same patents. The ITC instituted an investigation in March 2019. Both parties agreed to end the dispute and the ITC terminated the investigation in October 2019. The pending litigation in the U.S. District Court for the District of Delaware was dismissed at the same time.

d. On September 28, 2017, TSMC was contacted by the European Commission (the “Commission”), which has asked us for information and documents concerning alleged anti-competitive practices in relation to semiconductor sales. We are cooperating with the Commission to provide the requested information and documents. In light of the fact that this proceeding is still in its preliminary stage, it is premature to predict how the case will proceed, the outcome of the proceeding or its impact.

e. TSMC entered into long-term purchase agreements of material with multiple suppliers. The relative minimum purchase quantity and price are specified in the agreements.

f. TSMC entered into a long-term purchase agreement of equipment. The relative purchase quantity and price are specified in the agreement.

g. TSMC entered into long-term energy purchase agreements with multiple suppliers. The relative purchase period, quantity and price are specified in the agreements.

h. Amounts available under unused letters of credit as of December 31, 2018 and 2019 were NT$70.7 million and NT$60.0 million, respectively.

38. SIGNIFICANT OPERATION LOSSES

The Company experienced a computer virus outbreak on August 3, 2018, which affected a number of computer systems and fab tools, and consequently impacted wafer production in Taiwan. All the impacted tools have been recovered by August 6, 2018. The Company recognized a loss of NT$2,596.0 million related to this incident for the three months ended September 30, 2018, which was included in cost of revenue.

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.

39. 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, selling, 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, product and major customers information were as follows:

1) Geographic information

	Net Revenue from External Customers	Noncurrent Assets	
	Year Ended December 31	December 31,	
	2017	2018	2019
	NT$ (In Millions)	NT$ (In Millions)	NT$ (In Millions)
Taiwan	$ 88,046.1	$ 1,039,471.3	$ 1,344,352.6
United States	635,851.7	7,569.8	8,850.1
China	110,201.4	43,574.5	38,586.6
Europe, the Middle East and Africa	69,046.8	8.3	186.2
Japan	60,628.0	13.1	27.1
Others	13,673.2	—	3.1
	$ 977,447.2	$ 1,090,637.0	$ 1,392,005.7

The Company categorized the net revenue mainly based on the countries where the customers are headquartered. For geographic information in 2018 and 2019, please refer to Note 24. Noncurrent assets include property, plant and equipment, right-of-use assets, intangible assets and other noncurrent assets.

2) Product information

Product	Year Ended December 31 2017 NT$ (In Millions)
Wafer	$ 875,461.4
Others	101,985.8
	$ 977,447.2

For product information in 2018 and 2019, please refer to Note 24.

3) Major customers representing at least 10% of net revenue

	Years Ended December 31					
	2017		2018		2019	
	Amount NT$ (In Millions)	%	Amount NT$ (In Millions)	%	Amount NT$ (In Millions)	%
Customer A	$ 220,463.1	23	$ 224,690.7	22	$ 247,213.3	23
Customer B	46,355.5	5	83,885.6	8	152,876.9	14

Commencing in 2018, the Company began to break down the net revenue by product, by geography, by resolution and by customer based on a new method which associates most estimated sales returns and allowances with individual sales transactions, as opposed to the previous method which allocated sales returns and allowances based on the aforementioned gross revenue. The Company believes the new method provides a more relevant breakdown than the previous one. On a comparable basis, the classifications of 2017 have been revised accordingly.

Exhibit 1.1

ARTICLES OF INCORPORATION

OF

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED

Section I - General Provisions

Article 1

The Corporation shall be incorporated, as a company limited by shares, under the Company Law of the Republic of China, and its name shall be 台灣積體電路製造股份有限公司 in the Chinese language, and Taiwan Semiconductor Manufacturing Company Limited in the English language.

Article 2

The scope of business of the Corporation shall be as follows:

1. Manufacturing and sales of integrated circuits and assembly of other semiconductor devices in wafer form at the order of and pursuant to product design specifications provided by customers.

   Provision of packaging and testing services related to the above services. Providing computer assisted design services and technology for integrated circuits.

   Providing mask making and mask design services.

   (CC01080 Electronic Parts and Components Manufacturing)

2. Researching, developing, designing, manufacturing and selling LED lighting devices and related applications products and systems.

   (CC01080 Electronic Parts and Components Manufacturing)

   (CC01040 Electric Wires and Cables Manufacturing)

3. Researching, developing, designing, manufacturing and selling renewable energy and efficiency related technologies and products, including solar cells, solar photovoltaic modules and their related systems and applications.

   (CC01080 Electronic Parts and Components Manufacturing)

   (IG03010 Energy Technical Services)

   (CC01090 Batteries Manufacturing)

4. Selling recycled and processed chemical, metal, and plastic materials and products derived from the Corporation's manufacturing activities.

   (C801990 Other Chemical Materials Manufacturing)

   (C802990 Other Chemical Products Manufacturing)

   (CA02990 Other Fabricated Metal Products Manufacturing)

   (C805990 Other Plastic Products Manufacturing)

Article 3

The Corporation shall have its head office in Hsinchu Science Park, Taiwan, Republic of China, and shall be free, upon approval of government authorities in charge, to set up representative and branch offices at various locations within and without the territory of the Republic of China, wherever and whenever the Corporation deems it necessary or advisable to carry out any or all of its activities.

Article 4

Public announcements of the Corporation shall be made in accordance with the Company Law and other relevant rules and regulations of the Republic of China.

Article 5

The Corporation may provide endorsement and guarantee and act as a guarantor.

Article 6

The total amount of the Corporation's reinvestment shall not be subject to the restriction of not more than forty percent of the Corporation's paid-up capital as provided in Article 13 of the Company Law. Any matters regarding the reinvestment shall be resolved in accordance with the resolutions of the Board of Directors.

Section II - Capital Stock

Article 7

The total capital stock of the Corporation shall be in the amount of 280,500,000,000 New Taiwan Dollars, divided into 28,050,000,000 shares, at ten New Taiwan Dollars each, and may be paid-up in installments.

The Corporation may issue employee stock options from time to time. A total of 500,000,000 shares among the above total capital stock should be reserved for issuing employee stock options.

Article 8

The Corporation may issue shares without printing share certificate(s). If the Corporation decides to print share certificates for shares issued, the Corporation shall comply with relevant provisions of the Company Law and relevant rules and regulations of the Republic of China.

Article 9

The share certificates of the Corporation shall all be name-bearing share certificates, and issued in accordance with the Company Law and relevant rules and regulations of the Republic of China.

Article 10

All transfer of stocks, pledge of rights, loss, succession, gift, loss of seal, amendment of seal, change of address or similar stock transaction conducted by shareholders of the Corporation shall follow the "Guidelines for Stock Operations for Public Companies" unless specified otherwise by law and securities regulations.

Article 11

Registration for transfer of shares shall be suspended sixty (60) days immediately before the date of regular meeting of shareholders, and thirty (30) days immediately before the date of any special meeting of shareholders, or within five (5) days before the day on which dividend, bonus, or any other benefit is scheduled to be paid by the Corporation.

Article 12

Shareholders' meetings of the Corporation are of two types, namely: (1) regular meetings and (2) special meetings. Regular meetings shall be convened, by the Board of Directors, within six (6) months after the close of each fiscal year. Special meetings shall be convened in accordance with the relevant laws, rules and regulations of the Republic of China.

Article 13

Written notices shall be sent to all shareholders at their latest places of residence as registered with the Corporation for the convening of shareholders' meetings, at least thirty (30) days in advance, in case of regular meetings; and at least fifteen (15) days in advance, in case of special meetings. The purpose(s) for convening any such meeting shall be clearly stated in the written notices sent out to the shareholders. Notices shall be written in Chinese, and English when necessary.

Article 14

Except as provided in the Company Law of the Republic of China, shareholders' meetings may be held if attended by shareholders in person or by proxy representing more than one half of the total issued and outstanding capital stock of the Corporation, and resolutions shall be adopted at the meeting with the concurrence of a majority of the votes held by shareholders present at the meeting. According to regulatory requirements, shareholders may also vote via an electronic voting system, and those who do shall be deemed as attending the shareholders' meeting in person; electronic voting shall be conducted in accordance with the relevant laws and regulations.

Article 15

Each share of stock shall be entitled to one vote.

Article 16

If a shareholder is unable to attend a meeting, he/she may appoint a representative to attend it, and to exercise, on his/her behalf, all rights at the meeting, in accordance with Article 177 of the Company Law. A representative does not need to be a shareholder of the Corporation.

Article 17

The shareholders' meeting shall be presided over by the Chairman of the Board of Directors of the Corporation. In his absence, either the Vice Chairman of the Board of Directors, or one of the Directors shall preside in accordance with Article 208 of the Company Law.

Article 18

The resolutions of the shareholders' meeting shall be recorded in the minutes, and such minutes shall be signed by or sealed with the chop of the chairman of the meeting. Such minutes, together with the attendance list and proxies, shall be filed and kept at the head office of the Corporation. The minutes shall be drafted in both the Chinese language and the English language.

