

**ASE Technology Holding Co., Ltd.
and Subsidiaries**

**Consolidated Financial Statements as of December 31,
2018 and 2019 and for the Years Ended December 31,
2017, 2018 and 2019 and
Reports of Independent Registered Public
Accounting Firms**

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of
ASE Technology Holding Co., Ltd.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of ASE Technology Holding Co., Ltd. (a corporation incorporated under the laws of the Republic of China) and its subsidiaries (collectively, the “Group”) as of December 31, 2018 and 2019, the related consolidated statements of comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the “Consolidated Financial Statements”) (all expressed in New Taiwan Dollars). In our opinion, based on our audits and the report of other auditors, the Consolidated Financial Statements present fairly, in all material respects, the financial position of the Group as of December 31, 2018 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

We did not audit the consolidated financial statements of Siliconware Precision Industries Co., Ltd. and its subsidiaries (collectively, “SPIL”), in which the Group’s investment was accounted for (1) as an investment accounted for using the equity method for the year ended December 31, 2017 and the period from January 1, 2018 through April 29, 2018 and (2) as a consolidated subsidiary as of December 31, 2018 and 2019, and for the period from April 30, 2018 through December 31, 2018 and for the year ended December 31, 2019. The accompanying Consolidated Financial Statements included its share of profit in SPIL of NT\$ 915,253 thousand and NT\$127,266 thousand for the year ended December 31, 2017 and the period from January 1, 2018 through April 29, 2018. The total assets of SPIL constituted 22% and 23% of the Group’s total assets as of December 31, 2018 and 2019, respectively, and the revenues of SPIL for the period from April 30, 2018 through December 31, 2018 and for the year ended December 31, 2019 constituted 17% and 22% of the Group’s revenues for each of the two years in the period ended December 31, 2019. The consolidated financial statements of SPIL were audited by other auditors whose report has been furnished to us, and our opinion, insofar as it relates to the amounts included for SPIL, is based solely on the report of other auditors.

Our audits also comprehended the translation of New Taiwan dollar amounts into U.S. dollar amounts and, in our opinion, such translation has been made in conformity with the basis stated in Note 4 to the Consolidated Financial Statements. Such U.S. dollar amounts are presented solely for the convenience of the readers outside the Republic of China.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Group’s internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated March 27, 2020, expressed an unqualified opinion on the Group’s internal control over financial reporting based on our audit and the report of other auditors.

Basis for Opinion

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

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

Critical Audit Matter

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

Goodwill - Packaging and Testing Segments - Refer to Notes 4, 5 and 18 to the Consolidated Financial Statements

Critical Audit Matter Description

The Group's evaluation of goodwill for impairment involves the comparison of the value in use of each segment to its carrying value. The Group used the discounted cash flow model to estimate value in use, which requires management to make significant estimates and assumptions related to discount rates and forecasts of future revenues. Changes in these assumptions could have a significant impact on either the value in use, the amount of any goodwill impairment charge, or both. The goodwill balance was NT\$50,198,436 thousand (US\$1,678,316 thousand) as of December 31, 2019, of which NT\$35,717,828 thousand (US\$1,194,177 thousand) and NT\$13,421,321 thousand (US\$448,724 thousand) were allocated to the packaging segment and the testing segment, respectively. Both the value in use of the packaging segment and the testing segment exceeded their carrying values as of the measurement date and, therefore, no impairment was recognized.

We identified the valuation of goodwill for the Group's packaging segment and testing segment as a critical audit matter due to the significant estimates and assumptions management makes to estimate the value in use of both the packaging segment and the testing segment and the sensitivity of their operations to changes in demand. Auditing management's judgments related to the selection of the discount rates and forecasts of future revenues for the packaging segment and the testing segment required a high degree of auditor judgment and an increased

extent of effort, including the need to involve our fair value specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the discount rates and forecasts of future revenues used by management to estimate the value in use of the packaging segment and the testing segment included the following, among others:

- We tested the design and operating effectiveness of controls over management’s goodwill impairment evaluation, including those over the determination of the value in use of the packaging segment and the testing segment, such as controls related to management’s selection of the discount rate and assessment on the reasonableness of forecasts of future revenue.
- We evaluated management’s ability to accurately forecast future revenues by comparing actual results to management’s historical forecasts.
- We performed sensitivity analyses to evaluate the risk of impairment if key assumptions are changed.
- With the assistance of our fair value specialists, we evaluated the reasonableness of the discount rate selected by performing certain procedures, including:
 - Testing the source information underlying the determination of the discount rate and the mathematical accuracy of the calculation.
 - Developing a range of independent estimates and comparing those to the discount rate selected by management.

/s/Deloitte & Touche

Taipei, Taiwan
Republic of China
March 27, 2020

We have served as the Group’s auditor since 1984.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholder of
Siliconware Precision Industries Co., Ltd.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the consolidated balance sheets of Siliconware Precision Industries Co., Ltd. and its subsidiaries (the “Company”) as of December 31, 2019 and 2018, and the related consolidated statements of comprehensive income, of changes in equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the “consolidated financial statements”)(not presented herein). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 3 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management’s Annual Report on Internal Control over Financial Reporting (not presented herein). Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing

procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

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

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

/s/PricewaterhouseCoopers, Taiwan

Taipei, Taiwan
March 19, 2020

We have served as the Company's auditor since 1994.

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS (Amounts in Thousands)

ASSETS	December 31, 2018	December 31, 2019	
	NT\$	NT\$	US\$ (Note 4)
CURRENT ASSETS			
Cash and cash equivalents (Note 6)	\$ 51,518,436	\$ 60,130,875	\$ 2,010,394
Financial assets at fair value through profit or loss - current (Note 7)	7,262,227	4,127,566	137,999
Contract assets - current (Note 42)	4,488,500	5,897,316	197,169
Trade receivables, net (Note 10)	79,481,359	78,948,473	2,639,534
Other receivables	1,283,180	1,293,819	43,257
Current tax assets (Note 27)	524,263	553,092	18,492
Inventories (Note 11)	36,627,451	33,883,750	1,132,857
Inventories related to real estate business (Notes 12 and 37)	10,060,608	11,416,726	381,703
Other financial assets - current (Notes 13 and 37)	6,539,467	765,834	25,605
Other current assets	3,773,384	4,983,667	166,622
Total current assets	201,558,875	202,001,118	6,753,632
NON-CURRENT ASSETS			
Financial assets at fair value through profit or loss - non-current (Note 7)	636,231	1,161,430	38,831
Financial assets at fair value through other comprehensive income - non-current (Note 8)	1,597,323	1,770,775	59,203
Investments accounted for using the equity method (Note 14)	9,312,308	12,085,207	404,052
Property, plant and equipment (Notes 15, 26, 37 and 38)	214,592,588	232,093,327	7,759,723
Right-of-use assets (Notes 3 and 16)	-	9,792,221	327,390
Investment properties (Notes 17, 26 and 37)	7,738,379	12,854,071	429,758
Goodwill (Notes 18 and 30)	49,974,446	50,198,436	1,678,316
Other intangible assets (Notes 19, 26 and 30)	30,897,700	29,024,392	970,391
Deferred tax assets (Note 27)	5,108,357	4,707,704	157,396
Other financial assets - non-current (Notes 13 and 37)	1,044,294	559,493	18,706
Long-term prepayments for lease (Notes 20 and 37)	10,764,835	-	-
Other non-current assets	836,591	975,532	32,616
Total non-current assets	332,503,052	355,222,588	11,876,382
TOTAL	\$ 534,061,927	\$ 557,223,706	\$ 18,630,014

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ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS (Amounts in Thousands)

LIABILITIES AND EQUITY	December 31, 2018	December 31, 2019	
	NT\$	NT\$	US\$ (Note 4)
CURRENT LIABILITIES			
Short-term borrowings (Note 21)	\$ 43,263,469	\$ 37,339,028	\$ 1,248,379
Financial liabilities at fair value through profit or loss - current (Note 7)	36,655	973,571	32,550
Financial liabilities for hedging - current (Note 35)	3,899,634	3,233,301	108,101
Trade payables	56,884,116	56,065,639	1,874,478
Other payables (Note 23)	31,003,882	39,181,690	1,309,986
Current tax liabilities (Note 27)	6,781,136	4,858,578	162,440
Lease liabilities - current (Note 16)	-	632,802	21,157
Current portion of bonds payable (Note 22)	-	250,000	8,358
Current portion of long-term borrowings (Notes 21 and 37)	10,779,034	5,112,768	170,938
Other current liabilities	5,984,156	6,652,925	222,432
Total current liabilities	158,632,082	154,300,302	5,158,819
NON-CURRENT LIABILITIES			
Bonds payable (Note 22)	16,985,936	36,272,155	1,212,710
Long-term borrowings (Notes 21 and 37)	127,119,295	135,965,830	4,545,832
Deferred tax liabilities (Note 27)	5,806,713	5,772,237	192,987
Lease liabilities - non-current (Note 16)	-	5,176,123	173,057
Net defined benefit liabilities (Note 24)	5,118,677	5,254,401	175,674
Other non-current liabilities	1,371,302	1,680,346	56,180
Total non-current liabilities	156,401,923	190,121,092	6,356,440
Total liabilities	315,034,005	344,421,394	11,515,259
EQUITY ATTRIBUTABLE TO OWNERS OF THE COMPANY (Note 25)			
Share capital			
Ordinary shares	43,201,486	43,254,026	1,446,139
Shares subscribed in advance	15,658	51,261	1,714
Total share capital	43,217,144	43,305,287	1,447,853
Capital surplus	143,276,664	138,910,363	4,644,279
Retained earnings			
Legal reserve	-	2,203,895	73,684
Special reserve	3,353,938	6,902,782	230,785
Unappropriated earnings	20,403,477	21,029,962	703,108
Total retained earnings	23,757,415	30,136,639	1,007,577
Other equity	(6,903,681)	(10,965,782)	(366,626)
Treasury shares	(1,959,107)	(1,959,107)	(65,500)
Equity attributable to owners of the Company	201,388,435	199,427,400	6,667,583
NON-CONTROLLING INTERESTS (Note 25)	17,639,487	13,374,912	447,172
Total equity	219,027,922	212,802,312	7,114,755
TOTAL	\$ 534,061,927	\$ 557,223,706	\$ 18,630,014

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

(Concluded)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Amounts in Thousands Except Earnings Per Share)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
OPERATING REVENUES (Note 42)	\$ 290,441,208	\$ 371,092,421	\$ 413,182,184	\$ 13,814,182
OPERATING COSTS (Notes 12 and 26)	<u>237,708,937</u>	<u>309,929,371</u>	<u>348,871,391</u>	<u>11,664,038</u>
GROSS PROFIT	<u>52,732,271</u>	<u>61,163,050</u>	<u>64,310,793</u>	<u>2,150,144</u>
OPERATING EXPENSES (Note 26)				
Selling and marketing expenses	3,308,992	4,933,602	5,751,168	192,282
General and administrative expenses	12,458,054	14,618,900	16,637,887	556,265
Research and development expenses	<u>11,746,613</u>	<u>14,962,799</u>	<u>18,395,334</u>	<u>615,023</u>
Total operating expenses	<u>27,513,659</u>	<u>34,515,301</u>	<u>40,784,389</u>	<u>1,363,570</u>
OTHER OPERATING INCOME AND EXPENSES, NET (Note 26)	<u>108,556</u>	<u>371,583</u>	<u>(268,555)</u>	<u>(8,979)</u>
PROFIT FROM OPERATIONS	<u>25,327,168</u>	<u>27,019,332</u>	<u>23,257,849</u>	<u>777,595</u>
NON-OPERATING INCOME AND EXPENSES				
Other income (Note 26)	707,754	1,092,558	1,359,093	45,439
Other gains, net (Note 26)	6,259,453	7,874,273	2,683,989	89,735
Finance costs (Note 26)	(1,799,494)	(3,568,241)	(4,203,395)	(140,535)
Share of the profit or loss of associates and joint ventures	<u>525,782</u>	<u>(480,244)</u>	<u>182,275</u>	<u>6,094</u>
Total non-operating income and expenses	<u>5,693,495</u>	<u>4,918,346</u>	<u>21,962</u>	<u>733</u>
PROFIT BEFORE INCOME TAX	31,020,663	31,937,678	23,279,811	778,328
INCOME TAX EXPENSE (Note 27)	<u>6,523,603</u>	<u>4,513,369</u>	<u>5,011,246</u>	<u>167,544</u>
PROFIT FOR THE YEAR	<u>24,497,060</u>	<u>27,424,309</u>	<u>18,268,565</u>	<u>610,784</u>
OTHER COMPREHENSIVE INCOME (LOSS)				
Items that will not be reclassified subsequently to profit or loss:				
Remeasurement of defined benefit obligation	205,344	(308,180)	(365,262)	(12,212)
Unrealized loss on equity instruments at fair value through other comprehensive income	-	(422,441)	(216,121)	(7,226)
Share of other comprehensive income (loss) of associates and joint ventures	7,249	(558,217)	1,504,760	50,310
Income tax relating to items that will not be reclassified subsequently to profit or loss	<u>(51,217)</u>	<u>134,853</u>	<u>(3,816)</u>	<u>(128)</u>
	<u>161,376</u>	<u>(1,153,985)</u>	<u>919,561</u>	<u>30,744</u>

(Continued)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Amounts in Thousands Except Earnings Per Share)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Items that may be reclassified subsequently to profit or loss:				
Exchange differences on translating foreign operations	\$ (5,287,734)	\$ 227,821	\$ (5,202,145)	\$ (173,927)
Unrealized gain on available-for-sale financial assets	224,036	-	-	-
Unrealized loss on investments in debt instruments at fair value through other comprehensive income	-	(63,076)	(2,052)	(69)
Share of other comprehensive income (loss) of associates and joint ventures	264,389	136,608	(85,975)	(2,874)
	<u>(4,799,309)</u>	<u>301,353</u>	<u>(5,290,172)</u>	<u>(176,870)</u>
Other comprehensive loss for the year, net of income tax	<u>(4,637,933)</u>	<u>(852,632)</u>	<u>(4,370,611)</u>	<u>(146,126)</u>
TOTAL COMPREHENSIVE INCOME FOR THE YEAR	<u>\$ 19,859,127</u>	<u>\$ 26,571,677</u>	<u>\$ 13,897,954</u>	<u>\$ 464,658</u>
PROFIT FOR THE YEAR ATTRIBUTABLE TO:				
Owners of the Company	\$ 22,819,119	\$ 26,220,721	\$ 17,060,591	\$ 570,397
Non-controlling interests	<u>1,677,941</u>	<u>1,203,588</u>	<u>1,207,974</u>	<u>40,387</u>
	<u>\$ 24,497,060</u>	<u>\$ 27,424,309</u>	<u>\$ 18,268,565</u>	<u>\$ 610,784</u>
TOTAL COMPREHENSIVE INCOME FOR THE YEAR ATTRIBUTABLE TO:				
Owners of the Company	\$ 18,524,067	\$ 25,620,461	\$ 13,122,185	\$ 438,722
Non-controlling interests	<u>1,335,060</u>	<u>951,216</u>	<u>775,769</u>	<u>25,936</u>
	<u>\$ 19,859,127</u>	<u>\$ 26,571,677</u>	<u>\$ 13,897,954</u>	<u>\$ 464,658</u>
EARNINGS PER SHARE (Note 28)				
Basic	<u>\$ 5.59</u>	<u>\$ 6.18</u>	<u>\$ 4.01</u>	<u>\$ 0.13</u>
Diluted	<u>\$ 5.19</u>	<u>\$ 6.07</u>	<u>\$ 3.91</u>	<u>\$ 0.13</u>
EARNINGS PER AMERICAN DEPOSITARY SHARE ("ADS") (Note 28)				
Basic	<u>\$ 11.18</u>	<u>\$ 12.35</u>	<u>\$ 8.02</u>	<u>\$ 0.27</u>
Diluted	<u>\$ 10.38</u>	<u>\$ 12.14</u>	<u>\$ 7.82</u>	<u>\$ 0.26</u>

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

(Concluded)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY (Amounts in Thousands)

	Equity Attributable to Owners of the Company							Other Equity							
	Share Capital		Capital Surplus	Retained Earnings			Total	Exchange Differences on Translating Foreign Operations	Unrealized Gain (Loss) on Available-for-sale Financial Assets	Unrealized Gain (Loss) on Financial Assets at Fair Value Through Other Comprehensive Income	Total	Treasury Shares	Total	Non-controlling Interests	Total Equity
	Shares (In Thousands)	Amounts		Legal Reserve	Special Reserve	Unappropriated Earnings									
BALANCE AT JANUARY 1, 2017	7,946,184	\$ 79,568,040	\$ 22,266,500	\$ 14,597,032	\$ 3,353,938	\$ 44,188,554	\$ 62,139,524	\$ (1,643,623)	\$ (197,314)	\$ -	\$ (1,840,937)	\$ (7,292,513)	\$ 154,840,614	\$ 12,000,551	\$ 166,841,165
Appropriation of 2016 earnings															
Legal reserve	-	-	-	2,168,034	-	(2,168,034)	-	-	-	-	-	-	-	-	-
Cash dividends distributed by the Company	-	-	-	-	-	(11,415,198)	(11,415,198)	-	-	-	-	-	(11,415,198)	-	(11,415,198)
-	-	-	-	2,168,034	-	(13,583,232)	(11,415,198)	-	-	-	-	-	(11,415,198)	-	(11,415,198)
Net profit for the year ended December 31, 2017	-	-	-	-	-	22,819,119	22,819,119	-	-	-	-	-	22,819,119	1,677,941	24,497,060
Other comprehensive income (loss) for the year ended December 31, 2017, net of income tax	-	-	-	-	-	175,100	175,100	(5,090,036)	619,884	-	(4,470,152)	-	(4,295,052)	(342,881)	(4,637,933)
Total comprehensive income (loss) for the year ended December 31, 2017	-	-	-	-	-	22,994,219	22,994,219	(5,090,036)	619,884	-	(4,470,152)	-	18,524,067	1,335,060	19,859,127
Change from investments in associates accounted for using the equity method	-	-	1,490	-	-	-	-	-	-	-	-	-	1,490	-	1,490
Issue of ordinary shares for capital increase by cash	300,000	3,000,000	7,290,000	-	-	-	-	-	-	-	-	-	10,290,000	-	10,290,000
Issue of ordinary shares under conversion of bonds (Notes 22 and 25)	424,258	4,242,577	9,657,905	-	-	-	-	-	-	-	-	-	13,900,482	-	13,900,482
Cash dividends received by subsidiaries from the Company	-	-	200,977	-	-	-	-	-	-	-	-	-	200,977	-	200,977
Changes in percentage of ownership interest in subsidiaries	-	-	3,055	-	-	-	-	-	-	-	-	-	3,055	(3,055)	-
Issue of ordinary shares under employee share options (Note 29)	67,637	570,170	1,256,789	-	-	-	-	-	-	-	-	-	1,826,959	(159,200)	1,667,759
Cash dividends distributed by subsidiaries	-	-	-	-	-	-	-	-	-	-	-	-	-	(246,440)	(246,440)
Additional non-controlling interest arising on issue of employee share options by subsidiaries (Note 29)	-	-	(52,388)	-	-	-	-	-	-	-	-	-	(52,388)	263,213	210,825
BALANCE AT DECEMBER 31, 2017	8,738,079	\$ 87,380,787	\$ 40,624,328	\$ 16,765,066	\$ 3,353,938	\$ 53,599,541	\$ 73,718,545	\$ (6,733,659)	\$ 422,570	\$ -	\$ (6,311,089)	\$ (7,292,513)	\$ 188,120,058	\$ 13,190,129	\$ 201,310,187
Effect of retrospective applications	-	-	-	-	-	886,316	886,316	-	(422,570)	135,517	(287,053)	-	599,263	5,183	604,446
ADJUSTED BALANCE AT JANUARY 1, 2018	8,738,079	87,380,787	40,624,328	16,765,066	3,353,938	54,485,857	74,604,861	(6,733,659)	-	135,517	(6,598,142)	(7,292,513)	188,719,321	13,195,312	201,914,633
Change from investments in associates accounted for using the equity method	-	-	1,411,899	-	-	88,201	88,201	-	-	-	-	-	1,500,100	-	1,500,100
Cash dividends paid from capital surplus (Note 25)	-	-	(10,795,980)	-	-	-	-	-	-	-	-	-	(10,795,980)	-	(10,795,980)
Other changes in the capital surplus	-	-	872	-	-	-	-	-	-	-	-	-	872	-	872
Net profit for the year ended December 31, 2018	-	-	-	-	-	26,220,721	26,220,721	-	-	-	-	-	26,220,721	1,203,588	27,424,309
Other comprehensive income (loss) for the year ended December 31, 2018, net of income tax	-	-	-	-	-	(146,194)	(146,194)	562,794	-	(1,016,860)	(454,066)	-	(600,260)	(252,372)	(852,632)
Total comprehensive income (loss) for the year ended December 31, 2018	-	-	-	-	-	26,074,527	26,074,527	562,794	-	(1,016,860)	(454,066)	-	25,620,461	951,216	26,571,677
Effect of the joint share exchange (Note 25)	(4,318,392)	(43,183,919)	117,693,658	(16,765,066)	-	(57,744,673)	(74,509,739)	-	-	-	-	-	-	-	-
Buy-back of ordinary shares	-	-	-	-	-	-	-	-	-	-	-	(71,302)	(71,302)	-	(71,302)
Cancellation of treasury shares	(121,852)	(1,218,520)	(1,480,903)	-	-	(2,705,285)	(2,705,285)	-	-	-	-	5,404,708	-	-	-
Cash dividends received by subsidiaries from the Company	-	-	182,354	-	-	-	-	-	-	-	-	-	182,354	-	182,354
Disposal of interest in associates and joint ventures accounted for using the equity method (Note 15)	-	-	(1,408,495)	-	-	204,450	204,450	282,291	-	(133,364)	148,927	-	(1,055,118)	-	(1,055,118)

(Continued)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY (Amounts in Thousands)

	Equity Attributable to Owners of the Company							Other Equity				Non-controlling Interests	Total Equity		
	Share Capital		Capital Surplus	Retained Earnings			Exchange Differences on Translating Foreign Operations	Unrealized Gain (Loss) on Available-for-sale Financial Assets	Unrealized Gain (Loss) on Financial Assets at Fair Value Through Other Comprehensive Income	Treasury Shares	Total				
	Shares (In Thousands)	Amounts		Legal Reserve	Special Reserve	Unappropriated Earnings								Total	
Differences between consideration and carrying amount arising from acquisition or disposal of subsidiaries (Note 33)	-	\$ -	\$ (1,142,856)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,142,856)	\$ 2,783,015	\$ 1,640,159	
Changes in percentage of ownership interest in subsidiaries (Note 33)	-	-	(1,118,102)	-	-	-	-	-	-	-	-	(1,118,102)	(801,884)	(1,919,986)	
Issue of ordinary shares under employee share options (Note 29)	23,879	238,796	549,345	-	-	-	-	-	-	-	-	788,141	-	788,141	
Cash dividends distributed by subsidiaries	-	-	-	-	-	-	-	-	-	-	-	-	(424,815)	(424,815)	
Additional non-controlling interest arising on issue of employee share options by subsidiaries (Note 29)	-	-	(1,239,456)	-	-	-	-	-	-	-	-	(1,239,456)	1,936,643	697,187	
Fair value through other comprehensive income - equity instruments	-	-	-	-	400	400	-	-	(400)	(400)	-	-	-	-	
BALANCE AT DECEMBER 31, 2018	4,321,714	43,217,144	143,276,664	-	3,353,938	20,403,477	23,757,415	(5,888,574)	-	(1,015,107)	(6,903,681)	(1,959,107)	201,388,435	17,639,487	219,027,922
BALANCE AT JANUARY 1, 2019	4,321,714	43,217,144	143,276,664	-	3,353,938	20,403,477	23,757,415	(5,888,574)	-	(1,015,107)	(6,903,681)	(1,959,107)	201,388,435	17,639,487	219,027,922
Appropriation of 2018 earnings	-	-	-	2,203,895	-	(2,203,895)	-	-	-	-	-	-	-	-	-
Legal reserve	-	-	-	2,203,895	-	(2,203,895)	-	-	-	-	-	-	-	-	-
Special reserve	-	-	-	-	3,548,844	(3,548,844)	-	-	-	-	-	-	-	-	-
Cash dividends distributed by the Company	-	-	-	-	-	(10,806,454)	(10,806,454)	-	-	-	-	-	(10,806,454)	-	(10,806,454)
	-	-	-	2,203,895	3,548,844	(16,559,193)	(10,806,454)	-	-	-	-	-	(10,806,454)	-	(10,806,454)
Change from investments in associates and joint ventures accounted for using the equity method	-	-	3,604	-	-	-	-	-	-	-	-	-	3,604	-	3,604
Other changes in the capital surplus	-	-	1,070	-	-	-	-	-	-	-	-	-	1,070	-	1,070
Net profit for the year ended December 31, 2019	-	-	-	-	-	17,060,591	17,060,591	-	-	-	-	-	17,060,591	1,207,974	18,268,565
Other comprehensive income (loss) for the year ended December 31, 2019, net of income tax	-	-	-	-	-	(280,461)	(280,461)	(4,874,110)	-	1,216,165	(3,657,945)	-	(3,938,406)	(432,205)	(4,370,611)
Total comprehensive income (loss) for the year ended December 31, 2019	-	-	-	-	-	16,780,130	16,780,130	(4,874,110)	-	1,216,165	(3,657,945)	-	13,122,185	775,769	13,897,954
Cash dividends received by subsidiaries from the Company	-	-	182,354	-	-	-	-	-	-	-	-	-	182,354	-	182,354
Disposal of interest in associates and joint ventures accounted for using the equity method (Note 15)	-	-	(75,276)	-	-	1,392	1,392	-	-	-	-	-	(73,884)	-	(73,884)
Actual disposal or acquisition of interests in subsidiaries (Note 33)	-	-	(2,779,613)	-	-	-	-	-	-	-	-	-	(2,779,613)	(4,335,090)	(7,114,703)
Changes in percentage of ownership interest in subsidiaries (Note 33)	-	-	(1,960,167)	-	-	-	-	-	-	-	-	-	(1,960,167)	(2,017,319)	(3,977,486)
Issue of ordinary shares under employee share options (Note 29)	8,814	88,143	1,137,020	-	-	-	-	-	-	-	-	-	1,225,163	-	1,225,163
Cash dividends distributed by subsidiaries	-	-	-	-	-	-	-	-	-	-	-	-	-	(360,245)	(360,245)
Additional non-controlling interest arising on issue of employee share options by subsidiaries (Note 29)	-	-	(875,293)	-	-	-	-	-	-	-	-	-	(875,293)	1,672,310	797,017
Disposal of investments in equity instruments at fair value through other comprehensive income	-	-	-	-	-	404,156	404,156	-	-	(404,156)	(404,156)	-	-	-	-
BALANCE AT DECEMBER 31, 2019	4,330,528	\$ 43,305,287	\$ 138,910,363	\$ 2,203,895	\$ 6,902,782	\$ 21,029,962	\$ 30,136,639	\$ (10,762,684)	\$ -	\$ (203,098)	\$ (10,965,782)	\$ (1,959,107)	\$ 199,427,400	\$ 13,374,912	\$ 212,802,312
US DOLLARS (Note 4)															
BALANCE AT DECEMBER 31, 2019	4,330,528	\$ 1,447,853	\$ 4,644,279	\$ 73,684	\$ 230,785	\$ 703,108	\$ 1,007,577	\$ (359,836)	\$ -	\$ (6,790)	\$ (366,626)	\$ (65,500)	\$ 6,667,583	\$ 447,172	\$ 7,114,755

