

# Financial Highlights and Analysis

## 6.1 Financial Highlights

### 6.1.1 Condensed Balance Sheet

#### Condensed Balance Sheet from 2014 to 2018 (Consolidated) (Note 1)

Unit: NT\$ thousands

Item	Year	2014 (Adjusted)	2015	2016	2017	2018
Current Assets		626,565,639	746,743,991	817,729,126	857,203,110	951,679,721
Long-term Investments (Note 2)		30,056,279	34,993,583	46,153,916	41,569,074	29,304,796
Property, Plant and Equipment		818,198,801	853,470,392	997,777,687	1,062,542,322	1,072,050,279
Intangible Assets		13,531,510	14,065,880	14,614,846	14,175,140	17,002,137
Other Assets (Note 3)		6,696,857	8,244,452	10,179,727	16,371,997	20,091,105
<b>Total Assets</b>		<b>1,495,049,086</b>	<b>1,657,518,298</b>	<b>1,886,455,302</b>	<b>1,991,861,643</b>	<b>2,090,128,038</b>
Current Liabilities						
Before Distribution		201,013,629	212,228,594	318,239,273	358,706,680	340,542,586
After Distribution		317,697,110	367,810,877	499,751,936	566,149,724	(Note 4)
Noncurrent Liabilities		247,707,125	222,655,225	178,164,903	110,395,320	72,089,056
<b>Total Liabilities</b>						
Before Distribution		448,720,754	434,883,819	496,404,176	469,102,000	412,631,642
After Distribution		565,404,235	590,466,102	677,916,839	676,545,044	(Note 4)
Equity Attributable to Shareholders of the Parent						
Capital Stock		259,296,624	259,303,805	259,303,805	259,303,805	259,303,805
Capital Surplus		55,989,922	56,300,215	56,272,304	56,309,536	56,315,932
Retained Earnings						
Before Distribution		705,165,274	894,293,586	1,072,008,169	1,233,362,010	1,376,647,841
After Distribution		588,481,793	738,711,303	890,495,506	1,025,918,966	(Note 4)
Others		25,749,291	11,774,113	1,663,983	(26,917,818)	(15,449,913)
Equity Attributable to Shareholders of the Parent						
Before Distribution		1,046,201,111	1,221,671,719	1,389,248,261	1,522,057,533	1,676,817,665
After Distribution		929,517,630	1,066,089,436	1,207,735,598	1,314,614,489	(Note 4)
Noncontrolling Interests		127,221	962,760	802,865	702,110	678,731
<b>Total Equity</b>						
Before Distribution		1,046,328,332	1,222,634,479	1,390,051,126	1,522,759,643	1,677,496,396
After Distribution		929,644,851	1,067,052,196	1,208,538,463	1,315,316,599	(Note 4)

Note 1: The financial statements for 2014-2018 were prepared in accordance with 2013 Taiwan-IFRSs version. The financial statements of 2014 were adjusted to retrospectively apply newly effected GAAP. Adjustments included a decrease of NT\$84,759 thousand in total assets, a decrease of NT\$737,344 thousand in total liabilities before distribution and an increase of NT\$652,585 thousand in total equity before distribution.

Note 2: Long-term investments as of December 31, 2014, 2015, 2016 and 2017 include noncurrent available-for-sale financial assets, held-to-maturity financial assets, financial assets carried at cost and investments accounted for using equity method. Starting from 2018, upon initial application of IFRS 9 "Financial Instruments", the category includes noncurrent financial assets at fair value through other comprehensive income, and noncurrent financial assets at amortized cost, and investments accounted for using equity method.

Note 3: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

Note 4: Pending shareholders' approval.



### Condensed Balance Sheet from 2014 to 2018 (Unconsolidated) (Note 1)

Unit: NT\$ thousands

Item	Year	2014 (Adjusted)	2015	2016	2017	2018
Current Assets		370,949,497	426,913,080	443,781,164	436,769,337	469,966,106
Long-term Investments (Note 2)		242,395,596	326,330,737	397,290,976	464,401,415	550,524,494
Property, Plant and Equipment		796,684,361	831,784,912	979,401,337	1,016,355,970	1,025,286,941
Intangible Assets		8,996,810	9,391,418	10,047,991	9,870,127	12,429,930
Other Assets (Note 3)		3,935,389	5,265,368	6,816,676	11,992,542	17,253,537
Total Assets		1,422,961,653	1,599,685,515	1,837,338,144	1,939,389,391	2,075,461,008
Current Liabilities						
Before Distribution		178,261,092	194,299,278	308,177,214	308,383,240	328,060,518
After Distribution		294,944,573	349,881,561	489,689,877	515,826,284	(Note 4)
Noncurrent Liabilities		198,499,450	183,714,518	139,912,669	108,948,618	70,582,825
Total Liabilities						
Before Distribution		376,760,542	378,013,796	448,089,883	417,331,858	398,643,343
After Distribution		493,444,023	533,596,079	629,602,546	624,774,902	(Note 4)
Equity						
Capital Stock		259,296,624	259,303,805	259,303,805	259,303,805	259,303,805
Capital Surplus		55,989,922	56,300,215	56,272,304	56,309,536	56,315,932
Retained Earnings						
Before Distribution		705,165,274	894,293,586	1,072,008,169	1,233,362,010	1,376,647,841
After Distribution		588,481,793	738,711,303	890,495,506	1,025,918,966	(Note 4)
Others		25,749,291	11,774,113	1,663,983	(26,917,818)	(15,449,913)
Total Equity						
Before Distribution		1,046,201,111	1,221,671,719	1,389,248,261	1,522,057,533	1,676,817,665
After Distribution		929,517,630	1,066,089,436	1,207,735,598	1,314,614,489	(Note 4)

Note 1: The financial statements for 2014-2018 were prepared in accordance with 2013 Taiwan-IFRSs version. The financial statements of 2014 were adjusted to retrospectively apply newly effected GAAP. Adjustments included a decrease of NT\$82,771 thousand in total assets, a decrease of NT\$735,381 thousand in total liabilities before distribution and an increase of NT\$652,610 thousand in total equity before distribution.

Note 2: Long-term investments as of December 31, 2014, 2015, 2016 and 2017 include held-to-maturity financial assets, financial assets carried at cost and investments accounted for using equity method. Starting from 2018, upon initial application of IFRS 9 "Financial Instruments", the category includes noncurrent financial assets at fair value through other comprehensive income, and noncurrent financial assets at amortized cost, and investments accounted for using equity method.

Note 3: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

Note 4: Pending shareholders' approval.

### 6.1.2 Condensed Statement of Comprehensive Income

#### Condensed Statement of Comprehensive Income from 2014 to 2018 (Consolidated) (Note 1)

Unit: NT\$ thousands (Except EPS: NT\$)

Item	Year	2014 (Adjusted)	2015	2016	2017	2018
Net Revenue		762,806,465	843,497,368	947,938,344	977,447,241	1,031,473,557
Gross Profit		377,722,016	410,394,893	474,832,098	494,826,402	497,874,253
Income from Operations		295,870,309	320,047,775	377,957,778	385,559,223	383,623,524
Non-operating Income and Expenses		6,208,048	30,381,136	8,001,602	10,573,807	13,886,739
Income before Income Tax		302,078,357	350,428,911	385,959,380	396,133,030	397,510,263
Net Income		263,763,958	306,556,167	334,338,236	343,146,848	351,184,406
Other Comprehensive Income for the Year, Net of Income Tax		11,805,021	(14,714,182)	(11,067,189)	(28,821,631)	9,836,976
Total Comprehensive Income for the Year		275,568,979	291,841,985	323,271,047	314,325,217	361,021,382
Net Income (Loss) Attributable to:						
Shareholders of the Parent		263,881,771	306,573,837	334,247,180	343,111,476	351,130,884
Noncontrolling Interests		(117,813)	(17,670)	91,056	35,372	53,522
Total Comprehensive Income (Loss) Attributable to:						
Shareholders of the Parent		275,670,991	291,867,757	323,186,736	314,294,993	360,965,015
Noncontrolling Interests		(102,012)	(25,772)	84,311	30,224	56,367
Basic/Diluted Earnings Per Share (Note 2)		10.18	11.82	12.89	13.23	13.54

Note 1: The financial statements for 2014-2018 were prepared in accordance with 2013 Taiwan-IFRSs version. The financial statements of 2014 were adjusted to retrospectively apply newly effected GAAP. Adjustments included a decrease of NT\$12,359 thousand in gross profit, a decrease of NT\$19,984 thousand in income from operations, a decrease of NT\$16,911 thousand in net income and a decrease of NT\$46,054 thousand in total comprehensive income for the year.

Note 2: Based on weighted average shares outstanding in each year.

#### Condensed Statement of Comprehensive Income from 2014 to 2018 (Unconsolidated) (Note 1)

Unit: NT\$ thousands (Except EPS: NT\$)

Item	Year	2014 (Adjusted)	2015	2016	2017	2018
Net Revenue		757,152,389	837,046,888	936,387,291	969,136,109	1,023,925,713
Gross Profit		366,899,120	397,708,840	461,808,296	478,937,691	492,955,501
Income from Operations		290,640,302	313,408,698	369,730,533	374,690,117	384,027,838
Non-operating Income and Expenses		10,363,515	36,579,970	15,458,427	18,626,059	12,170,315
Income before Income Tax		301,003,817	349,988,668	385,188,960	393,316,176	396,198,153
Net Income		263,881,771	306,573,837	334,247,180	343,111,476	351,130,884
Other Comprehensive Income for the Year, Net of Income Tax		11,789,220	(14,706,080)	(11,060,444)	(28,816,483)	9,834,131
Total Comprehensive Income for the Year		275,670,991	291,867,757	323,186,736	314,294,993	360,965,015
Basic/Diluted Earnings Per Share (Note 2)		10.18	11.82	12.89	13.23	13.54

Note 1: The financial statements for 2014-2018 were prepared in accordance with 2013 Taiwan-IFRSs version. The financial statements of 2014 were adjusted to retrospectively apply newly effected GAAP. Adjustments included a decrease of NT\$12,583 thousand in gross profit, a decrease of NT\$19,356 thousand in income from operations, a decrease of NT\$17,023 thousand in net income and a decrease of NT\$46,150 thousand in total comprehensive income for the year.