Section III - Directors

Article 19

The Corporation shall have seven to ten Directors. The Board of Directors is authorized to determine the number of Directors.

The aforesaid Board of Directors must have at least three independent directors.

Article 19-1

For the election of Directors, each share has the same voting rights equal to the number of Directors to be elected, and a shareholder may cast all his/her voting rights to one candidate or among several candidates; those candidates receiving more voting rights shall be elected as Directors.

Directors shall be elected by adopting candidates nomination system as specified in Article 192-1 of the Company Law. The nomination of directors and related announcement shall comply with the relevant regulations of the Company Law and the Securities and Exchange Law. The election of independent directors and non- independent directors shall be held together; provided, however, the number of independent directors and non-independent directors elected shall be calculated separately.

Article 19-2

In compliance with Articles 14-4 of the Securities and Exchange Law, the Corporation shall establish an Audit Committee, which shall consist of all independent directors. The Audit Committee or the members of Audit Committee shall be responsible for those responsibilities of Supervisors specified under the Company Law, the Securities and Exchange Law and other relevant regulations.

Article 20

The term of office for Directors shall be three (3) years, and all Directors shall be eligible for re-election.

Article 21

Except as otherwise provided in the Company Law of the Republic of China, a meeting of the Board of Directors may be held if attended by a majority of total Directors and resolutions shall be adopted with the concurrence of the majority of the Directors present at the meeting.

Article 22

The Directors shall elect from among themselves a Chairman of the Board of Directors, and may elect a Vice Chairman of the Board of Directors, by a majority in a meeting attended by over two-thirds of the Directors. The Chairman shall not have a second or casting vote at any meeting of the Board of Directors. The Chairman of the Board of Directors shall have the authority to represent the Corporation.

Article 23

Except the first Board meeting of every term of the newly elected Board of Directors, which shall be convened by the Director who has received the largest number of votes after such new election, meetings of the Board of Directors shall be convened by the Chairman of the Board of Directors, upon written notice mailed to all the other Directors, at least fourteen days, unless in case of urgent circumstances, prior to the date of the meeting, specifying the date and place of the meeting and its agenda. The meeting of the Board of Directors shall be held at least once every quarter. Such prescribed notices may be waived in writing by any Director, either before or after the meeting. The meetings of the Board of Directors may be convened, at any time, without such prescribed notice in case of urgent circumstances. Notices shall be written in both the Chinese language and the English language. Personal attendance at a meeting will represent a waiver of the notice. Any Director attending the meeting via video conference shall be deemed attending the meeting in person.

Article 24

The Chairman of the Board of Directors shall preside over all meetings of the Board of Directors. In addition, the Chairman shall have the right to execute documents in accordance with the resolutions of the Board of Directors in the name and on behalf of the Corporation as well as acting on behalf of the Board pursuant to Board resolutions and the Corporation's objectives when the Board is not in session. In his absence, the Vice Chairman of the Board of Directors, or any one of the Directors shall be acting for him according to Article 208 of the Company Law.

Article 25

A Director may, by written authorization, appoint another Director to attend on his behalf any meeting of the Board of Directors, and to vote for him on all matters presented at such meeting, but no Director may act as proxy for more than one other Director.

Article 26

The Directors shall exercise their functions by resolutions adopted at meetings of Shareholders and the Board of Directors.

Article 27

In the case that vacancies on the Board of Directors exceed, for any reason, one third of the total number of the Directors, then the Board of Directors shall convene a shareholders' meeting to elect new Directors to fill such vacancies in accordance with relevant laws, rules and regulations. Except for the election of new Directors across the board, the new Directors shall serve the remaining term of the predecessors.

Article 28

The Board of Directors is authorized to determine the salary for the Chairman, Vice- Chairman and Directors, taking into account the extent and value of the services provided for the management of the Corporation and the standards of the industry within the R.O.C. and overseas.

Section IV - Management of the Corporation

Article 29

The Corporation may, by resolution of the Board of Directors, appoint one or more Chief Executive Officer, President(s), Vice President(s) or such other officers to meet the Corporation's operational or managerial needs.

The Chief Executive Officer shall cause to be prepared and furnished to the Board of Directors of the Corporation a balance sheet of the Corporation and related statements of income and loss, as of the end of each calendar month, quarter and year. Quarterly statements shall be furnished no more than forty-five (45) days after the end of each quarter, and year-end statements shall be furnished no more than ninety (90) days after the end of each year. Such financial statements shall be prepared in accordance with generally accepted accounting principles applied in the Republic of China on a consistent basis. Such statements shall be accompanied by a certification of the Corporation that such statements have been so prepared. Subject to the policies of the Corporation, the officers as stated in the previous paragraph shall be responsible for the overall control of allocated business and operation of the Corporation and shall make reports to the Board of Directors, and shall also supervise and control day-to- day business and operation of the Corporation in accordance with the policies of the Board of Directors headed by the Chairman. The Vice President-Finance shall have special responsibility for the financial affairs and accounting of the Corporation.

Article 30

The Chief Executive Officer reports to the Board of Directors. The President(s), Vice President(s) and other officers shall perform such duties as designated by the Chief Executive Officer or the Board of Directors.

Article 31

Subject to the provisions of the Company Law of the Republic of China and these Articles of Incorporation, all actions of the Corporation's employees shall be in conformance with, and in furtherance of, the directions of the Board of Directors.

Section V - Financial Reports

Article 32

The fiscal year for the Corporation shall be from January 1 of each year to December 31 of the same year. After the close of each fiscal year, the following reports shall be prepared by the Board of Directors, and submitted to the regular shareholders' meeting for acceptance:

1. Business Report;
2. Financial Statements;
3. Proposal Concerning the Distribution of Earnings or Covering of Losses.

Article 33

The distribution of earnings or the covering of losses may be made on a quarterly basis after the close of each quarter. When the earnings are to be distributed in cash, the distribution shall be approved by the Board of Directors in accordance with Article 228-1 and Paragraph V of Article 240 of the Company Law and reported to the shareholders' meeting, instead of being submitted to the shareholders' meeting for acceptance.

The Corporation shall not pay dividends or bonuses to shareholders when there are no earnings. When allocating the earnings, the Corporation 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 provided that the amount of accumulated legal capital reserve has not reached the amount of the paid-in capital of the Corporation, then set aside a special capital reserve in accordance with relevant laws or regulations or as requested by the authorities in charge.

Before paying dividends or bonuses to shareholders, the Corporation shall set aside not more than 0.3% of its profits of the period for which the Corporation distributes the earnings as compensation to its directors and not less than 1% as profit sharing bonuses to its employees; provided, however, that the Corporation shall have reserved a sufficient amount to offset its accumulated losses. Directors’ compensation is governed by the rules set by the Board of Directors; directors who also serve as executive officers of the Corporation are not entitled to receive compensation to directors. Employees’ profit sharing bonuses are resolved by a majority vote at a Board of Directors meeting attended by at least two-thirds of the total number of directors and shall be reported to the shareholders’ meeting. The Corporation may issue profit sharing bonuses to employees of an affiliated company meeting the conditions set by the Board of Directors or, by the person duly authorized by the Board of Directors.

After the Corporation has set aside the capital reserves pursuant to the second Paragraph of this Article, the balance left over shall be allocated according to the applicable laws and regulations, the relevant rules set forth herein, and the following principles: Earnings may be distributed in total after taking into consideration financial, business and operational factors. Earnings of the Corporation may be distributed by way of cash dividend and/or stock dividend. Since the Corporation is in a capital-intensive industry at the steady growth stage of its business, 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 however, the ratio for stock dividend shall not exceed 50% of total distribution.

In case there are no earnings for distribution, or the earnings are far less than the earnings actually distributed by the Corporation previously, or considering the financial, business or operational factors of the Corporation, the Corporation may allocate a portion or all of its reserves for distribution in accordance with relevant laws or regulations or the orders of the authorities in charge. When the reserves are to be distributed in cash, the distribution may be approved by the Board of Directors in accordance with Article 241 of the Company Law and reported to the shareholders’ meeting, instead of being submitted to the shareholders’ meeting for acceptance.

Section VI - Supplementary Provisions

Article 34

The internal organization of the Corporation and the detailed procedures of business operation shall be determined by the Board of Directors.

Article 35

In regard to all matters not provided for in these Articles of Incorporation, the Company Law of the Republic of China shall govern.

Article 36

These Articles of Incorporation are agreed to and signed on December 10, 1986 by all the promoters of the Corporation, and the first Amendment was approved by the shareholders' meeting on April 28, 1987, the second Amendment on November 27, 1989, the third Amendment on May 28, 1991, the fourth Amendment on May 18, 1993, the fifth Amendment on January 28, 1994, the sixth Amendment on May 12, 1995, the seventh Amendment on April 8, 1996, the eighth Amendment on May 13, 1997, the ninth Amendment on May 12, 1998, the tenth Amendment on May 11, 1999, the eleventh Amendment on April 14, 2000, the twelfth Amendment on September 5, 2000, the thirteenth Amendment on May 15, 2001, the fourteenth Amendment on May 7, 2002, the fifteenth Amendment on June 3, 2003, the sixteenth Amendment on December 21, 2004, the seventeenth Amendment on May 10, 2005, the eighteenth Amendment on May 16, 2006, the nineteenth Amendment on May 7, 2007, the twentieth Amendment on June 15, 2010, the twenty-first Amendment on June 12, 2012, the twenty-second Amendment on June 7, 2016, the twenty-third Amendment on June 8, 2017, the twenty-fourth Amendment on June 5, 2018, and the twenty-fifth Amendment on June 5, 2019.