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

(Concluded)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

(Amounts in Thousands)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
CASH FLOWS FROM OPERATING ACTIVITIES				
Profit before income tax	\$ 31,020,663	\$ 31,937,678	\$ 23,279,811	\$ 778,328
Adjustments for:				
Depreciation expense	28,747,518	40,286,453	46,890,235	1,567,711
Amortization expense	457,666	2,402,450	3,576,606	119,579
Net loss (gain) on fair value change of financial assets and liabilities at fair value through profit or loss	2,783,902	(1,989,490)	(1,646,822)	(55,059)
Finance costs	1,799,494	3,568,241	4,203,395	140,535
Interest income	(306,871)	(466,211)	(549,681)	(18,378)
Dividend income	(59,039)	(190,397)	(185,061)	(6,187)
Compensation cost of employee share options	438,765	215,648	871,699	29,144
Share of loss (profit) of associates and joint ventures	(525,782)	480,244	(182,275)	(6,094)
Loss (gain) on disposal of property, plant and equipment	(348,070)	56,902	164,467	5,499
Impairment loss recognized on financial assets	77,101	675,624	400,201	13,380
Reversal of impairment loss recognized on financial assets	-	-	(35,727)	(1,194)
Impairment loss recognized on non-financial assets	1,113,499	1,113,998	653,140	21,837
Reversal of impairment loss recognized on non-financial assets	-	(100,000)	-	-
Gain on disposal of subsidiaries	(5,589,457)	-	-	-
Gain on remeasurement of investments for using the equity method	-	(7,421,408)	(319,712)	(10,689)
Net loss (gain) on foreign currency exchange	(2,356,480)	1,360,380	(1,498,107)	(50,087)
Others	1,172,005	1,142,735	(117,504)	(3,929)
Changes in operating assets and liabilities				
Financial assets held for trading	(226,049)	-	-	-
Financial assets mandatorily at fair value through profit or loss	-	345,540	6,102,421	204,026
Contract assets	-	(508,166)	(1,408,816)	(47,102)
Trade receivables	(4,066,374)	(9,313,539)	995,839	33,295
Other receivables	(330,491)	443,517	(10,755)	(360)
Inventories	(2,907,848)	(9,249,714)	1,407,099	47,044
Other current assets	(781,477)	(385,172)	(1,206,456)	(40,336)
Financial liabilities held for trading	(3,874,662)	(2,039,771)	(1,053,535)	(35,224)
Trade payables	4,753,270	6,989,198	(1,024,250)	(34,244)
Other payables	685,398	1,016,338	1,515,776	50,678
Other current liabilities	211,145	228,190	781,885	26,141
Other operating activities items	27,538	(281,736)	267,965	8,959
Cash generated from operations	51,915,364	60,317,532	81,871,838	2,737,273
Interest received	236,746	523,679	549,846	18,383
Dividend received	1,929,218	297,882	518,115	17,322
Interest paid	(1,666,759)	(3,239,159)	(4,015,673)	(134,259)
Income tax paid	(4,983,769)	(6,825,243)	(6,620,876)	(221,360)
Net cash generated from operating activities	47,430,800	51,074,691	72,303,250	2,417,359

(Continued)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

(Amounts in Thousands)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
CASH FLOWS FROM INVESTING				
ACTIVITIES				
Purchase of financial assets at fair value through other comprehensive income	\$ -	\$ (105,000)	\$ (409,985)	\$ (13,707)
Proceeds on sale of financial assets at fair value through other comprehensive income	-	94,217	-	-
Return of capital from financial assets at fair value other comprehensive income	-	116,278	12,664	424
Purchase of financial assets designated as at fair value through profit or loss	(61,308,095)	-	-	-
Proceeds on sale of financial assets designated as at fair value through profit or loss	61,601,865	-	-	-
Purchase of available-for-sale financial assets	(902,648)	-	-	-
Proceeds on sale of available-for-sale financial assets	1,121,517	-	-	-
Cash received from return of capital by available-for-sale financial assets	16,175	-	-	-
Purchase of financial assets at fair value through profit or loss	-	-	(26,852)	(898)
Acquisition of associates and joint ventures	-	(451,563)	(2,107,844)	(70,473)
Net cash outflow on acquisition of subsidiaries	-	(95,241,855)	(81,646)	(2,730)
Cash received from return of capital by investee accounted for using the equity method	-	262,941	-	-
Net cash inflow from disposal of subsidiaries	7,020,883	-	-	-
Payments for property, plant and equipment	(24,699,240)	(41,386,443)	(56,810,153)	(1,899,370)
Proceeds from disposal of property, plant and equipment	1,488,210	1,127,644	448,939	15,010
Payments for intangible assets	(337,984)	(577,765)	(1,411,068)	(47,177)
Proceeds from disposal of intangible assets	34,690	-	6,929	232
Payments for right-of-use assets	-	-	(288,052)	(9,631)
Payments for investment properties	(186,522)	(125,764)	(2,532)	(85)
Proceeds from disposal of investment properties	-	-	5	-
Increase in other financial assets	(137,314)	(10,977,004)	(2,275,354)	(76,073)
Decrease in other financial assets	373,541	17,185,531	8,561,929	286,256
Increase in other non-current assets	(186,152)	(2,081,459)	(216,158)	(7,227)
Decrease in other non-current assets	14,832	110,687	20,032	670
Increase in financial liabilities for hedging	-	2,507,233	-	-
Other investing activities items	-	-	89	3
Net cash used in investing activities	<u>(16,086,242)</u>	<u>(129,542,322)</u>	<u>(54,579,057)</u>	<u>(1,824,776)</u>
CASH FLOWS FROM FINANCING				
ACTIVITIES				
Net proceeds from (repayment of) short-term borrowings	(2,038,993)	22,327,813	(4,683,142)	(156,574)
Proceeds from bonds offering	8,000,000	-	19,279,033	644,568
Repayment of bonds payable	(9,123,972)	(6,185,600)	-	-
Proceeds from long-term borrowings	35,394,158	199,743,582	165,757,252	5,541,867
Repayment of long-term borrowings	(51,867,539)	(114,232,623)	(164,612,521)	(5,503,595)
Repayment of the principle portion of lease	-	-	(636,556)	(21,282)
Dividends paid	(11,214,221)	(10,613,626)	(10,623,030)	(355,166)

(Continued)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

(Amounts in Thousands)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Proceeds from issue of ordinary shares	\$ 10,290,000	\$ -	\$ -	\$ -
Proceeds from exercise of employee share options	1,439,819	1,269,680	1,149,227	38,423
Payments for buy-back of ordinary shares	-	(71,302)	-	-
Proceeds from disposal of interests in subsidiaries	-	2,807,568	-	-
Decrease in non-controlling interests	(246,440)	(11,820,227)	(12,117,251)	(405,124)
Other financing activities items	43,761	(113,859)	(11,820)	(395)
Net cash generated from (used in) financing activities	<u>(19,323,427)</u>	<u>83,111,406</u>	<u>(6,498,808)</u>	<u>(217,278)</u>
EFFECTS OF EXCHANGE RATE CHANGES ON THE BALANCE OF CASH AND CASH EQUIVALENTS HELD IN FOREIGN CURRENCY	<u>(4,335,589)</u>	<u>796,595</u>	<u>(2,612,946)</u>	<u>(87,360)</u>
NET INCREASE IN CASH AND CASH EQUIVALENTS	7,685,542	5,440,370	8,612,439	287,945
CASH AND CASH EQUIVALENTS AT THE BEGINNING OF THE YEAR	<u>38,392,524</u>	<u>46,078,066</u>	<u>51,518,436</u>	<u>1,722,449</u>
CASH AND CASH EQUIVALENTS AT THE END OF THE YEAR	<u>\$ 46,078,066</u>	<u>\$ 51,518,436</u>	<u>\$ 60,130,875</u>	<u>\$ 2,010,394</u>

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

(Concluded)

ASE TECHNOLOGY HOLDING CO., LTD. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Amounts in Thousands, Unless Stated Otherwise)

1. GENERAL INFORMATION

ASE Technology Holding Co., Ltd. (the “Company”) is a corporation incorporated in Nantze Export Processing Zone under the laws of Republic of China (“R.O.C.”) starting from April 30, 2018 (date of incorporation). The Company and its subsidiaries (collectively referred to as the “Group”) offer a comprehensive range of semiconductors packaging, testing, and electronic manufacturing services (“EMS”).

The board of directors of the Company’s subsidiaries, Advanced Semiconductor Engineering, Inc. (symbol “2311”, “ASE”) and Siliconware Precision Industries Co., Ltd. (symbol “2325”, “SPIL”), approved in June 2016 to enter into and execute a joint share exchange agreement to establish the Company and the Company acquired all issued and outstanding ordinary shares of ASE and SPIL in the way of share exchange. The share exchange was conducted at an exchange ratio of 1 ordinary share of ASE for 0.5 ordinary share of the Company, and at NT\$51.2 in cash per SPIL’s ordinary share. The share exchange transaction has been approved both at ASE’s and SPIL’s special shareholders’ meeting on February 12, 2018 and has been completed on April 30, 2018. As a result, ASE and SPIL became wholly-owned subsidiaries of the Company on April 30, 2018, and both of ASE’s and SPIL’s ordinary shares have been delisted while the ordinary shares of the Company were listed starting from the same date under the symbol “3711”. In addition, ASE’s ordinary shares that have been traded on the New York Stock Exchange (the “NYSE”) under the symbol “ASX” in the form of American Depositary Shares (“ADS”) starting from September 2000 were exchanged as the Company’s ADSs under the same symbol “ASX” starting from April 30, 2018.

For enhancing operational flexibility through organization restructure, the board of directors of ASE resolved in October 2018 to spin off its investment department which was responsible for managing the ordinary shares and assets of USI Inc. (“USIINC”) as well as relevant assets (including assets, liabilities and business) into a newly established company, USI Global Inc. (the “USI Global”). USI Global then issued new ordinary shares to the Company as a consideration. In November 2018, the spin off has been completed and the Company has obtained control over ASE and USI Global. In December 2018, the board of directors of the Company and USI Global further resolved to proceed with the merger which was completed in January 2019. After the merger, the Company is the surviving company while USI Global is the dissolving company. The aforementioned spin off and merger have no material effect on the Group’s financial position and financial performance.

The ordinary shares of the Company’s subsidiary, Universal Scientific Industrial (Shanghai) Co., Ltd. (“USISH”), have been listed on the Shanghai Stock Exchange (the “SSE”) under the symbol “601231” since February 2012.

The consolidated financial statements are presented in the Company’s functional currency, New Taiwan dollar (NT\$).

2. APPROVAL OF FINANCIAL STATEMENTS

The consolidated financial statements were approved for issue by the management on March 23, 2020.

3. APPLICATION OF NEW AND REVISED INTERNATIONAL FINANCIAL REPORTING STANDARDS AS ISSUED BY THE INTERNATIONAL ACCOUNTING STANDARDS BOARD (“IASB”) (collectively, “IFRSs”)

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

In the current year, the Group has applied the following new, revised or amended standards and interpretations that have been issued and effective:

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

Except for the following, the initial application of the aforementioned new, revised or amended standards and interpretations did not have effect on the Group’s accounting policies:

- 1) IFRS 16 “Leases”

IFRS 16 provides a comprehensive model for the identification of lease arrangements and their treatment in the financial statements of both lessee and lessor. It supersedes IAS 17 “Leases”, IFRIC 4 “Determining whether an Arrangement contains a Lease”, and a number of related interpretations. Refer to Note 4 for information relating to the relevant accounting policies.

Definition of a lease

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

The Group as lessee

The Group recognizes right-of-use assets or investment properties if the right-of-use assets meet the definition of investment properties, and lease liabilities for all leases on the consolidated balance sheets except for those whose payments under low-value assets and short-term leases are recognized as expenses on a straight-line basis. On the consolidated statements of comprehensive income, the Group presents the depreciation expense charged on right-of-use assets separately from the interest expense accrued on lease liabilities; interest is computed using the effective interest method. On the consolidated statements of cash flows, cash payments for the principal portion of lease liabilities are classified within financing activities; cash payments for the interest portion are classified within operating activities.

Prior to the application of IFRS 16, payments under operating lease contracts, including property interest qualified as investment properties, were recognized as expenses on a straight-line basis. Prepaid lease payments for land use rights were recognized as long-term prepayments for lease. Cash flows for operating leases were classified within operating activities on the consolidated

statements of cash flows. Leased assets and finance lease payables were recognized on the consolidated balance sheets for contracts classified as finance leases.

The Group elects to apply IFRS 16 retrospectively with the cumulative effect of the initial application of this standard recognized in retained earnings on January 1, 2019. Comparative information is not restated.

Lease liabilities were recognized on January 1, 2019 for leases previously classified as operating leases under IAS 17. Lease liabilities were measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rates on January 1, 2019. Right-of-use assets are measured at an amount equal to the lease liabilities, adjusted by the amount of any prepaid or accrued lease payments. The Group applies IAS 36 to all right-of-use assets.

The Group also applies the following practical expedients:

- a) The Group accounts for those leases for which the lease term ends on or before December 31, 2019 as short-term leases.
- b) The Group excludes initial direct costs from the measurement of right-of-use assets on January 1, 2019.
- c) The Group uses hindsight, such as in determining lease terms, to measure lease liabilities.

For leases previously classified as finance leases under IAS 17, the carrying amounts of right-of-use assets and lease liabilities on January 1, 2019 are determined as at the carrying amounts of the respective leased assets and finance lease payables on December 31, 2018.

The weighted average lessee's incremental borrowing rates applied to lease liabilities recognized on January 1, 2019 was 1.35%. The difference between the (i) lease liabilities recognized and (ii) operating lease commitments disclosed under IAS 17 on December 31, 2018 is explained as follows:

	NT\$	US\$ (Note 4)
The future minimum lease payments of non-cancellable operating lease commitments on December 31, 2018	\$ 2,386,102	\$ 79,776
Less: Recognition exemption for short-term leases	(108,946)	(3,642)
Less: Recognition exemption for leases of low-value assets	<u>(10,822)</u>	<u>(362)</u>
Undiscounted amounts on January 1, 2019	<u>\$ 2,266,334</u>	<u>\$ 75,772</u>
Discounted amounts using the incremental borrowing rates on January 1, 2019	\$ 2,006,553	\$ 67,086
Add: Finance lease liabilities (excluding the amounts applied for the exemption for short-term leases and leases of low-value assets) on December 31, 2018	248,808	8,319
Add: Adjustments as a result of a different treatment of extension	<u>3,829,368</u>	<u>128,030</u>
Lease liabilities recognized on January 1, 2019	<u>\$ 6,084,729</u>	<u>\$ 203,435</u>

The Group as lessor

The application of IFRS 16 starting from January 1, 2019 did not have a material impact on the accounting treatments of the Group as lessor.

The impact on assets, liabilities and equity as of January 1, 2019 from the initial application of IFRS 16 is set out as follows:

	As Originally Stated on January 1, 2019	Adjustments Arising from Initial Application	Adjusted on January 1, 2019
	NT\$	NT\$	NT\$
Other financial assets - current	\$ 6,539,467	\$ (31)	\$ 6,539,436
Other current assets	3,773,384	(385,014)	3,388,370
Long-term prepayments for lease	10,764,835	(10,764,835)	-
Property, plant and equipment	214,592,588	(277,079)	214,315,509
Right-of-use assets	-	10,720,769	10,720,769
Investment properties	7,738,379	6,599,225	14,337,604
Other financial assets - non-current	1,044,294	(2,745)	1,041,549
Other intangible assets	<u>30,897,700</u>	<u>(59,667)</u>	<u>30,838,033</u>
Total effect on assets	<u>\$ 275,350,647</u>	<u>\$ 5,830,623</u>	<u>\$ 281,181,270</u>
Obligation under leases - current	\$ -	\$ 489,984	\$ 489,984
Other current liabilities	5,984,156	(17,144)	5,967,012
Obligation under leases - non-current	-	5,594,745	5,594,745
Other non-current liabilities	<u>1,371,302</u>	<u>(236,962)</u>	<u>1,134,340</u>
Total effect on liabilities	<u>\$ 7,355,458</u>	<u>\$ 5,830,623</u>	<u>\$ 13,186,081</u>

	As Originally Stated on January 1, 2019	Adjustments Arising from Initial Application	Adjusted on January 1, 2019
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Other financial assets - current	\$ 218,638	\$ (1)	\$ 218,637
Other current assets	126,158	(12,872)	113,286
Long-term prepayments for lease	359,908	(359,908)	-
Property, plant and equipment	7,174,610	(9,264)	7,165,346
Right-of-use assets	-	358,434	358,434
Investment properties	258,722	220,636	479,358
Other financial assets - non-current	34,915	(92)	34,823
Other intangible assets	<u>1,033,022</u>	<u>(1,994)</u>	<u>1,031,028</u>
Total effect on assets	<u>\$ 9,205,973</u>	<u>\$ 194,939</u>	<u>\$ 9,400,912</u>
Obligation under leases - current	\$ -	\$ 16,382	\$ 16,382
Other current liabilities	200,072	(573)	199,499
Obligation under leases - non-current	-	187,053	187,053
Other non-current liabilities	<u>45,848</u>	<u>(7,923)</u>	<u>37,925</u>
Total effect on liabilities	<u>\$ 245,920</u>	<u>\$ 194,939</u>	<u>\$ 440,859</u>

2) Amendments to IAS 19 “Plan Amendment, Curtailment or Settlement”

The amendments stipulate that, if a plan amendment, curtailment or settlement occurs, the current service cost and the net interest for the remainder of the annual reporting period are determined using the actuarial assumptions used for the remeasurement of the net defined benefit liabilities (assets). In addition, the amendments clarify the effect of a plan amendment, curtailment or settlement on the requirements regarding the asset ceiling. The Group applied the above amendment prospectively.

b. New, revised or amended standards and interpretations in issue but not yet effective

The Group has not applied the following new, revised or amended standards and interpretations that have been issued but are not yet effective:

New, Revised or Amended Standards and Interpretations		Effective Date Issued by IASB
Amendments to IFRS 10 and IAS 28	Sale or Contribution of Assets between an Investor and its Associate or Joint Venture	To be determined by IASB
Amendments to IFRS 3	Definition of a Business	January 1, 2020 (Note 1)
Amendments to IFRS 9, IAS 39 and IFRS 7	Interest Rate Benchmark Reform	January 1, 2020 (Note 2)
Amendments to IAS 1 and IAS 8	Definition of Material	January 1, 2020 (Note 3)
Conceptual Framework	Amendments to References to the Conceptual Framework in IFRS Standards	January 1, 2020
Amendments to IAS 1	Classification of Liabilities as Current or Non-current	January 1, 2022

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

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

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

c. Significant changes in accounting policy resulted from new, revised and amended standards and interpretations in issue but not yet effective

Except for the following, as of the date that the accompanying consolidated financial statements were authorized for issue, the Group continues in evaluating the impact on its financial position and financial performance as a result of the initial application of the aforementioned new, revised or amended standards and interpretations. The related impact will be disclosed when the Group completes the evaluation.

Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”

The amendments clarify that for a liability to be classified as non-current, the Group shall assess whether it has the right at the end of the reporting period to defer settlement of the liability for at least twelve months after the reporting period. If such rights are in existence at the end of the reporting period, the liability is classified as non-current regardless of whether the Group will exercise that right. The amendments also clarify that, if the right to defer settlement is subject to compliance with specified conditions, the Group must comply with those conditions at the end of the reporting period even if the lender does not test compliance until a later date.

The amendments stipulate that, for the purpose of liability classification, the aforementioned settlement refers to a transfer of cash, other economic resources or the Group’s own equity instruments to the counterparty that results in the extinguishment of the liability. However, if the terms of a liability that could, at the option of the counterparty, result in its settlement by a transfer of the Group’s own equity

instruments, and if such option is recognized separately as equity in accordance with IAS 32: Financial Instruments: Presentation, the aforementioned terms would not affect the classification of the liability.

4. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

a. Statement of compliance

The consolidated financial statements have been prepared in accordance with IFRSs as issued by the IASB.

b. Basis of preparation

As disclosed in Note 1, the share exchange between the Company and ASE was an organization restructure under common control that the Company was essentially the continuation of ASE. The related assets and liabilities in the Company's consolidated financial statements, before the date of incorporation, were recognized based on the carrying amounts of those in ASE's consolidated financial statements. The consolidated financial statements of the Company before the date of incorporation are prepared under the assumption that the Company owned 100% shareholdings of ASE at the very beginning.

The consolidated financial statements have been prepared on the historical cost basis except for financial instruments measured at fair value and net defined benefit liabilities which are measured at the present value of the defined benefit obligation less the fair value of plan assets.

The fair value measurements, which are grouped into Levels 1 to 3 based on the degree to which the fair value measurement inputs are observable and based on the significance of the inputs to the fair value measurement in its entirety, are described as follows:

- 1) Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities;
- 2) Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or a liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices); and
- 3) Level 3 inputs are unobservable inputs for an asset or a liability.

c. Classification of current and non-current assets and liabilities

Current assets include cash and cash equivalents and those assets held primarily for trading purposes or expected to be realized within twelve months after the balance sheet date, unless the asset is to be used for an exchange or to settle a liability, or otherwise remains restricted, at more than twelve months after the balance sheet date. Current liabilities are obligations incurred for trading purposes or to be settled within twelve months after the balance sheet date (even if an agreement to refinance, or to reschedule payments, on a long-term basis is completed after the balance sheet date and before the consolidated financial statements are authorized for issue) and liabilities that do not have an unconditional right to defer settlement for at least 12 months after the balance sheet date (terms of a liability that could, at the option of the counterparty, result in its settlement by the issue of equity instruments do not affect its classification). Assets and liabilities that are not classified as current are classified as non-current.

The Group engages in the construction business which has an operating cycle of over one year. The normal operating cycle applies when considering the classification of the Group's construction-related assets and liabilities.

d. Basis of consolidation

1) Principles for preparing consolidated financial statements

The consolidated financial statements incorporate the financial statements of the Company and the entities controlled by the Company (i.e. its subsidiaries, including structured entities).

Income and expenses of subsidiaries acquired or disposed of during the period are included in the consolidated statement of profit or loss and other comprehensive income from the effective dates of acquisitions up to the effective dates of disposals, as appropriate.

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

All intra-group transactions, balances, income and expenses are eliminated in full upon consolidation. Total comprehensive income of subsidiaries is attributed to the owners of the Company and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

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

When the Group loses control of a subsidiary, a gain or loss is recognized in profit or loss and is calculated as the difference between (i) the aggregate of the fair value of the consideration received and any investment retained in the former subsidiary at its fair value at the date when control is lost and (ii) the assets (including any goodwill) and liabilities and any non-controlling interests of the former subsidiary at their carrying amounts at the date when control is lost. The Group accounts for all amounts recognized in other comprehensive income in relation to that subsidiary on the same basis as would be required had the Group directly disposed of the related assets or liabilities.

2) Subsidiaries included in consolidated financial statements were as follows:

Name of Investee	Main Businesses	Establishment and Operating Location	Percentage of Ownership (%)	
			December 31 2018	December 31 2019
ASE	Engaged in the packaging and testing of semiconductors	R.O.C.	100.0	100.0
A.S.E. Holding Limited	Holding company	Bermuda	100.0	100.0
J & R Holding Limited ("J&R Holding")	Holding company	Bermuda	100.0	100.0
Innosource Limited	Holding company	British Virgin Islands	100.0	100.0
Omniquiest Industrial Limited	Holding company	British Virgin Islands	100.0	100.0
ASE Marketing & Service Japan Co., Ltd.	Engaged in marketing and sales services	Japan	100.0	100.0
ASE Test, Inc.	Engaged in the testing of semiconductors	R.O.C.	100.0	100.0
Luchu Development Corporation	Engaged in the development of real estate properties	R.O.C.	86.1	86.1

(Continued)

Name of Investee	Main Businesses	Establishment and Operating Location	Percentage of Ownership (%)	
			December 31 2018	2019
TLJ Intertech Inc.	Engaged in information software services	R.O.C.	60.0	60.0
MingFeng Information Service Corp., Ltd.	Engaged in information software services, and was established in May 2018.	R.O.C.	100.0	100.0
ASE Embedded Electronics Inc. (“ASEEE”)	Engaged in the sale and manufacturing of embedded substrate	R.O.C.	-	100.0
Advanced Microelectronic Products Inc. (“AMPI”)	Engaged in the manufacturing of integrated circuit	R.O.C.	-	51.0
Alto Enterprises Limited	Holding company	British Virgin Islands	100.0	100.0
Super Zone Holdings Limited	Holding company	Hong Kong	100.0	100.0
ASE (Kun Shan) Inc.	Engaged in the packaging and testing of semiconductors	Kun Shan, China	100.0	100.0
ASE Investment (Kun Shan) Limited	Holding company	Kun Shan, China	100.0	100.0
Advanced Semiconductor Engineering (China) Ltd.	Will engage in the packaging and testing of semiconductors	Shanghai, China	100.0	100.0
ASE Investment (Labuan) Inc.	Holding company	Malaysia	100.0	100.0
ASE Test Limited (“ASE Test”)	Holding company	Singapore	100.0	100.0
ASE (Korea) Inc. (“ASE Korea”)	Engaged in the packaging and testing of semiconductors	Korea	100.0	100.0
J&R Industrial Inc.	Engaged in leasing equipment and investing activity	R.O.C.	100.0	100.0
ASE Japan Co., Ltd. (“ASE Japan”)	Engaged in the packaging and testing of semiconductors	Japan	100.0	100.0
ASE (U.S.) Inc.	After-sales service and sales support	U.S.A.	100.0	100.0
Global Advanced Packaging Technology Limited	Holding company	British Cayman Islands	100.0	100.0
ASE WeiHai Inc.	Engaged in the packaging and testing of semiconductors	Shandong, China	100.0	100.0
Suzhou ASEN Semiconductors Co., Ltd. (“ASEN”)	Engaged in the packaging and testing of semiconductors	Suzhou, China	70.0	100.0
Anstock Limited	Engaged in financing activity	British Cayman Islands	100.0	100.0
Anstock II Limited	Engaged in financing activity	British Cayman Islands	100.0	100.0
ASE (Shanghai) Inc.	Engaged in the production of substrates	Shanghai, China	100.0	100.0
ASE Corporation	Holding company	British Cayman Islands	100.0	100.0
ASE Mauritius Inc.	Holding company	Mauritius	100.0	100.0
ASE Labuan Inc.	Holding company	Malaysia	100.0	100.0

(Continued)

Name of Investee	Main Businesses	Establishment and Operating Location	Percentage of Ownership (%)	
			December 31 2018	2019
Shanghai Ding Hui Real Estate Development Co., Ltd.	Engaged in the development, construction and sale of real estate properties	Shanghai, China	100.0	100.0
Shanghai Ding Qi Property Management Co., Ltd.	Engaged in the management of real estate properties	Shanghai, China	100.0	100.0
Advanced Semiconductor Engineering (HK) Limited	Engaged in the trading of substrates	Hong Kong	100.0	100.0
Shanghai Ding Wei Real Estate Development Co., Ltd.	Engaged in the development, construction and leasing of real estate properties	Shanghai, China	100.0	100.0
Shanghai Ding Yu Real Estate Development Co., Ltd.	Engaged in the development, construction and leasing of real estate properties	Shanghai, China	100.0	100.0
Shanghai Ding Fan Department Store Co., Ltd.	Engaged in department store business	Shanghai, China	100.0	100.0
Kun Shan Ding Hong Real Estate Development Co., Ltd.	Engaged in the development, construction and leasing of real estate properties	Kun Shan, China	100.0	100.0
Shanghai Ding Xu Property Management Co., Ltd.	Engaged in the management of real estate properties	Shanghai, China	100.0	100.0
ASE Electronics Inc.	Engaged in the production of substrates	R.O.C.	100.0	100.0
ASE Test Holdings, Ltd.	Holding company	British Cayman Islands	100.0	100.0
ASE Holdings (Singapore) Pte. Ltd.	Holding company	Singapore	100.0	100.0
ASE Singapore Pte. Ltd.	Engaged in the packaging and testing of semiconductors	Singapore	100.0	100.0
ISE Labs, Inc.	Engaged in the testing of semiconductors	U.S.A.	100.0	100.0
ASE Electronics (M) Sdn. Bhd.	Engaged in the packaging and testing of semiconductors	Malaysia	100.0	100.0
ASE Assembly & Test (Shanghai) Limited	Engaged in the packaging and testing of semiconductors	Shanghai, China	100.0	100.0
ISE Labs, China, Ltd.	Engaged in the testing of semiconductors, and was established in October 2018	Shanghai, China	100.0	100.0
Wuxi Tongzhi Microelectronics Co., Ltd.	Engaged in the packaging and testing of semiconductors	Wuxi, China	100.0	100.0
USI Global	Merged by the Company in January 2019	R.O.C.	100.0	-
USIINC	Engaged in investing activity	R.O.C.	100.0	100.0
Huntington Holdings International Co. Ltd.	Holding company	British Virgin Islands	100.0	100.0

(Continued)