Note 2: Based on weighted average shares outstanding in each year.

### 6.1.3 Financial Analysis

#### Financial Analysis from 2014 to 2018 (Consolidated) (Note 1)

		2014 (Adjusted)	2015	2016	2017	2018
Capital Structure Analysis	Debts Ratio (%)	30.01	26.24	26.31	23.55	19.74
	Long-term Fund to Property, Plant and Equipment (%)	158.16	169.34	157.17	153.70	163.20
Liquidity Analysis	Current Ratio (%)	311.70	351.86	256.95	238.97	279.46
	Quick Ratio (%)	278.03	319.58	241.34	217.94	248.76
	Times Interest Earned (Times)	94.34	110.84	117.74	119.95	131.28
Operating Performance Analysis	Average Collection Turnover (Times)	8.12	8.37	8.78	7.74	8.19
	Days Sales Outstanding	44.95	43.61	41.57	47.16	44.57
	Average Inventory Turnover (Times)	7.42	6.49	8.18	7.88	6.02
	Average Inventory Turnover Days	49.19	56.24	44.62	46.32	60.63
	Average Payment Turnover (Times)	19.39	20.10	20.11	16.82	16.56
	Property, Plant and Equipment Turnover (Times)	0.95	1.01	1.02	0.95	0.97
	Total Assets Turnover (Times)	0.55	0.54	0.53	0.50	0.51
Profitability Analysis	Return on Total Assets (%)	19.33	19.62	19.03	17.84	17.34
	Return on Equity Attributable to Shareholders of the Parent (%)	27.86	27.04	25.60	23.57	21.95
	Operating Income to Paid-in Capital Ratio (%)	114.10	123.43	145.76	148.69	147.94
	Pre-tax Income to Paid-in Capital Ratio (%)	116.50	135.14	148.84	152.77	153.30
	Net Margin (%)	34.58	36.34	35.27	35.11	34.05
	Basic Earnings Per Share (NT\$)	10.18	11.82	12.89	13.23	13.54
	Diluted Earnings Per Share (NT\$)	10.18	11.82	12.89	13.23	13.54
Cash Flow	Cash Flow Ratio (%)	209.70	249.67	169.63	163.17	168.54
	Cash Flow Adequacy Ratio (%)	92.15	103.82	108.57	112.41	113.11
	Cash Flow Reinvestment Ratio (%)	13.04	13.76	11.51	11.08	9.06
Leverage	Operating Leverage	2.15	2.26	2.15	2.16	2.28
	Financial Leverage	1.01	1.01	1.01	1.01	1.01
Industry Specific Key Performance Indicator	Billing Utilization Rate (%) (Note 2)	97	93	92	91	87
	Advanced Technologies (28-nanometer and below) Percentage of Wafer Sales (%)	42	48	54	58	63
	Sales Growth (%)	27.77	10.58	12.38	3.11	5.53
	Net Income Growth (%)	40.25	16.18	9.03	2.65	2.34

Analysis of deviation of 2018 vs. 2017 over 20%:  
Average inventory turnover (Times) decreased by 24% and average inventory turnover days increased by 31% mainly due to an increase in raw wafers, and a higher level of work-in-process inventories driven by 7nm ramping.

Note 1: The financial statements for 2014-2018 were prepared in accordance with 2013 Taiwan-IFRSs version.

Note 2: Capacity includes wafers committed by Vanguard and SSMC.

#### \* Glossary

##### 1. Capital Structure Analysis

- (1) Debt Ratio = Total Liabilities / Total Assets
- (2) Long-term Fund to Property, Plant and Equipment Ratio = (Shareholders' Equity + Noncurrent Liabilities) / Net Property, Plant and Equipment

##### 2. Liquidity Analysis

- (1) Current Ratio = Current Assets / Current Liabilities
- (2) Quick Ratio = (Current Assets - Inventories - Prepaid Expenses) / Current Liabilities
- (3) Times Interest Earned = Earnings before Interest and Taxes / Interest Expenses

##### 3. Operating Performance Analysis

- (1) Average Collection Turnover = Net Sales / Average Trade Receivables
- (2) Days Sales Outstanding = 365 / Average Collection Turnover
- (3) Average Inventory Turnover = Cost of Sales / Average Inventory
- (4) Average Inventory Turnover Days = 365 / Average Inventory Turnover
- (5) Average Payment Turnover = Cost of Sales / Average Trade Payables
- (6) Property, Plant and Equipment Turnover = Net Sales / Average Net Property, Plant and Equipment
- (7) Total Assets Turnover = Net Sales / Average Total Assets

##### 4. Profitability Analysis

- (1) Return on Total Assets = (Net Income + Interest Expenses \* (1 - Effective Tax Rate)) / Average Total Assets
- (2) Return on Equity Attributable to Shareholders of the Parent = Net Income Attributable to Shareholders of the Parent / Average Equity Attributable to Shareholders of the Parent
- (3) Operating Income to Paid-in Capital Ratio = Operating Income / Paid-in Capital
- (4) Pre-tax Income to Paid-in Capital Ratio = Income before Tax / Paid-in Capital
- (5) Net Margin = Net Income / Net Sales
- (6) Earnings Per Share = (Net Income Attributable to Shareholders of the Parent - Preferred Stock Dividend) / Weighted Average Number of Shares Outstanding

##### 5. Cash Flow

- (1) Cash Flow Ratio = Net Cash Provided by Operating Activities / Current Liabilities
- (2) Cash Flow Adequacy Ratio = Five-year Sum of Cash from Operations / Five-year Sum of Capital Expenditures, Inventory Additions, and Cash Dividend
- (3) Cash Flow Reinvestment Ratio = (Cash Provided by Operating Activities - Cash Dividends) / (Gross Property, Plant and Equipment + Long-term Investments + Other Noncurrent Assets + Working Capital)

##### 6. Leverage

- (1) Operating Leverage = (Net Sales - Variable Cost) / Income from Operations
- (2) Financial Leverage = Income from Operations / (Income from Operations - Interest Expenses)

#### Financial Analysis from 2014 to 2018 (Unconsolidated) (Note)

		2014 (Adjusted)	2015	2016	2017	2018
Capital Structure Analysis	Debt Ratio (%)	26.48	23.63	24.39	21.52	19.21
	Long-term Fund to Property, Plant and Equipment Ratio (%)	156.24	168.96	156.13	160.48	170.43
Liquidity Analysis	Current Ratio (%)	208.09	219.72	144.00	141.63	143.26
	Quick Ratio (%)	171.82	186.00	128.65	118.68	113.07
	Times Interest Earned (Times)	120.82	144.41	146.73	144.04	137.46
Operating Performance Analysis	Average Collection Turnover (Times)	8.29	8.58	8.89	7.86	8.45
	Days Sales Outstanding	44.02	42.54	41.07	46.44	43.21
	Average Inventory Turnover (Times)	7.90	6.87	8.56	8.39	6.31
	Average Inventory Turnover Days	46.18	53.11	42.63	43.49	57.89
	Average Payment Turnover (Times)	18.64	19.73	19.04	16.39	16.22
	Property, Plant and Equipment Turnover (Times)	0.97	1.03	1.03	0.97	1.00
	Total Assets Turnover (Times)	0.58	0.55	0.54	0.51	0.51
Profitability Analysis	Return on Total Assets (%)	20.22	20.42	19.58	18.29	17.62
	Return on Equity (%)	27.86	27.04	25.60	23.57	21.95
	Operating Income to Paid-in Capital Ratio (%)	112.09	120.87	142.59	144.50	148.10
	Pre-tax Income to Paid-in Capital Ratio (%)	116.08	134.97	148.55	151.68	152.79
	Net Margin (%)	34.85	36.63	35.70	35.40	34.29
	Basic Earnings Per Share (NT\$)	10.18	11.82	12.89	13.23	13.54
	Diluted Earnings Per Share (NT\$)	10.18	11.82	12.89	13.23	13.54
Cash Flow	Cash Flow Ratio (%)	230.29	264.94	172.81	184.45	173.17
	Cash Flow Adequacy Ratio (%)	90.72	102.35	107.06	99.42	113.52
	Cash Flow Reinvestment Ratio (%)	13.30	13.85	11.74	10.98	9.23
Leverage	Operating Leverage	2.19	2.31	2.19	2.22	2.28
	Financial Leverage	1.01	1.01	1.01	1.01	1.01

Analysis of deviation of 2018 vs. 2017 over 20%:  
Average inventory turnover (Times) decreased by 25% and average inventory turnover days increased by 33% mainly due to an increase in raw wafers, and a higher level of work-in-process inventories driven by 7nm ramping.

Note: The financial statements for 2014-2018 were prepared in accordance with 2013 Taiwan-IFRSs version.