EXHIBIT 2a.1

DESCRIPTION OF SECURITIES
REGISTERED UNDER SECTION 12 OF THE EXCHANGE ACT

As of December 31, 2019, Taiwan Semiconductor Manufacturing Company Limited (“TSMC”, the “Company”, “we”, “us” and “our”) had (i) common shares and (ii) American Depositary Shares (the “ADSs”) registered pursuant to Section 12(b) of the U.S. Securities Exchange Act of 1934, as amended (the “Exchange Act”). The common shares are not for trading and registered only in connection with the registration of the ADSs representing such common shares, pursuant to the requirement of the U.S. Securities and Exchange Commission (the “SEC”). Section headings referenced herein are to those set forth in this annual report on Form 20-F.

A. Description of Common Shares

The following description of our common shares is a summary and does not purport to be complete. This summary is subject to and qualified in its entirety by reference to our Articles of Incorporation, the R.O.C. Company Act, the R.O.C. Securities and Exchange Law and the regulations promulgated thereunder, each as amended from time to time. See also “Item 10. Additional Information – Description of Common Shares”.

Title and Class

Our authorized share capital is NT$280,500,000,000, divided into 28,050,000,000 common shares (par value NT$10.00 each). See “Item 10. Additional Information – Description of Common Shares – General”.

Dividend Rights

See “Item 10. Additional Information – Description of Common Shares – Dividends and Distributions”.

Redemption of Shares

See “Item 10. Additional Information – Description of Common Shares – Acquisition of Common Shares by Us”.

Voting Rights

See “Item 10. Additional Information – Description of Common Shares – Voting Rights”.

Liquidation Rights

See “Item 10. Additional Information – Description of Common Shares – Liquidation Rights”.

Preemption Rights

See “Item 10. Additional Information – Description of Common Shares – Preemptive Rights and Issues of Additional Common Shares”.

Limitations on the Rights to Own Shares

See “Item 10. Additional Information – Foreign Investment in the R.O.C.”.

Provisions Affecting Any Change of Control

See “Item 10. Additional Information – Description of Common Shares – Other Rights of Shareholders” relating to appraisal rights under the R.O.C. Company Act and other shareholder rights.

Transfer Restrictions

See “Item 10. Additional Information – Description of Common Shares – Transaction Restrictions”.

Amendments to Shareholder Rights

See “Item 10. Additional Information – Description of Common Shares – Voting Rights”.

B. Description of the ADSs

The following description of our ADSs is a summary and does not purport to be complete. This summary is subject to and qualified in its entirety by reference to our registration statement on Form F-6, filed with the SEC on November 16, 2007, including any exhibits thereto. In the following description, references to "you" are to the person registered with the Depositary (as defined below).

General

We have appointed Citibank, N.A. (the "Depositary") as the depositary bank for our ADSs pursuant to the Deposit Agreement, entered into among us, the Depositary and the holders and owners of beneficial interests in our ADSs (the "Deposit Agreement'). The Depositary's offices are located at 388 Greenwich Street, 14th Floor, New York, New York 10013. The Depositary typically appoints a custodian to safekeep the securities on deposit. In this case, the custodian is Citibank, N.A. Taipei Branch, located at B1, No. 16, Nanking E. Road, Section 4, Taipei, Taiwan, R.O.C.

Each ADS represents ownership of five common shares on deposit with the custodian. The ADSs are normally evidenced by certificates that are commonly known as American Depositary Receipts ("ADRs"). If you become an owner of ADSs, you will become a party to the Deposit Agreement and therefore will be bound to its terms and to the terms of the ADR that represents your ADSs. As a holder of ADSs, you appoint the Depositary to act on your behalf in certain circumstances.

As an owner of ADSs, you may hold your ADSs either by means of an ADR registered in your name or through a brokerage or safekeeping account. If you decide to hold your ADSs through your brokerage or safekeeping account, you must rely on the procedures of your broker or bank to assert your rights as an ADS owner. Please consult with your broker or bank to determine what those procedures are. This summary description assumes you have opted to own the ADSs directly by means of an ADR registered in your name and, as such, we will refer to you as the "holder". When we refer to "you", we assume the reader owns ADSs or will own ADSs at the relevant time.

Voting Rights and Procedures

You 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 and applicable R.O.C. law.

Except as described below, you will not be able to exercise the voting rights attaching to the common shares represented by your ADSs on an individual basis. According to 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 or its nominee, who represents all holders of ADSs, collectively in the same manner, except in the case of an election of directors, if such election is done by means of cumulative voting. Directors are elected by cumulative voting unless our Articles of Incorporation stipulate otherwise.

We will provide the Depositary with copies (including English translations) of notices of meetings of our shareholders and the agenda of these meetings, including an indication of the number of directors to be elected if an election of directors is to be held at the meeting. The Depositary has agreed to request and we will, therefore, also provide a list of the candidates who have expressed their intention to run for an election of directors. The Depositary will mail these materials, together with a voting instruction form to holders as soon as practicable after the Depositary 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 the voting instruction form by a date specified by the Depositary.

Subject to the provisions described in the second paragraph of this subsection, 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 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 will notify the instructions to the chairman of our board of directors or a person the chairman may designate. The Depositary will appoint the chairman or designated person to serve as the voting representative of the Depositary 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 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 done by means of cumulative voting), then the holders will be deemed to have instructed the Depositary or its nominee to authorize and appoint the voting representative as the representative of the Depositary 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 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 and in form and substance satisfactory to the Depositary, 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 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 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 at shareholders' meetings in a manner consistent with applicable R.O.C. law.

The Depositary 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 and the owners to attend such meeting and vote the common shares represented by ADSs as to which the Depositary 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 have not delivered instructions to the Depositary will be deemed to have instructed the Depositary to authorize and appoint the voting representative as the representative of the Depositary or its nominee and the holders to attend such meeting and vote all the common shares represented by ADSs as to which the Depositary 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.

By accepting and continuing to hold ADSs or any interest therein, you 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 you will receive notice of shareholders' meetings sufficiently prior to the date established by the Depositary for receipt of instructions to enable you to give voting instructions before the cutoff date.

Moreover, in accordance with the Deposit Agreement, 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 Depositary 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 submitted to 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 Depositary, 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 Depositary, in the form required by the Depositary, 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 Depositary or its agent to attend the general meeting of the shareholders) as such fees and expenses may be reasonably determined and documented by the Depositary 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.

Dividends and Distributions

As a holder, you generally have the right to receive the distributions we make on the securities deposited with the custodian. Your receipt of these distributions may be limited, however, by practical considerations, legal limitations and the terms of the Deposit Agreement. Holders will receive such distributions under the terms of the Deposit Agreement in proportion to the number of ADSs held as of a specified record date.

Distributions of Cash. Whenever we make a cash distribution for the securities on deposit with the custodian, the Depositary will arrange for the funds to be converted into U.S. dollars and for the distribution of the U.S. dollars to the holders subject to any restrictions imposed by applicable laws and regulations.

The conversion into U.S. dollars will take place only if practicable and only if the U.S. dollars are transferable to the United States. The amounts distributed to holders will be net of the fees, expenses, taxes and governmental charges payable by holders under the terms of the Deposit Agreement.

Distributions of Shares. Subject to applicable laws, whenever we declare a dividend in or make a free distribution of common shares for the securities on deposit with the custodian, the Depositary may, and will upon our request, distribute to holders new ADSs representing the common shares deposited. Only whole new ADSs will be distributed. Fractional entitlements will be sold and the proceeds of such sale will be distributed as in the case of a cash distribution. If additional ADSs are not distributed, the ADS-to-common share ratio will be modified subject to applicable R.O.C. law, in which case each ADS you hold will represent rights and interests in the additional common shares so deposited.

The distribution of new ADSs or the modification of the ADS-to-common share ratio upon a distribution of common shares will be made net of the fees, expenses, taxes and governmental charges payable by holders under the terms of the Deposit Agreement. In order to pay such taxes or governmental charges, the Depositary may sell all or a portion of the new common shares so distributed.

No such distribution of new ADSs or modification of the ADS-to-common share ratio will be made if it would violate a law (i.e., U.S. securities laws). If the Depositary does not distribute new ADSs or modify the ADS-to-common share ratio as described above, it is expected to use its best efforts to sell the common shares received and would distribute the proceeds of the sales as in the case of a distribution in cash.

Distributions of Rights. Subject to applicable laws, whenever we distribute rights to purchase additional common shares, we will assist the Depositary in determining whether it is lawful and reasonably practicable to distribute rights to purchase additional ADSs to holders.