Name of Investee	Main Businesses	Establishment and Operating Location	Percentage of Ownership (%)	
			December 31 2018	2019
Unitech Holdings International Co., Ltd.	Holding company	British Virgin Islands	100.0	100.0
Real Tech Holdings Limited	Holding company	British Virgin Islands	100.0	100.0
Universal ABIT Holding Co., Ltd.	In the process of liquidation	British Cayman Islands	100.0	100.0
Rising Capital Investments Limited	Liquidated in November 2019	British Virgin Islands	100.0	-
Rise Accord Limited	Liquidated in December 2019	British Virgin Islands	100.0	-
Universal Scientific Industrial (Kunshan) Co., Ltd.	Engaged in the manufacturing and sale of computer assistance system and related peripherals	Kun Shan, China	100.0	100.0
USI Enterprise Limited (“USIE”)	Engaged in the services of investment advisory and warehousing management	Hong Kong	95.4	95.8
USISH	Engaged in the designing, manufacturing and sale of electronic components	Shanghai, China	74.6	75.3
Universal Global Technology Co., Limited	Holding company	Hong Kong	74.6	75.3
Universal Global Technology (Kunshan) Co., Ltd.	Engaged in the designing and manufacturing of electronic components	Kun Shan, China	74.6	75.3
Universal Global Technology (Shanghai) Co., Ltd.	Engaged in the processing and sales of computer and communication peripherals as well as business in import and export of goods and technology	Shanghai, China	74.6	75.3
Universal Global Electronics (Shanghai) Co., Ltd.	Engaged in the sale of electronic components and telecommunications equipment	Shanghai, China	74.6	75.3
USI America Inc.	Engaged in the manufacturing and processing of motherboards and wireless network communication and provision of related technical service	U.S.A.	74.6	75.3
Universal Global Industrial Co., Limited	Engaged in manufacturing, trading and investing activity	Hong Kong	74.6	75.3

(Continued)

Name of Investee	Main Businesses	Establishment and Operating Location	Percentage of Ownership (%)	
			December 31 2018	2019
Universal Global Scientific Industrial Co., Ltd. (“UGTW”)	Engaged in the manufacturing of components of telecomm and cars and provision of related R&D services	R.O.C.	74.6	75.3
Universal Scientific Industrial De Mexico S.A. De C.V.	Engaged in the assembling of motherboards and computer components	Mexico	74.6	75.3
USI Japan Co., Ltd.	Engaged in the manufacturing and sale of computer peripherals, integrated chip and other related accessories	Japan	74.6	75.3
USI Electronics (Shenzhen) Co., Ltd.	Engaged in the design, manufacturing and sale of motherboards and computer peripherals	Shenzhen, China	74.6	75.3
Universal Global Electronics Co., Ltd.	Engaged in accepting and outsourcing orders as well as sales of electronic components and service of technical advisory, and was established in February 2018	Hong Kong	74.6	75.3
Universal Scientific Industrial Co., Ltd. (“USI”)	Engaged in the manufacturing, processing and sale of computers, computer peripherals and related accessories	R.O.C.	74.4	75.3
Semicondutores Avancados do Brasil S.A.	Engaged in the research and manufacturing of multi-functional system-in-package products, and was established in March 2019 and then invested in May 2019	Brasil	-	56.5
Huanrong Electronics (Huizhou) Co., Ltd.	Engaged in the research and manufacturing of new electronic applications, communications, computers and other electronics products and also provided auxiliary technical services as well as import and export services, and was established in April 2019 and then invested in May 2019	Huizhou, China	-	75.3

(Continued)

Name of Investee	Main Businesses	Establishment and Operating Location	Percentage of Ownership (%)	
			December 31 2018	December 31 2019
Universal Scientific Industrial (France) (“USIFR”)	Engaged in investing activities and was established in August 2019	France	-	75.3
Chung Hong Electronics Poland Sp. z o.o. (“UGPL”)	Engaged in designing, miniaturization, material sourcing, manufacturing, logistics, and after services of electronic devices and modules and was established in October 2019	Poland	-	45.2
SPIL	Engaged in the assembly, testing and turnkey services of integrated circuits	R.O.C.	100.0	100.0
SPIL (B.V.I.) Holding Limited	Engaged in investing activities	British Virgin Islands	100.0	100.0
Siliconware Investment Co., Ltd.	Engaged in investing activities	R.O.C.	100.0	100.0
Siliconware USA, Inc.	Engaged in marketing activities	U.S.A.	100.0	100.0
SPIL (Cayman) Holding Limited	Engaged in investing activities	British Cayman Islands	100.0	100.0
Siliconware Technology (Suzhou) Limited (“SZ”)	Engaged in the packaging and testing of semiconductors	Suzhou, China	70.0	100.0
Siliconware Electronics (Fujian) Co., Limited	Engaged in the packaging and testing of semiconductors	Fujian, China	100.0	100.0

(Concluded)

e. Business combinations

Acquisitions of businesses are accounted for using the acquisition method. Acquisition-related costs are generally recognized in profit or loss as they are incurred.

Goodwill is measured as the excess of the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree, and the fair value of the acquirer’s previously held equity interest in the acquiree (if any) over the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed. If, after re-assessment, the net of the acquisition-date amounts of the identifiable assets acquired and liabilities assumed exceeds the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree and the fair value of the acquirer’s previously held interest in the acquiree (if any), the excess is recognized immediately in profit or loss as a bargain purchase gain.

When a business combination is achieved in stages, the Group’s previously held equity interest in the acquiree is remeasured to its acquisition-date fair value and the resulting gain or loss, if any, is recognized in profit or loss or other comprehensive income. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are recognized on the same basis as would be required if that interest were directly disposed of by the Group.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted retrospectively during the measurement period, or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognized at that date.

Business combination involving entities under common control is not accounted for by acquisition method but accounted for at the carrying amounts of the entities.

f. Foreign currencies

In preparing the financial statements of each individual group entity, transactions in currencies other than the entity's functional currency (i.e. foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions.

At each balance sheet date, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Exchange differences on monetary items arising from settlement or translation are recognized in profit or loss in the period in which they arise except for exchange differences on transactions entered into in order to hedge certain foreign currency risks.

Non-monetary items measured at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Exchange differences arising from the retranslation of non-monetary items are included in profit or loss for the period except for exchange differences arising from the retranslation of non-monetary items in respect of which gains and losses are recognized directly in other comprehensive income, in which cases, the exchange differences are also recognized directly in other comprehensive income.

Non-monetary items that are measured at historical cost in a foreign currency are translated using the exchange rate at the date of the transaction, and are not retranslated.

For the purposes of presenting the consolidated financial statements, the assets and liabilities of the Group's foreign operations (including subsidiaries, associates and joint ventures in other countries that use currencies which are different from the currency of the Company) are translated into the New Taiwan dollars using exchange rates prevailing at each balance sheet date. Income and expense items are translated at the average exchange rates for the period. The resulting currency translation differences are recognized in other comprehensive income and accumulated in equity attributed to the owners of the Company and non-controlling interests as appropriate.

On the disposal of the Group's entire interest in a foreign operation, or a disposal involving the loss of control over a subsidiary that includes a foreign operation, or a partial disposal of an interest in a joint arrangement or an associate that includes a foreign operation of which the retained interest becomes a financial asset, all of the exchange differences accumulated in equity in respect of that operation attributable to the owners of the Company are reclassified to profit or loss.

In relation to a partial disposal of a subsidiary that does not result in the Group losing control over the subsidiary, the proportionate share of accumulated exchange differences is re-attributed to the non-controlling interests of the subsidiary and is not recognized in profit or loss. For all other partial disposals, the proportionate share of the accumulated exchange differences recognized in other comprehensive income is reclassified to profit or loss.

g. Inventories and inventories related to real estate business

Inventories, including raw materials (materials received from customers for processing, mainly semiconductor wafers, are excluded from inventories as title and risk of loss remain with the customers), supplies, work in process, finished goods, and materials and supplies in transit are stated at

the lower of cost or net realizable value. Inventory write-downs are made by item, except for those that may be appropriate to group items of similar or related inventories. Net realizable value is the estimated selling prices of inventories less all estimated costs of completion and estimated costs necessary to make the sale. Raw materials and supplies are recorded at moving average cost while work in process and finished goods are recorded at standard cost.

Inventories related to real estate business include land and buildings held for sale, land held for construction and construction in progress. Land held for development is recorded as land held for construction upon obtaining the title of ownership. Prior to the completion, the borrowing costs directly attributable to construction in progress are capitalized as part of the cost of the asset. Construction in progress is transferred to land and buildings held for sale upon completion. Land and buildings held for sale, construction in progress and land held for construction are stated at the lower of cost or net realizable value and related write-downs are made by item. The amounts received in advance for real estate properties are first recorded as advance receipts and then recognized as revenue when the construction is completed and the title and significant risk of the real estate properties are transferred to customers. Cost of sales of land and buildings held for sale are recognized based on the ratio of property sold to the total property developed.

h. Investments in associates and joint ventures

An associate is an entity over which the Group has significant influence and that is neither a subsidiary nor an interest in a joint venture. Joint venture is a joint arrangement whereby the Group and other parties that have joint control of the arrangement have rights to the net assets of the arrangement.

The Group applies the equity method to investments in an associate and joint venture.

Under the equity method, investments in an associate and a joint venture are initially recognized at cost and adjusted thereafter to recognize the Group's share of the profit or loss and other comprehensive income of the associate and joint venture. The Group also recognizes the changes in the Group's share of equity of associates and joint venture.

Any excess of the cost of acquisition over the Group's share of the net fair value of the identifiable assets and liabilities of an associate or a joint venture at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment and is not amortized. Any excess of the Group's share of the net fair value of the identifiable assets and liabilities over the cost of acquisition after reassessment is recognized immediately in profit or loss.

When the Group subscribes for additional new shares of an associate and joint venture at a percentage different from its existing ownership percentage, the resulting carrying amount of the investment differs from the amount of the Group's proportionate interest in the associate and joint venture. The Group records such a difference as an adjustment to investments with the corresponding amount charged or credited to capital surplus - changes in capital surplus from investments in associates and joint ventures accounted for using the equity method. If the Group's ownership interest is reduced due to its additional subscription of the new shares of the associate and joint venture, the proportionate amount of the gains or losses previously recognized in other comprehensive income in relation to that associate and joint venture is reclassified to profit or loss on the same basis as would be required had the investee directly disposed of the related assets or liabilities. When the adjustment should be debited to capital surplus, but the capital surplus recognized from investments accounted for using the equity method is insufficient, the shortage is debited to retained earnings.

When the Group's share of losses of an associate and a joint venture equals or exceeds its interest in that associate and joint venture (which includes any carrying amount of the investment accounted for using the equity method and long-term interests that, in substance, form part of the Group's net investment in the associate and joint venture), the Group discontinues recognizing its share of further losses. Additional losses and liabilities are recognized only to the extent that the Group has incurred legal obligations or constructive obligations, or made payments on behalf of that associate and joint

venture.

The entire carrying amount of an investment (including goodwill) is tested for impairment as a single asset by comparing its recoverable amount with its carrying amount. Any impairment loss recognized is not allocated to any asset, including goodwill, that forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized to the extent that the recoverable amount of the investment subsequently increases.

The Group discontinues the use of the equity method from the date on which its investment ceases to be an associate and a joint venture. Any retained investment is measured at fair value at that date, and the fair value is regarded as the investment's fair value on initial recognition as a financial asset. The difference between the previous carrying amount of the associate and the joint venture attributable to the retained interest and its fair value is included in the determination of the gain or loss on disposal of the associate and the joint venture. The Group accounts for all amounts previously recognized in other comprehensive income in relation to that associate and joint venture on the same basis as would be required had that associate directly disposed of the related assets or liabilities. If an investment in an associate becomes an investment in a joint venture or an investment in a joint venture becomes an investment in an associate, the Group continues to apply the equity method and does not remeasure the retained interest.

When a group entity transacts with its associate and joint venture, profits and losses resulting from the transactions with the associate and joint venture are recognized in the Group's consolidated financial statements only to the extent that interests in the associate and the joint venture are not related to the Group.

i. Property, plant and equipment

Except for land which is stated at cost, property, plant and equipment (including assets held under finance leases) are stated at cost less accumulated depreciation and accumulated impairment. Before January 1, 2019, property, plant and equipment also included assets held under finance leases.

Properties in the course of construction are carried at cost, less any recognized impairment loss. Cost includes professional fees and borrowing costs eligible for capitalization. Such assets are depreciated and classified to the appropriate categories of property, plant and equipment when completed and ready for their intended use.

Freehold land is not depreciated.

Depreciation of property, plant and equipment is recognized using the straight-line method. Each significant part is depreciated separately. For assets which were held under finance leases before January 1, 2019, if their respective lease terms are shorter than their useful lives, such assets are depreciated over their lease terms. The estimated useful lives, residual values and depreciation method are reviewed at each balance sheet date, with the effect of any changes in estimate accounted for on a prospective basis.

On derecognition of an item of property, plant and equipment, the difference between the sales proceeds and the carrying amount of the asset is recognized in profit or loss.

j. Investment properties

Investment properties are properties held to earn rental and/or for capital appreciation. Beginning January 1, 2019, investment properties include right-of-use assets if the definition of investment properties is met; before January 1, 2019, investment properties included properties under construction if the definition of investment properties was met.

Freehold investment properties are initially measured at cost, including transaction costs. Subsequent to initial recognition, investment properties are measured at cost less accumulated depreciation and accumulated impairment loss.

Beginning January 1, 2019, investment properties acquired through leases are initially measured at cost, which comprises the initial measurement of lease liabilities adjusted for lease payments made on or before the commencement date, plus initial direct costs incurred and an estimate of costs needed to restore the underlying assets, and less any lease incentives received. These investment properties are subsequently measured at cost less accumulated depreciation and accumulated impairment loss and adjusted for any remeasurement of the lease liabilities.

Depreciation is recognized using the straight-line method.

Investment properties under construction are measured at cost less accumulated impairment loss. Cost includes professional fees and borrowing costs eligible for capitalization. Depreciation of these assets commences when the assets are ready for their intended use.

For a transfer of classification from investment properties to property, plant and equipment and to right-of-use assets, the deemed cost of the property for subsequent accounting is its carrying amount at the commencement of owner-occupation.

For a transfer of classification from investment properties to inventories, the deemed cost of an item of property for subsequent accounting is its carrying amount at the commencement of development with a view to future sale.

For a transfer of classification from property, plant and equipment and right-of-use assets to investment properties, the deemed cost of an item of property for subsequent accounting is its carrying amount at the end of owner-occupation.

For a transfer of classification from inventories to investment properties, the deemed cost of an item of property for subsequent accounting is its carrying amount at the inception of an operating lease.

On derecognition of an investment property, the difference between the net disposal proceeds and the carrying amount of the asset is included in profit or loss.

k. Goodwill

Goodwill arising from an acquisition of a business is carried at cost as established at the date of acquisition of the business less accumulated impairment loss.

For the purposes of impairment testing, goodwill is allocated to each of the Group's cash-generating units or groups of cash-generating units (referred to as "cash-generating unit") that is expected to benefit from the synergies of the combination.

A cash-generating unit to which goodwill has been allocated is tested for impairment annually, or more frequently when there is an indication that the unit may be impaired, by comparing its carrying amount, including the attributed goodwill, with its recoverable amount. However, if the goodwill allocated to a cash-generating unit was acquired in a business combination during the current annual period, that unit shall be tested for impairment before the end of the current annual period. If the recoverable amount of the cash-generating unit is less than its carrying amount, the impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the unit and then pro rata to the other assets of the unit based on the carrying amount of each asset in the unit. Any impairment loss is recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.

l. Other intangible assets

1) Separate acquisition

Other intangible assets with finite useful lives acquired separately are initially measured at cost and subsequently measured at cost less accumulated amortization and accumulated impairment loss. Other intangible assets are amortized using the straight-line method over their estimated useful lives. The estimated useful lives, residual values, and amortization methods are reviewed at each balance sheet date, with the effect of any changes in estimate being accounted for on a prospective basis.

2) Acquired through business combinations

Other intangible assets acquired in a business combination and recognized separately from goodwill are initially recognized at their fair value at the acquisition date which is regarded as their cost. Subsequent to initial recognition, they are measured on the same basis as intangible assets that are acquired separately.

3) Derecognition

On derecognition of an intangible asset, the difference between the net disposal proceeds and the carrying amount of the asset are recognized in profit or loss.

m. Impairment of tangible and intangible assets other than goodwill

At each balance sheet date, the Group reviews the carrying amounts of its tangible and intangible assets, excluding goodwill, to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss. When it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the cash-generating unit to which the asset belongs. Corporate assets are allocated to the individual cash-generating units on a reasonable and consistent basis of allocation. The recoverable amount is the higher of fair value less costs to sell and value in use. If the recoverable amount of an asset or cash-generating unit is estimated to be less than its carrying amount, the carrying amount of the asset or cash-generating unit is reduced to its recoverable amount, with the resulting impairment loss recognized in profit or loss.

When an impairment loss is subsequently reversed, the carrying amount of the asset or cash-generating unit is increased to the revised estimate of its recoverable amount, but only to the extent of the carrying amount that would have been determined had no impairment loss been recognized for the asset or cash-generating unit in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

n. Financial instruments

Financial assets and financial liabilities are recognized when a group entity becomes a party to the contractual provisions of the instruments.

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

1) Financial assets

All regular way purchases or sales of financial assets are recognized and derecognized on a settlement date basis.

a) Measurement category

Before 2018

The classification of financial assets held by ASE and its subsidiaries includes financial assets at FVTPL, available-for-sale financial assets, and loans and receivables.

i. Financial assets at FVTPL

Financial assets are classified as at FVTPL when the financial assets are either held for trading or they are designated as at FVTPL.

A financial asset other than a financial asset held for trading may be designated as at FVTPL upon initial recognition if:

- i) Such designation eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise; or
- ii) The financial asset forms part of a group of financial assets or financial liabilities or both, which is managed and has performance evaluated on a fair value basis in accordance with ASE and its subsidiaries' documented risk management or investment strategy, and information about the grouping is provided internally on that basis; or
- iii) The contract contains one or more embedded derivatives so that the entire hybrid (combined) contract can be designated as at FVTPL.

Financial assets at FVTPL are stated at fair value with any gains or losses arising on remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any dividend or interest earned on the financial asset.

Fair value is determined in the manner described in Note 35.

ii. Available-for-sale financial assets

Available-for-sale financial assets are non-derivatives that are either designated as available-for-sale or are not classified as (1) loans and receivables, (2) held-to-maturity investments or (3) financial assets at fair value through profit or loss.

Available-for-sale financial assets are stated at fair value at each balance sheet date. Changes in the carrying amount of available-for-sale monetary financial assets relating to changes in foreign currency rates, interest income calculated using the effective interest method and dividends on available-for-sale equity investments are recognized in profit or loss. Other changes in the carrying amount of available-for-sale financial assets are recognized in other comprehensive income and accumulated under the heading of unrealized gain (loss) on available-for-sale financial assets. When the investment is disposed of or is determined to be impaired, the cumulative gain or loss previously accumulated in the unrealized gain (loss) on available-for-sale financial assets is reclassified to profit or loss.

Dividends on available-for-sale equity instruments are recognized in profit or loss when ASE and its subsidiaries's right to receive the dividends is established.

iii. Loans and receivables

Loans and receivables including cash and cash equivalents, trade receivables, other receivables and other financial assets are measured at amortized cost using the effective interest method, less any impairment. Interest income is recognized by applying the effective interest rate, except for short-term receivables when the effect of discounting is immaterial.

Cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of change in value.

Starting from 2018

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

i. Financial asset at FVTPL

Financial asset is classified as at FVTPL when the financial asset is mandatorily classified or it is designated as at FVTPL. The Group's financial assets mandatorily classified as at FVTPL include investments in equity instruments which are not designated as at FVTOCI and debt instruments that do not meet the amortized cost criteria or the FVTOCI criteria.

Financial assets at FVTPL are subsequently measured at fair value, and any dividends, interest earned and remeasurement gains or losses on such financial assets are recognized in other gains or losses.

Fair value is determined in the manner described in Note 35.

ii. Financial assets at amortized cost

Financial assets that meet the following conditions are subsequently measured at amortized cost:

- i) The financial asset is held within a business model whose objective is to hold financial assets in order to collect contractual cash flows; and
- ii) The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

Subsequent to initial recognition, financial assets at amortized cost, including cash and cash equivalents, trade receivables at amortized cost, other receivables and other financial assets, are measured at amortized cost, which equals to gross carrying amount determined using the effective interest method less any impairment loss. Exchange differences are recognized in profit or loss.

Interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset, except for:

- i) Purchased or originated credit-impaired financial assets, for which interest income is calculated by applying the credit-adjusted effective interest rate to the amortized cost of the financial asset; and

- ii) Financial assets that are not credit-impaired on purchase or origination but have subsequently become credit-impaired, for which interest income is calculated by applying the effective interest rate to the amortized cost of such financial assets in subsequent reporting periods.

Cash equivalents include time deposits with original maturities within 3 months from the date of acquisition, which are highly liquid, readily convertible to a known amount of cash and are subject to an insignificant risk of changes in value. These cash equivalents are held for the purpose of meeting short-term cash commitments.

iii. Investments in debt instruments at FVTOCI

For the Group's debt instruments that meet the following conditions are subsequently measured at FVTOCI:

- i) the debt instrument is held within a business model whose objective is achieved by both the collecting of contractual cash flows and the selling of the financial assets; and
- ii) the contractual terms of the debt instrument give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

Investments in debt instruments at FVTOCI are subsequently measured at fair value. Changes in the carrying amounts of these debt instruments relating to changes in foreign currency exchange rates, interest income calculated using the effective interest method and impairment losses or reversals are recognized in profit or loss. Other changes in the carrying amount of these debt instruments are recognized in other comprehensive income and will be reclassified to profit or loss when the investment is disposed of.

iv. Investments in equity instruments at FVTOCI

On initial recognition, the Group make an irrevocable election to designate investments in equity instruments as at FVTOCI. Designation at FVTOCI is not permitted if the equity investment is held for trading or if it is contingent consideration recognized by an acquirer in a business combination.

Investments in equity instruments at FVTOCI are subsequently measured at fair value with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in other equity. The cumulative gain or loss will not be reclassified to profit or loss on disposal of the equity investments, instead, they will be transferred to retained earnings.

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

b) Impairment of financial assets and contract assets

Before 2018

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

For financial assets carried at amortized cost, such as trade receivables and other receivables, assets that are assessed not to be impaired individually are, further, assessed for impairment on a

collective basis. ASE and its subsidiaries assess the collectability of receivables based on their past experience of collecting payments and observable changes that correlate with default on receivables.

For financial assets carried at amortized cost, the amount of the impairment loss recognized is the difference between the assets' carrying amounts and the present value of estimated future cash flows, discounted at the financial assets' original effective interest rates. If, in a subsequent period, the amount of the impairment loss decreases and the decreases can be objectively related to an event occurring after the impairment loss recognized, the previously recognized impairment loss is reversed either directly or by adjusting an allowance account through profit or loss. The reversal shall not result in carrying amounts of financial assets that exceed what the amortized cost would have been at the date the impairment is reversed.

For any available-for-sale equity investments, a significant or prolonged decline in the fair value of the security below its cost is considered to be objective evidence of impairment. When an available-for-sale financial asset is considered to be impaired, cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss in the period.

In respect of available-for-sale equity securities, impairment loss previously recognized in profit or loss is not reversed through profit or loss. Any increase in fair value subsequent to impairment is recognized in other comprehensive income. In respect of available-for-sale debt securities, impairment loss is subsequently reversed through profit or loss if an increase in the fair value of the investment can be objectively related to an event occurring after the recognition of the impairment loss.

The carrying amount of the financial asset is reduced by the impairment loss directly for all financial assets with the exception of trade and other receivables where the carrying amount is reduced through the use of an allowance account. When trade and other receivables are considered uncollectible, they are written off against the allowance account. Subsequent recoveries of amounts previously written off are credited against the allowance account. Changes in the carrying amount of the allowance account are recognized in profit or loss except for uncollectible trade receivables and other receivables that are written off against the allowance account.

Starting from 2018

At each balance sheet date, the Group recognizes a loss allowance for expected credit losses on financial assets at amortized cost (including trade receivables), investments in debt instruments that are measured at FVTOCI as well as contract assets.

The Group always recognizes lifetime Expected Credit Loss ("ECL") for trade receivables and contract assets. For all other financial instruments, the Group recognizes lifetime ECL when there has been a significant increase in credit risk since initial recognition. If, on the other hand, the credit risk on the financial instrument has not increased significantly since initial recognition, the Group measures the loss allowance for that financial instrument at an amount equal to 12-month ECL.

Expected credit losses reflect the weighted average of credit losses with the respective risks of a default occurring as the weights. Lifetime ECL represents the expected credit losses that will result from all possible default events over the expected life of a financial instrument. In contrast, 12-month ECL represents the portion of lifetime ECL that is expected to result from default events on a financial instrument that are possible within 12 months after the reporting date.

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

c) Derecognition of financial assets

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

Before 2018, on derecognition of a financial asset in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss which had been recognized in other comprehensive income is recognized in profit or loss.

Starting from 2018, on derecognition of a financial asset at amortized cost in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. On derecognition of an investment in a debt instrument at FVTOCI, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss which had been recognized in other comprehensive income is recognized in profit or loss. However, on derecognition of an investment in an equity instrument at FVTOCI, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss, and the cumulative gain or loss which had been recognized in other comprehensive income is transferred directly to retained earnings, without recycling through profit or loss.

2) Equity instruments

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

Equity instruments issued by a group entity are recognized at the proceeds received, net of direct issue costs.

Repurchase of the Company's own equity instruments is recognized in and deducted directly from equity. No gain or loss is recognized in profit or loss on the purchase, sale, issue or cancellation of the Company's own equity instruments.

3) Financial liabilities

a) Subsequent measurement

Except the following situations, all financial liabilities are measured at amortized cost using the effective interest method:

Financial liabilities are classified as at FVTPL when such financial liabilities are held for trading.

Financial liabilities held for trading are stated at fair value, and any gains or losses on such financial liabilities are recognized in other gains or losses.

b) Derecognition of financial liabilities

The difference between the carrying amount of a financial liability derecognized and the consideration paid, including any non-cash assets transferred or liabilities assumed, is recognized in profit or loss.

4) Derivative financial instruments

The Group enters into a variety of derivative financial instruments to manage its exposure to interest rate and foreign exchange rate risks, including forward exchange contracts and swap contracts.

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

Before 2018, derivatives embedded in non-derivative host contracts were treated as separate derivatives when they met the definition of a derivative; their risks and characteristics were not closely related to those of the host contracts; and the contracts were not measured at FVTPL. Starting from 2018, derivatives embedded in hybrid contracts that contain financial asset hosts that is within the scope of IFRS 9 are not separated; instead, the classification is determined in accordance with the entire hybrid contract. Derivatives embedded in non-derivative host contracts that are not financial assets that is within the scope of IFRS 9 (e.g. financial liabilities) are treated as separate derivatives when they meet the definition of a derivative, their risks and characteristics are not closely related to those of the host contracts and the host contracts are not measured at FVTPL.

o. Hedge Accounting

The Group designates certain hedging instruments, which include derivatives, embedded derivatives and non-derivatives in respect of foreign currency risk, as either fair value hedges or cash flow hedges.

1) Fair value hedges

Changes in the fair value of derivatives that are designated and qualify as fair value hedges are recognized in profit or loss immediately, together with any changes in the fair value of the hedged asset or liability that are attributable to the hedged risk. The change in the fair value of the hedging instrument and the change in the hedged item attributable to the hedged risk are recognized in profit or loss in the line item relating to the hedged item.

Before 2018, hedge accounting was discontinued prospectively when ASE and its subsidiaries revoked the designated hedging relationship; when the hedging instrument expired or was sold, terminated, or exercised; or when the hedging instrument no longer met the criteria for hedge accounting. From 2018, the Group discontinues hedge accounting only when the hedging relationship ceases to meet the qualifying criteria; for instance, when the hedging instrument expires or is sold, terminated, or exercised.

2) Cash flow hedges

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in other comprehensive income. The gain or loss relating to the ineffective portion are recognized immediately in profit or loss.

The associated gains or losses that were recognized in other comprehensive income are reclassified from equity to profit or loss as a reclassification adjustment in the line item relating to the hedged item in the same period when the hedged item affects profit or loss. If a hedge of a forecasted transaction subsequently results in the recognition of a non-financial asset or a non-financial liability, the associated gains and losses that were recognized in other comprehensive income are removed from equity and included in the initial cost of the non-financial asset or non-financial liability.