#### \* Glossary

##### 1. Capital Structure Analysis

- (1) Debt Ratio = Total Liabilities / Total Assets
- (2) Long-term Fund to Property, Plant and Equipment Ratio = (Shareholders' Equity + Noncurrent Liabilities) / Net Property, Plant and Equipment

##### 2. Liquidity Analysis

- (1) Current Ratio = Current Assets / Current Liabilities
- (2) Quick Ratio = (Current Assets - Inventories - Prepaid Expenses) / Current Liabilities
- (3) Times Interest Earned = Earnings before Interest and Taxes / Interest Expenses

##### 3. Operating Performance Analysis

- (1) Average Collection Turnover = Net Sales / Average Trade Receivables
- (2) Days Sales Outstanding = 365 / Average Collection Turnover
- (3) Average Inventory Turnover = Cost of Sales / Average Inventory
- (4) Average Inventory Turnover Days = 365 / Average Inventory Turnover
- (5) Average Payment Turnover = Cost of Sales / Average Trade Payables
- (6) Property, Plant and Equipment Turnover = Net Sales / Average Net Property, Plant and Equipment
- (7) Total Assets Turnover = Net Sales / Average Total Assets

##### 4. Profitability Analysis

- (1) Return on Total Assets = (Net Income + Interest Expenses \* (1 - Effective Tax Rate)) / Average Total Assets
- (2) Return on Equity = Net Income / Average Shareholders' Equity
- (3) Operating Income to Paid-in Capital Ratio = Operating Income / Paid-in Capital
- (4) Pre-tax Income to Paid-in Capital Ratio = Income before Tax / Paid-in Capital
- (5) Net Margin = Net Income / Net Sales
- (6) Earnings Per Share = (Net Income - Preferred Stock Dividend) / Weighted Average Number of Shares Outstanding

##### 5. Cash Flow

- (1) Cash Flow Ratio = Net Cash Provided by Operating Activities / Current Liabilities
- (2) Cash Flow Adequacy Ratio = Five-year Sum of Cash from Operations / Five-year Sum of Capital Expenditures, Inventory Additions, and Cash Dividend
- (3) Cash Flow Reinvestment Ratio = (Cash Provided by Operating Activities - Cash Dividends) / (Gross Property, Plant and Equipment + Long-term Investments + Other Noncurrent Assets + Working Capital)

##### 6. Leverage

- (1) Operating Leverage = (Net Sales - Variable Cost) / Income from Operations
- (2) Financial Leverage = Income from Operations / (Income from Operations - Interest Expenses)

#### 6.1.4 Auditors' Opinions from 2014 to 2018

Year	CPA	Audit Opinion
2014	Yih-Hsin Kao, Hung-Wen Huang	An Unqualified Opinion
2015	Yih-Hsin Kao, Hung-Wen Huang	An Unqualified Opinion
2016	Yih-Hsin Kao, Yu-Feng Huang	An Unmodified Opinion (Note)
2017	Yih-Hsin Kao, Yu-Feng Huang	An Unmodified Opinion (Note)
2018	Mei Yen Chiang, Yu-Feng Huang	An Unmodified Opinion (Note)

Note: Starting in 2016, the new auditing standard of the Republic of China requires "An Unqualified Opinion" be replaced by "An Unmodified Opinion".

Deloitte & Touche  
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#### 6.1.5 Audit Committee's Review Report

The Board of Directors has prepared the Company's 2018 Business Report, Financial Statements, and proposal for allocation of earnings. The CPA firm of Deloitte & Touche was retained to audit TSMC's Financial Statements and has issued an audit report relating to the Financial Statements. The Business Report, Financial Statements, and earnings allocation proposal have been reviewed and determined to be correct and accurate by the Audit Committee members of Taiwan Semiconductor Manufacturing Company Limited. According to relevant requirements of the Securities and Exchange Act and the Company Law, we hereby submit this report.

Taiwan Semiconductor Manufacturing Company Limited

Chairman of the Audit Committee: Sir Peter L. Bonfield



February 19, 2019

#### 6.1.6 Financial Difficulties

The Company should disclose the financial impact to the Company if the Company and its affiliated companies have incurred any financial or cash flow difficulties in 2018 and as of the date of this Annual Report: None

#### 6.1.7 Consolidated Financial Statements and Independent Auditors' Report along with Parent Company Only Financial Statements and Independent Auditors' Report

Please refer to Annual Report section (II), Financial Statements.

## 6.2 Financial Status and Operating Results

### 6.2.1 Financial Status

#### Consolidated

Unit: NT\$ thousands

Item	2018	2017	Difference	%
Current Assets	951,679,721	857,203,110	94,476,611	11%
Long-term Investments (Note 1)	29,304,796	41,569,074	(12,264,278)	-30%
Property, Plant and Equipment	1,072,050,279	1,062,542,322	9,507,957	1%
Intangible Assets	17,002,137	14,175,140	2,826,997	20%
Other Assets (Note 2)	20,091,105	16,371,997	3,719,108	23%
Total Assets	2,090,128,038	1,991,861,643	98,266,395	5%
Current Liabilities	340,542,586	358,706,680	(18,164,094)	-5%
Noncurrent Liabilities	72,089,056	110,395,320	(38,306,264)	-35%
Total Liabilities	412,631,642	469,102,000	(56,470,358)	-12%
Capital Stock	259,303,805	259,303,805	0	0%
Capital Surplus	56,315,932	56,309,536	6,396	0%
Retained Earnings	1,376,647,841	1,233,362,010	143,285,831	12%
Others	(15,449,913)	(26,917,818)	11,467,905	-43%
Equity Attributable to Shareholders of the Parent	1,676,817,665	1,522,057,533	154,760,132	10%
Total Equity	1,677,496,396	1,522,759,643	154,736,753	10%

Note 1: Long-term investments as of December 31, 2017 include noncurrent available-for-sale financial assets, held-to-maturity financial assets, financial assets carried at cost and investments accounted for using equity method. Starting from 2018, upon initial application of IFRS 9 "Financial Instruments", the category includes noncurrent financial assets at fair value through other comprehensive income, and noncurrent financial assets at amortized cost, and investments accounted for using equity method.

Note 2: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

#### • Analysis of Deviation over 20%

Decrease in long-term investments: The decrease was mainly due to decrease in financial assets at amortized cost.

Increase in other assets: The increase was mainly due to increase in deferred income tax assets and refundable deposits.

Decrease in noncurrent liabilities: The decrease was mainly due to reclassification of bonds payable due in 1 year to current liabilities and decrease in guarantee deposits.

Increase in other equity: The increase was mainly due to increase in currency exchange gain arising from translation of foreign operations in 2018.

#### • Major Impact on Financial Position

The above deviations had no major impact on TSMC's financial position.

• **Future Plan on Financial Position:** Not applicable.

## Unconsolidated

Unit: NT\$ thousands

Item	2018	2017	Difference	%
Current Assets	469,966,106	436,769,337	33,196,769	8%
Long-term Investments (Note 1)	550,524,494	464,401,415	86,123,079	19%
Property, Plant and Equipment	1,025,286,941	1,016,355,970	8,930,971	1%
Intangible Assets	12,429,930	9,870,127	2,559,803	26%
Other Assets (Note 2)	17,253,537	11,992,542	5,260,995	44%
Total Assets	2,075,461,008	1,939,389,391	136,071,617	7%
Current Liabilities	328,060,518	308,383,240	19,677,278	6%
Noncurrent Liabilities	70,582,825	108,948,618	(38,365,793)	-35%
Total Liabilities	398,643,343	417,331,858	(18,688,515)	-4%
Capital Stock	259,303,805	259,303,805	0	0%
Capital Surplus	56,315,932	56,309,536	6,396	0%
Retained Earnings	1,376,647,841	1,233,362,010	143,285,831	12%
Others	(15,449,913)	(26,917,818)	11,467,905	-43%
Total Equity	1,676,817,665	1,522,057,533	154,760,132	10%

Note 1: Long-term investments as of December 31, 2017 include held-to-maturity financial assets, financial assets carried at cost and investments accounted for using equity method. Starting from 2018, upon initial application of IFRS 9 "Financial Instruments", the category includes noncurrent financial assets at fair value through other comprehensive income, and noncurrent financial assets at amortized cost, and investments accounted for using equity method.

Note 2: Other assets consist of deferred income tax assets, refundable deposits, and other noncurrent assets.

### • Analysis of Deviation over 20%

Increase in intangible assets: The increase was mainly due to increase in software.

Increase in other assets: The increase was mainly due to increase in deferred income tax assets and refundable deposits.

Decrease in noncurrent liabilities: The decrease was mainly due to reclassification of bonds payable due in 1 year to current liabilities and decrease in guarantee deposits.

Increase in other equity: The increase was mainly due to increase in currency exchange gain arising from translation of foreign operations in 2018.

### • Major Impact on Financial Position

The above deviations had no major impact on TSMC's financial position.

• **Future Plan on Financial Position:** Not applicable.

## 6.2.2 Financial Performance

### Consolidated

Unit: NT\$ thousands

Item	2018	2017	Difference	%
Net Revenue	1,031,473,557	977,447,241	54,026,316	6%
Cost of Revenue	533,487,516	482,616,286	50,871,230	11%
Gross Profit before Unrealized Gross Profit on Sales to Associates	497,986,041	494,830,955	3,155,086	1%
Unrealized Gross Profit on Sales to Associates	(111,788)	(4,553)	(107,235)	2,355%
Gross Profit	497,874,253	494,826,402	3,047,851	1%
Operating Expenses	112,149,280	107,901,668	4,247,612	4%
Other Operating Income and Expenses, Net	(2,101,449)	(1,365,511)	(735,938)	-54%
Income from Operations	383,623,524	385,559,223	(1,935,699)	-1%
Non-operating Income and Expenses	13,886,739	10,573,807	3,312,932	31%
Income before Income Tax	397,510,263	396,133,030	1,377,233	0%
Income Tax Expenses	46,325,857	52,986,182	(6,660,325)	-13%
Net Income	351,184,406	343,146,848	8,037,558	2%
Other Comprehensive Income (Loss), Net of Income Tax	9,836,976	(28,821,631)	38,658,607	NM
Total Comprehensive Income for the Year	361,021,382	314,325,217	46,696,165	15%
Total Net Income Attributable to Shareholders of the Parent	351,130,884	343,111,476	8,019,408	2%
Total Comprehensive Income Attributable to Shareholders of the Parent	360,965,015	314,294,993	46,670,022	15%

### • Analysis of Deviation over 20%

Increase in unrealized gross profit on sales to associates: The increase was mainly due to higher sales to investees in the fourth quarter of 2018.