The Depositary will establish procedures to distribute rights to purchase additional ADSs to holders if it is lawful and reasonably practicable to make the rights available to holders of ADSs, and if we provide all of the documentation contemplated in the Deposit Agreement (including opinions to address the legality of the transaction). You may have to pay fees, expenses, taxes and other governmental charges to subscribe for the new ADSs upon the exercise of your rights.

In circumstances in which rights would not otherwise be distributed, if you request the distribution of warrants or other instruments in order to exercise the rights allocable to your ADSs, the Depositary will make such rights available to you as allowed by applicable law upon written notice from us. Our notice to the Depositary must indicate that:

- we have elected in our sole discretion to permit the rights to be exercised; and
- you have executed such documents as we have determined in our sole discretion are reasonably required under applicable law.

The Depositary may sell the rights that are not exercised or not distributed if such sale is lawful and reasonably practicable. The proceeds of such sale will be allocated to the account of the holders otherwise entitled to the rights. If the Depositary is unable to sell the rights, it will allow the rights to lapse.

Other Distributions. Subject to applicable laws, whenever we distribute property other than cash, common shares or rights in respect of the deposited securities, the Depositary will determine whether such distribution to holders is feasible. If it is feasible to distribute such property to you, the Depositary will distribute the property to the holders in a manner it deems practicable. If the Depositary considers such distribution not to be feasible, it may sell all or a portion of the property received. The proceeds of such a sale will be distributed to holders as in the case of a distribution in cash.

Any distribution will be made net of fees, expenses, taxes and governmental charges payable by holders under the terms of the Deposit Agreement.

Transmittal of Notices, Reports and Communications

The Depositary will make available for inspection by holders at its principal office any reports and communications received from us which are both (a) received by the Depositary as representative of the holder of record of the deposited securities, and (b) made generally available to the holders of such deposited securities by us. The Depositary will also promptly provide or make available to the holders copies of such reports and communications when furnished by us pursuant to the Deposit Agreement. In addition, we are subject to the periodic reporting requirements of the Exchange Act and, accordingly, file certain reports with the SEC. Such reports and documents can be retrieved from the SEC's website (www.sec.gov).

Issuance of ADSs upon Deposit of Common Shares

Under current R.O.C. law, no deposit of common shares may be made into the depositary facility, and no ADSs may be issued against such deposits, without specific approval by the R.O.C. Financial Supervisory Commission, except in connection with (i) dividends on or free distributions of common shares, (ii) the exercise by holders of existing ADSs of their pre-emptive rights in connection with rights offerings or (iii) if permitted under the Deposit Agreement and the custodian agreement, the deposit of common shares purchased by any person directly or through the Depositary on the Taiwan Stock Exchange or the Taipei Exchange (formerly the Gre Tai Securities Market) (as applicable) or held by such person for deposit in the depositary facility; provided that the total number of ADSs outstanding after an issuance described in clause (iii) above does not exceed the number of issued ADSs previously approved by the R.O.C. Financial Supervisory Commission (plus any ADSs created pursuant to clauses (i) and (ii) above) and subject to any adjustment in the number of common shares represented by each ADS. Under current R.O.C. law, issuances under clause (iii) above will be permitted only to the extent that previously issued ADSs have been cancelled and the underlying shares have been withdrawn from the ADR facility. The Depositary will refuse to accept common shares for deposit pursuant to clause (iii) unless it receives satisfactory legal opinions as described in the Deposit Agreement. In addition, the Depositary may, or if so directed by us, will, refuse to accept common shares for deposit whenever we have notified the Depositary that (i) there are outstanding common shares with rights, including rights to dividends, that are different from the common shares held by the Depositary, (ii) we have restricted the transfer of these common shares to comply with delivery, transfer or ownership restrictions referred to in the Deposit Agreement or under applicable law or otherwise or (iii) we have otherwise restricted the deposit of common shares pursuant to the Deposit Agreement.

The Depositary may create ADSs on your behalf if you or your broker deposits common shares with the custodian and meets the foregoing requirements. The Depositary will deliver these ADSs to the person you indicate only after you pay any applicable fees, charges and taxes payable for the transfer of the common shares to and the issuance and delivery of the ADSs by the Depositary or custodian.

The issuance of ADSs may be delayed until the Depositary or the custodian receives confirmation that all required approvals have been given and that the common shares have been duly transferred to the custodian. The Depositary will only issue ADSs in whole numbers.

When you make a deposit of common shares, you will be responsible for transferring good and valid title to the Depositary. As such, you will be deemed to represent and warrant that:

- the common shares are duly and validly authorized, issued and outstanding, fully paid and non-assessable and free of any preemptive rights;
- you are duly authorized to deposit the common shares; and
- the common shares are not restricted securities and your deposit of common shares is not restricted by United States federal securities laws and does not violate the Deposit Agreement.

If any of the representations or warranties are incorrect in any way, we and the Depositary may, at your cost and expense, take any and all actions necessary to correct the consequences of the misrepresentations.

Changes Affecting Common Shares

The common shares held on deposit for your ADSs may change from time to time. For example, there may be a change in nominal or par value, a split-up, consolidation or reclassification of such common shares, or a recapitalization, reorganization, merger, consolidation or sale of assets.

If any such change were to occur, your ADSs would, to the extent permitted by law, represent the right to receive the property received or exchanged in respect of the common shares held on deposit. The Depositary may in such circumstances deliver new ADSs to you or call for the exchange of your existing ADSs for new ADSs. If the Depositary may not lawfully distribute such property to you, the Depositary may sell such property and distribute the net proceeds to you in cash.

Amendments and Termination

We may agree with the Depositary to modify the Deposit Agreement at any time without your consent. We undertake to give holders 30 days' prior notice of any modifications that would prejudice any of their substantial rights under the Deposit Agreement (except in very limited circumstances enumerated in the Deposit Agreement).

You will be bound by the modifications to the Deposit Agreement if you continue to hold your ADSs after the modifications to the Deposit Agreement become effective. The Deposit Agreement cannot be amended to prevent you from withdrawing the common shares represented by your ADSs (except to comply with applicable law).

We have the right to direct the Depositary to terminate the Deposit Agreement. Similarly, the Depositary may in certain circumstances on its own initiative terminate the Deposit Agreement. In either case, the Depositary must give notice to the holders at least 60 days before termination.

Upon termination, the following will occur under the Deposit Agreement:

- for a period of six months after termination, you will be able to request the cancellation of your ADSs and the withdrawal of the common shares represented by your ADSs and the delivery of all other property held by the Depositary in respect of those common shares on the same terms as prior to the termination. During this six-month period, the Depositary will continue to collect all distributions received on the common shares on deposit (i.e., dividends) but will not distribute any property to you until you request the cancellation of your ADSs; and
- after the expiration of the six-month period, the Depositary may sell the securities held on deposit. The Depositary will hold the proceeds from such sale and any other funds then held for the holders of ADSs in a non-interest bearing account. At that point, the Depositary will have no further obligations to holders other than to account for the funds then held for the holders of ADSs still outstanding.

Rights to Inspect the Books of the Depositary and the List of Holders

The Depositary will maintain ADS holder records at its depositary office. You may inspect such records at that office during regular business hours, but solely for the purpose of communicating with other holders in the interest of our business or matters relating to the ADSs and the Deposit Agreement.

The Depositary will maintain in The City of New York facilities to record and process the execution and delivery, registration, registration of transfers and surrender of ADRs. These facilities may be closed from time to time, to the extent not prohibited by law.

Withdrawal of Common Shares Upon Cancellation of ADSs

You may withdraw and hold the common shares represented by your ADSs unless you are a citizen of the PRC, or an entity organized under the laws of the PRC or request the Depositary to sell the common shares represented by your ADSs. If you are a non-R.O.C. person and elect to withdraw common shares and hold the withdrawn common shares, you will be required to appoint a tax guarantor as well as an agent and a custodian in the R.O.C.

In order to withdraw the common shares represented by your ADSs, you will be required to pay to the depositary the fees for cancellation of ADSs and any charges and taxes payable upon the transfer of the common shares being withdrawn. You assume the risk for delivery of all funds and securities upon withdrawal. Once cancelled, the ADSs will not have any rights under the Deposit Agreement.

If you hold any ADSs registered in your name, the Depositary may ask you to provide proof of citizenship, residence, tax payer status, exchange control approval, payment of taxes and other governmental charges, compliance with applicable laws and regulations and certain other documents as the Depositary may deem appropriate before it will effect any withdrawal of the common shares represented by such ADS. The withdrawal of the common shares represented by your ADSs may be delayed until the Depositary receives satisfactory evidence of compliance with all applicable laws and regulations. If the common shares are withdrawn to or for the account of any person other than the person receiving the proceeds from the sale of ADSs, such evidence may include the disclosure of:

- your name;
- the name and nationality (and the identity number, if such person is an R.O.C. citizen) of any person in whose name the common shares you are withdrawing will be registered;
- the number of common shares such person will receive upon such withdrawal;
- the aggregate number of common shares such person has received upon all withdrawals since the establishment of the depositary facility; and
- any other information that we or the Depositary may deem necessary or desirable to comply with any R.O.C. disclosure or reporting requirements.