Before 2018, hedge accounting was discontinued prospectively when ASE and its subsidiaries revoked the designated hedging relationship; when the hedging instrument expired or was sold, terminated, or exercised; or when the hedging instrument no longer met the criteria for hedge accounting. From 2018, the Group discontinues hedge accounting only when the hedging relationship ceases to meet the qualifying criteria; for instance, when the hedging instrument expires or is sold, terminated, or exercised. The cumulative gain or loss on the hedging instrument that has been previously recognized in other comprehensive income from the period when the hedge was effective remains separately in equity until the forecast transaction occurs. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in profit or loss.

p. Revenue recognition

Before 2018

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

1) Revenue from sale of goods and real estate properties

Revenue from the sale of goods and real estate properties is recognized when all the following conditions are satisfied:

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

2) Revenue from rendering of services

Service income is recognized when services are rendered.

3) Revenue from dividend and interest income

Dividend income from investments and interest income from financial assets are recognized when they are probable that the economic benefits will flow to ASE and its subsidiaries and the amount of income can be reliably measured. Interest income is accrued on a time basis, by reference to the principal outstanding and at the effective interest rate applicable.

Starting from 2018

The Group identifies the contracts with customers, allocates transaction prices to performance obligations and, when performance obligations are satisfied, recognizes revenues at fixed amounts as agreed in the contracts with taking estimated volume discounts into consideration.

For contracts where the period between the date on which the Group transfers a promised good or service to a customer and the date on which the customer pays for that good or service is one year or less, the Group does not adjust the promised amount of consideration for the effects of a significant financing component.

The Group's duration of contracts with customers is expected to be one year or less, and the consideration from contracts with customers is included in transaction price and, therefore, can apply the practical expedient that not to disclose the performance obligations including (i) the aggregate amount of the transaction price allocated to the performance obligations that are not fully satisfied or have partially completed at the end of the reporting period, and (ii) the expected timing for recognition of revenue.

The Group's operating revenues include revenues from sale of goods and services as well as sale and leasing of real estate properties.

When customers control goods while they are manufactured in progress, the Group measures the progress on the basis of costs incurred relative to the total expected costs as there is a direct relationship between the costs incurred and the progress of satisfying the performance obligations. Revenue and contract assets are recognized during manufacture and contract assets are reclassified to trade receivables when the manufacture is completed or when the goods are shipped upon customer's request.

The Group recognizes revenues and trade receivables when the goods are shipped or when the goods are delivered to the customer's specific location because it is the time when the customer has full discretion over the manner of distribution and price to sell the goods, has the primary responsibility for sales to future customers and bears the risks of obsolescence.

Revenues from sale of real estate properties are recognized when customers purchase real estate properties and complete the transfer procedures. Revenues from leasing real estate properties are recognized during leasing periods on the straight-line basis.

q. Leases

Before 2019

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

1) The Group as lessor

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

2) The Group as lessee

Assets held under finance leases are initially recognized as assets of the Group at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the consolidated balance sheets as a finance lease obligation.

Finance expenses implicit in lease payments for each period are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets; in which case, they are capitalized.

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

Starting from 2019

At the inception of a contract, the Group assesses whether the contract is, or contains, a lease.

For a contract that contains a lease component and non-lease components, the Group elects to account for the lease and non-lease components as a single lease component.

1) The Group as lessor

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

When the Group subleases a right-of-use asset, the sublease is classified by reference to the right-of-use asset arising from the head lease, not with reference to the underlying asset. However, if the head lease is a short-term lease that the Group, as a lessee, has accounted for applying recognition exemption, the sublease is classified as an operating lease.

Lease payments (less any lease incentives payable) from operating leases are recognized as income on a straight-line basis over the terms of the relevant leases. Initial direct costs incurred in obtaining operating leases are added to the carrying amounts of the underlying assets and recognized as expenses on a straight-line basis over the lease terms.

2) The Group as lessee

The Group recognizes right-of-use assets and lease liabilities for all leases at the commencement date of a lease, except for short-term leases and low-value asset leases accounted for applying a recognition exemption where lease payments are recognized as expenses on a straight-line basis over the lease terms.

Right-of-use assets are initially measured at cost, which comprises the initial measurement of lease liabilities adjusted for lease payments made on or before the commencement date, plus any initial direct costs incurred and an estimate of costs needed to restore the underlying assets, and less any lease incentives received. Right-of-use assets are subsequently measured at cost less accumulated depreciation and impairment losses and adjusted for any remeasurement of the lease liabilities. Right-of-use assets are presented on a separate line in the consolidated balance sheets. With respect to the recognition and measurement of right-of-use assets that meet the definition of investment properties, refer to the aforementioned accounting policies for investment properties.

Right-of-use assets are depreciated using the straight-line method from the commencement dates to the earlier of the end of the useful lives of the right-of-use assets or the end of the lease terms. However, if leases transfer ownership of the underlying assets to the Group by the end of the lease terms or if the costs of right-of-use assets reflect that the Group will exercise a purchase option, the Group depreciates the right-of-use assets from the commencement dates to the end of the useful lives of the underlying assets.

Lease liabilities are initially measured at the present value of the lease payments, which comprise fixed payments, in-substance fixed payments, variable lease payments which depend on an index or a rate, residual value guarantees, the exercise price of a purchase option if the Group is reasonably certain to exercise that option, and payments of penalties for terminating a lease if the lease term reflects such termination, less any lease incentives receivable. The lease payments are discounted using the interest rate implicit in a lease, if that rate can be readily determined. If that rate cannot be

readily determined, the Group uses the lessee's incremental borrowing rate. Subsequently, lease liabilities are measured at amortized cost using the effective interest method, with interest expense recognized over the lease terms. When there is a change in a lease term, a change in the amounts expected to be payable under a residual value guarantee, a change in the assessment of an option to purchase an underlying asset, or a change in future lease payments resulting from a change in an index or a rate used to determine those payments, the Group remeasures the lease liabilities with a corresponding adjustment to the right-of-use assets. However, if the carrying amount of the right-of-use assets is reduced to zero, any remaining amount of the remeasurement is recognized in profit or loss. Lease liabilities are presented on a separate line in the consolidated balance sheets.

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

r. Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets are added to the cost of those assets, until such time as the assets are substantially ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

Other than stated above, all other borrowing costs are recognized in profit or loss in the period in which they are incurred.

s. Government grants

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

Government grants are recognized in profit or loss on a systematic basis over the periods in which the Group recognizes as expenses the related costs for which the grants are intended to compensate. Specifically, government grants whose primary condition is that the Group should purchase, construct or otherwise acquire non-current assets are recognized as deferred revenue in the consolidated financial statements and transferred to profit or loss on a systematic and rational basis over the useful lives of the related assets.

Government grants that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the Group with no future related costs are recognized in profit or loss in the period in which they become receivable.

The benefit of a government loan received at a below-market rate of interest is treated as a government grant measured as the difference between the proceeds received and the fair value of the loan based on prevailing market interest rates.

t. Employee benefits

1) Short-term employee benefits

Liabilities recognized in respect of short-term employee benefits are measured at the undiscounted amount of the benefits expected to be paid in exchange for the related services.

2) Retirement benefits

Payments to defined contribution retirement benefit plans are recognized as expenses when employees have rendered services entitling them to the contributions.

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

Net defined benefit liability (asset) represents the actual deficit (surplus) in the Group's defined benefit plan. Any surplus resulting from this calculation is limited to the present value of any refunds from the plans or reductions in future contributions to the plans.

u. Employee share options

The fair value at the grant date of the employee share options is expensed on a straight-line basis over the vesting period, based on the Group's best estimate of the number of options that are expected to ultimately vest, with a corresponding increase in capital surplus - employee share options and non-controlling interests. It is recognized as an expense in full at the grant date if vesting immediately. The grant date of issued ordinary shares for cash which are reserved for employees is the date on which the number of shares that the employees purchase is confirmed.

At each balance sheet date, the Group reviews its estimate of the number of employee share options expected to vest. The impact of the revision of the original estimates is recognized in profit or loss such that the cumulative expense reflects the revised estimate, with a corresponding adjustment to the capital surplus - employee share options and non-controlling interests.

The grant by the Company of its equity instruments to the employees of a subsidiary under options is treated as a capital contribution. The fair value of employee services received under the arrangement is measured by reference to the grant-date fair value and is recognized over the vesting period as an addition to the investment in the subsidiary, with a corresponding credit to capital surplus - employee share options.

v. Taxation

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

1) Current tax

According to the Income Tax Law of the R.O.C., an additional tax of unappropriated earnings is provided for as income tax in the year the shareholders approve to retain earnings.

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

2) Deferred tax

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable profit. If a temporary difference arises from the initial recognition (other than in a business combination) of assets and liabilities in a transaction that affects neither the

taxable profit nor the accounting profit, the resulting deferred tax asset or liability is not recognized. In addition, a deferred tax liability is not recognized on taxable temporary differences arising from the initial recognition of goodwill.

Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences, unused loss carryforwards and unused tax credits for purchases of machinery and equipment to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilized.

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

The carrying amount of deferred tax assets is reviewed at each balance sheet date and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the assets to be recovered. A previously unrecognized deferred tax asset is also reviewed at each balance sheet date and recognized to the extent that it has become probable that future taxable profit will allow the deferred tax asset to be recovered.

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

3) Current and deferred tax for the year

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

Where current tax or deferred tax arises from the initial accounting for a business combination, the tax effect is included in the accounting for the business combination.

w. U.S. Dollar Amounts

A translation of the consolidated financial statements into U.S. dollars is included solely for the convenience of the readers, and has been translated from New Taiwan dollar (NT\$) at the exchange rate as set forth in the statistical release by the U.S. Federal Reserve Board of the United States, which was NT\$29.91 to US\$1.00 as of December 31, 2019. The translation should not be construed as a representation that the NT\$ amounts have been, could have been, or could in the future be, converted into U.S. dollars at this or any other rate of exchange.

5. CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION UNCERTAINTY

In the application of the Group's accounting policies, management is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and underlying assumptions are based on historical experience and other factors that

are considered to be relevant. Actual results may differ from these estimates.

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

a. Impairment of goodwill

Determining whether goodwill is impaired requires an estimation of the value in use of the cash-generating units to which goodwill has been allocated. The calculation of the value in use requires management to estimate the future cash flows expected to be generated from the cash-generating units and a suitable discount rate in order to calculate the present value. Where the actual future cash flows are less than expected, a material impairment loss may arise.

b. Acquisition of subsidiaries

After the acquisition of a subsidiary, the Group should identify the difference between the investment cost and the Group's share of the net fair value of the subsidiary's identifiable assets acquired and liabilities assumed. It involves critical judgments and estimations when determining the aforementioned net fair values, including the type of intangible assets that may be identified and the related estimated cash flows or the relief from expenses. The related estimation and assumption, which were adopted by the management, may be of high uncertainty related to the semiconductor industry varied by economic trends.

6. CASH AND CASH EQUIVALENTS

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Cash on hand	\$ 7,940	\$ 6,567	\$ 220
Checking accounts and demand deposits	32,329,820	44,565,936	1,490,001
Cash equivalents	<u>19,180,676</u>	<u>15,558,372</u>	<u>520,173</u>
	<u>\$ 51,518,436</u>	<u>\$ 60,130,875</u>	<u>\$ 2,010,394</u>

7. FINANCIAL INSTRUMENTS AT FAIR VALUE THROUGH PROFIT OR LOSS

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Financial assets mandatorily classified as at FVTPL			
Derivative instruments (non-designated hedges)			
Forward exchange contracts	\$ 32,070	\$ 104,308	\$ 3,487
Swap contracts	1,557,714	56,561	1,891
Call option (Note 30)	-	24,556	821
Non-derivative financial assets			
Quoted ordinary shares	5,151,255	3,460,123	115,685
Open-end mutual funds	581,800	662,290	22,143

(Continued)

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Private-placement funds	\$ 200,123	\$ 603,718	\$ 20,184
Unquoted preferred shares	275,000	377,440	12,619
Hybrid financial assets			
Private-placement convertible bonds	<u>100,496</u>	<u>-</u>	<u>-</u>
	7,898,458	5,288,996	176,830
Current	<u>7,262,227</u>	<u>4,127,566</u>	<u>137,999</u>
Non-current	<u>\$ 636,231</u>	<u>\$ 1,161,430</u>	<u>\$ 38,831</u>

(Concluded)

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
<u>Financial liabilities held for trading</u>			
Derivative instruments (non-designated hedging)			
Swap contracts	\$ 29,058	\$ 862,581	\$ 28,839
Forward exchange contracts	<u>7,597</u>	<u>110,990</u>	<u>3,711</u>
	<u>\$ 36,655</u>	<u>\$ 973,571</u>	<u>\$ 32,550</u>

At each balance sheet date, the outstanding swap contracts not accounted for hedge accounting were as follows:

Currency	Maturity Period	Notional Amount (In Thousands)
<u>December 31, 2018</u>		
Sell NT\$/Buy US\$	2019.01-2019.12	NT\$49,570,469/US\$1,687,400
Sell US\$/Buy CNY	2019.01	US\$50,292/CNY349,800
Sell US\$/Buy JPY	2019.01	US\$54,203/JPY6,090,000
Sell US\$/Buy NT\$	2019.01	US\$208,800/NT\$6,423,242
<u>December 31, 2019</u>		
Sell NT\$/Buy US\$	2020.01-2020.12	NT\$50,241,799/US\$1,660,000
Sell US\$/Buy CNY	2020.02	US\$49,666/CNY349,800
Sell US\$/Buy JPY	2020.02-2020.03	US\$45,878/JPY5,000,000
Sell US\$/Buy KRW	2020.01	US\$28,000/KRW32,454,800
Sell US\$/Buy MYR	2020.01	US\$11,000/MYR45,507
Sell US\$/Buy NT\$	2020.01	US\$189,960/NT\$5,719,478

At each balance sheet date, the outstanding forward exchange contracts not accounted for hedge accounting were as follow:

Currency	Maturity Period	Notional Amount (In Thousands)
<u>December 31, 2018</u>		
Sell NT\$/Buy US\$	2019.01-2019.02	NT\$2,453,540/US\$80,000
Sell US\$/Buy CNY	2019.01	US\$29,000/CNY200,108
Sell US\$/Buy EUR	2019.01	US\$4,103/EUR3,600
Sell US\$/Buy JPY	2019.01-2019.02	US\$37,733/JPY4,231,754
Sell US\$/Buy MYR	2019.01-2019.02	US\$14,000/MYR58,430
Sell US\$/Buy SGD	2019.01-2019.02	US\$13,400/SGD18,391
<u>December 31, 2019</u>		
Sell CNY/Buy US\$	2020.01-2020.02	CNY2,224,491/US\$316,896
Sell HKD/Buy US\$	2020.01	HKD1,705,281/US\$218,297
Sell NT\$/Buy US\$	2020.01	NT\$2,275,860/US\$75,000
Sell US\$/Buy CNY	2020.01-2020.03	US\$109,000/CNY767,277
Sell US\$/Buy JPY	2020.01-2020.04	US\$87,398/JPY9,509,491
Sell US\$/Buy MYR	2020.01-2020.05	US\$26,000/MYR108,330
Sell US\$/Buy NT\$	2020.01-2020.02	US\$170,000/NT\$5,142,441
Sell US\$/Buy SGD	2020.01-2020.02	US\$8,600/SGD11,691

8. FINANCIAL ASSETS AT FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME (FVTOCI)

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Investments in equity instruments at FVTOCI	\$ 580,399	\$ 755,903	\$ 25,272
Investments in debt instruments at FVTOCI	<u>1,016,924</u>	<u>1,014,872</u>	<u>33,931</u>
	<u>\$ 1,597,323</u>	<u>\$ 1,770,775</u>	<u>\$ 59,203</u>

a. Investments in equity instruments at FVTOCI

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Unquoted ordinary shares	\$ 532,047	\$ 565,028	\$ 18,891
Unquoted preferred shares	8,683	158,718	5,306
Limited partnership	<u>39,669</u>	<u>32,157</u>	<u>1,075</u>
	<u>\$ 580,399</u>	<u>\$ 755,903</u>	<u>\$ 25,272</u>

b. Investments in debt instruments at FVTOCI

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Unsecured subordinate corporate bonds	<u>\$ 1,016,924</u>	<u>\$ 1,014,872</u>	<u>\$ 33,931</u>

In June 2016, the Group purchased 1,000 units of perpetual unsecured subordinate corporate bonds in the amount of NT\$1,000,000 thousand. The corporate bonds are in denomination of NT\$1,000 thousand (US\$33 thousand) with annual interest rate at 3.5% as well as effective interest rate at 3.2% both as of December 31, 2018 and 2019.

9. CREDIT RISK MANAGEMENT FOR INVESTMENTS IN DEBT INSTRUMENTS

The Group's investment in unsecured subordinate corporate bonds is rated the equivalent of investment grade or higher and has low credit risk for the purpose of impairment assessment.

There was no significant increase in credit risk of such debt instrument since initial recognition leading to changes in interest rates and terms, and there was also no significant change in bond issuer's operation affecting the ability performing debt obligation. We evaluated that no expected credit losses existed. The Group reviews changes in bond yields and other public information periodically and makes an assessment whether there has been a significant increase in lifetime Expected Credit Loss ("ECL") since initial recognition.

10. TRADE RECEIVABLES, NET

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
At amortized cost			
Gross carrying amount	\$ 79,636,748	\$ 77,055,280	\$ 2,576,238
Less: Allowance for impairment loss	<u>155,389</u>	<u>136,497</u>	<u>4,564</u>
	79,481,359	76,918,783	2,571,674
At FVTOCI	<u>-</u>	<u>2,029,690</u>	<u>67,860</u>
	<u>\$ 79,481,359</u>	<u>\$ 78,948,473</u>	<u>\$ 2,639,534</u>

a. Trade receivables

1) At amortized cost

The Group's average credit terms were 30 to 90 days. The Group evaluates the risk and probability of credit loss by reference to the Group's past experiences, financial condition of each customer, as well as general economic conditions, competitive advantage and future development of the industry in which the customer operates. The Group then reviews the recoverable amount of each individual trade receivable at each balance sheet date to ensure that adequate allowance is made for possible irrecoverable amounts. In this regard, management believes the Group's credit risk was significantly reduced. In addition, the Group measures the loss allowance for trade receivables at an amount equal to lifetime ECLs. The expected credit losses on trade receivables are estimated using a provision matrix by reference to past default experience of the debtor and an analysis of the debtor's current financial position, adjusted for general economic conditions of the industry in which the debtors operate and an assessment of both the current as well as the forecast direction of economic conditions at each balance sheet date. As the Group's historical credit loss experience shows significantly different loss patterns for different customer segments, the provision matrix for expected credit loss allowance based on trade receivables due status is further distinguished according to the Group's different customer base.

The Group writes off a trade receivable when there is information indicating that the debtor is in severe financial difficulty and there is no realistic prospect of recovery. For trade receivables that

have been written off, the Group continues to engage in enforcement activity to attempt to recover the receivables due. Where recoveries are made, these are recognized in profit or loss.

The following table details the loss allowance of trade receivables based on the Group's provision matrix.

December 31, 2018

	<u>Not Past Due</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Individually</u>	<u>Total</u>
	<u>NTS</u>	<u>1 to 30 days</u>	<u>31 to 90 Days</u>	<u>Over 91 Days</u>	<u>Impaired</u>	<u>NTS</u>
	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>
Expected credit loss rate	0%	0%~10%	0%~50%	1%~100%	0%~100%	-
Gross carrying amount	\$ 71,819,583	\$ 6,537,819	\$ 778,799	\$ 405,707	\$ 94,840	\$ 79,636,748
Loss allowance (Lifetime ECLs)	<u>(7,119)</u>	<u>(4,463)</u>	<u>(14,949)</u>	<u>(40,080)</u>	<u>(88,778)</u>	<u>(155,389)</u>
	<u>\$ 71,812,464</u>	<u>\$ 6,533,356</u>	<u>\$ 763,850</u>	<u>\$ 365,627</u>	<u>\$ 6,062</u>	<u>\$ 79,481,359</u>

December 31, 2019

	<u>Not Past Due</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Individually</u>	<u>Total</u>
	<u>NTS</u>	<u>1 to 30 days</u>	<u>31 to 90 Days</u>	<u>Over 91 Days</u>	<u>Impaired</u>	<u>NTS</u>
	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>
Expected credit loss rate	0%	0%~10%	1%~70%	1%~100%	50%~100%	-
Gross carrying amount	\$ 70,042,018	\$ 6,111,309	\$ 695,384	\$ 153,458	\$ 53,111	\$ 77,055,280
Loss allowance (Lifetime ECLs)	<u>(12,379)</u>	<u>(841)</u>	<u>(26,587)</u>	<u>(53,629)</u>	<u>(43,061)</u>	<u>(136,497)</u>
	<u>\$ 70,029,639</u>	<u>\$ 6,110,468</u>	<u>\$ 668,797</u>	<u>\$ 99,829</u>	<u>\$ 10,050</u>	<u>\$ 76,918,783</u>

	<u>Not Past Due</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Individually</u>	<u>Total</u>
	<u>US\$ (Note 4)</u>	<u>1 to 30 days</u>	<u>31 to 90 Days</u>	<u>Over 91 Days</u>	<u>Impaired</u>	<u>US\$ (Note 4)</u>
	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>
Expected credit loss rate	0%	0%~10%	1%~70%	1%~100%	50%~100%	-
Gross carrying amount	\$ 2,341,759	\$ 204,323	\$ 23,249	\$ 5,131	\$ 1,776	\$ 2,576,238
Loss allowance (Lifetime ECLs)	<u>(414)</u>	<u>(28)</u>	<u>(889)</u>	<u>(1,793)</u>	<u>(1,440)</u>	<u>(4,564)</u>
	<u>\$ 2,341,345</u>	<u>\$ 204,295</u>	<u>\$ 22,360</u>	<u>\$ 3,338</u>	<u>\$ 336</u>	<u>\$ 2,571,674</u>

Movement of the allowance for doubtful trade receivables for the year ended December 31, 2017 was as follows:

	<u>Impaired</u>	<u>Impaired</u>	<u>Total</u>
	<u>Individually</u>	<u>Collectively</u>	<u>NTS</u>
	<u>NTS</u>	<u>NTS</u>	<u>NTS</u>
Balance at January 1, 2017	\$ 16,453	\$ 37,256	\$ 53,709
Impairment losses recognized	9,527	4,102	13,629
Amounts written off	-	(34)	(34)
Effect of foreign currency exchange differences	<u>(850)</u>	<u>(1,553)</u>	<u>(2,403)</u>
Balance at December 31, 2017	<u>\$ 25,130</u>	<u>\$ 39,771</u>	<u>\$ 64,901</u>

The movements of the loss allowance of trade receivables for the years ended December 31, 2018 and 2019 were as follows:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Balance at January 1	\$ 64,901	\$ 155,389	\$ 5,195
Net remeasurement of loss allowance	150,128	(38,277)	(1,280)
Reclassification to loss allowance of other receivables	-	(5,877)	(196)
Acquisition through business combinations	3,482	25,553	855
Amounts written off	(60,109)	-	-
Effects of foreign currency exchange differences	(3,013)	(291)	(10)
Balance at December 31	<u>\$ 155,389</u>	<u>\$ 136,497</u>	<u>\$ 4,564</u>

2) At FVTOCI

For the trade receivables due from certain customers, the Group decides whether to factor these trade receivables to banks without recourse based on its level of working capital. These trade receivables are classified as at FVTOCI because they are held within a business model whose objective is achieved by both the collecting of contractual cash flows and the selling of financial assets.

The following table details the loss allowance of trade receivables at FVTOCI based on the Group's provision matrix.

December 31, 2019

	<u>Not Past Due</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Individually</u>	<u>Total</u>
	<u>NT\$</u>	<u>1 to 30 days</u>	<u>31 to 90 Days</u>	<u>Over 91 Days</u>	<u>Impaired</u>	<u>NT\$</u>
		<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	
Expected credit loss rate	0%	-	0%	1%	-	-
Gross carrying amount	\$ 2,029,324	\$ -	\$ 207	\$ 160	\$ -	\$ 2,029,691
Loss allowance (Lifetime ECLs)	-	-	-	(1)	-	(1)
	<u>\$ 2,029,324</u>	<u>\$ -</u>	<u>\$ 207</u>	<u>\$ 159</u>	<u>\$ -</u>	<u>\$ 2,029,690</u>
	<u>Not Past Due</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Overdue</u>	<u>Individually</u>	<u>Total</u>
	<u>US\$ (Note 4)</u>	<u>1 to 30 days</u>	<u>31 to 90 Days</u>	<u>Over 91 Days</u>	<u>Impaired</u>	<u>US\$ (Note 4)</u>
		<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>
Expected credit loss rate	0%	-	0%	1%	-	-
Gross carrying amount	\$ 67,848	\$ -	\$ 7	\$ 5	\$ -	\$ 67,860
Loss allowance (Lifetime ECLs)	-	-	-	-	-	-
	<u>\$ 67,848</u>	<u>\$ -</u>	<u>\$ 7</u>	<u>\$ 5</u>	<u>\$ -</u>	<u>\$ 67,860</u>

b. Transfers of financial assets

The followings were the Group's outstanding trade receivables transferred but not yet due as of December 31, 2019:

<u>Counterparties</u>	<u>Receivables</u>	<u>Reclassified</u>	<u>Advances</u>	<u>Advances</u>	<u>Interest Rates</u>
	<u>Factoring</u>	<u>to Other</u>	<u>Received-</u>	<u>Received-</u>	<u>on Advances</u>
	<u>Proceeds</u>	<u>Receivables</u>	<u>Unused</u>	<u>Used</u>	<u>Received</u>
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	
First Commercial Bank	\$ 7,567	\$ -	\$ -	\$ 7,567	2.2%

<u>Counterparties</u>	<u>Receivables Factoring Proceeds</u>	<u>Reclassified to Other Receivables</u>	<u>Advances Received- Unused</u>	<u>Advances Received- Used</u>	<u>Interest Rates on Advances Received</u>
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	
First Commercial Bank	\$ 253	\$ -	\$ -	\$ 253	2.2%

Pursuant to the factoring agreements, losses from commercial disputes (such as sales returns and discounts) are borne by the Group, while losses from credit risk are borne by banks.

11. INVENTORIES

	<u>December 31</u>		
	<u>2018</u>	<u>2019</u>	
	NT\$	NT\$	US\$ (Note 4)
Finished goods	\$ 7,680,083	\$ 7,174,716	\$ 239,877
Work in process	3,195,478	2,952,182	98,702
Raw materials	23,250,801	20,996,346	701,984
Supplies	1,892,194	2,229,576	74,543
Raw materials and supplies in transit	<u>608,895</u>	<u>530,930</u>	<u>17,751</u>
	<u>\$ 36,627,451</u>	<u>\$ 33,883,750</u>	<u>\$ 1,132,857</u>

The cost of inventories recognized as operating costs for the years ended December 31, 2017, 2018 and 2019 were NT\$237,193,286 thousand, NT\$309,020,850 thousand and NT\$347,877,603 thousand (US\$11,630,813 thousand), respectively, which included write-downs of inventories at NT\$398,824 thousand, NT\$980,927 thousand and NT\$452,134 thousand (US\$15,117 thousand), respectively.

12. INVENTORIES RELATED TO REAL ESTATE BUSINESS

	<u>December 31</u>		
	<u>2018</u>	<u>2019</u>	
	NT\$	NT\$	US\$ (Note 4)
Land and buildings held for sale	\$ 20,734	\$ 9,983	\$ 334
Construction in progress	8,252,348	9,619,217	321,605
Land held for construction	<u>1,787,526</u>	<u>1,787,526</u>	<u>59,764</u>
	<u>\$ 10,060,608</u>	<u>\$ 11,416,726</u>	<u>\$ 381,703</u>

Construction in progress is mainly located on Hutai Road in Shanghai, China and Lidu Road in Kun Shan, China. The capitalized borrowing costs for the years ended December 31, 2017, 2018 and 2019 are disclosed in Note 26.

As of December 31, 2018 and 2019, inventories related to real estate business of NT\$10,060,608 thousand and NT\$11,416,726 thousand (US\$381,703 thousand), respectively, are expected to be recovered longer than twelve months.

Refer to Note 37 for the carrying amount of inventories related to real estate business that had been pledged by the Group to secure bank borrowings.