Decrease in other operating income and expenses, net: The decrease was mainly due to impairment losses on property, plant and equipment in 2018.

Increase in non-operating income and expenses: The increase was mainly due to higher interest income in 2018.

Increase in other comprehensive income (loss), net of income tax: The increase was mainly due to increase in currency exchange gain arising from translation of foreign operations in 2018.

### • Sales Volume Forecast and Related Information

For additional details, please refer to "1. Letter to Shareholders" on pages 3-7 of this Annual Report.

### • Major Impact on Financial Performance

The above deviations had no major impact on TSMC's financial performance.

• **Future Plan on Financial Performance:** Not applicable.

## Unconsolidated

Unit: NT\$ thousands

Item	2018	2017	Difference	%
Net Revenue	1,023,925,713	969,136,109	54,789,604	6%
Cost of Revenue	530,861,166	490,196,856	40,664,310	8%
Gross Profit before Unrealized Gross Profit on Sales to Subsidiaries and Associates	493,064,547	478,939,253	14,125,294	3%
Unrealized Gross Profit on Sales to Subsidiaries and Associates	(109,046)	(1,562)	(107,484)	6,881%
Gross Profit	492,955,501	478,937,691	14,017,810	3%
Operating Expenses	107,259,429	102,985,909	4,273,520	4%
Other Operating Income and Expenses, Net	(1,668,234)	(1,261,665)	(406,569)	-32%
Income from Operations	384,027,838	374,690,117	9,337,721	2%
Non-operating Income and Expenses	12,170,315	18,626,059	(6,455,744)	-35%
Income before Income Tax	396,198,153	393,316,176	2,881,977	1%
Income Tax Expenses	45,067,269	50,204,700	(5,137,431)	-10%
Net Income	351,130,884	343,111,476	8,019,408	2%
Other Comprehensive Income (Loss), Net of Income Tax	9,834,131	(28,816,483)	38,650,614	NM
Total Comprehensive Income for the Year	360,965,015	314,294,993	46,670,022	15%

### • Analysis of Deviation over 20%

Increase in unrealized gross profit on sales to subsidiaries and associates: The increase was mainly due to higher sales to investees in the fourth quarter of 2018.

Decrease in other operating income and expenses, net: The decrease was mainly due to impairment losses on property, plant and equipment in 2018.

Decrease in non-operating income and expenses: The decrease was mainly due to lower share of profits of subsidiaries and associates in 2018.

Increase in other comprehensive income (loss), net of income tax: The increase was mainly due to increase in currency exchange gain arising from translation of foreign operations in 2018.

### • Sales Volume Forecast and Related Information

For additional details, please refer to "1. Letter to Shareholders" on pages 3-7 of this Annual Report.

### • Major Impact on Financial Performance

The above deviations had no major impact on TSMC's financial performance.

### • Future Plan on Financial Performance: Not applicable.

## 6.2.3 Cash Flow

### Consolidated

Unit: NT\$ thousands

Cash Balance 12/31/2017	Net Cash Provided by Operating Activities in 2018	Net Cash Used in Investing Activities in 2018	Net Cash Used in Financing Activities in 2018	Effect of Exchange Rate Changes on Cash and Cash Equivalents in 2018	Cash Balance 12/31/2018	Remedy for Liquidity Shortfall	
						Investment Plan	Financing Plan
553,391,696	573,954,308	(314,268,908)	(245,124,791)	9,862,296	577,814,601	None	None

### • Analysis of Cash Flow

NT\$574.0 billion net cash generated by operating activities: mainly include net income and depreciation and amortization expenses.

NT\$314.3 billion net cash used in investing activities: primarily for capital expenditures and net purchase of marketable financial instruments.

NT\$245.1 billion net cash used in financing activities: primarily for cash dividend payment and repayment of corporate bonds.

### • Remedial Actions for Liquidity Shortfall

As a result of positive operating cash flows and cash on-hand, remedial actions are not required.

### • Cash Flow Projection for Next Year: Not applicable.

### Unconsolidated

Unit: NT\$ thousands

Cash Balance 12/31/2017	Net Cash Provided by Operating Activities in 2018	Net Cash Used in Investing Activities in 2018	Net Cash Used in Financing Activities in 2018	Cash Balance 12/31/2018	Remedy for Liquidity Shortfall	
					Investment Plan	Financing Plan
239,176,841	568,101,343	(296,555,902)	(270,519,757)	240,202,525	None	None

### • Analysis of Cash Flow

NT\$568.1 billion net cash generated by operating activities: mainly include net income and depreciation and amortization expenses.

NT\$296.6 billion net cash used in investing activities: primarily for capital expenditures.

NT\$270.5 billion net cash used in financing activities: primarily for cash dividend payment, capital injection in subsidiaries and repayment of corporate bonds.

### • Remedial Actions for Liquidity Shortfall

As a result of positive operating cash flows and cash on-hand, remedial actions are not required.

### • Cash Flow Projection for Next Year: Not applicable.

## 6.2.4 Recent Years Major Capital Expenditures and Impact on Financial and Business

Unit: NT\$ thousands

Plan	Actual or Planned Source of Capital	Total Amount for 2018 and 2017	Actual Use of Capital	
			2018	2017
Production Facilities, R&D and Production Equipment	Cash flow generated from operations	639,620,221	312,302,551	327,317,670
Others	Cash flow generated from operations	6,549,848	3,279,330	3,270,518
Total		646,170,069	315,581,881	330,588,188

Based on capital expenditures listed above, TSMC's annual production capacity increased by approximately 0.9 million 12-inch equivalent wafers in 2018.

## 6.2.5 Long-term Investment Policy and Results

TSMC's long-term investments, accounted for under the equity method, were all made for strategic purposes. However, when an investment is no longer of strategic value, it may be considered a financial investment. In 2018, the investment gains from these investments amounted to NT\$3,057,781 thousand on a consolidated basis, increasing from previous year mainly due to demand increase. For future investments, TSMC will continue to focus on strategic purposes through prudent assessments.



### 6.3 Risk Management

The Board of Directors plays a key role in helping the Company identify and manage economic risks. The Risk Management organization periodically briefs the Audit Committee on the ever-changing risk environment facing TSMC, the focus of the Company's enterprise risk management, and risk assessment and mitigation efforts. The Audit Committee's Chairperson also reports on the risk environment and risk mitigation actions to be taken.

TSMC and its subsidiaries are committed to proactively and cost effectively integrating and managing strategic, operational, financial and hazardous risks together with potential consequences to operations and financial results. TSMC operates an enterprise risk management (ERM) program based on both its corporate vision and its long-term, sustainable, responsibility to both industry and society. ERM seeks to provide the appropriate management of risks by TSMC on behalf of all stakeholders. A risk map that considers likelihood and impact severity is used to identify and prioritize corporate risk controls. Various risk treatment strategies are also adopted in response to corporate risks as they are identified.

#### Scope of Risk Management

##### Strategic Perspective

- Regulatory change & compliance
- Government policies
- Changes in technology & industry
- Technology development & competition
- Demand & capacity expansion

##### Operational Perspective

- Sales & purchase concentration
- Information security
- Intellectual property rights
- Recruiting qualified personnel
- Corporate image

##### Financial Perspective

- Interest rate, foreign exchange, inflation & deflation, taxation
- External financing
- High-risk/high-leveraged investment, financial derivative transactions
- Strategic investments

##### Hazardous Events

- Earthquakes & natural hazards
- Fire or chemical spills
- Climate change
- Utility supply

#### Enterprise Risk Management Framework



To mitigate the operational impacts of crisis events, ERM conducts pre-crisis risk assessment and identifies feasible strategies for crisis prevention. Corresponding to different scenarios, response procedures and recovery plans have been compiled. For specific severe crisis events involving multiple TSMC's manufacturing sites, the cross-functional central crisis command center composed of operations and support functions is responsible for internal coordination to speed up response time and proactively communicate with related stakeholders. To raise risk awareness and strengthen the risk management culture in TSMC, RM (Risk Management) task forces were formed in 2018. Enhanced risk assessment and crisis response exercises were also conducted for critical risk events such as fire, earthquake, IT service disruption, IT security, supply chain disruption and utility supply disruption. In order to continuously mitigate corporate risks, crisis response exercises are used to test the integrity and risk-control effectiveness of ERM.