The Depositary will only accept ADSs for cancellation that represent a whole number of common shares on deposit. If you surrender a number of ADSs for withdrawal representing other than a whole number of common shares the Depositary will either return the number of ADSs representing any remaining fractional common shares or sell the common shares represented by the ADSs you surrendered and remit the net proceeds of that sale to you as in the case of a distribution in cash.

You will have the right to withdraw the securities represented by your ADSs at any time subject to the requirements listed above and:

- temporary delays that may arise because (i) the transfer books for the shares or ADSs are closed, or (ii) common shares are immobilized on account of a shareholders' meeting, a payment of dividends or rights offering;
- obligations to pay fees, taxes and similar charges; and
- restrictions imposed because of laws or regulations applicable to ADSs or the withdrawal of securities on deposit.

The Deposit Agreement may not be modified to impair your right to withdraw the securities represented by your ADSs except to comply with mandatory provisions of law.

Pre-Release Transactions

The Depositary may, to the extent permitted by applicable laws and regulations, issue ADSs before receiving a deposit of common shares. These transactions are commonly referred to as "pre-release transactions". The Deposit Agreement limits the aggregate size of pre-release transactions and imposes a number of conditions on such transactions (i.e., the need to receive collateral, the type of collateral required, the representations required from brokers, etc.). The Depositary may retain the compensation received from the pre-release transactions.

Limitations on Obligations and Liabilities

The Deposit Agreement is governed by New York law. However, our obligations to the holders of common shares will continue to be governed by the laws of the R.O.C., which may be different from the laws in the United States. The Deposit Agreement limits our obligations and the Depositary's obligations to you. Please note the following:

- We and the Depositary are obligated only to take the actions specifically stated in the depositary agreement without negligence and in good faith.
- The Depositary disclaims any liability for any failure to carry out voting instructions, for any manner in which a vote is cast or for the effect of any vote, provided it acts in good faith and in accordance with the terms of the Deposit Agreement.
- The Depositary disclaims any liability to monitor or enforce our obligations under the Deposit Agreement, including our obligation to replace the certificate of payment in respect of common shares.
- We and the Depositary will not be obligated to perform any act that is not set forth in the Deposit Agreement.
- We and the Depositary disclaim any liability if we are prevented or forbidden from acting on account of any law or regulation, any provision of our Articles of Incorporation, any provision of any securities on deposit or by reason of any act of God or war or other circumstances beyond our control.
- We and the Depositary disclaim any liability by reason of any exercise of, or failure to exercise, any discretion provided for in the Deposit Agreement.
- We and the Depositary further disclaim any liability for any action or inaction in reliance on the advice or information received from legal counsel, accountants, any person presenting common shares for deposit, any holder of ADSs or authorized representative thereof, or any other person believed by either of us in good faith to be competent to give such advice or information.
- We and the Depositary also disclaim liability for the inability by a holder to benefit from any distribution, offering, right or other benefit which is made available to holders of common shares but is not, under the terms of the Deposit Agreement, made available to that holder.
- We and the Depositary may rely without any liability upon any written notice, request or other document believed to be genuine and to have been signed or presented by the proper parties.

Exhibit 3.2

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED
RULES AND PROCEDURES OF BOARD OF DIRECTORS MEETINGS

Article 1 (Scope of the Rules and Procedures)

Unless relevant laws and regulations or the Company's Articles of Incorporation provide otherwise, the Company's Board of Directors meetings ("Board Meetings") shall be conducted in accordance with the Rules and Procedures of Board of Directors Meetings (the "Rules and Procedures").

Article 2 (Convention and Chairman of Board Meetings)

Board Meetings shall be held at least once every quarter but may be held at any time in case of urgent circumstances.

Board Meetings shall be convened and presided over by the Chairman of the Board of Directors. However, the first meeting of every term of the newly elected Board of Directors shall be convened and presided over by the Director who has received the largest number of votes after such election; if there are two or more persons with such convening rights, they shall elect from amongst themselves one person to convene and preside over the meeting.

In case the Chairman of the Board of Directors is on leave or unable to exercise his powers for any cause, the Vice Chairman of the Board of Directors shall act on his behalf. If the Vice Chairman is also on leave or unable to exercise his powers for any cause, the Chairman shall appoint a Director to act on his behalf. In the absence of such an appointee, the Directors shall elect from amongst themselves one person to act on the behalf of the Chairman.

Article 3 (Place and Time of Board Meetings)

Board Meetings shall be held at the head office and during the office hours of the Company or at any other appropriate place and time convenient for the Directors to attend.

Article 4 (Designated Secretariat, Corporate Governance Officer, Meeting Notices, and Meeting Materials)

The subject matters of Board Meetings shall be decided by the Chairman of the Board of Directors. The Board secretariat shall conduct the drafting of meeting agendas and minutes, and handle other administrative matters related to Board Meetings, and reports to the Chairman of the Board of Directors. The Company's Board secretariat shall be appointed by the Chairman of the Board of Directors. The Company's Corporate Governance Officer (the "CGO") may be the Board Secretary, both of whom shall be nominated by the Chairman of the Board and be appointed by the Board of Directors.

Board Meetings shall be convened upon written notices sent to all Directors fourteen days prior to the date of the meeting, specifying the date and place of the meeting and attaching the meeting agenda and related materials. Notices shall be written in both the Chinese language and the English language. However, Board Meetings may be convened at any time without such prescribed notices in case of urgent circumstances. Any Director attending the meeting in person shall be deemed to have received such meeting notice.

If the Directors consider meeting materials to be insufficient, they may request the Board secretariat to provide supplemental materials in advance. The Board secretariat shall provide the requested materials within 3 business days except in exceptional circumstances. If the Directors consider meeting materials concerning any proposal to be insufficient during the meeting, the deliberation or resolution of such proposal may be postponed upon a resolution of the Board of Directors.

The CGO shall provide full support to all Directors to ensure that the Board operates in compliance with the Rules and Procedures and all applicable laws and regulations, as well as to facilitate smooth communications among Directors themselves and between Directors and the management. The CGO is responsible for handling the requests from Directors, and shall respond to Directors' requests within 3 business days (except in exceptional circumstances) to timely and effectively facilitate Directors' performance of their duties.

Except for any urgent circumstances or legitimate reasons, the material matters listed below should be included in the meeting agenda in advance and may not be presented as special motions:

1. The Company's business plans;
2. Annual financial statements;
3. Adoption or amendment of an internal control system and assessment of the effectiveness of the internal control system;
4. Adoption or amendment of procedures for acquisition or disposal of assets, financial derivatives transactions, lending funds to other parties, or providing endorsement or guarantees for other parties;
5. Material transactions of assets or financial derivatives; material monetary loans, endorsements or guarantees;
6. Offering, issuance, or private placement of any equity-type securities;
7. Appointment or discharge of CFO, Controller, or head of internal auditor;

8. Donations to related parties or material donations to non-related parties. For emergency donations made for the public welfare for material disasters relief, the Board may ratify such donations in its next Board Meeting; and

9. Any other matters that shall be resolved by the Shareholders' Meeting or Board Meeting as required by relevant laws and regulations or the Company's Articles of Incorporation, or that are deemed to be material by the regulatory authorities.

For purposes of Item 8 above, "material donation to a non-related party" shall mean donations made, individually or in the aggregate, to any single recipient within an one-year period, that equals or exceeds NT$100 million or 1% of revenue or 5% of paid-in capital as reflected in the audited financial statements for the most current fiscal year.

Article 5 (Subject Matters of Board Meetings)

The agenda of regular Board Meetings shall include at least the following items:

1. Report items:
   (1) The meeting minutes of the preceding meeting;
   (2) Material business and financial reports;
   (3) Internal audit matters reports; and
   (4) Other important matters report, including the report on implementation status of previous resolutions.
2. Discussion items:
   (1) Discussion items reserved by the preceding meeting; and
   (2) Discussion items of the current meeting.
3. Special motions

Article 6 (Attendance Signing Booklet and Proxies)

A signing booklet shall be provided at every Board Meeting for the attending Directors to sign in. The Directors shall attend Board Meetings in person. If unable to attend, a Director may appoint another Director to attend on his behalf by proxy which specifies the scope of authorization; any appointee shall not act as proxy for more than one Director.

Notwithstanding the foregoing, at least one Independent Director must attend the Board Meeting in person. Any Director attending the meeting via video conference shall be deemed to have attended the meeting in person but shall sign an attendance card and send it to the Board secretariat via facsimile in lieu of signing on the attendance signing booklet.

With respect to the discussion of matters specified under Paragraph 1 of Article 7 of the Regulations Governing Procedure for Board of Directors Meetings of Public Companies, all Independent Directors shall attend the Board Meetings in person; if any Independent Director is unable to attend a Board Meeting in person, he/she shall delegate another Independent Director to attend on his/her behalf. Any dissenting opinion or abstention by Independent Directors shall be recorded in the Board Meetings minutes. If Independent Directors are unable to attend Board Meetings in person to express their dissenting opinion or abstention, except for legitimate reasons, they shall submit a written statement in advance to be recorded in the Board Meetings minutes.