13. OTHER FINANCIAL ASSETS

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Guarantee deposits	\$ 766,190	\$ 661,667	\$ 22,122
Pledged time deposits (Note 37)	496,847	620,817	20,756
Time deposits with original maturity of over three months	6,320,669	25,885	866
Others (Note 37)	<u>55</u>	<u>16,958</u>	<u>567</u>
	7,583,761	1,325,327	44,311
Current	<u>6,539,467</u>	<u>765,834</u>	<u>25,605</u>
Non-current	<u>\$ 1,044,294</u>	<u>\$ 559,493</u>	<u>\$ 18,706</u>

14. INVESTMENTS ACCOUNTED FOR USING THE EQUITY METHOD

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Investments in associates	\$ 9,131,814	\$ 11,805,505	\$ 394,701
Investments in joint ventures	<u>180,494</u>	<u>279,702</u>	<u>9,351</u>
	<u>\$ 9,312,308</u>	<u>\$ 12,085,207</u>	<u>\$ 404,052</u>

a. Investments in associates

- 1) Investments in associates accounted for using the equity method that was not individually material consisted of the following:

Name of Associate	Main Business	Operating Location	Carrying Amount as of December 31		
			2018	2019	
			NT\$	NT\$	US\$ (Note 4)
ChipMOS Technologies Inc. ("ChipMOS")	Engaged in the packaging and testing of semiconductors	R.O.C.	\$ 4,237,982	\$ 4,370,075	\$ 146,108
Yann Yuan Investment Co., Ltd. ("Yann Yuan")	Engaged in investing activities	R.O.C.	2,752,530	3,934,190	131,534
M-Universe Investments Pte. Ltd. ("MU")	Investment company	Singapore	-	1,814,699	60,672
Hung Ching Development & Construction Co. ("HC")	Engaged in the development, construction and leasing of real estate properties	R.O.C.	1,095,233	1,380,162	46,144
Deca Technologies Inc. ("DECA")	Holding company and the group engaged in manufacturing, development and marketing of wafer level packaging and interconnect technology	British Cayman Islands	866,312	323,423	10,813
Hung Ching Kwan Co. ("HCK")	Engaged in the leasing of real estate properties	R.O.C.	295,772	283,105	9,465
AMPI	Engaged in the manufacturing of integrated circuit	R.O.C.	184,134	-	-
			<u>9,431,963</u>	<u>12,105,654</u>	<u>404,736</u>
	Less: Deferred gain on transfer of land		<u>300,149</u>	<u>300,149</u>	<u>10,035</u>
			<u>\$ 9,131,814</u>	<u>\$ 11,805,505</u>	<u>\$ 394,701</u>

- 2) At each balance sheet date, the percentages of ownership held by the Group's subsidiary were as follows:

	December 31	
	2018	2019
ChipMOS	20.47%	20.48%
Yann Yuan	32.21%	32.21%
MU	-	42.23%
HC	26.22%	26.22%
DECA	22.04%	22.02%
HCK	27.31%	27.31%
AMPI	38.76%	-

- 3) In March 2019, the board of directors of ChipMOS resolved to cancel its issued employee restricted shares, which resulted in an increase in the percentage of ownership in ChipMOS from 20.47% to 20.48% and an increase in capital surplus of NT\$2,016 thousand (US\$67 thousand).
- 4) The Group evaluated the recoverable amount of its investment in DECA using the value in use and fair value less costs of disposal in 2018 and 2019, respectively. The recoverable amount was lower than the carrying amount of investment in DECA and, therefore, the Group recognized an impairment loss of NT\$521,010 thousand and NT\$400,201 thousand (US\$13,380 thousand) under the line item of other gains, net (Note 26) for the years ended December 31, 2018 and 2019, respectively. The value in use was the discounted cash flow based on the future projections made by DECA's management with a discount rate of 14.1%, while the fair value was the estimated transaction price of DECA's preferred shares, of which the fair value hierarchy was Level 3. In addition, due to the exercise of employee share options issued by DECA, the Group's percentage of ownership in DECA decreased to 22.02%.
- 5) In April 2019, the Group's subsidiary, ASE Test, Inc., subscribed for 100,000 thousand ordinary shares of AMPI from its private placement with NT\$250,000 thousand (US\$8,358 thousand) in cash. The percentage of the Group's ownership in AMPI then increased to 50.97% and, therefore, the Group obtained control over AMPI. The investments in ordinary shares of AMPI originally accounted for using the equity method were remeasured to the fair value at the acquisition date and the Group recognized remeasurement gain of NT\$243,057 thousand (US\$8,126 thousand) under the line item of other gains, net (Note 26).
- 6) In July 2019, the Group's subsidiary, Universal Global Technology Co., Limited, invested SGD79,863 thousand (equivalent to NT\$1,824,608 thousand (US\$61,003 thousand)) in MU, and then MU acquired the ordinary shares of Memtech International Ltd. ("Memtech"), a listed company in Singapore, from the public market. At the same time, MU issued new ordinary shares to the former shareholder of Memtech, Keytech Investment Pte. Ltd. ("Keytech"), in exchange for Memtech's ordinary shares held by Keytech. The aforementioned share exchange resulted the Group's percentage of ownership in MU decreased to 42.23%.
- 7) Fair values (Level 1) of investments in associates with available published price quotation are summarized as follows:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
ChipMOS	\$ 3,886,561	\$ 5,100,181	\$ 170,518
HC	\$ 1,537,307	\$ 1,551,033	\$ 51,857
AMPI	\$ 369,925	\$ -	\$ -

8) Aggregate information of associates that are not individually material

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
The Group's share of:				
Net profit (loss)	\$ (190,532)	\$ 147,535	\$ 321,413	\$ 10,746
Other comprehensive income (loss)	<u>59,676</u>	<u>(613,471)</u>	<u>1,401,453</u>	<u>46,856</u>
Total comprehensive income (loss)	<u>\$ (130,856)</u>	<u>\$ (465,936)</u>	<u>\$ 1,722,866</u>	<u>\$ 57,602</u>

b. Investments in joint ventures

- 1) Investments in joint ventures that were not individually material and accounted for using the equity method consisted of the following:

Name of Joint Venture	Main Business	Operating Location	Carrying Amount as of December 31		
			2018	2019	
			NT\$	NT\$	US\$ (Note 4)
ASEEE	Engaged in the production of embedded substrate	R.O.C.	\$ 180,494	\$ -	\$ -
SUMA-USI Electronics Co., Ltd. ("SUMA-USI")	Engaged in the design and production of electronic products	China	-	279,702	9,351
			<u>\$ 180,494</u>	<u>\$ 279,702</u>	<u>\$ 9,351</u>

- 2) At each balance sheet date, the percentages of ownership held by the Group's subsidiary were as follows:

	December 31	
	2018	2019
ASEEE	51.00%	-
SUMA-USI	-	49.00%

- 3) In March 2019, UGKS entered into a joint venture agreement with Cancon Information Industry Co., Ltd. to establish SUMA-USI with an estimated total consideration of CNY107,800 thousand and obtained 49.00% ownership of SUMA-USI. As of December 31, 2019, the Group has invested CNY65,170 thousand (NT\$283,236 thousand (US\$9,470 thousand)). Based on the joint venture agreement, both investors jointly lead the relevant operation activities of SUMA-USI, which resulted in that the investment in SUMA-USI was accounted for using the equity method.
- 4) In April 2019, ASE entered into a memorandum of understanding with TDK Corporation ("TDK") in relation to ASEEE that was incorporated by a joint venture agreement entered into by the Group and TDK. In addition to a reduction of one legal representative director of TDK, which resulted in that the Group obtained control over ASEEE starting from April 2019 and the investments in ASEEE originally accounted for using the equity method was remeasured to fair value at the acquisition date with a remeasurement gain of NT\$76,655 thousand (US\$2,563 thousand) under the line item of other gains, net for the year ended December 31, 2019 (Note 26), the memorandum of understanding set out that, after ASEEE offset its accumulated deficits against its capital in an amount of NT\$1,147,595 thousand (US\$38,368 thousand), ASE subscribed all of 150,000 thousand ordinary shares newly issued by ASEEE through its capital increase by cash in an amount of

NT\$1,500,000 thousand (US\$50,150 thousand) in May 2019 and then repurchased all of ASEEE's ordinary shares held by TDK in an amount of US\$6,000 thousand in July 2019. As a result, the Group eventually held 100.00% of ownership in ASEEE (Note 32). Furthermore, the board of directors of ASE further resolved to merge with ASEEE in December 2019. The record date of merger was February 1, 2020 and was completed.

5) Aggregate information of joint ventures that were not individually material

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
The Group's share of net loss and total comprehensive loss	<u>\$ (184,366)</u>	<u>\$ (306,156)</u>	<u>\$ (142,306)</u>	<u>\$ (4,758)</u>

15. PROPERTY, PLANT AND EQUIPMENT

The carrying amounts of each class of property, plant and equipment were as follows:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Land	\$ 10,165,969	\$ 10,333,822	\$ 345,497
Buildings and improvements	78,963,937	85,409,580	2,855,553
Machinery and equipment	108,087,970	112,996,670	3,777,889
Other equipment	6,463,160	6,715,694	224,530
Construction in progress and machinery in transit	<u>10,911,552</u>	<u>16,637,561</u>	<u>556,254</u>
	<u>\$ 214,592,588</u>	<u>\$ 232,093,327</u>	<u>\$ 7,759,723</u>

For the year ended December 31, 2017

	Land	Buildings and Improvements	Machinery and Equipment	Other Equipment	Construction in Progress and Machinery in Transit	Total
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
<u>Cost</u>						
Balance at January 1, 2017	\$ 3,365,013	\$ 96,258,175	\$248,200,756	\$ 8,474,661	\$ 7,713,542	\$364,012,147
Additions	-	350,434	102,301	130,659	23,094,288	23,677,682
Disposals	-	(609,294)	(8,449,949)	(763,937)	(73,248)	(9,896,428)
Reclassification	(35,965)	6,483,392	18,331,738	174,947	(25,428,464)	(474,352)
Effect of foreign currency exchange differences	<u>(70,530)</u>	<u>(2,294,779)</u>	<u>(4,986,843)</u>	<u>(204,250)</u>	<u>557,595</u>	<u>(6,998,807)</u>
Balance at December 31, 2017	<u>\$ 3,258,518</u>	<u>\$100,187,928</u>	<u>\$253,198,003</u>	<u>\$ 7,812,080</u>	<u>\$ 5,863,713</u>	<u>\$370,320,242</u>
<u>Accumulated depreciation and impairment</u>						
Balance at January 1, 2017	\$ -	\$ 38,229,544	\$175,499,994	\$ 6,385,080	\$ 17,288	\$220,131,906
Depreciation expenses	-	5,156,558	22,722,307	746,422	-	28,625,287
Impairment losses recognized	-	2,310	286,880	368	-	289,558
Disposals	-	(478,903)	(7,540,654)	(720,319)	(17,288)	(8,757,164)
Reclassification	-	(210,080)	34,452	(24,117)	-	(199,745)
Effect of foreign currency exchange differences	<u>-</u>	<u>(784,365)</u>	<u>(3,990,174)</u>	<u>(163,467)</u>	<u>-</u>	<u>(4,938,006)</u>
Balance at December 31, 2017	<u>\$ -</u>	<u>\$ 41,915,064</u>	<u>\$187,012,805</u>	<u>\$ 6,223,967</u>	<u>\$ -</u>	<u>\$235,151,836</u>

For the year ended December 31, 2018

	Land	Buildings and	Machinery and	Other	Construction in	Total
	NTS	Improvements	Equipment	Equipment	Progress and	Total
	NTS	NTS	NTS	NTS	Machinery	NTS
	NTS	NTS	NTS	NTS	in Transit	NTS
Cost						
Balance at January 1, 2018	\$ 3,258,518	\$ 100,187,928	\$ 253,198,003	\$ 7,812,080	\$ 5,863,713	\$ 370,320,242
Additions	-	144,898	192,673	84,860	38,669,807	39,092,238
Disposals	-	(677,206)	(26,493,282)	(2,251,060)	(34,902)	(29,456,450)
Reclassification	-	5,388,709	32,060,513	2,148,211	(39,612,324)	(14,891)
Acquisition through business combinations (Note 30)	6,880,400	37,127,957	95,810,062	11,122,171	5,781,189	156,721,779
Effect of foreign currency exchange differences	27,051	(464,275)	(929,579)	(78,095)	244,069	(1,200,829)
Balance at December 31, 2018	<u>\$ 10,165,969</u>	<u>\$ 141,708,011</u>	<u>\$ 353,838,390</u>	<u>\$ 18,838,167</u>	<u>\$ 10,911,552</u>	<u>\$ 535,462,089</u>
Accumulated depreciation and impairment						
Balance at January 1, 2018	\$ -	\$ 41,915,064	\$ 187,012,805	\$ 6,223,967	\$ -	\$ 235,151,836
Depreciation expenses	-	6,325,948	31,751,251	1,816,587	-	39,893,786
Impairment losses recognized	-	29,531	97,680	5,860	-	133,071
Disposals	-	(491,033)	(25,704,778)	(2,070,302)	-	(28,266,113)
Reclassification	-	(265)	-	-	-	(265)
Acquisition through business combinations (Note 30)	-	15,097,920	53,210,063	6,428,174	-	74,736,157
Effect of foreign currency exchange differences	-	(133,091)	(616,601)	(29,279)	-	(778,971)
Balance at December 31, 2018	<u>\$ -</u>	<u>\$ 62,744,074</u>	<u>\$ 245,750,420</u>	<u>\$ 12,375,007</u>	<u>\$ -</u>	<u>\$ 320,869,501</u>

For the year ended December 31, 2019

	Land	Buildings and	Machinery and	Other	Construction in	Total
	NTS	Improvements	Equipment	Equipment	Progress and	Total
	NTS	NTS	NTS	NTS	Machinery	NTS
	NTS	NTS	NTS	NTS	in Transit	NTS
Cost						
Balance at January 1, 2019	\$ 10,165,969	\$ 141,708,011	\$ 353,838,390	\$ 18,838,167	\$ 10,911,552	\$ 535,462,089
Adjustments on initial application of IFRS 16 (Note 3)	-	-	-	(458,045)	-	(458,045)
Adjusted balance at January 1, 2019	10,165,969	141,708,011	353,838,390	18,380,122	10,911,552	535,004,044
Additions	-	806,844	413,008	76,671	61,777,364	63,073,887
Disposals	-	(983,690)	(19,139,634)	(2,507,440)	-	(22,630,764)
Reclassification	-	13,601,469	41,302,651	3,062,838	(57,221,627)	745,331
Acquisitions through business combinations (Note 30)	189,111	1,044,383	5,507,315	43,611	250,455	7,034,875
Effect of foreign currency exchange differences	(21,258)	(2,204,057)	(5,176,282)	(300,686)	919,817	(6,782,466)
Balance at December 31, 2019	<u>\$ 10,333,822</u>	<u>\$ 153,972,960</u>	<u>\$ 376,745,448</u>	<u>\$ 18,755,116</u>	<u>\$ 16,637,561</u>	<u>\$ 576,444,907</u>
Accumulated depreciation and impairment						
Balance at January 1, 2019	\$ -	\$ 62,744,074	\$ 245,750,420	\$ 12,375,007	\$ -	\$ 320,869,501
Adjustments on initial application of IFRS 16 (Note 3)	-	-	-	(180,966)	-	(180,966)
Adjusted balance at January 1, 2019	-	62,744,074	245,750,420	12,194,041	-	320,688,535
Depreciation expense	-	6,989,392	35,747,308	2,503,967	-	45,240,667
Impairment losses recognized	-	78,562	102,056	20,388	-	201,006
Disposals	-	(881,149)	(18,640,266)	(2,503,438)	-	(22,024,853)
Reclassification	-	210,558	83,777	(103)	-	294,232
Acquisitions through business combinations (Note 30)	-	445,682	4,000,338	19,028	-	4,465,048
Effect of foreign currency exchange differences	-	(1,023,739)	(3,294,855)	(194,461)	-	(4,513,055)
Balance at December 31, 2019	<u>\$ -</u>	<u>\$ 68,563,380</u>	<u>\$ 263,748,778</u>	<u>\$ 12,039,422</u>	<u>\$ -</u>	<u>\$ 344,351,580</u>

	Land	Buildings and Improvements	Machinery and Equipment	Other Equipment	Construction in Progress and Machinery in Transit	Total
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Cost						
Balance at January 1, 2019	\$ 339,885	\$ 4,737,814	\$ 11,830,103	\$ 629,828	\$ 364,813	\$ 17,902,443
Adjustments on initial application of IFRS 16 (Note 3)	-	-	-	(15,314)	-	(15,314)
Adjusted balance at January 1, 2019	339,885	4,737,814	11,830,103	614,514	364,813	17,887,129
Additions	-	26,976	13,808	2,564	2,065,441	2,108,789
Disposals	-	(32,888)	(639,908)	(83,833)	-	(756,629)
Reclassification	-	454,746	1,380,898	102,402	(1,913,127)	24,919
Acquisitions through business combinations (Note 30)	6,323	34,917	184,130	1,458	8,374	235,202
Effect of foreign currency exchange differences	(711)	(73,689)	(173,062)	(10,053)	30,753	(226,762)
Balance at December 31, 2019	<u>\$ 345,497</u>	<u>\$ 5,147,876</u>	<u>\$ 12,595,969</u>	<u>\$ 627,052</u>	<u>\$ 556,254</u>	<u>\$ 19,272,648</u>
Accumulated depreciation and impairment						
Balance at January 1, 2019	\$ -	\$ 2,097,762	\$ 8,216,330	\$ 413,741	\$ -	\$ 10,723,833
Adjustments on initial application of IFRS 16 (Note 3)	-	-	-	(6,050)	-	(6,050)
Adjusted balance at January 1, 2019	-	2,097,762	8,216,330	407,691	-	10,721,783
Depreciation expense	-	233,681	1,195,162	83,717	-	1,512,560
Impairment losses recognized	-	2,626	3,412	682	-	6,720
Disposals	-	(29,460)	(623,212)	(83,699)	-	(736,371)
Reclassification	-	7,040	2,801	(3)	-	9,838
Acquisitions through business combinations (Note 30)	-	14,901	133,746	636	-	149,283
Effect of foreign currency exchange differences	-	(34,227)	(110,159)	(6,502)	-	(150,888)
Balance at December 31, 2019	<u>\$ -</u>	<u>\$ 2,292,323</u>	<u>\$ 8,818,080</u>	<u>\$ 402,522</u>	<u>\$ -</u>	<u>\$ 11,512,925</u>

Based on the future operation plans and the capacity evaluation, the Group assessed that a portion of plant and equipment in the packaging segment and the testing segment were not qualified for the production needs and, therefore, recognized an impairment loss of NT\$289,558 thousand, NT\$133,071 thousand and NT\$201,006 thousand (US\$6,721 thousand) under the line item of other operating income and expenses (Note 26) for the years ended December 31, 2017, 2018 and 2019, respectively. The recoverable amount of a portion of the impaired plant and equipment was determined by its fair value less costs of disposal, of which the fair value was based on the recent quoted prices of assets with similar age and obsolescence that were provided by the vendors in secondary market which represent a Level 3 input because the secondary market was not very active. The recoverable amount of the other portion of the impaired plant and equipment was determined using value in use and the Group expected to derive zero future cash flows from these assets.

Each class of property, plant and equipment was depreciated on a straight-line basis over the following useful lives:

Buildings and improvements	
Main plant buildings	10-55 years
Cleanrooms	10-20 years
Others	3-20 years
Machinery and equipment	2-10 years
Other equipment	2-20 years

The capitalized borrowing costs for the years ended December 31, 2017, 2018 and 2019 are disclosed in Note 26.

16. LEASE ARRANGEMENTS

a. Right-of-use assets - 2019

	December 31, 2019	
	NT\$	US\$ (Note 4)
<u>Carrying amounts</u>		
Land	\$ 7,036,887	\$ 235,269
Buildings and improvements	2,121,797	70,939
Machinery and equipment	588,443	19,674
Other equipment	<u>45,094</u>	<u>1,508</u>
	<u>\$ 9,792,221</u>	<u>\$ 327,390</u>
For the Year Ended December 31, 2019		
	NT\$	US\$ (Note 4)
Additions to right-of-use assets	<u>\$ 824,268</u>	<u>\$ 27,558</u>
Depreciation charge for right-of-use assets		
Land	\$ 215,301	\$ 7,198
Buildings and improvements	307,708	10,288
Machinery and equipment	507,443	16,966
Other equipment	<u>25,006</u>	<u>836</u>
	<u>\$ 1,055,458</u>	<u>\$ 35,288</u>

The amounts disclosed above with respect to the right-of-use assets did not include the right-of-use assets that meet the definition of investment properties.

b. Lease liabilities - 2019

	December 31, 2019	
	NT\$	US\$ (Note 4)
<u>Carrying amounts</u>		
Current	<u>\$ 632,802</u>	<u>\$ 21,157</u>
Non-current	<u>\$ 5,176,123</u>	<u>\$ 173,057</u>

The Group's lease liabilities were mainly from land and buildings and improvements. The range of discount rates for lease liabilities was as follows:

	December 31, 2019
Land (%)	0.54-4.90
Buildings and improvements (%)	0.30-8.62

c. Material lease-in activities and terms

The Group leases land and buildings for the use of plants and offices with remaining lease terms of 1-69 years and 1-31 years, respectively. For the leasehold land located in the R.O.C., the Group has

extension options at the expiry of the lease periods. However, the government has the right to adjust the lease payments on the basis of changes in announced land value prices and also has the right to terminate the lease contract under certain circumstances. The Group does not have bargain purchase options to acquire the leasehold land and buildings at the expiry of the lease periods. In addition, the Group is prohibited from subleasing or transferring all or any portion of the underlying assets without the lessor's consent.

d. Subleases

In addition to the sublease transactions described in Note 17, the Group did not have other sublease transactions.

e. Other lease information

1) Lease arrangements under operating leases for the leasing out of investment properties and freehold property, plant and equipment are set out in Note 17.

2) Other related lease information

	For the Year Ended December 31, 2019	
	NT\$	US\$ (Note 4)
Expenses relating to short-term leases	\$ 421,924	\$ 14,106
Expenses relating to low-value assets leases	\$ 4,473	\$ 150
Expenses relating to variable lease payments not included in the measurement of lease liabilities	\$ 53,403	\$ 1,785
Total cash outflow for leases	\$ (1,511,277)	\$ (50,527)

The Group leased certain machinery and equipment which qualify as short-term leases and certain other equipment which qualify as low-value asset leases. The Group elected to apply the recognition exemption and, thus, did not recognize right-of-use assets and lease liabilities for these leases.

2018

The future minimum lease payments of non-cancellable operating lease commitments were as follows:

	December 31, 2018
	NT\$
Less than 1 year	\$ 509,994
1 to 5 years	828,482
More than 5 years	<u>1,047,626</u>
	<u>\$ 2,386,102</u>

The minimum lease payments recognized in profit or loss for the year ended December 31, 2018 was NT\$785,295 thousand.

17. INVESTMENT PROPERTIES

For the year ended December, 2017

	<u>Land</u> NT\$	<u>Buildings and Improvements</u> NT\$	<u>Total</u> NT\$
<u>Cost</u>			
Balance at January 1, 2017	\$ -	\$ -	\$ -
Additions	-	186,535	186,535
Disposals	-	(342)	(342)
Reclassification	35,965	8,114,110	8,150,075
Effects of foreign currency exchange differences	-	<u>106,482</u>	<u>106,482</u>
Balance at December 31, 2017	<u>\$ 35,965</u>	<u>\$ 8,406,785</u>	<u>\$ 8,442,750</u>
<u>Accumulated depreciation and impairment</u>			
Balance at January 1, 2017	\$ -	\$ -	\$ -
Depreciation expenses	-	122,231	122,231
Disposals	-	(161)	(161)
Reclassification	-	199,745	199,745
Effects of foreign currency exchange differences	-	<u>1,499</u>	<u>1,499</u>
Balance at December 31, 2017	<u>\$ -</u>	<u>\$ 323,314</u>	<u>\$ 323,314</u>
Carrying amount at December 31, 2017	<u>\$ 35,965</u>	<u>\$ 8,083,471</u>	<u>\$ 8,119,436</u>

For the year ended December, 2018

	<u>Land</u> NT\$	<u>Buildings and Improvements</u> NT\$	<u>Total</u> NT\$
<u>Cost</u>			
Balance at January 1, 2018	\$ 35,965	\$ 8,406,785	\$ 8,442,750
Additions	-	125,853	125,853
Reclassification	-	14,891	14,891
Effects of foreign currency exchange differences	-	<u>(137,739)</u>	<u>(137,739)</u>
Balance at December 31, 2018	<u>\$ 35,965</u>	<u>\$ 8,409,790</u>	<u>\$ 8,445,755</u>
<u>Accumulated depreciation and impairment</u>			
Balance at January 1, 2018	\$ -	\$ 323,314	\$ 323,314
Depreciation expenses	-	392,667	392,667
Reclassification	-	265	265
Effects of foreign currency exchange differences	-	<u>(8,870)</u>	<u>(8,870)</u>
Balance at December 31, 2018	<u>\$ -</u>	<u>\$ 707,376</u>	<u>\$ 707,376</u>
Carrying amount at December 31, 2018	<u>\$ 35,965</u>	<u>\$ 7,702,414</u>	<u>\$ 7,738,379</u>

For the year ended December, 2019

	Land	Buildings and	Right-of-use	Total
	NTS	Improvements	Assets	NTS
	NTS	NTS	NTS	NTS
<u>Cost</u>				
Balance at January 1, 2019	\$ 35,965	\$ 8,409,790	\$ -	\$ 8,445,755
Adjustments on initial application of IFRS 16 (Note 3)	-	-	<u>6,891,947</u>	<u>6,891,947</u>
Adjusted balance at January 1, 2019	35,965	8,409,790	6,891,947	15,337,702
Additions	-	2,532	-	2,532
Reclassification	-	(490,130)	(21,069)	(511,199)
Disposals	-	(1,843)	-	(1,843)
Effects of foreign currency exchange differences	-	<u>(209,980)</u>	<u>(303,086)</u>	<u>(513,066)</u>
Balance at December 31, 2019	<u>\$ 35,965</u>	<u>\$ 7,710,369</u>	<u>\$ 6,567,792</u>	<u>\$ 14,314,126</u>
<u>Accumulated depreciation and impairment</u>				
Balance at January 1, 2019	\$ -	\$ 707,376	\$ -	\$ 707,376
Adjustments on initial application of IFRS 16 (Note 3)	-	-	<u>292,722</u>	<u>292,722</u>
Adjusted balance at January 1, 2019	-	707,376	292,722	1,000,098
Depreciation expenses	-	377,536	216,574	594,110
Reclassification	-	(210,455)	543	(209,912)
Disposals	-	(1,240)	-	(1,240)
Effects of foreign currency exchange differences	-	<u>99,354</u>	<u>(22,355)</u>	<u>76,999</u>
Balance at December 31, 2019	<u>\$ -</u>	<u>\$ 972,571</u>	<u>\$ 487,484</u>	<u>\$ 1,460,055</u>
Carrying amount at December 31, 2019	<u>\$ 35,965</u>	<u>\$ 6,737,798</u>	<u>\$ 6,080,308</u>	<u>\$ 12,854,071</u>
	Land	Buildings and	Right-of-use	Total
	US\$ (Note 4)	Improvements	Assets	US\$ (Note 4)
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
<u>Cost</u>				
Balance at January 1, 2019	\$ 1,202	\$ 281,170	\$ -	\$ 282,372
Adjustments on initial application of IFRS 16 (Note 3)	-	-	<u>230,423</u>	<u>230,423</u>
Adjusted balance at January 1, 2019	1,202	281,170	230,423	512,795
Additions	-	85	-	85
Reclassification	-	(16,387)	(704)	(17,091)

(Continued)

	Land	Buildings and Improvements	Right-of-use Assets	Total
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Disposals	\$ -	\$ (62)	\$ -	\$ (62)
Effects of foreign currency exchange differences	<u>-</u>	<u>(7,020)</u>	<u>(10,133)</u>	<u>(17,153)</u>
Balance at December 31, 2019	<u>\$ 1,202</u>	<u>\$ 257,786</u>	<u>\$ 219,586</u>	<u>\$ 478,574</u>
<u>Accumulated depreciation and impairment</u>				
Balance at January 1, 2019	\$ -	\$ 23,650	\$ -	\$ 23,650
Adjustments on initial application of IFRS 16 (Note 3)	<u>-</u>	<u>-</u>	<u>9,787</u>	<u>9,787</u>
Adjusted balance at January 1, 2019	-	23,650	9,787	33,437
Depreciation expenses	-	12,622	7,241	19,863
Reclassification	-	(7,036)	18	(7,018)
Disposals	-	(41)	-	(41)
Effects of foreign currency exchange differences	<u>-</u>	<u>3,322</u>	<u>(747)</u>	<u>2,575</u>
Balance at December 31, 2019	<u>\$ -</u>	<u>\$ 32,517</u>	<u>\$ 16,299</u>	<u>\$ 48,816</u>
Carrying amount at December 31, 2019	<u>\$ 1,202</u>	<u>\$ 225,269</u>	<u>\$ 203,287</u>	<u>\$ 429,758</u> (Concluded)

Right-of-use assets included in investment properties were leasehold land located in Shanghai and were subleased under operating leases.