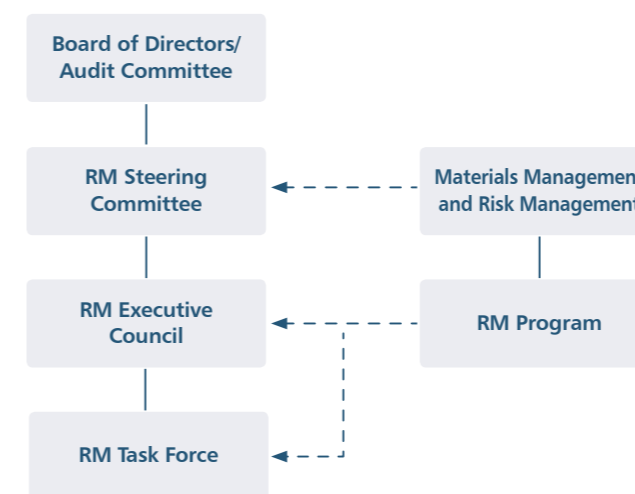
To reduce supply chain disruption risks, TSMC created a task force comprised of members from fab operations, material management, risk management and quality system management to work with suppliers to develop business continuity plans and enhance supply chain resilience to manage their potential risks. Partly as a result of these efforts, there was no interruption in TSMC's supply chain in 2018.

As production capacity continued to expand with more advanced technology, TSMC initiated and implemented seismic protection engineering design, risk treatment practices and green manufacturing projects in all new fabs.

#### 6.3.1 Risk Management Organization Chart

TSMC's Risk Management organization annually reports to the Audit Committee on the focus of enterprise risk management, risk assessment and mitigation efforts. The Audit Committee Chairperson also reports to the Board on such discussion and actions.

#### Organization Functions



##### RM Steering Committee

- Consists of functional heads (with internal audit head sitting in as an observer)
- Reports to Audit Committee
- Reviews risk control progress
- Identifies and approves prioritization of risk controls

##### RM Executive Council

- Consists of representatives from each function
- Determines and implements cost-effective risk controls
- Improves transparency and how risks are managed

##### RM Program

- Pushes RM task forces to enhance effective risk control
- Coordinates and facilitates RM Executive Council on Risk Management activities
- Consolidates ERM reports and updates to the RM Steering Committee

##### RM Task Force

- Identify potential scenarios and business impact
- Determine risk mitigation actions responding to the scenarios
- Compile crisis management procedures & conduct exercises

#### 6.3.2 Strategic Risks

##### Risks Associated with Changes in Technology and Industry

###### • Industry Developments

The electronics industries and semiconductor market are cyclical and subject to significant and often rapid fluctuations in product demand, which could impact TSMC's semiconductor foundry business. Variations in order levels from customers may result in volatility in the Company's revenue and earnings.

From time to time, the electronics and semiconductor industries have experienced significant, occasionally prolonged periods of downturns and overcapacity. Because TSMC is, 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 TSMC's services. If TSMC cannot take appropriate actions such as reducing its costs to sufficiently offset declines in demand, the Company's revenue, margin, and earnings will likely suffer during periods of downturns and overcapacity.

###### • Changes in Technology

The semiconductor industry and its technologies are constantly changing. TSMC competes by developing process technologies using increasingly advanced nodes and on manufacturing products with more functions. We also compete by developing new derivative technologies. If TSMC does not anticipate these changes in technologies and rapidly develop new and innovative technologies, or the Company's competitors unforeseeably gain sudden access to additional technologies, TSMC may not be able to provide foundry services on competitive terms. In addition, TSMC's customers have significantly decreased the time in which their products or services are launched into the market. If TSMC is unable to meet these shorter product time-to-market, it risks losing these customers. These factors have also been intensified by the shift of the global technology market to consumer driven products such as mobile devices, 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 are expected to have a negative effect on our gross margin and operating margin. We have strengthened inline wafer inspection and tightened control of incoming

material to deal with the increasing complexity of leading-edge technologies. If TSMC is unable to innovate new technologies that meet the demands of its customers or overcome the above factors, it may become less competitive and its revenue may decline significantly.

Regarding the response measures for the above-mentioned risks, please refer to “2.2.4 TSMC Position, Differentiation and Strategy” on pages 13-15 of this annual report.

#### **Risks Associated with Decrease in Demand and Average Selling Price**

A vast majority of the Company’s revenue is derived from customers who use TSMC services in communication products, computing products, consumer electronics products and industrial/standard products. The demand for the Company’s products is significantly affected by the outlook of the major and emerging end markets for its products, such as smartphones, high-performance computing, automotive electronics and the IoT. 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 TSMC’s products and services, could adversely affect the Company’s revenue. Further, semiconductor manufacturing facilities require substantial investment to construct and are largely fixed-cost assets once they are in operation. Because the Company owns most of its manufacturing capacities, a significant portion of TSMC’s operating costs is fixed. In general, these costs do not decline when customer demand or TSMC’s capacity utilization rates drop, and thus declines in customer demand, among other factors, may significantly decrease TSMC’s margins. Conversely, as product demand rises and factory utilization increases, the fixed costs are spread over increased output, which can improve TSMC’s 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 the Company may lead to a reduction of TSMC’s revenue, margin and earnings.

#### **Risks Associated with Competition**

The markets for TSMC’s foundry services are highly competitive. TSMC competes 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 TSMC. Other companies may have greater financial and other resources than TSMC, such as the possibility of receiving direct or indirect government subsidy, economic stimulus funds, or

other incentives that may be unavailable to TSMC. For example, Chinese companies are expected to be key players for new semiconductor fab development and fab equipment spending through 2020 in part due to various incentives provided by the Chinese government.

Furthermore, the Company’s competitors may, from time to time, also decide to undertake aggressive pricing initiatives in one or several technology nodes. These competitive activities may decrease TSMC’s customer base, or its ASP, or both. If TSMC is unable to compete effectively with these new and aggressive competitors on technology, manufacturing capacity, product quality and customer satisfaction, it risks losing customers to these new contenders.

#### **Risks Associated with Changes in the Government Policies and Regulatory Environment**

TSMC management closely monitors all domestic and foreign governmental policies and regulations that might impact TSMC’s business and financial operations. During 2018 and as of the date of this Annual Report, the following changes or developments in governmental policies and regulations may influence the Company’s business operations:

The R.O.C. Company Law was amended on August 1, 2018. The amendments permit a company authorized by its Articles of Incorporation to distribute its earnings on a quarterly or semi-annual basis, and to have its Board of Directors to approve the distribution if the earnings are distributed in cash. TSMC plans to amend its Articles of Incorporation at its June 2019 shareholders’ meeting to authorize TSMC’s Board of Directors to distribute the earnings in cash after the close of each quarter.

With respect to environmental laws, in terms of air pollution protection, the regulations “Collection Rate for Stationary Pollution Source Air Pollutant Emissions Fees” and “Air Pollution Control Act” were amended in July and August 2018, respectively. These amendments impose new items for air pollution control fees and strengthen the surveillance of the stationary pollution sources, both of which may increase the Company’s operating costs, but the impact is not expected to be material. Also, the regulation “Toxic Chemical and High Concern Substances Control Act” was amended in January 2019, to which one of the amendments including establishing a new category of control substances called “Concern Chemical Substances” and their control requirements. The exact effects of which are still uncertain as the relevant sub-regulations have not been finalized yet, but we expect which may increase the Company’s operating costs. In addition, some other environmental laws were proposed to be amended (such as

“Environmental Impact Assessment Act”), the exact effects of which are still uncertain as the amendments have not been finalized yet. However, we expect these amendments may affect our future expansion plans and increase the Company’s operating costs.

It is not expected that other governmental policies or regulatory changes would materially impact TSMC’s operations or financial condition.

#### **6.3.3 Operational Risks**

##### **Risks Associated with Capacity Expansion**

TSMC performs long-term market demand forecast for its products and services to manage its overall capacity. Because market conditions are dynamic, TSMC’s market demand forecast may change significantly at any time. During periods of decreased demand, certain manufacturing lines or tools in some of the Company’s manufacturing facilities may be suspended or shut down temporarily. However, if subsequent demand increases rapidly in a short period of time, TSMC may not be able to restore the capacity in a timely manner to take advantage of the upturn.

According to the market demand forecast, TSMC has recently been adding capacity in its 300mm wafer fabs to meet market needs for its products and services. Expansion of the Company’s capacity will increase its costs. For example, the Company will need to purchase additional equipment, hire additional personnel and train personnel to operate the new equipment. If TSMC does not increase its net revenue accordingly, its financial performance may be adversely affected by these increased costs.

In order to mitigate the risk associated with capacity expansion, TSMC continuously watches for changes in market conditions and works closely with its customers. When market demand is not as expected, the Company will adjust its capacity plans in a timely manner to reduce the impact on its financial performance.

##### **Risks Associated with Sales Concentration**

Over the years, TSMC’s customer profile and the nature of its customers’ businesses have changed dramatically. While it generates revenue from hundreds of customers worldwide, TSMC’s ten largest customers in 2016, 2017, and 2018 accounted for approximately 68%, 66% and 68% of its net revenue in the respective year. The Company’s largest customer in 2016, 2017, and 2018 accounted for 17%, 23% and 22% of its net revenue in the respective year. Our second largest customer in 2016 accounted for 11% of our net revenue. In 2017 and 2018, our second largest customer accounted for less than 10% of our net revenue.

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, TSMC has seen the changes of nature in its 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 TSMC’s customers have engaged in industry consolidations in order to remain competitive. Such consolidations have taken the form of mergers and acquisitions. If more of TSMC’s major customers consolidate, this will further decrease the overall number of its customer pool. The loss of, or significant curtailment of purchases by, one or more of the Company’s top customers, including curtailments due to increased competitive pressures, industry consolidation, a change in their designs, or change in their manufacturing sourcing policies or practices of these customers, or the timing of customer or distributor inventory adjustments, or change in its major customers’ business models may adversely affect TSMC’s results of operations and financial condition.