Article 7 (Convention of Board Meetings)

If half or more of the Directors are not yet present at the scheduled time for a Board Meeting, the Chairman may postpone the time of the meeting. The postponements shall be limited to twice at the most. If after two postponements no quorum can yet be constituted, the Chairman may reconvene the meeting pursuant to the procedures under Article 4 of the Rules and Procedures.

Article 8 (Other Attendants)

Depending on the subject matters of proposed resolutions, relevant managerial personnel may be invited to present at Board Meetings to assist the Directors in understanding the Company's current conditions so that they can make appropriate resolutions. In addition, CPAs, legal counsels, or other professional personnel may be invited to the meetings to provide professional opinions for the Board of Directors' reference, but shall excuse themselves and vacate the meeting when the proposed resolution will be discussed and resolved.

Article 9 (Discussion of Proposed Resolutions)

In principle, the discussion of proposed resolutions at a Board Meeting shall proceed in accordance with the agenda attached to the meeting notice. However, if no objection is voiced by any Director present at the meeting or with more than half of the attending Directors' consent, the Chairman may make changes. Unless otherwise resolved at the meeting, the Chairman cannot announce adjournment of the meeting before all the discussion items (including special motions) listed in the above agenda are resolved.

In the process of a Board Meeting, if the number of Directors present at the meeting become fewer than half of the Directors originally attending the meeting, the Chairman shall announce a temporary adjournment of the meeting upon a motion made by any Director present at the meeting, and Article 7 of the Rules and Procedures applies *mutatis mutandis* to such case.

During a meeting, the Chairman may, at his discretion, set time for intermission or negotiation.

Article 10 (Voting)

The Chairman may announce to end the discussion of any resolution and go into voting if the Chairman deems it appropriate for voting.

Resolutions shall be deemed adopted if no objection is voiced by any of the attending Directors after solicitation by the Chairman. If objection is voiced after solicitation by the Chairman, such resolution shall be voted. Except otherwise specified in applicable laws and regulations, a resolution shall be adopted by a majority of those Directors present at a meeting attended by a majority of all Directors. If there is an amendment to or substitute for a proposed resolution, the Chairman shall decide the sequence of voting for such proposed resolution and the amendment or substitute. If any one of them has been adopted, the others shall be deemed vetoed and no further voting is required. The result of voting shall be announced at the meeting and placed on record.

The method of voting shall be one of the following as determined by the Chairman:

1. By showing of hands;
2. By voicing votes; or
3. By casting ballots. The Chairman shall appoint person(s) to monitor the voting process and person(s) to count the ballots; and the person (s) appointed to monitor the voting process should be a Director.

Article 11 (The Recusal of Conflict-Interested Directors)

If a Director or the judicial person the Director represents has a personal interest in the matter under discussion at the meeting, the relevant Director shall disclose the nature of such personal interest. If such interest may impair the interest of the Company, the relevant Director shall not join the discussion and voting of such matter, and shall recuse himself/herself when the matter is being discussed and resolved; nor shall the relevant Director exercise voting right on behalf of another Director.

Where the spouse of a Director, a blood relative having a second or closer degree of kinship of a Director, or any company which controls or is controlled by a Director, has an interest in the matter under discussion at the meeting, such Director shall be deemed to have a personal interest in the matter.

Article 12 (Meeting Items to be Recorded and Signed)

The resolutions of every Board Meeting shall be recorded in the meeting minutes. The meeting minutes shall accurately record the following items:

1. The term (or year), place, and time of the meeting;
2. The name of the chairman;
3. The attendance situation of the Directors, including the names and numbers of those who are present, on leave, and absent;
4. The names and titles of the other attendants;
5. The name of the recorder;
6. Report items;
7. Discussion items: the voting method and the result of each proposed resolution; the summary of opinion by the Directors, experts, and other personnel; the names of the Directors that disclosed a conflict of interest under Article 11 of the Rules and Procedures, summary of the nature of the conflict of interest, the reasons for recusal or non-recusal, and the circumstances of recusal; any dissenting opinion or abstention with a written statement; any written statement provided by the Independent Directors pursuant to Paragraph 2 of Articles 6 of the Rules and Procedures;
8. Special motions: the names of the persons proposing the special motions; the voting method and the result of each proposed resolution; the summary of opinion by the Directors, experts, and other personnel; any dissenting opinion or abstention with a written statement; and
9. Other items that shall be recorded.

Meeting minutes shall be signed or chopped by the chairman of the meeting and the recorder, distributed to each Director within twenty days after the meeting, and carefully kept as the Company's important file throughout the life of the Company. The attendance signing booklet of a Board Meeting shall be part of the meeting minutes and be permanently retained throughout the life of the Company. The recording and distribution of meeting minutes may be performed by means of electronic transmission.

Article 13 (Recording of Board Meeting Process)

The process of a Board Meeting regarding the subject matters specified in Article 5 of the Rules and Procedures shall be fully audio recorded and retained for five years in a method that may be encrypted. If litigation occurs regarding any matter resolved by the Board of Directors before the above retention period expires, the relevant recordings shall continue to be retained until the litigation is concluded, and the above mentioned five-year rule shall not be applicable.

If a Board Meeting is held via video conference, the video recording shall be part of the meeting minutes and be permanently retained throughout the life of the Company.

Article 14 (Cancellation of Board Meetings)

In the case of special circumstances where a scheduled Board Meeting of the Company must be cancelled after meeting notices have been sent to the Directors, the meeting may be cancelled if the person with convening right notifies the Directors in writing at least three days prior to the scheduled meeting date. In the case of urgent circumstances where the scheduled Board Meeting must be cancelled and it is impossible to notify the Directors prior to the time specified above, the meeting may be cancelled if the person with convening right notifies the Directors by telephone or other means at least three hours prior to the scheduled meeting time and confirms that each Director has received such notice.

Article 15 (Delegation of the Board of Directors)

The Chairman of the Board of Directors shall act on behalf of the Board of Directors pursuant to the Company's objectives when the Board of Directors is not in session. In case the Chairman of the Board of Directors is unable to exercise his powers for any cause, the Vice Chairman of the Board of Directors or another Director shall act for him according to the Company's Articles of Incorporation and Article 208 of the Company Law.

Article 16 (Effective Date and Amendment)

These Rules and Procedures shall be effective from January 1, 2007. Any amendment to these Rules and Procedures shall be approved by the Board of Directors.

EXHIBIT 4.3

(English Summary)
LEASE 201910210016

Parties:

SOUTHERN TAIWAN SCIENCE PARK ADMINISTRATION OF MINISTRY OF SCIENCE AND TECHNOLOGY (the "Lessor")

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED (the "Lessee")

Lease Premises:

The government-owned land containing 15,000 square meters, located in Tainan Science Park.

Lease Term:

Commencing November 1, 2019 and expiring on October 31, 2039.

Rental:

The rental should be Twenty New Taiwan Dollars and Forty-four cents (NT$20.44) per square meter per month.

The total amount of monthly rental shall be Three Hundred and Six Thousand, Six Hundred New Taiwan Dollars (NT$306,600).

After the commencement of this Lease, the Lessee shall pay the rental amount of NT$306,600 including applicable taxes, each month in the manner prescribed by the Lessor.

If Lessee, with Lessor's consent, uses the land before the execution date of this Lease, the above-mentioned rental should be calculated from the starting date of use.

If Lessee fails to make monthly rental according to the agreed schedule and Lessor's procedures for payment, certain punitive fine may apply according to the Lease.

Lessee must adhere to the terms and conditions set forth under this Lease concerning the use of the Lease Premises, including Waste Disposal Act, Air Pollution Control Act, Soil and Groundwater Pollution Remediation Act, Act for Establishment and Administration of Science Parks and other relevant rules and regulations.

During the term of the Lease, should the government adjust the rental in accordance with relevant regulations or for any reasons, Lessee agrees to an adjustment of the rent to become effective immediately upon the confirmation of the adjustment. Any deficit/overpayment of rent shall be pursued/reimbursed.

Termination by Lessor:

Lessor may terminate the lease at any time if any of the following shall happen:

a. Lessee is disqualified from operating or providing service in the park and ordered by the Lessor to withdraw from the Tainan Science Park;

b. Lessee violates any term or provision of this Lease pertaining to the use of the land and the execution of this Lease while fails to provide remedy after receiving Lessor's written notice within limited time;

c. Lessee has defaulted in the payment of rent for period or amount exceeding relevant rules and regulations;

d. Lessee fails to apply for construction license within three months from execution of this Lease; after the Lessor has set a time for such application and the Lessee continues failing to do so; or the application is inadequate and the Lessee has been ordered to supplement the application and fails to do so within such time limit;

e. Lessee fails to complete the construction according to the schedule and fails to provide remedy during the extended period granted by the Lessor.

f. Lessee violates the term and provision pertaining to the restrictions on sub-leasing.