The abovementioned investment properties were leased out for 1 to 15 years, with an option to extend for an additional years. The lease contracts contain market review clauses in the event that the lessees exercise their options to extend. The lessees do not have bargain purchase options to acquire the investment properties at the expiry of the lease periods.

In addition to fixed lease payments, the lease contracts also indicated that the lessees should make variable payments determined at a specific percentage of the excess of respective lessee's monthly revenues over a specific amount.

The maturity analysis of lease payments receivable under operating leases of investment properties was as follows:

	December 31, 2019	
	NT\$	US\$ (Note 4)
Year 1	\$ 921,649	\$ 30,814
Year 2	744,366	24,887
Year 3	623,326	20,840
Year 4	408,634	13,662
Year 5	320,611	10,719
Year 6 onwards	<u>830,091</u>	<u>27,753</u>
	<u>\$ 3,848,677</u>	<u>\$ 128,675</u>

The future lease payments of non-cancellable operating lease commitments were as follows:

	December 31, 2018
	<u>NT\$</u>
Not later than 1 year	\$ 916,891
Later than 1 year and not later than 5 years	2,391,843
Later than 5 years	<u>1,157,093</u>
	<u>\$ 4,465,827</u>

The investment properties were depreciated on a straight-line basis over the following useful lives:

Main buildings	10-40 years
Right-of-use assets	15-50 years
Others	3-20 years

The fair value of the investment properties was measured using the market approach and the income approach based on level 3 inputs by independent professional appraisers. The significant unobservable inputs were discount rates. The fair value of the investment properties was as follows:

	December 31		
	2018	2019	
	<u>NT\$</u>	<u>NT\$</u>	<u>US\$ (Note 4)</u>
Fair value	<u>\$ 11,764,829</u>	<u>\$ 19,586,287</u>	<u>\$ 654,841</u>

Refer to Note 37 for the carrying amount of the investment properties that had been pledged by the Group to secure borrowings.

18. GOODWILL

	Cost	Accumulated Impairment	Carrying Amount
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>
Balance at January 1, 2017	\$ 12,479,305	\$ 1,988,996	\$ 10,490,309
Impairment losses recognized	-	425,117	(425,117)
Effect of foreign currency exchange differences	<u>(130,698)</u>	<u>-</u>	<u>(130,698)</u>
Balance at December 31, 2017	12,348,607	2,414,113	9,934,494
Acquisition through business combinations (Note 30)	39,990,231	-	39,990,231
Effect of foreign currency exchange differences	<u>49,721</u>	<u>-</u>	<u>49,721</u>
Balance at December 31, 2018	52,388,559	2,414,113	49,974,446
Acquisition through business combinations (Note 30)	264,977	-	264,977
Effect of foreign currency exchange differences	<u>(40,987)</u>	<u>-</u>	<u>(40,987)</u>
Balance at December 31, 2019	<u>\$ 52,612,549</u>	<u>\$ 2,414,113</u>	<u>\$ 50,198,436</u>

	<u>Cost</u> US\$ (Note 4)	<u>Accumulated Impairment</u> US\$ (Note 4)	<u>Carrying Amount</u> US\$ (Note 4)
Balance at January 1, 2019	\$ 1,751,540	\$ 80,713	\$ 1,670,827
Acquisition through business combinations (Note 30)	8,859	-	8,859
Effect of foreign currency exchange differences	<u>(1,370)</u>	<u>-</u>	<u>(1,370)</u>
Balance at December 31, 2019	<u>\$ 1,759,029</u>	<u>\$ 80,713</u>	<u>\$ 1,678,316</u>

a. Allocating goodwill to cash-generating units

The Group did not monitor goodwill for internal management purpose but for financial reporting purpose and, therefore, the goodwill was allocated to the following cash-generating units for evaluation of impairment: packaging segment, testing segment, EMS segment and other segment. The carrying amounts of goodwill allocated to cash-generating units were as follows:

Cash-generating units	<u>December 31</u>		
	<u>2018</u>	<u>2019</u>	
	NT\$	NT\$	US\$ (Note 4)
Packaging segment	\$ 35,729,371	\$ 35,717,828	\$ 1,194,177
Testing segment	13,448,886	13,421,321	448,724
Others	<u>796,189</u>	<u>1,059,287</u>	<u>35,415</u>
	<u>\$ 49,974,446</u>	<u>\$ 50,198,436</u>	<u>\$ 1,678,316</u>

b. Impairment assessment

At the end of each year, the Group performs evaluation of goodwill for impairment by reviewing the recoverable amounts based on value in use which incorporates cash flow projections estimated by management covering a five-year period. The cash flows beyond that five-year period are extrapolated using a steady per annum growth rate. In assessing value in use, the estimated future cash flows are discounted to their present value using annual pre-tax discount rates which were 10.82%-12.42%, 9.74%-10.22% and 9.59%-14.99% as of December 31, 2017, 2018 and 2019, respectively. As of December 31, 2017, the recoverable amount of other segment was lower than its carrying amount since its actual growth in revenue did not meet its forecast previously made by management. The review led to the recognition of an impairment loss of NT\$425,117 thousand under the line item of other operating income and expenses, net (Note 26) for the year ended December 31, 2017. For the years ended December 31, 2018 and 2019, no impairment loss was recognized. The key assumption used in calculating each segment's value in use also included the growth rates for operating revenues, which were based on the forecast for the Group and the industry as well as the Group's historical performance.

Management believes that any reasonably possible change in the key assumptions on which the recoverable amount was based would not cause the carrying amount of the cash-generating unit to exceed its recoverable amount.

19. OTHER INTANGIBLE ASSETS

The carrying amounts of each class of other intangible assets were as follows:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Customer relationships	\$ 10,366,797	\$ 9,333,333	\$ 312,047
Computer software	1,159,682	1,929,539	64,511
Patents and acquired specific technology	19,255,669	17,718,523	592,395
Others	<u>115,552</u>	<u>42,997</u>	<u>1,438</u>
	<u>\$ 30,897,700</u>	<u>\$ 29,024,392</u>	<u>\$ 970,391</u>

For the year ended December 31, 2017

	Customer Relationships	Computer Software	Patents and Acquired Specific Technology	Others	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
<u>Cost</u>					
Balance at January 1, 2017	\$ 915,636	\$ 3,552,229	\$ 514,443	\$ 192,392	\$ 5,174,700
Additions	-	265,497	-	12,328	277,825
Disposals	-	(83,595)	(123,744)	(4,978)	(212,317)
Effect of foreign currency exchange differences	<u>-</u>	<u>(47,679)</u>	<u>(1,213)</u>	<u>(988)</u>	<u>(49,880)</u>
Balance at December 31, 2017	<u>\$ 915,636</u>	<u>\$ 3,686,452</u>	<u>\$ 389,486</u>	<u>\$ 198,754</u>	<u>\$ 5,190,328</u>
<u>Accumulated amortization</u>					
Balance at January 1, 2017	\$ 721,547	\$ 2,608,702	\$ 155,216	\$ 71,974	\$ 3,557,439
Amortization expense	80,313	316,580	43,493	17,280	457,666
Disposals	-	(72,481)	(123,743)	-	(196,224)
Effect of foreign currency exchange differences	<u>-</u>	<u>(30,680)</u>	<u>(4,882)</u>	<u>144</u>	<u>(35,418)</u>
Balance at December 31, 2017	<u>\$ 801,860</u>	<u>\$ 2,822,121</u>	<u>\$ 70,084</u>	<u>\$ 89,398</u>	<u>\$ 3,783,463</u>

For the year ended December 31, 2018

	Customer Relationships	Computer Software	Patents and Acquired Specific Technology	Others	Total
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>
<u>Cost</u>					
Balance at January 1, 2018	\$ 915,636	\$ 3,686,452	\$ 389,486	\$ 198,754	\$ 5,190,328
Additions	-	528,883	-	8,776	537,659
Disposals	-	(95,358)	(231)	(4,000)	(99,589)
Acquisition through business combinations (Note 30)	11,000,000	274,868	20,200,000	32,800	31,507,668
Effect of foreign currency exchange differences	<u>-</u>	<u>6,200</u>	<u>(899)</u>	<u>(332)</u>	<u>4,969</u>
Balance at December 31, 2018	<u>\$ 11,915,636</u>	<u>\$ 4,401,045</u>	<u>\$ 20,588,356</u>	<u>\$ 235,998</u>	<u>\$ 37,141,035</u>
<u>Accumulated amortization</u>					
Balance at January 1, 2018	\$ 801,860	\$ 2,822,121	\$ 70,084	\$ 89,398	\$ 3,783,463
Amortization expense	746,979	373,536	1,263,309	18,626	2,402,450
Disposals	-	(95,202)	(231)	(4,000)	(99,433)
Acquisition through business combinations (Note 30)	-	137,799	-	15,483	153,282
Effect of foreign currency exchange differences	<u>-</u>	<u>3,109</u>	<u>(475)</u>	<u>939</u>	<u>3,573</u>
Balance at December 31, 2018	<u>\$ 1,548,839</u>	<u>\$ 3,241,363</u>	<u>\$ 1,332,687</u>	<u>\$ 120,446</u>	<u>\$ 6,243,335</u>

For the year ended December 31, 2019

	Customer Relationships	Computer Software	Patents and Acquired Specific Technology	Others	Total
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>
<u>Cost</u>					
Balance at January 1, 2019	\$ 11,915,636	\$ 4,401,045	\$ 20,588,356	\$ 235,998	\$ 37,141,035
Adjustments on initial application of IFRS 16 (Note 3)	<u>-</u>	<u>-</u>	<u>-</u>	<u>(152,341)</u>	<u>(152,341)</u>
Adjusted balance at January 1, 2019	11,915,636	4,401,045	20,588,356	83,657	36,988,694
Additions	-	1,358,533	-	(7,625)	1,350,908
Disposals or derecognition	(915,635)	(1,123,446)	-	(6,315)	(2,045,396)
					(Continued)

	Customer Relationships	Computer Software	Patents and Acquired Specific Technology	Others	Total
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>
Acquisition through business combinations (Note 30)	\$ -	\$ 19,944	\$ 732,604	\$ -	\$ 752,548
Effect of foreign currency exchange differences	<u>-</u>	<u>(49,198)</u>	<u>(2,264)</u>	<u>(1,417)</u>	<u>(52,879)</u>
Balance at December 31, 2019	<u>\$ 11,000,001</u>	<u>\$ 4,606,878</u>	<u>\$ 21,318,696</u>	<u>\$ 68,300</u>	<u>\$ 36,993,875</u>
<u>Accumulated amortization</u>					
Balance at January 1, 2019	\$ 1,548,839	\$ 3,241,363	\$ 1,332,687	\$ 120,446	\$ 6,243,335
Adjustments on initial application of IFRS 16 (Note 3)	<u>-</u>	<u>-</u>	<u>-</u>	<u>(92,674)</u>	<u>(92,674)</u>
Adjusted balance at January 1, 2019	1,548,839	3,241,363	1,332,687	27,772	6,150,661
Amortization expense	1,033,464	583,300	1,955,703	4,139	3,576,606
Disposals or derecognition	(915,635)	(1,116,512)	-	(6,315)	(2,038,462)
Acquisition through business combinations (Note 30)	-	7,765	313,422	-	321,187
Effect of foreign currency exchange differences	<u>-</u>	<u>(38,577)</u>	<u>(1,639)</u>	<u>(293)</u>	<u>(40,509)</u>
Balance at December 31, 2019	<u>\$ 1,666,668</u>	<u>\$ 2,677,339</u>	<u>\$ 3,600,173</u>	<u>\$ 25,303</u>	<u>\$ 7,969,483</u> (Concluded)

	Customer Relationships	Computer Software	Patents and Acquired Specific Technology	Others	Total
	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>
<u>Cost</u>					
Balance at January 1, 2019	\$ 398,383	\$ 147,143	\$ 688,343	\$ 7,890	\$ 1,241,759
Adjustments on initial application of IFRS 16 (Note 3)	<u>-</u>	<u>-</u>	<u>-</u>	<u>(5,093)</u>	<u>(5,093)</u>
Adjusted balance at January 1, 2019	398,383	147,143	688,343	2,797	1,236,666
Additions	-	45,421	-	(255)	45,166
Disposals or derecognition	(30,613)	(37,561)	-	(211)	(68,385)
					(Continued)

	Customer Relationships	Computer Software	Patents and Acquired Specific Technology	Others	Total
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Acquisition through business combinations (Note 30)	\$ -	\$ 667	\$ 24,494	\$ -	\$ 25,161
Effect of foreign currency exchange differences	<u>-</u>	<u>(1,645)</u>	<u>(76)</u>	<u>(47)</u>	<u>(1,768)</u>
Balance at December 31, 2019	<u>\$ 367,770</u>	<u>\$ 154,025</u>	<u>\$ 712,761</u>	<u>\$ 2,284</u>	<u>\$ 1,236,840</u>
<u>Accumulated amortization</u>					
Balance at January 1, 2019	\$ 51,783	\$ 108,371	\$ 44,557	\$ 4,027	\$ 208,738
Adjustments on initial application of IFRS 16 (Note 3)	<u>-</u>	<u>-</u>	<u>-</u>	<u>(3,099)</u>	<u>(3,099)</u>
Adjusted balance at January 1, 2019	51,783	108,371	44,557	928	205,639
Amortization expense	34,553	19,502	65,386	138	119,579
Disposals or derecognition	(30,613)	(37,329)	-	(211)	(68,153)
Acquisition through business combinations (Note 30)	-	260	10,479	-	10,739
Effect of foreign currency exchange differences	<u>-</u>	<u>(1,290)</u>	<u>(55)</u>	<u>(10)</u>	<u>(1,355)</u>
Balance at December 31, 2019	<u>\$ 55,723</u>	<u>\$ 89,514</u>	<u>\$ 120,367</u>	<u>\$ 845</u>	<u>\$ 266,449</u> (Concluded)

Each class of other intangible assets was amortized on the straight-line basis over the following useful lives:

Customer relationships	11 years
Computer software	2-10 years
Patents and acquired specific technology	5-17 years
Others	5-32 years

20. LONG-TERM PREPAYMENTS FOR LEASE

Long-term prepayments for lease mainly represented land use rights located in China with periods for use

from 30 to 70 years and will expire through 2048 to 2089. Starting from 2019, the Group reclassified the amount of NT\$6,599,225 thousand (US\$220,636 thousand) and NT\$4,165,610 thousand (US\$139,271 thousand) to investment properties and right-of-use assets, respectively, upon initial application of IFRS 16.

21. BORROWINGS

a. Short-term borrowings

Short-term borrowings mainly represented unsecured revolving bank loans and letters of credit with annual interest rates at 0.76%-5.10% and 0.70%-5.40% as of December 31, 2018 and 2019, respectively.

b. Long-term borrowings

1) Bank loans

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Revolving bank loans			
Syndicated bank loans - repayable through May 2020 to May 2023, annual interest rates both were 1.80% as of December 31, 2018 and 2019	\$ 55,000,000	\$ 20,000,000	\$ 668,673
Others - repayable through January 2020 to July 2029, annual interest rates were 0.75%-3.77% and 0.82%-4.13% as of December 31, 2018 and 2019, respectively	75,533,354	105,214,824	3,517,714
Mortgage loans			
Repayable through January 2020 to December 2033, annual interest rates were 5.39% and 2.43%-4.90% as of December 31, 2018 and 2019, respectively	<u>4,393,826</u>	<u>4,880,822</u>	<u>163,183</u>
	134,927,180	130,095,646	4,349,570
Less: unamortized arrangement fee	<u>128,083</u>	<u>10,292</u>	<u>344</u>
	134,799,097	130,085,354	4,349,226
Less: current portion	<u>10,779,034</u>	<u>5,017,970</u>	<u>167,769</u>
	<u>\$ 124,020,063</u>	<u>\$ 125,067,384</u>	<u>\$ 4,181,457</u>

Pursuant to some of the above revolving bank loans agreements, the Company and its subsidiaries should meet certain financial covenants which are calculated based on each of their annual audited consolidated financial statements or semi-annual reviewed consolidated financial statements. The Company and its subsidiaries were in compliance with all of the financial covenants as of December 31, 2018 and 2019.

2) Long-term bills payable

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
China Bills Finance Corporation, repayable in February and March 2021, annual interest rates were 0.99% and 1.02%-1.05% as of December 31, 2018 and 2019, respectively	\$ 1,000,000	\$ 2,800,000	\$ 93,614
International Bills Finance Corporation, repayable in March 2021, annual interest rates were 1.00% and 1.02%- 1.05% as of December 31, 2018 and 2019, respectively	1,000,000	3,000,000	100,301
Ta Ching Bills Finance Corporation, repayable through January 2021 to March 2022, annual interest rates were 0.98% and 1.01%-1.03% as of December 31, 2018 and 2019, respectively	1,100,000	3,100,000	103,644
Mega Bills Finance Corporation, repayable in March 2022, annual interest rate was 1.04% as of December 31, 2019	-	2,000,000	66,868
	<u>3,100,000</u>	<u>10,900,000</u>	<u>364,427</u>
Less: unamortized discounts	<u>768</u>	<u>4,635</u>	<u>155</u>
	<u>\$ 3,099,232</u>	<u>\$ 10,895,365</u>	<u>\$ 364,272</u>

3) Long-term notes payable

The Company's subsidiary funded NT\$100,016 thousand (US\$3,344 thousand) from leasing companies by after-sales repurchasing its inventory and machinery. The subsidiary issued notes to those leasing companies for monthly installments through February 2021. As of December 31, 2019, the unamortized discounts were NT\$2,137 thousand (US\$72 thousand), current portion of long-term notes payable was NT\$94,798 thousand (US\$3,169 thousand), and the annual interest rates were 5.02%-6.89%.

22. BONDS PAYABLE

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Unsecured domestic bonds			
Repayable at maturity in January 2021 and interest due annually with annual interest rate at 1.30%	\$ 7,000,000	\$ 7,000,000	\$ 234,035
Repayable at maturity in January 2023 and interest due annually with annual interest rate at 1.50%	2,000,000	2,000,000	66,867
			(Continued)

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Repayable at maturity in January 2022 and interest due annually with annual interest rate at 1.25%	\$ 3,700,000	\$ 3,700,000	\$ 123,704
Repayable at maturity in January 2024 and interest due annually with annual interest rate at 1.45%	4,300,000	4,300,000	143,765
Repayable at maturity in April 2024 and interest due annually with annual interest rate at 0.90%	-	6,500,000	217,319
Repayable at maturity in April 2026 and interest due annually with annual interest rate at 1.03%	-	3,500,000	117,018
Unsecured international bonds			
US\$200,000 thousand (linked to New Taiwan dollar), repayable at maturity in October 2022 and interest due quarterly with annual interest rate at 2.15%	-	6,204,800	207,449
US\$100,000 thousand (linked to New Taiwan dollar), repayable at maturity in October 2024 and interest due quarterly with annual interest rate at 2.50%	-	3,102,400	103,725
Secured domestic bonds			
Repayable at maturity in December 2020 and interest due annually with nil annual interest rate	-	<u>250,000</u>	<u>8,358</u>
	<u>17,000,000</u>	<u>36,557,200</u>	<u>1,222,240</u>
Less: discounts on bonds payable	<u>14,064</u>	<u>35,045</u>	<u>1,172</u>
	<u>16,985,936</u>	<u>36,522,155</u>	<u>1,221,068</u>
Less: current portion of bonds payable	<u>-</u>	<u>250,000</u>	<u>8,358</u>
	<u>\$ 16,985,936</u>	<u>\$ 36,272,155</u>	<u>\$ 1,212,710</u>

(Concluded)

- a. In August 2017, AMPI offered its third private-placement unsecured domestic convertible bonds in NT\$100,000 thousand with a coupon rate of 3.5% and a maturity of 3 years. The conversion price was NT\$3 per share at offering date and all the bonds were subscribed by ASE. Such convertible bonds were deemed as a hybrid financial instrument under IFRS 9 and, therefore, ASE classified them as financial assets designated at FVTPL. As disclosed in Notes 14 and 30, the Group obtained control over AMPI starting from April 30, 2019 and the aforementioned contractual obligations assumed by AMPI and the contractual rights entitled to ASE were extinguished. The assets and liabilities related to the convertible bonds were eliminated upon the Group's preparation of the consolidated financial statements.
- b. In December 2017, AMPI offered the fifth secured domestic convertible bonds in NT\$250,000 thousand with nil coupon rate and a maturity of 3 years. Each holder of the bonds has the right to convert the bonds into ordinary shares of AMPI at the conversion price at any time from the 3 months after the offering date to the maturity date. The initial conversion price was NT\$4.8 per share at offering date and the conversion price will be subject to adjustment in the event of the conversion provisions due to anti-dilution clause. As of December 31, 2019, the conversion prices was NT\$4.8 (US\$0.2) per share. The bonds may be early redeemed at the option of AMPI, in whole or in part, at any time provided that (1) if the closing price of AMPI's ordinary shares on the Taipei Exchange exceeds the conversion price by 30% or more for 30 consecutive business days in the period starting from 3 months after the offering to 40 days before the maturity or (2) the outstanding amount of the

bonds falls below 10% of the originally offered in the period aforementioned.

- c. In October 2019, the Company offered the second unsecured international bonds in the aggregate amount of US\$300,000 thousand with par value of US\$1,000 thousand. These unsecured international bonds were divided into tranche A, in the amount of US\$200,000 thousand with maturity of 3 years, and tranche B, in the amount of US\$100,000 thousand with maturity of 5 years. The annual interest rates of tranche A and tranche B were 2.15% and 2.50%, respectively. All the proceeds from bonds offering were used to support ASE's green investments by subscribing for ASE's newly issued ordinary shares from its private placement.

23. OTHER PAYABLES

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Payables for property, plant and equipment	\$ 7,995,634	\$ 14,282,564	\$ 477,518
Accrued salary and bonus	10,591,202	10,384,089	347,178
Accrued employees' compensation and remuneration to directors	3,038,417	3,206,036	107,189
Accrued employee insurance	875,638	900,367	30,103
Accrued utilities	427,106	504,866	16,879
Others	<u>8,075,885</u>	<u>9,903,768</u>	<u>331,119</u>
	<u>\$ 31,003,882</u>	<u>\$ 39,181,690</u>	<u>\$ 1,309,986</u>

24. RETIREMENT BENEFIT PLANS

a. Defined contribution plans

- 1) The pension plan under the R.O.C. Labor Pension Act ("LPA") for the Group's R.O.C. resident employees is a government-managed defined contribution plan. Based on the LPA, the Company and its subsidiaries in Taiwan makes monthly contributions to employees' individual pension accounts at 6% of their monthly salaries.
- 2) The subsidiaries located in China, U.S.A., Malaysia, Singapore and Mexico also make contributions at various ranges according to relevant local regulations.

b. Defined benefit plans

- 1) The Company and its subsidiaries in Taiwan joined the defined benefit pension plan under the R.O.C. Labor Standards Law operated by the government. Pension benefits are calculated on the basis of the length of service and average monthly salaries of the last six months before retirement. The Company and its subsidiaries in Taiwan make contributions based on a certain percentage of their domestic employees' monthly salaries to a pension fund administered by the pension fund monitoring committee. Before the end of each year, the Company and its subsidiaries in Taiwan assess the balance in the pension fund. If the amount of the balance in the pension fund is inadequate to pay retirement benefits for employees who conform to retirement requirements in the next year, the Company and its subsidiaries in Taiwan are required to fund the difference in one appropriation that should be made by the end of March in the next year. Pension contributions are deposited in the Bank of Taiwan in the committee's name and are managed by the Bureau of Labor Funds, Ministry of Labor ("the Bureau"); the Company and its subsidiaries in Taiwan have no right to influence the investment policy and strategy.

- 2) ASE Japan has a pension plan under which eligible employees with more than ten years of service are entitled to receive pension benefits based on their length of service and salaries at the time of termination of employment. ASE Japan makes contributions based on a certain amount of pension cost to employees. ASE Korea also has a pension plan under which eligible employees and directors with more than one year of service are entitled to receive a lump-sum payment upon termination of their service with ASE Korea, based on their length of service and salaries at the time of termination. ASE Korea makes contributions based on a certain percentage of employees' salaries to an external financial institution in the names of employees and were administered by the management.
- 3) ASE, SPIL, ASE Test, Inc. and ASE Electronics Inc. maintain pension plans for executive managers. Pension costs under the plans were NT\$3,171 thousand, NT\$11,137 thousand and NT\$11,567 thousand (US\$387 thousand) for the years ended December 31, 2017, 2018 and 2019, respectively. As of December 31, 2018 and 2019, accrued pension liabilities for executive managers were NT\$320,542 thousand and NT\$335,109 thousand (US\$11,204 thousand), respectively.
- 4) The amounts included in the consolidated balance sheets arising from the Group's obligation in respect of its defined benefit plans excluding those for executive managers were as follows:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Present value of the defined benefit obligation	\$ 10,297,139	\$ 10,668,574	\$ 356,689
Fair value of the plan assets	<u>(5,492,123)</u>	<u>(5,742,178)</u>	<u>(191,982)</u>
Present value of unfunded defined benefit obligation	4,805,016	4,926,396	164,707
Recorded under other payables	(18,791)	(19,014)	(636)
Recorded under other non-current assets	<u>11,910</u>	<u>11,910</u>	<u>399</u>
Net defined benefit liability	<u>\$ 4,798,135</u>	<u>\$ 4,919,292</u>	<u>\$ 164,470</u>

Movements in net defined benefit liability (asset) were as follows:

	Present Value of the Defined Benefit Obligation	Fair Value of the Plan Assets	Net Defined Benefit Liability (Asset)
	NT\$	NT\$	NT\$
Balance at January 1, 2017	<u>\$ 8,389,884</u>	<u>\$ (4,417,367)</u>	<u>\$ 3,972,517</u>
Service cost			
Current service cost	278,412	-	278,412
Past service cost and gain on settlements	(68,979)	-	(68,979)
Net interest expense (income)	<u>157,404</u>	<u>(103,741)</u>	<u>53,663</u>
Recognized in profit or loss	<u>366,837</u>	<u>(103,741)</u>	<u>263,096</u>
Remeasurement			
Return on plan assets (excluding amounts included in net interest)	-	52,124	52,124
Actuarial loss arising from changes in financial assumptions	56,860	-	56,860

(Continued)

	Present Value of the Defined Benefit Obligation	Fair Value of the Plan Assets	Net Defined Benefit Liability (Asset)
	NTS	NTS	NTS
Actuarial gain arising from experience adjustments	\$ (315,090)	\$ -	\$ (315,090)
Actuarial loss arising from changes in demographic assumptions	<u>762</u>	<u>-</u>	<u>762</u>
Recognized in other comprehensive income	<u>(257,468)</u>	<u>52,124</u>	<u>(205,344)</u>
Contributions from the employer	-	(484,790)	(484,790)
Benefits paid from the pension fund	(690,830)	690,830	-
Benefits paid from the Group	(96,575)	-	(96,575)
Exchange differences on foreign plans	<u>198,790</u>	<u>(78,429)</u>	<u>120,361</u>
Balance at December 31, 2017	<u>7,910,638</u>	<u>(4,341,373)</u>	<u>3,569,265</u>
Service cost			
Current service cost	224,126	-	224,126
Net interest expense (income)	<u>178,779</u>	<u>(122,709)</u>	<u>56,070</u>
Recognized in profit or loss	<u>402,905</u>	<u>(122,709)</u>	<u>280,196</u>
Remeasurement			
Return on plan assets (excluding amounts included in net interest)	-	(16,589)	(16,589)
Actuarial gain arising from changes in financial assumptions	(8,643)	-	(8,643)
Actuarial loss arising from experience adjustments	302,499	-	302,499
Actuarial loss arising from changes in demographic assumptions	8,190	-	8,190
Actuarial loss arising from changes in other assumptions	<u>22,723</u>	<u>-</u>	<u>22,723</u>
Recognized in other comprehensive income	<u>324,769</u>	<u>(16,589)</u>	<u>308,180</u>
Contributions from the employer	-	(364,237)	(364,237)
Benefits paid from the pension fund	(541,989)	541,989	-
Benefits paid from the Group	(295,953)	-	(295,953)
Business combinations	2,522,805	(1,210,524)	1,312,281
Exchange differences on foreign plans	<u>(26,036)</u>	<u>21,320</u>	<u>(4,716)</u>
Balance at December 31, 2018	<u>10,297,139</u>	<u>(5,492,123)</u>	<u>4,805,016</u>
Service cost			
Current service cost	211,226	-	211,226
Net interest expense (income)	<u>151,635</u>	<u>(97,387)</u>	<u>54,248</u>
Recognized in profit or loss	<u>362,861</u>	<u>(97,387)</u>	<u>265,474</u>