##### **Risks Associated with Purchase Concentration**

###### **• Raw Materials**

TSMC’s production operations require that it obtains 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. For example, the increase in silicon wafer prices due to increased demand for such wafers across the industry had a negative impact on TSMC’s gross margin in 2018. Moreover, major natural disasters, 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 TSMC procures some of its raw materials from sole-sourced suppliers, there is a risk that TSMC’s 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, sanctions or other non-tariff barriers. TSMC's revenue and earnings could decline if the Company is 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. To reduce the supply chain risk and to manage the cost effectively, TSMC is committing resources toward developing new supply sources. In addition, the Company continually encourages its suppliers to reduce their supply chain risk by decentralizing production plants and to improve their cost competitiveness by moving their production facilities to Taiwan from higher-cost areas.

In the meantime, given that qualified backup suppliers are harder to obtain, TSMC is engaging early and extensively with primary suppliers on managing quality and capacity issues in order to be prepared for any unexpected need to ramp up production, which could leave the Company with insufficient time to re-tune its production process. For leading technology nodes, TSMC uses world-class processes at world-class facilities but also requires world-class material quality. To streamline supply chain risk management, the Company intensifies supplier site audits and meetings to extend supply chain best practices to its upstream suppliers. In addition, in response to the rapid increase or decrease in production capacity of new products, TSMC has continued to improve its inventory monitoring system to achieve more accurate demand forecasts to ensure that the supply chain maintains sufficient stock levels. The Company has established a supply chain risk assessment to ensure critical suppliers meet standards in labor, ethics, ESH (environmental, safety and health) and BCP (business continuity plan). To ultimately empower these suppliers to take responsibility for their supply chain, onsite audits are conducted regularly. Any regulatory violations or any adverse environmental impact event, as well as a failure to meet TSMC's expectations in sustainability requirements, may result in business reduction or termination.

#### • Equipment

The Company's operations and ongoing expansion plans depend on its 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 its supply chain, the Company has

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 TSMC is unable to obtain equipment in a timely manner to fulfill its customers' demands on technology and production capacity, or at a reasonable cost, its financial condition and results of operations could be negatively impacted.

#### Risks Associated with IT Security

TSMC has adopted an IT security policy to establish and maintain a secure environment for TSMC's information and systems. In addition, the Company has established an ISO 27001 information security management system (ISMS) with a formal information risk assessment and management process. Even though TSMC has established these policies, procedures, and many other security measures, it cannot guarantee that the Company's computing systems, which control or maintain vital corporate functions such as its manufacturing operations and enterprise accounting, would be completely immune to crippling cyber attacks by any third party to gain unauthorized access to its internal network systems, to sabotage its operations and goodwill or otherwise. In the event of a serious cyber attack, TSMC's systems may lose important corporate data or its production lines may be shut down pending the resolution of such attack. While TSMC seeks to continuously review and assess its cybersecurity policies and procedures to ensure their adequacy and effectiveness, it cannot guarantee that the Company 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 TSMC's trade secrets and other sensitive information, such as proprietary information of the Company's customers and other stakeholders and personal information of the Company's employees.

Malicious hackers may also try to introduce computer viruses, corrupted software or ransomware into the Company's network systems to disrupt its operations, blackmail it to regain control of its computing systems or spy on the Company for sensitive information. These attacks may result in TSMC having to pay damages for its delayed or disrupted orders or incur significant expenses in implementing remedial and improvement measures to enhance the Company's cybersecurity network, and may also expose TSMC 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 TSMC has an obligation to keep confidential.

TSMC may also be attacked by malicious software contained in the equipment it purchases and installs. In August 2018, TSMC experienced a computer virus outbreak, which caused the malfunction of a number of the Company's computer systems and fab tools in Taiwan and interrupted the operations of certain equipment. The virus incident was due to a misoperation by the Company's staff when installing a new equipment that contained malicious software unknown to the Company. Also, the Company's firewall controls did not effectively prevent the software from propagating. While neither data integrity nor confidential information were compromised, the incident caused shipment delays and a loss of NT\$2,596 million (US\$85 million) classified as the cost of revenue in the third quarter of 2018. Remedial actions have since been taken, such as implementation of an automated system to prevent unprotected tool installation, and strengthening of firewall and network control to prevent computer viruses from spreading among tools and fabs, and enhancements to further improve the Company's protection against malicious software are ongoing. TSMC has additionally budgeted an adequate amount for IT security solution enhancement. However, there can be no assurance that the Company is no longer subject to malicious software attacks.

In addition, the Company employs certain third party service providers for TSMC and its affiliates worldwide with whom the Company needs to share highly sensitive and confidential information to enable them to provide the relevant services. Despite that TSMC requires the third party service providers to comply with the confidentiality and/or Internet security requirements in its 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 TSMC or its service providers are not able to timely resolve the respective technical difficulties caused by such cyber attacks, or ensure the integrity and availability of its data (and data belonging to its customers and other third parties) or control of its or its service providers' computing systems, the Company's commitments to its customers and other stakeholders may be materially impaired and its results of operations, financial condition, prospects and reputation may also be materially and adversely affected as a result.

#### Risks Associated with Intellectual Property Rights

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

TSMC has received, from time-to-time, communications from third parties asserting that TSMC's technologies, manufacturing processes, or the design IPs of the semiconductors made by TSMC or the use of those semiconductors by its customers may infringe their patents or other intellectual property rights. Because of the nature of the industry, the Company may continue to receive such communications in the future. These assertions have at times resulted in litigation. Recently, there has been a notable increase within the industry in the number of assertions made and lawsuits initiated by certain litigious, non-practicing entities and these litigious, non-practicing entities are also becoming more aggressive in their monetary demands and requests for court-issued injunctions. Such lawsuits or assertions may increase TSMC's cost of doing business and may potentially be extremely disruptive if these non-practicing entities succeed in blocking the trade of products and services offered by TSMC. Also, as the Company expended its manufacturing operations into certain non-R.O.C jurisdictions, it has 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 TSMC fails to obtain or maintain certain technologies or intellectual property licenses or fails to prevent our intellectual property from being misappropriated and, if litigation relating to alleged intellectual property matters occurs, it could: (1) prevent the Company from manufacturing particular products or selling particular services or applying particular technologies; and (2) reduce our ability to compete effectively against entities benefiting from our misappropriated intellectual property, which could reduce its opportunities to generate revenue.

TSMC has taken related measures to minimize potential loss of shareholder value arising from intellectual property claims and litigation filed against the Company. These measures include: strategically obtaining licenses from certain semiconductor and other technology companies as needed; timely securing intellectual property rights for defensive and/or offensive protection of TSMC technology and business; and aggressively defending against baseless litigation.

#### **Risks Associated with Litigious and Non-litigious Matters**

As is the case with many companies in the semiconductor industry, TSMC has received from time-to-time communications from third parties asserting that its technologies, its manufacturing processes, or the design of the semiconductors made by TSMC or the use of those semiconductors by its customers may infringe upon their patents or other intellectual property rights. These assertions have at times resulted in litigation by or against the Company and settlement payments by the Company. Irrespective of the validity of these claims, TSMC could incur significant costs in the defense thereof or could suffer adverse effects on its operations. TSMC is 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 TSMC's business and distract its management, and thereby have a material adverse effect on its results of operations or prospects, and subject TSMC to potential significant legal liability.

Currently, TSMC's material legal proceedings are as follows:

In May 2017, Uri Cohen filed a complaint in the U.S. District Court for the Eastern District of Texas alleging that TSMC, TSMC North America and other companies infringe four U.S. patents. Cohen's case was transferred to and consolidated with the responsive declaratory judgment case for non-infringement of Cohen's asserted patents filed by TSMC and TSMC North

America in the U.S. District Court for the Northern District of California. In July 2018, all pending litigations between the parties in the U.S. District Court for the Northern District of California were dismissed.

On September 28, 2017, TSMC was 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.

Other than the matters described above, as of the date of this Annual Report, TSMC is not currently a party to any other material legal proceedings.

#### **Risks Associated with Mergers and Acquisitions**

During 2018 and in 2019 as of the date of this annual report, there were no such risks for TSMC.

#### **Risks Associated with Recruiting Quality Personnel**

The Company relies on the continued services and contributions of its executive officers, skilled technical and other personnel. The Company's business could suffer if it loses, for whatever reasons, the services and contributions of some of these personnel and it cannot adequately replace them. The Company may be required to increase or reduce the number of employees in connection with any business expansion or contraction, in accordance with market demand for its products and services. Since there is intense competition for the recruitment of these personnel, the Company cannot ensure that it will be able to fulfill its personnel requirements in a timely manner.

#### **Future R&D Plans and Expected R&D Spending**

For additional details, see "5.2.7 Future R&D Plans" on page 76 of this annual report.

#### **Changes in Corporate Reputation and Impact on Company's Crisis Management**

TSMC has established an excellent corporate reputation around the world based on its core values of integrity, commitment, innovation and customer trust, as well as its outstanding operations, rigorous corporate governance, and dedication to social responsibility by serving as a good corporate citizen and continuing to pursue innovation in the economic, environmental and social dimensions of CSR.

In 2018, TSMC was honored with awards and recognition for achievements in operations, corporate governance, patents, innovation, profit growth, investor relations, environmental protection, corporate sustainability and other fields. These included: the Taiwan Institute for Sustainable Energy 2018 Taiwan Corporate Sustainability Awards No.1 for Domestic Corporates and Platinum Medal For Sustainability Report; ranked top 5% in the Taiwan Stock Exchange Corporate Governance Evaluation; member of the *Fortune Magazine* 2018 Global 500; the R.O.C. Ministry of Economic Affairs Industrial Development Bureau "Green Factory Label"; the R.O.C. Environmental Protection Administration "Enterprise Green Procurement Award"; and ranked No. 1 in profit for the China Credit Information Services' ranking of large Taiwan companies. In addition, TSMC was selected as a component of the Dow Jones Sustainability Indices for the 18<sup>th</sup> consecutive year, further strengthening the Company's reputation and corporate culture.