Miscellaneous:

The Lease term shall automatically expire unless Lessor and Lessee renew this Lease.

This Lease shall be effective from the execution date of the Lease, however, if the Lessee uses the land before the execution date of this Lease, the Lease shall be effective from the date when the Lessor consent to Lessee's use of the land.

Should any suits arise from this Lease, Lessor and Lessee agree that the governing law shall be the laws of Republic of China and the Taiwan Tainan District Court shall be the competent court of jurisdiction in the first instance.

EXHIBIT 4.7

(English Summary)
LEASE 201911070021

Parties:

HSINCHU SCIENCE PARK ADMINISTRATION OF MINISTRY OF SCIENCE AND TECHNOLOGY (the "Lessor")

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED (the "Lessee")

Lease Premises:

The government-owned land containing 32,000 square meters, located in Hsinchu Science Park.

Lease Term:

Commencing December 1, 2019 and expiring on December 31, 2038.

Rental:

The rental should be Fifty-four New Taiwan Dollars and Twenty-six cents (NT$54.26) per square meter per month.

The total amount of monthly rental shall be One Million, Seven Hundred and Thirty-six Thousand, Three Hundred and Twenty New Taiwan Dollars (NT$1,736,320).

After the commencement of this Lease, the Lessee shall pay the rental amount of NT$$1,736,320 including applicable taxes, each month in the manner prescribed by the Lessor.

If Lessee, with Lessor's consent, uses the land before the execution date of this Lease, the above-mentioned rental should be calculated from the starting date of use.

If Lessee fails to make monthly rental according to the agreed schedule and Lessor's procedures for payment, certain punitive fine may apply according to the Lease.

Lessee must adhere to the terms and conditions set forth under this Lease concerning the use of the Lease Premises, including Waste Disposal Act, Air Pollution Control Act, Soil and Groundwater Pollution Remediation Act, Act for Establishment and Administration of Science Parks and other relevant rules and regulations.

During the term of the Lease, should the government adjust the rental in accordance with relevant regulations or for any reasons, Lessee agrees to an adjustment of the rent to become effective immediately upon the confirmation of the adjustment. Any deficit/overpayment of rent shall be pursued/reimbursed.

Termination by Lessor:

Lessor may terminate the lease at any time if any of the following shall happen:

a. Lessee is disqualified from operating or providing service in the park and ordered by the Lessor to withdraw from the Hsinchu Science Park;

b. Lessee violates any term or provision of this Lease pertaining to the use of the land and the execution of this Lease while fails to provide remedy after receiving Lessor's written notice within limited time;

c. Lessee has defaulted in the payment of rent for period or amount exceeding relevant rules and regulations;

d. Lessee fails to apply for construction license within three months from execution of this Lease; after the Lessor has set a time for such application and the Lessee continues failing to do so; or the application is inadequate and the Lessee has been ordered to supplement the application and fails to do so within such time limit;

e. Lessee fails to complete the construction according to the schedule and fails to provide remedy during the extended period granted by the Lessor.

f. Lessee violates the term and provision pertaining to the restrictions on sub-leasing.

Miscellaneous:

The Lease term shall automatically expire unless Lessor and Lessee renew this Lease.

This Lease shall be effective from the execution date of the Lease, however, if the Lessee uses the land before the execution date of this Lease, the Lease shall be effective from the date when the Lessor consent to Lessee's use of the land.

Should any suits arise from this Lease, Lessor and Lessee agree that the governing law shall be the laws of Republic of China and the Taiwan Hsinchu District Court shall be the competent court of jurisdiction in the first instance.

EXHIBIT 4.27

(English Summary)
LEASE 201904230023

Parties:

HSINCHU SCIENCE PARK ADMINISTRATION OF MINISTRY OF SCIENCE AND TECHNOLOGY (the "Lessor")

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED (the "Lessee")

Lease Premises:

The government-owned land containing 6,198 square meters, located in Hsinchu Science Park.

Lease Term:

Commencing May 15, 2019 and expiring on December 31, 2038.

Rental:

The rental should be Thirty-two New Taiwan Dollars and Fifty-six cents (NT$32.56) per square meter per month.

The total amount of monthly rental shall be Two Hundred and One Thousand, Eight Hundred and Seven New Taiwan Dollars (NT$201,807).

After the commencement of this Lease, the Lessee shall pay the rental amount of NT$201,807 including applicable taxes, each month in the manner prescribed by the Lessor.

If Lessee, with Lessor's consent, uses the land before the execution date of this Lease, the above-mentioned rental should be calculated from the starting date of use.

If Lessee fails to make monthly rental according to the agreed schedule and Lessor's procedures for payment, certain punitive fine may apply according to the Lease.

Lessee must adhere to the terms and conditions set forth under this Lease concerning the use of the Lease Premises, including Waste Disposal Act, Air Pollution Control Act, Soil and Groundwater Pollution Remediation Act, Act for Establishment and Administration of Science Parks and other relevant rules and regulations.

During the term of the Lease, should the government adjust the rental in accordance with relevant regulations or for any reasons, Lessee agrees to an adjustment of the rent to become effective immediately upon the confirmation of the adjustment. Any deficit/overpayment of rent shall be pursued/reimbursed.

Termination by Lessor:

Lessor may terminate the lease at any time if any of the following shall happen:

a. Lessee is disqualified from operating or providing service in the park and ordered by the Lessor to withdraw from the Hsinchu Science Park;

b. Lessee violates any term or provision of this Lease pertaining to the use of the land and the execution of this Lease while fails to provide remedy after receiving Lessor's written notice within limited time;

c. Lessee has defaulted in the payment of rent for period or amount exceeding relevant rules and regulations;

d. Lessee fails to apply for construction license within three months from execution of this Lease; after the Lessor has set a time for such application and the Lessee continues failing to do so; or the application is inadequate and the Lessee has been ordered to supplement the application and fails to do so within such time limit;

e. Lessee fails to complete the construction according to the schedule and fails to provide remedy during the extended period granted by the Lessor.

f. Lessee violates the term and provision pertaining to the restrictions on sub-leasing.

Miscellaneous:

The Lease term shall automatically expire unless Lessor and Lessee renew this Lease.

This Lease shall be effective from the execution date of the Lease, however, if the Lessee uses the land before the execution date of this Lease, the Lease shall be effective from the date when the Lessor consent to Lessee's use of the land.

Should any suits arise from this Lease, Lessor and Lessee agree that the governing law shall be the laws of Republic of China and the Taiwan Hsinchu District Court shall be the competent court of jurisdiction in the first instance.

EXHIBIT 4.38

(English Summary)
LEASE 201912170012

Parties:

SOUTHERN TAIWAN SCIENCE PARK ADMINISTRATION OF MINISTRY OF SCIENCE AND TECHNOLOGY (the “Lessor”)

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED (the “Lessee”)

Lease Premises:

The government-owned land containing 271,930.93 square meters, located in Tainan Science Park.

Lease Term:

Commencing January 1, 2020 and expiring on December 31, 2034.

Rental:

The rental should be Twenty New Taiwan Dollars and Forty-four cents (NT$20.44) per square meter per month.

The total amount of monthly rental shall be Eight Million, One Hundred and Thirty-three Thousand, Four Hundred and Fifty-four New Taiwan Dollars (NT$8,133,454).

After the commencement of this Lease, the Lessee shall pay the rental amount of NT$8,133,454 including applicable taxes, each month in the manner prescribed by the Lessor.

If Lessee, with Lessor’s consent, uses the land before the execution date of this Lease, the above-mentioned rental should be calculated from the starting date of use.

If Lessee fails to make monthly rental according to the agreed schedule and Lessor’s procedures for payment, certain punitive fine may apply according to the Lease.

Lessee must adhere to the terms and conditions set forth under this Lease concerning the use of the Lease Premises, including Waste Disposal Act, Air Pollution Control Act, Soil and Groundwater Pollution Remediation Act, Act for Establishment and Administration of Science Parks and other relevant rules and regulations.

During the term of the Lease, should the government adjust the rental in accordance with relevant regulations or for any reasons, Lessee agrees to an adjustment of the rent to become effective immediately upon the confirmation of the adjustment. Any deficit/overpayment of rent shall be pursued/reimbursed.

Termination by Lessor:

Lessor may terminate the lease at any time if any of the following shall happen:

a. Lessee is disqualified from operating or providing service in the park and ordered by the Lessor to withdraw from the Tainan Science Park;

b. Lessee violates any term or provision of this Lease pertaining to the use of the land and the execution of this Lease while fails to provide remedy after receiving Lessor's written notice within limited time;

c. Lessee has defaulted in the payment of rent for period or amount exceeding relevant rules and regulations;

d. Lessee fails to apply for construction license within three months from execution of this Lease; after the Lessor has set a time for such application and the Lessee continues failing to do so; or the application is inadequate and the Lessee has been ordered to supplement the application and fails to do so within such time limit;

e. Lessee fails to complete the construction according to the schedule and fails to provide remedy during the extended period granted by the Lessor.

f. Lessee violates the term and provision pertaining to the restrictions on sub-leasing.