(Continued)

	Present Value of the Defined Benefit Obligation	Fair Value of the Plan Assets	Net Defined Benefit Liability (Asset)
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>
Remeasurement			
Return on plan assets (excluding amounts included in net interest)	\$ -	\$ (104,516)	\$ (104,516)
Actuarial gain arising from changes in financial assumptions	398,732	-	398,732
Actuarial loss arising from experience adjustments	70,374	-	70,374
Actuarial loss arising from changes in demographic assumptions	<u>(2,329)</u>	<u>-</u>	<u>(2,329)</u>
Recognized in other comprehensive income	<u>466,777</u>	<u>(104,516)</u>	<u>362,261</u>
Contributions from the employer	-	(514,617)	(514,617)
Benefits paid from the pension fund	(393,897)	393,897	-
Benefits paid from the Group	(21,439)	-	(21,439)
Business combinations	62,857	(28,380)	34,477
Exchange differences on foreign plans	<u>(105,724)</u>	<u>100,948</u>	<u>(4,776)</u>
Balance at December 31, 2019	<u>\$ 10,668,574</u>	<u>\$ (5,742,178)</u>	<u>\$ 4,926,396</u> (Concluded)

	Present Value of the Defined Benefit Obligation	Fair Value of the Plan Assets	Net Defined Benefit Liability (Asset)
	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>
Balance at January 1, 2019	<u>\$ 344,271</u>	<u>\$ (183,621)</u>	<u>\$ 160,650</u>
Service cost			
Current service cost	7,062	-	7,062
Net interest expense (income)	<u>5,070</u>	<u>(3,256)</u>	<u>1,814</u>
Recognized in profit or loss	<u>12,132</u>	<u>(3,256)</u>	<u>8,876</u>
Remeasurement			
Return on plan assets (excluding amounts included in net interest)	-	(3,494)	(3,494)
Actuarial gain arising from changes in financial assumptions	13,331	-	13,331
Actuarial loss arising from experience adjustments	2,353	-	2,353
Actuarial loss arising from changes in demographic assumptions	<u>(78)</u>	<u>-</u>	<u>(78)</u>
Recognized in other comprehensive income	<u>15,606</u>	<u>(3,494)</u>	<u>12,112</u>

(Continued)

	Present Value of the Defined Benefit Obligation	Fair Value of the Plan Assets	Net Defined Benefit Liability (Asset)
	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>
Contributions from the employer	\$ -	\$ (17,206)	\$ (17,206)
Benefits paid from the pension fund	(13,169)	13,169	-
Benefits paid from the Group	(717)	-	(717)
Business combinations	2,101	(949)	1,152
Exchange differences on foreign plans	<u>(3,535)</u>	<u>3,375</u>	<u>(160)</u>
Balance at December 31, 2019	<u>\$ 356,689</u>	<u>\$ (191,982)</u>	<u>\$ 164,707</u> (Concluded)

- 5) The fair value of the plan assets by major categories at each balance sheet date was as follows:

	December 31		
	<u>2018</u>	<u>2019</u>	
	NT\$	NT\$	US\$ (Note 4)
Cash	\$ 2,340,903	\$ 2,396,657	\$ 80,129
Debt instruments	902,886	1,029,884	34,433
Equity instruments	2,164,895	2,315,637	77,420
Others	<u>83,439</u>	<u>-</u>	<u>-</u>
Total	<u>\$ 5,492,123</u>	<u>\$ 5,742,178</u>	<u>\$ 191,982</u>

- 6) Through the defined benefit plans under the Labor Standards Law of the R.O.C., the Group in Taiwan are exposed to the following risks:

- a) Investment risk

The plan assets are invested in equity and debt securities, bank deposits, etc. The investment is conducted at the discretion of the Bureau or under the mandated management. However, in accordance with relevant regulations, the return generated by plan assets should not be below the interest rate for a 2-year time deposit with local banks.

- b) Interest risk

A decrease in the government bond interest rate will increase the present value of the defined benefit obligation; however, this will be partially offset by an increase in the return on the plan's debt investments.

- c) Salary risk

The present value of the defined benefit obligation is calculated by reference to the future salaries of plan participants. As such, an increase in the salary of the plan participants will increase the present value of the defined benefit obligation.

- 7) The management of ASE Korea is responsible for the administration of the fund and determination of the investment strategies according to related local regulations. ASE Korea is responsible for the shortfall between the fund and the defined benefit obligation. The plan assets are invested in the certificates of deposits.

- 8) The present value of the defined benefit obligation and the related current service cost and past service cost were measured using the Projected Unit Credit Method. Except the pension plans for executive managers, the key assumptions used for the actuarial valuations were as follow:

	December 31	
	2018	2019
Discount rates (%)	0.05-3.02	0.08-2.85
Expected rates of salary increase (%)	1.75-4.06	1.00-4.01

The sensitivity analysis below has been determined based on reasonably possible changes of the respective assumptions occurring at each balance sheet date, while holding all other assumptions constant.

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Discount Rate			
0.5% higher	\$ (555,181)	\$ (555,266)	\$ (18,565)
0.5% lower	\$ 603,089	\$ 601,616	\$ 20,114
Expected rates of salary increase			
0.5% higher	\$ 591,712	\$ 591,915	\$ 19,790
0.5% lower	\$ (547,522)	\$ (545,528)	\$ (18,239)

The sensitivity analysis presented above may not be representative of the actual change in the defined benefit obligation as it is unlikely that the change in assumptions would occur in isolation of one another as some of the assumptions may be correlated.

- 9) Maturity analysis of undiscounted pension benefit

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
No later than 1 year	\$ 368,592	\$ 422,067	\$ 14,111
Later than 1 year but not later than 5 years	1,886,738	2,081,540	69,593
Later than 5 years	<u>13,322,695</u>	<u>12,216,422</u>	<u>408,439</u>
	<u>\$ 15,578,025</u>	<u>\$ 14,720,029</u>	<u>\$ 492,143</u>

The Group expected to make contributions of NT\$484,247 thousand and NT\$533,777 thousand (US\$17,846 thousand) to the defined benefit plans in the next year starting from January 1, 2019 and 2020, respectively.

As of December 31, 2018 and 2019, the average duration of the defined benefit obligation excluding those for executive managers of the Group was 9 to 15 years and 10 to 14 years, respectively.

25. EQUITY

a. Share capital

Ordinary shares

	December 31	
	2018	2019
Numbers of shares authorized (in thousands)	<u>5,000,000</u>	<u>5,000,000</u>
Numbers of shares reserved (in thousands)		
Employee share options	<u>400,000</u>	<u>400,000</u>
Number of shares issued and fully paid (in thousands)	<u>4,321,714</u>	<u>4,330,528</u>

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Share capital authorized	<u>\$ 50,000,000</u>	<u>\$ 50,000,000</u>	<u>\$ 1,671,682</u>
Share capital reserved			
Employee share options	<u>\$ 4,000,000</u>	<u>\$ 4,000,000</u>	<u>\$ 133,735</u>
Share capital issued and fully paid	<u>\$ 43,217,144</u>	<u>\$ 43,305,287</u>	<u>\$ 1,447,853</u>

American Depositary Receipts

The Company's ADS represents 2 ordinary shares of the Company. As of December 31, 2018 and 2019, 140,042 thousand and 125,542 thousand ADSs were outstanding and represented approximately 280,085 thousand and 251,084 thousand ordinary shares of the Company, respectively.

b. Capital surplus

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
<u>May be used to offset a deficit, distributed as cash dividends, or transferred to share capital (1)</u>			
Issuance of ordinary shares	\$ 12,906,401	\$ 13,070,330	\$ 436,989
Merger by share exchange	117,693,658	117,693,658	3,934,927
Difference between consideration and the carrying amount of the subsidiaries' net assets during actual disposal or acquisition	<u>6,034,102</u>	<u>3,254,489</u>	<u>108,809</u>
	<u>136,634,161</u>	<u>134,018,477</u>	<u>4,480,725</u>
<u>May be used to offset a deficit only</u>			
Changes in percentage of ownership interest in subsidiaries (2)	3,727,336	891,876	29,819
Treasury share transactions	182,354	364,708	12,193

(Continued)

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Exercised employee share options	\$ 1,366,480	\$ 1,443,995	\$ 48,278
Expired share options (Note 29)	645,978	645,903	21,595
Share of changes in capital surplus of associates	87,136	16,266	544
Dividends that the claim period has elapsed and unclaimed by shareholders	<u>872</u>	<u>1,942</u>	<u>65</u>
	<u>6,010,156</u>	<u>3,364,690</u>	<u>112,494</u>
<u>May not be used for any purpose</u>			
Employee share options	583,542	1,304,250	43,606
Others (3)	<u>48,805</u>	<u>222,946</u>	<u>7,454</u>
	<u>632,347</u>	<u>1,527,196</u>	<u>51,060</u>
	<u>\$ 143,276,664</u>	<u>\$ 138,910,363</u>	<u>\$ 4,644,279</u>
			(Concluded)

- 1) Such capital surplus may be used to offset a deficit; in addition, when the Company has no deficit, such capital surplus may be distributed as cash dividends or transferred to share capital (limited to a certain percentage of the Company's capital surplus and once a year).
- 2) Such capital surplus arises from the effect of changes in ownership interest in a subsidiary resulted from equity transactions other than actual disposal or acquisition, or from changes in capital surplus of subsidiaries accounted for using the equity method.
- 3) Such capital surplus represents the excess of the carrying amount of related accounts over the par value due to employee share options exercised and the Company has not completed registration formalities.

The Company's special shareholders' meeting held in June 2018 resolved to distribute cash to its shareholders in the amount of NT\$10,795,980 thousand from capital surplus arising from issuance of ordinary shares.

c. Retained earnings and dividend policy

The amended Articles of Incorporation of the Company (the "Articles") approved in shareholders' meeting in June 2019 provides that annual net income shall be distributed in the following order:

- 1) Replenishment of deficits;
- 2) 10.0% as legal reserve;
- 3) Special reserve appropriated or reversed in accordance with laws or regulations set forth by the authorities concerned;

For the policies on the distribution of employees' compensation and remuneration of directors, refer to employees' compensation and remuneration of directors in Note 26(g).

The Company is currently in the mature growth stage. To meet the capital needs for business development now and in the future and satisfy the shareholders' demand for cash inflows, the Company shall use residual dividend policy to distribute dividends, of which the cash dividend is not lower than

30% of the total dividend distribution, with the remainder to be distributed in shares. A distribution plan is also to be made by the board of directors and passed for resolution in the shareholders' meeting.

Appropriation of earnings to legal reserve shall be made until the legal reserve equals the Company's share capital. Legal reserve may be used to offset deficits. If the Company has no deficit and the legal reserve has exceeded 25% of the Company's share capital, the excess may be transferred to capital or distributed in cash.

Items referred to under Rule No. 1010012865 and Rule No. 1010047490 issued by the Financial Supervisory Commission R.O.C. and in the directive titled "Questions and Answers for Special Reserves Appropriated Following Adoption of IFRSs" should be appropriated to or reversed from a special reserve by the Company.

The appropriation of earnings for 2018 resolved at the Company's shareholders' meeting in June 2019, was as follows:

	Appropriation of Earnings		Dividends Per Share	
	NT\$	US\$ (Note 4)	NT\$ (in dollars)	US\$ (Note 4) (in dollars)
Legal reserve	\$ 2,203,895	\$ 73,684		
Special reserve	3,548,844	118,651		
Cash dividends	<u>10,806,454</u>	<u>361,299</u>	\$ 2.50	\$ 0.1
	<u>\$ 16,559,193</u>	<u>\$ 553,634</u>		

d. Others equity items

1) Exchange differences on translating foreign operations

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Balance at January 1	\$ (1,643,623)	\$ (6,733,659)	\$ (5,888,574)	\$ (196,876)
Exchange differences on translating foreign operations	(4,952,815)	426,186	(4,788,135)	(160,085)
Share from associates and joint venture accounted for using the equity method	(137,221)	136,608	(85,975)	(2,875)
Disposal of associates and joint venture accounted for using the equity method	<u>-</u>	<u>282,291</u>	<u>-</u>	<u>-</u>
Balance at December 31	<u>\$ (6,733,659)</u>	<u>\$ (5,888,574)</u>	<u>\$ (10,762,684)</u>	<u>\$ (359,836)</u>

2) Unrealized gain (loss) on available-for-sale financial assets

	For the Year Ended December 31, 2017
	<u>NT\$</u>
Balance at January 1, 2017	\$ (197,314)
Unrealized gain arising on revaluation of available-for-sale financial assets	169,585
Cumulative loss reclassified to profit or loss on impairment of available-for-sale financial assets	50,206
Cumulative gain reclassified to profit or loss on disposal of available-for-sale financial assets	(1,517)
Share from associates and joint venture accounted for using the equity method	<u>401,610</u>
Balance at December 31, 2017	<u>\$ 422,570</u>

3) Unrealized gain (loss) on financial assets at FVTOCI

	For the Year Ended December 31		
	2018	2019	
	<u>NT\$</u>	<u>NT\$</u>	<u>US\$ (Note 4)</u>
Balance at January 1	\$ 422,570	\$ (1,015,107)	\$ (33,939)
Adjustment on initial application of IFRS 9	<u>(287,053)</u>	<u>-</u>	<u>-</u>
Balance at January 1 as adjusted	135,517	(1,015,107)	(33,939)
Unrealized gain (loss) recognized during the year			
Debt instruments	(63,076)	(2,052)	(69)
Equity instruments	(398,513)	(283,472)	(9,477)
Share from associates and joint venture accounted for using the equity method	(555,271)	1,501,689	50,207
Realized loss (gain) recognized during the year			
Disposal of equity instruments and transferred cumulative gain to retained earnings	(1,518)	-	-
Disposal of associates and joint venture accounted for using the equity method	(133,364)	-	-
Share from associates and joint venture accounted for using the equity method	<u>1,118</u>	<u>(404,156)</u>	<u>(13,512)</u>
Balance at December 31	<u>\$ (1,015,107)</u>	<u>\$ (203,098)</u>	<u>\$ (6,790)</u>

e. Treasury shares (in thousand shares)

	Balance at January 1	Addition	Decrease	Balance at December 31
<u>2017</u>				
Shares held by subsidiaries	145,883	-	-	145,883
Shares reserved for bonds conversion	<u>120,000</u>	<u>-</u>	<u>-</u>	<u>120,000</u>
	<u>265,883</u>	<u>-</u>	<u>-</u>	<u>265,883</u>
<u>2018</u>				
Shares held by subsidiaries	145,883	-	(72,942)	72,941
Shares reserved for bonds conversion	120,000	-	(120,000)	-
Shares repurchased from dissenting shareholders in accordance with Business Mergers And Acquisitions Act	<u>-</u>	<u>1,852</u>	<u>(1,852)</u>	<u>-</u>
	<u>265,883</u>	<u>1,852</u>	<u>(194,794)</u>	<u>72,941</u>
<u>2019</u>				
Shares held by subsidiaries	<u>72,941</u>	<u>-</u>	<u>-</u>	<u>72,941</u>

The Company's shares held by its subsidiaries at each balance sheet date were as follows:

	Shares Held By Subsidiaries (in thousand shares)	Carrying Amount NT\$	Carrying Amount US\$ (Note 4)	Fair Value NT\$	Fair Value US\$ (Note 4)
<u>December 31, 2018</u>					
ASE Test	44,100	\$ 1,380,721		\$ 2,571,044	
J&R Holding	23,352	381,709		1,361,415	
ASE Test, Inc.	<u>5,489</u>	<u>196,677</u>		<u>320,031</u>	
	<u>72,941</u>	<u>\$ 1,959,107</u>		<u>\$ 4,252,490</u>	
<u>December 31, 2019</u>					
ASE Test	44,100	\$ 1,380,721	\$ 46,162	\$ 3,669,140	\$ 122,673
J&R Holding	23,352	381,709	12,762	1,942,876	64,957
ASE Test, Inc.	<u>5,489</u>	<u>196,677</u>	<u>6,576</u>	<u>456,717</u>	<u>15,270</u>
	<u>72,941</u>	<u>\$ 1,959,107</u>	<u>\$ 65,500</u>	<u>\$ 6,068,733</u>	<u>\$ 202,900</u>

Fair value (Level 1) of the Company's shares held by subsidiaries is based on the closing price from an available published price quotation.

In March 2018, ASE's board of directors approved, in accordance with Business Mergers and Acquisitions Act, to repurchase ASE's 1,852 thousand ordinary shares at \$38.5 per share held by the shareholders dissenting on the share exchange transaction which has been approved by both of ASE and SPIL's special shareholders' meetings on February 12, 2018. In addition, ASE's board of directors approved a capital reduction in April 2018 to cancel ASE's 121,852 thousand treasury shares and the record date was April 9, 2018. ASE has completed the registration formalities before April 30, 2018.

ASE issued ordinary shares in connection with its merger with its subsidiaries. The shares held by its subsidiaries were reclassified to treasury shares on the proportion owned by ASE. As disclosed in Note 1, ASE's ordinary shares held by subsidiaries were exchanged to the Company's ordinary shares on April 30, 2018 in accordance with the joint share exchange agreement.

The subsidiaries holding the aforementioned treasury shares retain shareholders' rights except the rights to participate in any capital increase by cash and voting.

f. Non-controlling interests

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Balance at January 1	\$ 12,000,551	\$ 13,190,129	\$ 17,639,487	\$ 589,752
Adjustment on initial application of IFRS 15	-	5,183	-	-
Balance at January 1 as adjusted	12,000,551	13,195,312	17,639,487	589,752
Share of profit for the year	1,677,941	1,203,588	1,207,974	40,387
Other comprehensive income (loss)				
Exchange difference on translating foreign operations	(334,920)	(198,365)	(414,010)	(13,842)
Unrealized gain on available-for-sale financial assets	5,763	-	-	-
Unrealized loss on equity instruments at FVTOCI	-	(23,928)	(10,773)	(360)
Remeasurement on defined benefit plans	(13,724)	(30,079)	(7,422)	(248)
Non-controlling interests arising from acquisition of subsidiaries (Note 30)	-	3,582,866	666,651	22,289
Subscribing for ordinary shares form subsidiaries' cash capital increase	-	-	83,044	2,776
Acquisition of non-controlling interests in subsidiaries (Note 32)	-	(2,492,915)	(5,084,785)	(170,003)
Partial disposal of subsidiaries (Note 32)	(3,055)	1,693,064	-	-
Subsidiaries' buy back of their own outstanding ordinary shares (Note 32)	-	(801,884)	(2,017,319)	(67,446)

(Continued)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Non-controlling interest relating to outstanding vested employee share options granted by subsidiaries	\$ 263,213	\$ 1,936,643	\$ 1,672,310	\$ 55,911
Non-controlling interest relating to outstanding expired employee share options granted by subsidiaries	(159,200)	-	-	-
Cash dividends to non-controlling interests	<u>(246,440)</u>	<u>(424,815)</u>	<u>(360,245)</u>	<u>(12,044)</u>
Balance at December 31	<u>\$ 13,190,129</u>	<u>\$ 17,639,487</u>	<u>\$ 13,374,912</u>	<u>\$ 447,172</u> (Concluded)

26. PROFIT BEFORE INCOME TAX

a. Other operating income and expenses, net

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Rental income	\$ 131,570	\$ 182,411	\$ 136,301	\$ 4,557
Gains (losses) on disposal of property, plant and equipment and other assets	367,110	(14,644)	(164,187)	(5,490)
Impairment losses on property, plant and equipment and goodwill	(714,675)	(133,071)	(201,006)	(6,720)
Loss on damages and claims	(85,585)	(24,114)	(459,544)	(15,364)
Others	<u>410,136</u>	<u>361,001</u>	<u>419,881</u>	<u>14,038</u>
	<u>\$ 108,556</u>	<u>\$ 371,583</u>	<u>\$ (268,555)</u>	<u>\$ (8,979)</u>

b. Other income

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Government subsidy	\$ 341,844	\$ 435,950	\$ 624,351	\$ 20,874
Interest income	306,871	466,211	549,681	18,378
Dividends income	<u>59,039</u>	<u>190,397</u>	<u>185,061</u>	<u>6,187</u>
	<u>\$ 707,754</u>	<u>\$ 1,092,558</u>	<u>\$ 1,359,093</u>	<u>\$ 45,439</u>

c. Other gains, net

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Remeasurement gain on investments accounted for using the equity method due to step acquisition (Note 14)	\$ -	\$ 7,421,408	\$ 319,712	\$ 10,689
Net gains on financial assets mandatorily at FVTPL	-	3,388,485	3,631,763	121,423
Gain on disposal of subsidiaries (Note 31)	5,589,457	-	-	-
Net losses arising on financial instruments held for trading	(3,111,253)	(1,398,995)	(1,984,941)	(66,364)
Net gains on financial assets designated as at FVTPL	327,351	-	-	-
Foreign exchange gains (losses), net	3,502,586	(1,015,615)	1,125,681	37,635
Impairment losses on financial assets	(50,206)	(521,010)	(400,201)	(13,380)
Others	<u>1,518</u>	<u>-</u>	<u>(8,025)</u>	<u>(268)</u>
	<u>\$ 6,259,453</u>	<u>\$ 7,874,273</u>	<u>\$ 2,683,989</u>	<u>\$ 89,735</u>

In addition to the remeasurement gain on investments accounted for using the equity method due to the step acquisition disclosed in Note 14, the Company, as disclosed in Note 1, acquired all issued and outstanding ordinary shares of SPIL on April 30, 2018 (the acquisition date) in accordance with the joint share exchange agreement and had the control over SPIL. The investment in SPIL originally accounted for using the equity method was remeasured to the fair value at the acquisition date and the Group recognized a remeasurement gain of NT\$7,421,408 thousand for the year ended December 31, 2018.

d. Finance costs

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Interest on lease liabilities	\$ -	\$ -	\$ 88,742	\$ 2,967
Total interest expense for financial liabilities measured at amortized cost	2,016,298	3,597,932	4,211,541	140,807
Less: Amounts included in the cost of qualifying assets				
Inventories related to real estate business	(190,137)	(11,648)	(35,713)	(1,194)
Property, plant and equipment	(51,262)	(50,309)	(77,715)	(2,598)
Investment properties	<u>(13)</u>	<u>(89)</u>	<u>-</u>	<u>-</u>
	1,774,886	3,535,886	4,186,855	139,982
Other finance costs	<u>24,608</u>	<u>32,355</u>	<u>16,540</u>	<u>553</u>
	<u>\$ 1,799,494</u>	<u>\$ 3,568,241</u>	<u>\$ 4,203,395</u>	<u>\$ 140,535</u>

Information relating to the capitalized borrowing costs was as follows:

	For the Year Ended December 31		
	2017	2018	2019
Annual interest capitalization rates			
Inventories related to real estate business (%)	4.35-5.39	4.35	4.35-4.85
Property, plant and equipment (%)	1.26-5.49	1.84-4.52	0.96-4.03
Investment properties (%)	1.26-1.97	1.84-2.23	-

e. Depreciation and amortization

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Property, plant and equipment	\$ 28,625,287	\$ 39,893,786	\$ 45,240,667	\$ 1,512,560
Right-of-use assets	-	-	1,055,458	35,288
Investment properties	122,231	392,667	594,110	19,863
Other intangible assets	<u>457,666</u>	<u>2,402,450</u>	<u>3,576,606</u>	<u>119,579</u>
Total	<u>\$ 29,205,184</u>	<u>\$ 42,688,903</u>	<u>\$ 50,466,841</u>	<u>\$ 1,687,290</u>
Summary of depreciation by function				
Operating costs	\$ 26,731,714	\$ 37,903,050	\$ 43,749,333	\$ 1,462,699
Operating expenses	<u>2,015,804</u>	<u>2,383,403</u>	<u>3,140,902</u>	<u>105,012</u>
	<u>\$ 28,747,518</u>	<u>\$ 40,286,453</u>	<u>\$ 46,890,235</u>	<u>\$ 1,567,711</u>
Summary of amortization by function				
Operating costs	\$ 140,175	\$ 1,394,664	\$ 2,092,074	\$ 69,946
Operating expenses	<u>317,491</u>	<u>1,007,786</u>	<u>1,484,532</u>	<u>49,633</u>
	<u>\$ 457,666</u>	<u>\$ 2,402,450</u>	<u>\$ 3,576,606</u>	<u>\$ 119,579</u>

Operating expenses directly related to investment properties

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Direct operating expenses of investment properties that generated rental income	<u>\$ 465,458</u>	<u>\$ 1,276,751</u>	<u>\$ 1,232,826</u>	<u>\$ 41,218</u>

f. Employee benefits expense

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Post-employment benefits				
Defined contribution plans	\$ 2,340,826	\$ 2,965,054	\$ 3,148,209	\$ 105,256
Defined benefit plans	<u>266,267</u>	<u>291,333</u>	<u>277,041</u>	<u>9,263</u>
	2,607,093	3,256,387	3,425,250	114,519
Equity-settled share-based payments	438,765	215,648	871,699	29,144
Other employee benefits	<u>51,043,198</u>	<u>63,940,430</u>	<u>70,279,752</u>	<u>2,349,707</u>
	<u>\$ 54,089,056</u>	<u>\$ 67,412,465</u>	<u>\$ 74,576,701</u>	<u>\$ 2,493,370</u>
Summary of employee benefits expense by function				
Operating costs	\$ 35,978,403	\$ 45,363,170	\$ 49,173,778	\$ 1,644,058
Operating expenses	<u>18,110,653</u>	<u>22,049,295</u>	<u>25,402,923</u>	<u>849,312</u>
	<u>\$ 54,089,056</u>	<u>\$ 67,412,465</u>	<u>\$ 74,576,701</u>	<u>\$ 2,493,370</u>

g. Employees' compensation and the remuneration to directors

The Articles before and after the amendment approved in shareholders' meeting in June 2019 both stipulates to distribute employees' compensation and remuneration to directors at the rates in 0.01%-1.00% and no higher than 0.75%, respectively, of net profit before income tax, employees' compensation and remuneration to directors.

	For the Year Ended December 31				
	2018		2019		
	Accrual Rate	Accrual Amount (NT\$)	Accrual Rate	Accrual Amount NT\$	Accrual Amount US\$ (Note 4)
Employees' compensation	0.20%	\$ 45,430	0.20%	\$ 34,400	\$ 1,150
Remuneration to directors	0.15%	34,073	0.40%	68,803	2,300

If there is a change in the proposed amounts after the consolidated financial statement authorized for issue, the differences are recorded as a change in accounting estimate and will be adjusted in the following year.

In March 2019, the board of directors resolved the appropriations of employees' compensation and remuneration to directors in cash for 2018. The differences between the resolved amounts and the accrued amounts reflected in the consolidated financial statements for the years ended December 31, 2018 were deemed changes in estimates. The difference was NT\$3 thousand (US\$0.1 thousand) and was adjusted in net profit for the year ended December 31, 2019.

	For Year 2018	
	Employees' compensation NT\$	Remuneration to directors NT\$
Resolved by the board of directors	\$ 45,430	\$ 34,070
Recognized in the consolidated financial statements	<u>\$ 45,430</u>	<u>\$ 34,073</u>

Information on the employees' compensation and the remuneration to directors resolved by the board of directors are available on the Market Observation Post System website of the Taiwan Stock Exchange (the "TSE").