TSMC's vision for corporate social responsibility is to "uplift society." The Company maintains a Corporate Social Responsibility Committee, which serves as the Company's highest-level CSR organization and acts as a decision-making center and communications platform for CSR. Committee members represent departments including Legal, Customer Service, Materials Management, Quality and Reliability, Research and Development, Risk Management, Finance, Investor Relations, Operations, Environment, Safety and Health (ESH), Human Resources, the TSMC Education and Culture Foundation, the TSMC Charity Foundation, and Public Relations. These departments address issues of concern to all stakeholders including employees, shareholders, customers, suppliers, government and society, and coordinate the Company's resources and collaborate to further enhance TSMC's positive corporate reputation.

In addition, to address crisis events that could affect the Company's public reputation, including earthquakes, fires, IT service disruption, supply chain disruption, environmental events and utility supply disruption, TSMC employs numerous preventative measures and maintains a "TSMC Crisis Command Center Control Instruction" and a "TSMC Emergency Response Procedure" to establish its emergency response command structure. Each TSMC fab holds regular monthly meetings of the ESH committee, and relevant departments hold regular drills and strive to continuously improve their emergency response and notification procedures to ensure clear channels

of communication to stakeholders in crisis management. The Public Relations department serves as the designated window for external communications. In the event of an emergency, all departments immediately deploy emergency response measures to reduce casualties and minimize the impact on the surrounding environment, Company property and manufacturing operations. Responders also alert the public relations department at the first stage of response to ensure clear and consistent disclosure regarding the situation to maintain the Company's reputation.

#### **Risks Associated with Change in Management**

After having led the Company for over 31 years, TSMC's Founder, Dr. Morris Chang, retired from the Company after the Annual Shareholders' Meeting on June 5, 2018. At the meeting, TSMC shareholders elected a new Board of Directors, which then convened to elect Dr. Mark Liu as Chairman and Dr. C.C. Wei as Chief Executive Officer (CEO) and Vice Chairman, completing the transition of responsibilities in accordance with the Company's succession plan.

#### **6.3.4 Financial Risks**

##### **Economic Risks**

##### **• Interest Rate Fluctuation**

TSMC is exposed to interest rate risks primarily related to its investment portfolio and outstanding debt, which are most sensitive to fluctuations in U.S. and R.O.C. interest rates. Changes in U.S. and R.O.C. interest rates affect the interest earned on the Company's cash, cash equivalents and marketable securities and the fair value of those securities, as well as interest paid on its debt.

The objective of TSMC's investment policy is to achieve a return that will allow the Company to preserve principal and support liquidity requirements. TSMC invests primarily in time deposits and investment grade debt securities. By policy, TSMC limits the amount of credit exposure to any one issuer. TSMC's investments in both fixed rate and floating rate interest earning securities carry a degree of interest rate risk. Fixed rate securities may have their fair market value adversely affected due to a rise in interest rates, while floating rate securities may generate less interest income than predicted if interest rates fall. As of December 31, 2018, a substantial majority of TSMC's fixed income securities are classified as financial assets at fair value through other comprehensive income, and may have their market value adversely impacted due to the rise in interest rates. TSMC has

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

As of December 31, 2018, all of TSMC's long-term debt are fixed-rate, NT dollar denominated bonds and measured at amortized costs. As such, changes in interest rate would not affect the future cash flows and the fair value.

#### • Foreign Exchange Volatility

More than 90% of TSMC'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 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 the Company's revenue and profit as expressed in NT dollar. For example, every one percent depreciation of the U.S. dollar against the NT dollar would result in approximately 0.4 percentage point decrease in TSMC's operating margin based on TSMC's 2018 results.

Conversely, if the U.S. dollar appreciates significantly versus other major currencies, the demand for the products and services of TSMC's customers and for TSMC's goods and services will likely decrease, which will negatively affect the Company's revenue.

TSMC uses foreign currency derivatives contracts, such as currency forwards and cross-currency swaps, to protect against currency exchange rate risks associated with non-NT dollar-denominated assets and liabilities and certain forecasted transactions. The Company also utilizes 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 its assets and liabilities.

Fluctuations in the exchange rate between the U.S. dollar and the NT dollar may affect the U.S. dollar value of the Company's common shares and the market price of the Company's American Depositary Shares (ADSs) and of any cash dividends paid in NT dollar on TSMC's common shares represented by ADSs.

#### • Inflation, Deflation and Resulting Market Volatility

The global economy is becoming more vulnerable to sudden unexpected fluctuations in inflationary and deflationary expectations and conditions. Expectations of high inflation or deflation each adversely affects the economy, at both macro and micro levels, by reducing economic efficiency and disrupting investment decisions. Recently, higher interest rates in the U.S., international trade tensions, and the possible changes in economic, fiscal and monetary policies in major economies have exacerbated, and may further exacerbate fluctuations in inflationary or deflationary expectations. Such volatility may negatively affect the costs of TSMC's operations and the business operations of its customers who may be forced to plan their purchases of TSMC's goods and services within an uncertain economy. Therefore, the demand for TSMC's products and services could unexpectedly fluctuate severely in accordance with expectations of inflation or deflation as affected by market volatility.

#### • Amendments to Tax Regulations or Implementation of New Tax Laws

Any amendments to existing tax regulations or the implementation of any new tax laws in the jurisdictions in which TSMC operates its business may have an adverse effect on its net income.

While TSMC is subject to tax laws and regulations in various jurisdictions in which it operates or conduct business, TSMC's principal operations are in the R.O.C. and it is exposed primarily to taxes levied by the R.O.C. government. Any unfavorable changes of tax laws and regulations in this jurisdiction could increase TSMC's effective tax rate and have an adverse effect on its operating results.

In order to control the tax risk, TSMC closely monitors all domestic and foreign governmental policies and regulations that might impact its financial operations. TSMC has established risk management procedures to collect information, analyze potential tax implications, and develop countermeasures.

#### Risks Associated with External Financing

In times of market instability, sufficient external financing may not be available to the Company on a timely basis, on commercially reasonable terms to the Company, or at all. If sufficient external financing is not available, when TSMC needs such financing to meet its capital requirements, it may be forced

to curtail expansion, modify plans or delay the deployment of new or expanded services until it obtains such financing.

**Risks Associated with High-Risk/Highly Leveraged Investments; Lending, Endorsements, and Guarantees for Other Parties; and Financial Derivative Transactions**  
TSMC did not make high-risk or highly leveraged financial investments in 2018 nor in 2019 up to the date of this annual report.

TSMC provided a guarantee to TSMC Global, a wholly-owned subsidiary of TSMC, for its issuance of U.S. dollar-denominated senior unsecured corporate bonds in April 2013. TSMC Global repaid the full amount of its U.S. dollar-denominated senior unsecured corporate bonds due in April 2018. TSMC also provided a guarantee amounting to no more than US\$83.21 million to TSMC North America, a wholly-owned subsidiary of TSMC, since November 2014 for its obligation to an office leasing contract.

As of February 28, 2019, TSMC had RMB 6 billion and US\$129 million intercompany loans arranged among the Company's subsidiaries, which were all in compliance with relevant rules and regulations.

In 2018, the financial transactions of a derivative nature that TSMC entered into were strictly for hedging and not for any trading or speculative purposes. For more transaction information and risk assessment, please refer to Note 7, Note 13, and Note 36 of the annual report section (II), Financial Statements.

To control various types of financial transactions, the Company has established internal policies and procedures based on sound financial and business practices, all in compliance with the relevant rules and regulations issued by the Taiwan Securities and Futures Bureau. TSMC policies and procedures include "Policies and Procedures for Financial Derivative Transactions," "Procedures for Lending Funds to Other Parties," "Procedures for Acquisition or Disposal of Assets," and "Procedures for Endorsement and Guarantee."

#### Risks Associated with Impairment Charges

Under Taiwan-IFRSs, TSMC is required to evaluate its investments, in debt securities, investments accounted for using equity method, tangible 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, TSMC is required to record an impairment charge. TSMC is also required under Taiwan-IFRSs to evaluate goodwill for impairment at least on an annual basis or more frequently whenever triggering events or changes in circumstances indicate that goodwill may be impaired and the carrying value may not be recoverable. TSMC holds investments in certain publicly listed and private companies, some of which have incurred certain impairment charges as disclosed in Annual Report section (II), Financial Statements.

The determination of an impairment charge at any given time is based significantly on the projected results of the Company's operations over several years subsequent to that time. Consequently, an impairment charge is more likely to occur during a period when the Company's operating results are otherwise already depressed.

TSMC has established the process and system to closely monitor and assess the risk of impairment charge. However, the management is unable to estimate the extent or timing of any impairment charge for future years, or whether such impairment charge may have a material adverse effect on the Company's net income.

#### 6.3.5 Hazardous Risks and Utility Supply Interruption or Shortage Risks

The frequency and severity of catastrophic events, including natural disasters and severe weather has been increasing, in part due to climate change or systemic regional geological changes that manifest in damaging earthquakes. TSMC has 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, that could disrupt operations. In addition, TSMC's suppliers and customers also have operations in such locations. For example, most of TSMC's production facilities, as well as those of many of its suppliers and customers and upstream providers of complementary semiconductor manufacturing services, are located in Taiwan and Japan, which are susceptible to earthquakes, tsunamis, flooding, typhoons, and droughts from time to time that may cause shortages in electricity and water or interruptions to our operations.