Miscellaneous:

The Lease term shall automatically expire unless Lessor and Lessee renew this Lease.

This Lease shall be effective from the execution date of the Lease, however, if the Lessee uses the land before the execution date of this Lease, the Lease shall be effective from the date when the Lessor consent to Lessee's use of the land.

Should any suits arise from this Lease, Lessor and Lessee agree that the governing law shall be the laws of Republic of China and the Taiwan Tainan District Court shall be the competent court of jurisdiction in the first instance.

EXHIBIT 4.39

(English Summary)
LEASE 202003170021

Parties:

SOUTHERN TAIWAN SCIENCE PARK ADMINISTRATION OF MINISTRY OF SCIENCE AND TECHNOLOGY (the “Lessor”)

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED (the “Lessee”)

Lease Premises:

The government-owned land containing 1300 square meters, located in Tainan Science Park.

Lease Term:

Commencing January 1, 2020 and expiring on December 31, 2034.

Rental:

The rental should be Thirty-one New Taiwan Dollars and eighteen cents (NT$31.18) per square meter per month.

The total amount of monthly rental shall be Forty Thousand, Five Hundred, Thirty-four New Taiwan Dollars (NT$40,534).

After the commencement of this Lease, the Lessee shall pay the rental amount of NT$$40,534 including applicable taxes, each month in the manner prescribed by the Lessor.

If Lessee, with Lessor’s consent, uses the land before the execution date of this Lease, the above-mentioned rental should be calculated from the starting date of use.

If Lessee fails to make monthly rental according to the agreed schedule and Lessor’s procedures for payment, certain punitive fine may apply according to the Lease.

Lessee must adhere to the terms and conditions set forth under this Lease concerning the use of the Lease Premises, including Waste Disposal Act, Air Pollution Control Act, Soil and Groundwater Pollution Remediation Act, Act for Establishment and Administration of Science Parks and other relevant rules and regulations.

During the term of the Lease, should the government adjust the rental in accordance with relevant regulations or for any reasons, Lessee agrees to an adjustment of the rent to become effective immediately upon the confirmation of the adjustment. Any deficit/overpayment of rent shall be pursued/reimbursed.

Termination by Lessor:

Lessor may terminate the lease at any time if any of the following shall happen:

a. Lessee is disqualified from operating or providing service in the park and ordered by the Lessor to withdraw from the Tainan Science Park;

b. Lessee violates any term or provision of this Lease pertaining to the use of the land and the execution of this Lease while fails to provide remedy after receiving Lessor's written notice within limited time;

c. Lessee has defaulted in the payment of rent for period or amount exceeding relevant rules and regulations;

d. Lessee fails to apply for construction license within three months from execution of this Lease; after the Lessor has set a time for such application and the Lessee continues failing to do so; or the application is inadequate and the Lessee has been ordered to supplement the application and fails to do so within such time limit;

e. Lessee fails to complete the construction according to the schedule and fails to provide remedy during the extended period granted by the Lessor.

f. Lessee violates the term and provision pertaining to the restrictions on sub-leasing.

Miscellaneous:

The Lease term shall automatically expire unless Lessor and Lessee renew this Lease.

This Lease shall be effective from the execution date of the Lease, however, if the Lessee uses the land before the execution date of this Lease, the Lease shall be effective from the date when the Lessor consent to Lessee's use of the land.

Should any suits arise from this Lease, Lessor and Lessee agree that the governing law shall be the laws of Republic of China and the Taiwan Tainan District Court shall be the competent court of jurisdiction in the first instance.

EXHIBIT 4.40

(English Summary)
LEASE 202002130006

Parties:

HSINCHU SCIENCE PARK ADMINISTRATION OF MINISTRY OF SCIENCE AND TECHNOLOGY (the “Lessor”)

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED (the “Lessee”)

Lease Premises:

The government-owned land containing 187,421 square meters, located in Hsinchu Science Park.

Lease Term:

Commencing February 5, 2020 and expiring on December 31, 2039.

Rental:

The rental should be Fifty-nine New Taiwan Dollars and Three cents (NT$59.3) per square meter per month.

The total amount of monthly rental shall be Eleven Million, One Hundred and Fourteen Thousand, Sixty-five New Taiwan Dollars (NT$11,114,065).

After the commencement of this Lease, the Lessee shall pay the rental amount of NT$11,114,065 including applicable taxes, each month in the manner prescribed by the Lessor.

If Lessee, with Lessor’s consent, uses the land before the execution date of this Lease, the above-mentioned rental should be calculated from the starting date of use.

If Lessee fails to make monthly rental according to the agreed schedule and Lessor’s procedures for payment, certain punitive fine may apply according to the Lease.

Lessee must adhere to the terms and conditions set forth under this Lease concerning the use of the Lease Premises, including Waste Disposal Act, Air Pollution Control Act, Soil and Groundwater Pollution Remediation Act, Act for Establishment and Administration of Science Parks and other relevant rules and regulations.

During the term of the Lease, should the government adjust the rental in accordance with relevant regulations or for any reasons, Lessee agrees to an adjustment of the rent to become effective immediately upon the confirmation of the adjustment. Any deficit/overpayment of rent shall be pursued/reimbursed.

Termination by Lessor:

Lessor may terminate the lease at any time if any of the following shall happen:

a. Lessee is disqualified from operating or providing service in the park and ordered by the Lessor to withdraw from the Hsinchu Science Park;

b. Lessee violates any term or provision of this Lease pertaining to the use of the land and the execution of this Lease while fails to provide remedy after receiving Lessor's written notice within limited time;

c. Lessee has defaulted in the payment of rent for period or amount exceeding relevant rules and regulations;

d. Lessee fails to apply for construction license within three months from execution of this Lease; after the Lessor has set a time for such application and the Lessee continues failing to do so; or the application is inadequate and the Lessee has been ordered to supplement the application and fails to do so within such time limit;

e. Lessee fails to complete the construction according to the schedule and fails to provide remedy during the extended period granted by the Lessor.

f. Lessee violates the term and provision pertaining to the restrictions on sub-leasing.

Miscellaneous:

The Lease term shall automatically expire unless Lessor and Lessee renew this Lease.

This Lease shall be effective from the execution date of the Lease, however, if the Lessee uses the land before the execution date of this Lease, the Lease shall be effective from the date when the Lessor consent to Lessee's use of the land.

Should any suits arise from this Lease, Lessor and Lessee agree that the governing law shall be the laws of Republic of China and the Taiwan Hsinchu District Court shall be the competent court of jurisdiction in the first instance.

Exhibit 8.1

Subsidiaries of Taiwan Semiconductor Manufacturing Company Ltd.*

	Jurisdiction of Incorporation
TSMC Global Ltd.	The British Virgin Islands

* Pursuant to Item 601(b)(21)(ii) of Regulation S-K, the names of other subsidiaries of Taiwan Semiconductor Manufacturing Company Ltd. are omitted because, considered in the aggregate, they would not constitute a significant subsidiary as of December 31, 2019.

Exhibit 12.1

I, C.C. Wei, certify that:

1. I have reviewed this annual report on Form 20-F of Taiwan Semiconductor Manufacturing Company Limited;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;

4. The company's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

   (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and

5. The company's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of company's board of directors (or persons performing the equivalent function):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: April 15, 2020

By: /s/ C.C. Wei
Name: C.C. Wei
Title: Chief Executive Officer

Exhibit 12.2

CERTIFICATIONS

I, Wendell Huang, certify that:

1. I have reviewed this annual report on Form 20-F of Taiwan Semiconductor Manufacturing Company Limited;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;

4. The company's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

   (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and

5. The company's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of company's board of directors (or persons performing the equivalent function):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: April 15, 2020

By: /s/ Wendell Huang

Name: Wendell Huang

Title: Vice President, Finance and Chief Financial Officer / Spokesperson

Exhibit 13.1

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED

Certification

Pursuant to 18 U.S.C. § 1350, the undersigned, C.C. Wei, Chief Executive Officer of Taiwan Semiconductor Manufacturing Company Limited (the "Company"), hereby certifies, to his knowledge, that the Company's annual report on Form 20-F for the year ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 15, 2020

By: /s/ C.C. Wei
Name: C.C. Wei
Title: Chief Executive Officer

The foregoing certification is being furnished solely pursuant to 18 U.S.C. § 1350 and is not being filed as part of the Report or as a separate disclosure document.

Exhibit 13.2

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED

Certification

Pursuant to 18 U.S.C. § 1350, the undersigned, Wendell Huang, Vice President, Finance and Chief Financial Officer / Spokesperson of Taiwan Semiconductor Manufacturing Company Limited (the “Company”), hereby certifies, to his knowledge, that the Company’s annual report on Form 20-F for the year ended December 31, 2019 (the “Report”) fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 15, 2020

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

The foregoing certification is being furnished solely pursuant to 18 U.S.C. § 1350 and is not being filed as part of the Report or as a separate disclosure document.