Thus, if one or more natural disasters that result in a prolonged disruption to TSMC's operations or those of its customers or suppliers, or if any of its fabs or vendor facilities were to be damaged or cease operations as a result of an explosion or fire, it could reduce the Company's manufacturing capacity and may cause us to lose important customers, thereby having a potentially adverse and material impact on our operational and financial performance.

TSMC has occasionally suffered power outages or surges in Taiwan caused by difficulties encountered by its electricity supplier, the Taiwan Power Company, or other power consumers on the same power grid, which have resulted in interruptions to our operations. Such shortages or interruptions in its electricity supply could further be exacerbated by changes in the energy policy of the government which will make Taiwan a nuclear-free country by 2025. If the Company is unable to secure reliable and uninterrupted supply of electricity to power its manufacturing fabs within Taiwan, its ability to satisfy the orders of its customers will be severely undercut.

TSMC maintains a comprehensive risk management system dedicated to the safety of people, the conservation of natural resources, and the protection of property. In order to effectively handle emergencies and natural disasters, at each facility management has developed comprehensive plans and procedures that focus on risk prevention, emergency response, crisis management and business continuity. All TSMC manufacturing fabs have been ISO 14001 certified (environmental management system) and OHSAS 18001 certified (occupational health and safety management system). All manufacturing fabs in Taiwan have also been TOSHMS (Taiwan Occupational Safety and Health Management System) certified. The new fabs will also attain the above certifications within 18 months after acquiring factory registration certification.

The Company pays special attention to preparedness of emergency response to disasters, such as typhoons, floods and droughts caused by climate change, earthquakes, pandemics (such as H1N1 influenza), and disruptions to water, electricity and other public utilities. TSMC has established a company-wide taskforce dedicated to managing the risk of a water or electricity shortage that might arise due to climate change. This taskforce monitors the external supply and internal demand for water and electricity, and collaborate with Taiwan Semiconductor Industry Association, the Allied Association for Science Park Industries, and related public agencies to ensure stable water and electricity supply.

TSMC has further strengthened its business continuity plans, which include periodic risk assessment, risk mitigation, and implementation through the establishment of emergency taskforces when necessary, combined with the preparation of a thorough analysis of the emergency, its impact, alternative actions, and solutions for each possible scenario together with appropriate precautionary and/or recovery measures. Each taskforce is given the responsibility of ensuring TSMC's ability to minimize personal injury, business disruption and financial impact under the circumstances. TSMC periodically review business continuity plan and revise it according to exercise results and implementation.

In response to the impact of the earthquake that occurred in Taiwan, TSMC conducted a continuous improvements including enhancing earthquake emergency response, enhancing tool anchorage and seismic isolation facilities, preparedness for speeding up tool salvage and production recovery. The improvements also have been embedded in new fab design. TSMC business continuity procedures were enhanced with reference to ISO 22301 business continuity management.

TSMC and many of its suppliers use combustible and toxic materials in their manufacturing processes and are therefore subject to risks that cannot be completely eliminated arising from explosion, fire, or environmental influences. Although the Company maintains many overlapping risk prevention and protection systems, as well as fire and casualty insurance, TSMC's risk management and insurance coverage may not always be sufficient to cover all of the Company's potential losses. If any of TSMC's fabs or vendor facilities were to be damaged or cease operations as a result of an explosion, fire or environmental causes, it could reduce the Company's manufacturing capacity and may lead to the loss of important sales and customers, and impact on TSMC's financial performance. In addition to periodic fire-protection inspections and firefighting drills, the Company has also carried out a corporate-wide fire risk mitigation project focused on managerial and hardware improvements.

#### **6.3.6 Risks Associated with Non-Compliance with Environmental and Climate Related Laws and Regulations, and with Other International Laws, Regulations and Accords**

Because TSMC engages in manufacturing activities in multiple jurisdictions and conducts business with customers located worldwide, such activities are subject to a myriad of

governmental regulations. For example, the manufacturing, assembling and testing of TSMC's 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.

The Company's failure to comply with any such laws or regulations, as amended from time to time, and its 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 permits or third party private lawsuits, criminal or administrative proceedings;
- the temporary or permanent suspension of production of the affected products;
- unfavorable alterations in TSMC manufacturing, fabrication and assembly and test processes;
- challenges from customers that place TSMC at a significant competitive disadvantage, such as loss of actual or potential sales contracts in case the Company is unable to satisfy the applicable legal standard or customer requirement;
- restrictions on TSMC 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 the Company is not entitled to; and
- damage to TSMC's goodwill and reputation.

Complying with applicable laws and regulations, such as environmental and climate related laws and regulations, could also require TSMC, among other things, to do the following: (1) purchase, use or install remedial equipment; (2) implement remedial programs such as climate change mitigation programs; (3) modify 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 the Company's operations.

TSMC's inability to timely obtain approvals necessary for the conduct of business could impair its operational and financial results. For example, if the Company is 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 its expansion plans that could also in turn adversely

affect its business and operational results. In light of increased public interest in environmental issues, TSMC's operations and expansion plans may be adversely affected or delayed responding to public concern and social environmental pressures even if the Company complies with all applicable laws and regulations.

TSMC believes that climate change should be regarded as a significant corporate risk that must be controlled to improve competitiveness. Climate change has the potential to create legal, physical and other risks. TSMC's control measures are as follows:

#### **• Climate Regulatory Risks**

Greenhouse gas (GHG) control regulations and agreements in countries around the world are becoming increasingly stringent. Enterprises are legally required to regularly disclose GHG-related information as well as limit GHG emissions. Future legal requirements, such as carbon or energy taxes and carbon emission cap-and-trade may drive up production costs, including material and energy costs. TSMC China is subject to the Shanghai carbon emission cap-and-trade regulation, which has had cost impacts since 2016. TSMC continues to monitor legislative trends and communicate with various governments through industrial organizations and associations to set reasonable and feasible legal requirements.

#### **• Conflict Minerals Risks**

For additional details, see the Supplier and Contractor Management section under 7.2.3 Safety and Health on page 128 of this annual report.

#### **• Climate Disaster Risks**

Abnormal climate caused by the greenhouse effect has increased the frequency and severity of climate disasters – storms, floods, drought, and water shortages – causing considerable impacts on business operations and supply chains. TSMC believes that climate change control should take into account both mitigation and adaption, and this requires cooperation among government, society and industry to reduce risk. To sustain electricity and raw water supplies, therefore, in addition to water-saving measures the Company undertakes at its own facilities and those of upstream and downstream partners, TSMC participates in the Taiwan Science Park Industrial Union Experts Committee platform, and is actively involved in regular meetings with Taipower Company and the Taiwan Water Corporation to discuss supply and allocation issues and disaster responses.

#### • Other Climate Risks

Climate change is a concern to the global supply chain, necessitating energy conservation, carbon reduction, and disaster prevention. For example, the Responsible Business Alliance (RBA) has also required members' suppliers to disclose GHG emissions information. TSMC not only discloses its own GHG emissions information each year, but it also assists and requires its major suppliers to establish a GHG inventory system and conduct reduction programs. TSMC insists that its major suppliers submit GHG emissions and reduction information as an important index of sustainability scoring in its procurement strategy.

To mitigate risks resulting from climate change, TSMC continues to actively carry out energy conservation measures, participate in voluntary emission reduction projects for perfluorinated compounds (PFCs), and conduct GHG inventory and verification on an annual basis. TSMC has publicly disclosed climate change information annually through the following channels:

- GHG emissions and reduction-related information submitted for evaluation to the Dow Jones Sustainability Index every year since 2001.
- GHG-related information disclosed in its CSR report on the Company website annually since 2008. TSMC also provides information to customers and investors upon request.
- Participation in an annual survey conducted by the nonprofit Carbon Disclosure Project (CDP) since 2005. The survey includes GHG emission and reduction information for all TSMC fabs and subsidiaries.
- Adherence to the ISO 14064-1 standard to conduct a GHG inventory and acquire verification by an accrediting agency since 2006. TSMC also reports GHG inventory data to the Taiwan Environmental Protection Administration (EPA) and the Taiwan Semiconductor Industry Association (TSIA).

#### 6.3.7 Other Risks

##### **Potential Impact and Risks Associated with Sales of Significant Numbers of Shares by TSMC's Directors, and/or Major Shareholders Who Own 10% or More of TSMC's Total Outstanding Shares**

The value of TSMC shareholders' investment may be reduced by possible future sales of TSMC shares owned by major shareholders.

One or more of TSMC's existing shareholders may, from time to time, dispose of significant numbers of TSMC common shares or ADSs. For example, the National Development Fund, Executive Yuan, R.O.C. which owned 6.38% of TSMC's outstanding shares as of February 28, 2019, had from time to time in the past sold TSMC shares in the form of ADSs in several transactions.

As of the date of this annual report, no shareholder owns 10% or more of TSMC's total outstanding shares.

#### **Risks of Trade Policies**

As TSMC's revenue is primarily derived from sales to major economies in the world (please refer to "2.2.4 TSMC Position, Differentiation and Strategy" on page 13 of this annual report), any changes in the trade policies (such as the increase of tariffs on certain products, the implementation of import and export controls, and the adoption of other trade barriers) of such major economies can affect the sales of TSMC or its customers and thereby affect TSMC's operating results. Accordingly, TSMC continues to monitor the recent shifts in trade policies and measures among the relevant major economies and will take corresponding responsive actions in accordance with subsequent developments.

#### **Other Material Risks**

During 2018 and in 2019 as of the date of this annual report, TSMC's management is not aware of any other risk event that could impart a potentially material impact on the financial status of the Company.