27. INCOME TAX

The Company and its subsidiaries expected to file a consolidated tax return for corporate income tax starting from 2019 and for unappropriated earnings starting from 2018.

a. Income tax recognized in profit or loss

The major components of income tax were as follows:

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Current income tax				
In respect of the current year	\$ 4,979,766	\$ 5,207,309	\$ 5,002,954	\$ 167,267
Income tax on unappropriated earnings	1,076,353	(1,022,560)	19,115	639
Changes in estimate for prior years	<u>(88,162)</u>	<u>(103,822)</u>	<u>(352,579)</u>	<u>(11,788)</u>
	<u>5,967,957</u>	<u>4,080,927</u>	<u>4,669,490</u>	<u>156,118</u>
Deferred income tax				
In respect of the current year	534,472	(227,327)	563,512	18,840
Effect of tax rate changes	-	657,346	54,072	1,808
Changes in estimate for prior years	52,872	5,696	(213,758)	(7,147)
Effect of foreign currency exchange differences	<u>(31,698)</u>	<u>(3,273)</u>	<u>(62,070)</u>	<u>(2,075)</u>
	<u>555,646</u>	<u>432,442</u>	<u>341,756</u>	<u>11,426</u>
Income tax expense recognized in profit or loss	<u>\$ 6,523,603</u>	<u>\$ 4,513,369</u>	<u>\$ 5,011,246</u>	<u>\$ 167,544</u>

A reconciliation of income tax expense calculated at the statutory rates and income tax expense recognized in profit or loss was as follows:

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Profit before income tax	<u>\$ 31,020,663</u>	<u>\$ 31,937,678</u>	<u>\$ 23,279,811</u>	<u>\$ 778,328</u>
Income tax expense calculated at the statutory rates	\$ 10,890,498	\$ 13,540,599	\$ 11,802,811	\$ 394,611
Nontaxable expense in determining taxable income	483,715	353,019	459,133	15,350
Tax-exempt income	(623,566)	(2,515,453)	(495,883)	(16,579)
Additional income tax on unappropriated earnings	1,076,353	(1,022,560)	19,115	639

(Continued)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Loss carry-forward and income tax credits currently used	\$ (1,124,043)	\$ (971,124)	\$ (898,198)	\$ (30,030)
Remeasurement of deferred income tax assets, net	(4,131,473)	(4,776,271)	(5,588,335)	(186,838)
Changes in estimate for prior periods	(88,162)	(103,822)	(352,579)	(11,788)
Withholding tax	<u>40,281</u>	<u>8,981</u>	<u>65,182</u>	<u>2,179</u>
Income tax expense recognized in profit or loss	<u>\$ 6,523,603</u>	<u>\$ 4,513,369</u>	<u>\$ 5,011,246</u>	<u>\$ 167,544</u> (Concluded)

For the year ended December 31, 2017, the Group applied a tax rate of 17% for resident entities subject to the Income Tax Law of the R.O.C. The Income Tax Act in the R.O.C. was amended in 2018, and the corporate income tax rate was adjusted from 17% to 20%. In addition, the rate of the corporate surtax applicable to the 2018 unappropriated earnings was reduced from 10% to 5%. The subsidiaries located in China applied tax rate of 25%. For other jurisdictions, the Group measures taxes by using the applicable tax rate for each individual jurisdiction.

In July 2019, the President of the R.O.C. announced the amendments to the Statute for Industrial Innovation, which stipulate that the amounts of unappropriated earnings in 2018 and thereafter that are reinvested in the construction or purchase of certain assets or technologies are allowed as deduction when computing the income tax on unappropriated earnings. The Group has already deducted the amount of capital expenditure from the unappropriated earnings in 2018 that was reinvested when calculating the tax on unappropriated earnings. However, the Group did not deduct such investment amounts from the undistributed earnings in calculation of income tax on unappropriated earnings in 2019.

b. Income tax recognized directly in equity

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Deferred income tax				
Related to employee share options	\$ <u>262</u>	\$ <u>(1,099)</u>	\$ <u>1,404</u>	\$ <u>47</u>

c. Income tax recognized in other comprehensive income

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Deferred income tax				
Related to remeasurement of defined benefit plans	\$ (51,217)	\$ 55,346	\$ 74,308	\$ 2,484
Unrealized loss on equity instruments at fair value through other comprehensive income	-	-	(78,124)	(2,612)
				(Continued)

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Effect of tax rate changes	\$ -	\$ 70,755	\$ -	\$ -
Income tax recognized in other comprehensive income	\$ (51,217)	\$ 126,101	\$ (3,816)	\$ (128) (Concluded)

d. Current tax assets and liabilities

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Current tax assets			
Tax refund receivable	\$ 50,456	\$ 90,569	\$ 3,028
Prepaid income tax	473,807	462,523	15,464
	<u>\$ 524,263</u>	<u>\$ 553,092</u>	<u>\$ 18,492</u>
Current tax liabilities			
Income tax payable	\$ 6,781,136	\$ 4,858,578	\$ 162,440

e. Deferred tax assets and liabilities

The Group offset certain deferred tax assets and deferred tax liabilities which met the offset criteria.

The movements of deferred tax assets and deferred tax liabilities were as follows:

For the year ended December 31, 2017

	Balance at January 1	Recognized in Profit or Loss	Recognized in Other Comprehensive Income	Recognized in Equity	Exchange Differences	Balance at December 31
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
<u>Deferred tax assets (liabilities)</u>						
Temporary differences						
Property, plant and equipment	\$ (3,758,847)	\$ (101,576)	\$ -	\$ -	\$ (18,643)	\$ (3,879,066)
Defined benefit obligation	873,484	(26,736)	(51,217)	-	(15,291)	780,240
FVTPL financial instruments	(21,363)	(86,342)	-	-	2,802	(104,903)
Others	1,079,824	(22,748)	-	262	(28,929)	1,028,409
	<u>(1,826,902)</u>	<u>(237,402)</u>	<u>(51,217)</u>	<u>262</u>	<u>(60,061)</u>	<u>(2,175,320)</u>
Loss carry-forward	1,124,541	(456,246)	-	-	13,146	681,441
Investment credits	382,736	138,002	-	-	13,475	534,213
	<u>\$ (319,625)</u>	<u>\$ (555,646)</u>	<u>\$ (51,217)</u>	<u>\$ 262</u>	<u>\$ (33,440)</u>	<u>\$ (959,666)</u>

For the year ended December 31, 2018

	Balance at January 1	Adjustment on initial Application of IFRS 15	Recognized in Profit or Loss	Recognized in Other Comprehensive Income	Recognized in Equity	Exchange Differences	Acquisitions Through Business Combinations	Balance at December 31
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
Deferred tax assets (liabilities)								
Temporary differences								
Property, plant and equipment	\$ (3,879,066)	\$ -	\$ (600,229)	\$ -	\$ -	\$ (21,146)	\$ (45,873)	\$ (4,546,314)
Defined benefit obligation	780,240	-	(131,687)	126,101	-	27,884	262,286	1,064,824
FVTPL financial instruments	(104,903)	-	284,659	-	-	(137)	27,402	207,021
Others	<u>1,028,409</u>	<u>(97,358)</u>	<u>(26,147)</u>	<u>-</u>	<u>(1,099)</u>	<u>74,327</u>	<u>294,540</u>	<u>1,272,672</u>
	(2,175,320)	(97,358)	(473,404)	126,101	(1,099)	80,928	538,355	(2,001,797)
Loss carry-forward	681,441	-	(50,059)	-	-	28,293	12,600	672,275
Investment credits	<u>534,213</u>	<u>-</u>	<u>91,021</u>	<u>-</u>	<u>-</u>	<u>5,932</u>	<u>-</u>	<u>631,166</u>
	\$ (959,666)	\$ (97,358)	\$ (432,442)	\$ 126,101	\$ (1,099)	\$ 115,153	\$ 550,955	\$ (698,356)

For the year ended December 31, 2019

	Balance at January 1	Recognized in Profit or Loss	Recognized in Other Comprehensive Income	Recognized in Equity	Exchange Differences	Acquisitions through Business Combinations	Balance at December 31
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
Deferred tax assets (liabilities)							
Temporary differences							
Property, plant and equipment	\$ (4,546,314)	\$ (80,593)	\$ -	\$ -	\$ (17,949)	\$ (16,917)	\$ (4,661,773)
Defined benefit obligation	1,064,824	(57,746)	74,308	-	(2,803)	-	1,078,583
FVTPL financial instruments	207,021	43,285	-	-	9	-	250,315
Others	<u>1,272,672</u>	<u>6,148</u>	<u>(78,124)</u>	<u>1,404</u>	<u>(21,763)</u>	<u>8,184</u>	<u>1,188,521</u>
	(2,001,797)	(88,906)	(3,816)	1,404	(42,506)	(8,733)	(2,144,354)
Loss carry-forward	672,275	(166,128)	-	-	(12,203)	48,837	542,781
Investment credits	<u>631,166</u>	<u>(86,722)</u>	<u>-</u>	<u>-</u>	<u>(7,404)</u>	<u>-</u>	<u>537,040</u>
	\$ (698,356)	\$ (341,756)	\$ (3,816)	\$ 1,404	\$ (62,113)	\$ 40,104	\$ (1,064,533)

	Balance at January 1	Recognized in Profit or Loss	Recognized in Other Comprehensive Income	Recognized in Equity	Exchange Differences	Acquisitions through Business Combinations	Balance at December 31
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Deferred tax assets (liabilities)							
Temporary differences							
Property, plant and equipment	\$ (152,000)	\$ (2,694)	\$ -	\$ -	\$ (600)	\$ (566)	\$ (155,860)
Defined benefit obligation	35,601	(1,931)	2,484	-	(94)	-	36,060
FVTPL financial instruments	6,921	1,447	-	-	-	-	8,368
Others	<u>42,550</u>	<u>205</u>	<u>(2,612)</u>	<u>47</u>	<u>(726)</u>	<u>274</u>	<u>39,738</u>
	(66,928)	(2,973)	(128)	47	(1,420)	(292)	(71,694)
Loss carry-forward	22,477	(5,554)	-	-	(408)	1,633	18,148
Investment credits	<u>21,102</u>	<u>(2,899)</u>	<u>-</u>	<u>-</u>	<u>(248)</u>	<u>-</u>	<u>17,955</u>
	\$ (23,349)	\$ (11,426)	\$ (128)	\$ 47	\$ (2,076)	\$ 1,341	\$ (35,591)

- f. Items for which no deferred tax assets have been recognized for loss carry-forward, investment credits and deductible temporary differences

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Loss carry-forward	\$ 666,043	\$ 966,783	\$ 32,323
Investment credits	-	51,217	1,712
Deductible temporary differences	<u>332,255</u>	<u>446,754</u>	<u>14,937</u>
	\$ 998,298	\$ 1,464,754	\$ 48,792

The unrecognized loss carry-forward will expire through 2030.

- g. Information about unused loss carry-forward, unused investment credits, tax-exemption and other tax relief

As of December 31, 2019, the unused loss carry-forward comprised of:

Expiry Year	NT\$	US\$ (Note 4)
2020	\$ 104,330	\$ 3,488
2021	78,009	2,608
2022	140,301	4,691
2023	298,669	9,986
2024 and thereafter	<u>888,255</u>	<u>29,698</u>
	<u>\$ 1,509,564</u>	<u>\$ 50,471</u>

As of December 31, 2019, unused investment credits comprised of:

Tax Credit Source	<u>Remaining Creditable Amount</u>		Expiry Year
	NT\$	US\$ (Note 4)	
Purchase of machinery and equipment	\$ 510,573	\$ 17,070	2025
Others	<u>77,684</u>	<u>2,597</u>	2025 and thereafter
	<u>\$ 588,257</u>	<u>\$ 19,667</u>	

As of December 31, 2019, profits attributable to the following expansion projects were exempted from income tax for a 5-year period:

	Tax-exemption Period
Construction and expansion of 2007 by ASE	2016.01-2020.12
Construction and expansion of 2009 by ASE Test Inc.	2018.01-2022.12
Construction and expansion of 2008 by ASE Electronics Inc.	2016.01-2020.12

Some China subsidiaries qualified as high technology enterprises were entitled to a reduced income tax rate of 15% and were eligible to deduct certain times of research and development expenses from their taxable income.

- h. Unrecognized deferred tax liabilities associated with investments

As of December 31, 2018 and 2019, the taxable temporary differences associated with the investments in subsidiaries for which no deferred tax liabilities have been recognized were NT\$28,810,874 thousand and NT\$27,139,427 thousand (US\$907,370 thousand), respectively.

- i. Income tax assessments

The tax returns of the Company and its R.O.C. subsidiaries through 2017 have been examined by the tax authorities.

28. EARNINGS PER SHARE

The earnings and weighted average number of ordinary shares outstanding in the computation of earnings per share were as follows:

Net profit for the year

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Profit for the year attributable to owners of the Company	\$ 22,819,119	\$ 26,220,721	\$ 17,060,591	\$ 570,397
Effect of potentially dilutive ordinary shares:				
From subsidiaries' potentially dilutive ordinary shares	(813,627)	(418,295)	(385,865)	(12,901)
From the investments in associates	(367,687)	-	-	-
From convertible bonds	<u>93,781</u>	<u>-</u>	<u>-</u>	<u>-</u>
Earnings used in the computation of diluted earnings per share	<u>\$ 21,731,586</u>	<u>\$ 25,802,426</u>	<u>\$ 16,674,726</u>	<u>\$ 557,496</u>

Weighted average number of ordinary shares outstanding (in thousand shares):

	For the Year Ended December 31		
	2017	2018	2019
Weighted average number of ordinary shares in computation of basic earnings per share	4,080,443	4,245,247	4,251,964
Effect of potentially dilutive ordinary shares:			
From convertible bonds	62,456	-	-
From employee share options	19,934	5,103	10,232
From employees' compensation	<u>21,787</u>	<u>779</u>	<u>570</u>
Weighted average number of ordinary shares in computation of diluted earnings per share	<u>4,184,620</u>	<u>4,251,129</u>	<u>4,262,766</u>

For the computation of earnings per ADS, the denominators were the half of the aforementioned weighted average outstanding shares (1 ADS represents 2 ordinary shares) while the numerators held constant.

The Group is able to settle the employees' compensation by cash or shares. The Group assumed that the entire amount of the compensation would be settled in shares and the resulting potential shares were included in the weighted average number of ordinary shares outstanding used in the computation of diluted earnings per share if the effect is dilutive. Such dilutive effect of the potential shares was included in the computation of diluted earnings per share until the shareholders approve the number of shares to be distributed to employees at their meeting in following year.

The third unsecured convertible overseas bonds issued by ASE were of anti-dilutive effect for the year ended December 31, 2017 and, therefore, were excluded from the computation of diluted earnings per share for the respective year.

29. SHARE-BASED PAYMENT ARRANGEMENTS

a. Employee share option plans of the Company

The Company's Option Plan

In order to attract, retain and reward employees, the Company has its employee share option plan for the Group's full-time employees and registered 150,000 thousand share options in 2018. Each share option represents the right to purchase one ordinary share of the Company when exercised. Under the terms of the plan, share options are granted at an exercise price equal to or not less than the closing price of the ordinary shares listed on the TSE at the issue date. The right of those share options granted under the plan is valid for 10 years, non-transferable and exercisable at certain percentages subsequent to the second anniversary of the grant date. For any subsequent changes in the Company's capital structure or when cash dividend per ordinary share exceeds 1.5% of the market price per ordinary share, the exercise price is accordingly adjusted.

ASE's Option Plans assumed by the Company

ASE had five employee share option plans for the Group's full-time employees. Each share option represents the right to purchase one ordinary share of ASE when exercised. Under the terms of the plans, share options are granted at an exercise price equal to or not less than the closing price of the ordinary shares listed on the TSE at the issue date. The option rights of these plans are valid for 10 years, non-transferable and exercisable at certain percentages subsequent to the second anniversary of the grant date. For any subsequent changes in ASE's capital structure, the exercise price was accordingly adjusted. As disclosed in Note 1, the Company assumed ASE's obligations of outstanding employee share option plans starting from April 30, 2018 and each share option represents the right to purchase 0.5 ordinary share of the Company with all other terms and conditions held constant.

Information about the share option plans that ASE granted for the year ended December 31, 2017 and for the period from January 1, 2018 through April 29, 2018 was as follows:

	For the Year Ended December 31, 2017		For the Period from January 1, 2018 to April 29, 2018	
	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (NT\$)	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (NT\$)
Balance, beginning of period	210,795	\$27.3	135,961	\$30.2
Options forfeited	(5,407)	36.3	(1,692)	36.3
Options expired	(1,790)	21.1	-	-
Options exercised	(67,637)	21.0	(20,557)	26.0
Options transferred to the Company in accordance with the joint share exchange agreement	<u>-</u>	-	<u>(113,712)</u>	30.9
Balance, end of period	<u>135,961</u>	30.2	<u>-</u>	-
Options exercisable, end of period	<u>85,642</u>	26.5	<u>-</u>	-

Information about the share option plans that the Company granted and assumed for the period from April 30, 2018 through December 31, 2018 and for the year ended December 31, 2019 was as follows:

	For the Year Ended December 31			
	2018		2019	
	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (NT\$)	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (NT\$)
Balance, beginning of year	-	\$-	183,814	\$58.1
Options assumed on April 30, 2018	56,856	61.7	-	-
Options granted	131,863	56.4	-	-
Options forfeited	(1,582)	71.5	(4,214)	61.8
Options exercised	<u>(3,323)</u>	43.6	<u>(8,814)</u>	48.4
Balance, end of year	<u>183,814</u>	58.1	<u>170,786</u>	57.0
Options exercisable, end of year	<u>36,354</u>	58.1	<u>33,822</u>	63.5
Fair value of options granted (NT\$)	<u>\$ 16.28-19.12</u>		<u>\$ -</u>	

The weighted average share prices at exercise dates of share options for the year ended December 31, 2017, the period from January 1, 2018 to April 29, 2018, the period from April 30, 2018 to December 31, 2018, and the year ended December 31, 2019 were NT\$37.6, NT\$41.0, NT\$68.5 and NT\$69.3 (US\$2.3), respectively. The options granted in 2007 were expired in December 2017 and, therefore, NT\$47,087 thousand was reclassified from capital surplus arising from employee share options to capital surplus arising from expired share options.

Information about the outstanding share options that the Company granted and assumed at each balance sheet date was as follows:

	Range of Exercise Price Per Share (NT\$)	Weighted Average Remaining Contractual Life (Years)
<u>December 31, 2018</u>		
ASE 4 th share options	40.8-45.2	1.5
ASE 5 th share options	73.0	6.7
The Company 1 st share options	56.4	9.9
<u>December 31, 2019</u>		
ASE 4 th share options	40.8-45.2	0.5
ASE 5 th share options	73.0	5.7
The Company 1 st share options	54.4	8.9

b. Employee share option plans of subsidiaries

ASE Mauritius Inc.

ASE Mauritius Inc. has an employee share option plan for full-time employees of the Group which granted 30,000 thousand units in December 2007. Under the terms of the plan, each unit represents the right to purchase one ordinary share of ASE Mauritius Inc. when exercised. The option rights of the

plan are valid for 10 years, non-transferable and exercisable at certain percentages subsequent to the second anniversary of the grant date. The option rights of the plan was expired in December 2017, of which shares had not been exercised and, therefore, NT\$159,200 thousand was reclassified from non-controlling interest to capital surplus arising from expired employee share options.

Information about share options was as follows:

	For the Year Ended December 31, 2017	
	Number of Options (In Thousands)	Exercise Price Per Share (US\$)
Balance at January 1	28,470	\$1.7
Options forfeited	(250)	1.7
Options expired	<u>(28,220)</u>	1.7
Balance at December 31	=====	-
Options exercisable, end of year	=====	-

USIE

The terms of the plans issued by USIE were the same with those option plans previously granted by ASE.

Information about share options was as follows:

	For the Year Ended December 31					
	2017		2018		2019	
	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (US\$)	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (US\$)	Number of Options (In Thousands)	Weighted Average Exercise Price Per Share (US\$)
Balance at January 1	25,933	\$2.2	25,556	\$2.2	16,711	\$2.1
Options exercised	<u>(377)</u>	1.9	<u>(8,845)</u>	2.2	<u>(8,362)</u>	2.0
Balance at December 31	<u>25,556</u>	2.2	<u>16,711</u>	2.1	<u>8,349</u>	2.3
Options exercisable, end of year	<u>25,556</u>	2.2	<u>16,711</u>	2.1	<u>8,349</u>	2.3

Information about USIE's outstanding share options at each balance sheet date was as follows:

	Range of Exercise Price Per Share (US\$)	Weighted Average Remaining Contractual Life (Years)
December 31, 2018		
1 st share options	1.5	2.0
2 nd and 3 rd share options	2.4-2.9	2.1
December 31, 2019		
1 st share options	1.5	1.0
3 rd share options	2.9	1.4

In 2017, 2018 and 2019, the Group's shareholdings in USIE decreased because USIE's share options were exercised. The transaction was accounted for as an equity transaction since the Group did not cease to have control over USIE and, as a result, capital surplus was decreased in NT\$52,388 thousand, NT\$1,239,456 thousand and NT\$981,078 thousand (US\$32,801 thousand) for the years ended December 31, 2017, 2018 and 2019, respectively.

USISH

Under the share option plan issued in 2015 ("2015 share options"), each unit represents the right to purchase one ordinary share of USISH when exercised. The options are valid for 10 years, non-transferable and exercisable at certain percentages subsequent to the second anniversary of the grant date incorporated with certain performance conditions. For any subsequent changes in USISH's capital structure, the exercise price is accordingly adjusted.

In November 2019, the shareholders' meeting of USISH approved a share option plan ("2019 share options") and granted 17,167 thousand share options to its employees. Each unit represents the right to purchase one ordinary share of USISH when exercised. The options are valid for 5 years and are exercisable at certain percentages within 12 months subsequent to the second, third and fourth anniversary of the grant date with the satisfaction of certain performance conditions within each respective vesting period. For any subsequent changes in USISH's capital structure, the exercisable share option units and the exercise price are accordingly adjusted.

In addition, in November 2019, the shareholders' meeting of USISH approved a restricted share plan ("2019 restricted shares") and granted 6,156 thousand ordinary shares to its directors (excluding independent directors), supervisors and employees. The plan was of 3 phases starting from November 2019 and each phase lasts for 1 year with valid period of 4.5 years, 3.5 years and 2.5 years, respectively. Upon satisfaction of certain performance conditions within each phase, participants are entitled to subscribe a certain percentage of the total USISH's ordinary shares issued under the plan with a lock-up period of 1 year. For any subsequent changes in USISH's capital structure, the exercise price is accordingly adjusted.

Information about share options was as follows:

	For the Year Ended December 31					
	2017		2018		2019	
	Number of Options (In Thousands)	Exercise Price Per Share (CNY)	Number of Options (In Thousands)	Exercise Price Per Share (CNY)	Number of Options (In Thousands)	Exercise Price Per Share (CNY)
Balance at January 1	24,997	\$15.5	22,341	\$15.5	21,537	\$15.5
Options granted	-	-	-	-	23,323	13.3
Options exercised	-	-	-	-	(3,164)	15.5
Options forfeited	<u>(2,656)</u>	15.5	<u>(804)</u>	15.5	<u>(463)</u>	15.4
Balance at December 31	<u>22,341</u>	15.5	<u>21,537</u>	15.5	<u>41,233</u>	14.3
Options exercisable, end of year	<u>8,896</u>	15.5	<u>12,884</u>	15.5	<u>13,694</u>	15.5
Fair value of options granted (CNY)	\$ -		\$ -		\$ 6.27-13.47	

Information about USISH's outstanding share options at each balance sheet date was as follows:

	Range of Exercise Price Per Share (CNY)	Remaining Contractual Life (Years)
<u>December 31, 2018</u>		
2015 share options	15.5	6.9
<u>December 31, 2019</u>		
2015 share options	15.5	5.9
2019 share options	13.3	4.9
2019 restricted shares	13.3	4.3

The Group's shareholdings in USISH decreased because the abovementioned 2015 share options were exercised in 2019. The transaction was accounted for as an equity transaction since the Group did not cease to have control over USISH and, as a result, capital surplus increased by NT\$105,785 thousand (US\$3,537 thousand).

c. New shares reserved for subscription by employees under cash capital increase

The board of directors of ASE approved the cash capital increase in December 2016 and, as required under the Company Act in the R.O.C., simultaneously granted options to employees to purchase 10% of such newly issued shares. The grant of the options was accounted for as employee options, accordingly a share-based compensation, and was measured at fair value in accordance with IFRS 2. ASE recognized employee benefits expense and capital surplus arising from exercised employee share options of NT\$84,000 thousand in full at the grant date (also the vested date), of which 4,836 thousand shares were not exercised and, therefore, NT\$13,541 thousand was reclassified from capital surplus arising from exercised employee share options to capital surplus arising from expired share options.

Information about ASE's employee share options related to the aforementioned newly issued shares was as follows:

	Number of Options (In Thousand)
Options granted for the year ended 2017	30,000
Options exercised for the year ended 2017	25,164
Fair value of options granted	NT\$2.80 per share

Fair value was measured using the Black-Scholes Option Pricing Model and the inputs to the model were as follows:

Share price at the grant date	NT\$36.55 per share
Exercise price	NT\$34.30 per share
Expected volatility (%)	27.15
Expected lives	47 days
Expected dividend yield	-
Risk free interest rate (%)	0.37

- d. The fair value of USISH's 2019 restricted shares were measured at the grant date by using the Black-Scholes Option Pricing Model incorporated with the effect of the lock-up period, while the fair value of USISH's 2019 share options and the Company's 1st share options granted in 2019 and 2018, respectively, were measured at the grant date by using the trinomial tree model. The inputs to the models were as follows:

	The Company 1 st share options	USISH 2019 share options	USISH 2019 restricted shares
Share price at the grant date	NT\$58.80 per share	CNY15.84 per share	CNY16.30 per share
Exercise price	NT\$56.40 per share	CNY13.34 per share	CNY13.34 per share
Expected volatility (%)	27.77-28.86	45.07-51.80	47.77
Expected lives	4.8 years-7.0 years	3.0 years-5.0 years	-
Expected dividend yield	-	-	-
Risk free interest rate (%)	0.73-0.80	2.80-2.97	2.70

Expected volatilities were based on ASE's, the Company's and USISH's historical share prices annualized volatilities.

For the years ended December 31, 2017, 2018 and 2019, employee benefits expense recognized on the aforementioned employee share option plans and the restricted share plan were NT\$354,765 thousand, NT\$215,648 thousand and NT\$871,699 thousand (US\$29,144 thousand), respectively.

30. BUSINESS COMBINATIONS

- a. Subsidiaries acquired

	Principal Activity	Date of Acquisition	Proportion of Voting Equity Interests Acquired (%)	Consideration Transferred	
				NT\$	US\$ (Note 4)
SPIL	Engaged in the assembly, testing and turnkey services of integrated circuits	April 30, 2018	100.00	<u>\$ 168,440,585</u>	
AMPI	Engaged in the manufacturing of integrated circuit	April 30, 2019	50.97	<u>\$ 250,000</u>	<u>\$ 8,358</u>
ASEEE	Engaged in the production of embedded substrate	April 26, 2019	51.00	<u>\$ -</u>	<u>\$ -</u>
UGPL	Engaged in designing, miniaturization, material sourcing, manufacturing, logistics, and after services of electronic devices and modules	October 31, 2019	60.00	<u>\$ 313,057</u>	<u>\$ 10,467</u>

As disclosed in Note 1, the Company acquired 100% shareholdings of SPIL at NT\$51.2 in cash per SPIL's ordinary share in accordance with the joint share exchange agreements between ASE and SPIL.

As disclosed in Note 14, the Group obtained control over AMPI and ASEEE in April 2019, respectively.

In October 2019, The Group's subsidiary, Universal Global Electronics Co., Ltd., acquired 60% shareholdings of UGPL with a total consideration based on independent professional appraisal reports.

a. Assets acquired and liabilities assumed at the date of acquisition

	<u>SPIL</u> NT\$	<u>AMPI</u> NT\$	<u>ASEEE</u> NT\$	<u>UGPL</u> NT\$
Assets				
Cash and cash equivalents	\$ 20,088,970	\$ 349,496	\$ 23,197	\$ 108,718
Trade and other receivables	15,840,649	371,144	5,732	58,713
Inventories	5,693,644	403,887	11,033	229
Property, plant and equipment	81,985,622	683,207	1,361,572	525,048
Intangible assets	31,354,386	128,900	290,757	11,704
Others	24,945,922	237,766	317,888	99,112
Liabilities				
Trade and other payables	(19,755,598)	(224,295)	(133,278)	(217,887)
Borrowings and bonds payables	(24,157,174)	(951,519)	(1,371,395)	(190,737)
Others	<u>(3,963,201)</u>	<u>(148,723)</u>	<u>(290,273)</u>	<u>(63,708)</u>
Fair value of identifiable net assets acquired	<u>\$ 132,033,220</u>	<u>\$ 849,863</u>	<u>\$ 215,233</u>	<u>\$ 331,192</u>
		<u>AMPI</u> US\$ (Note 4)	<u>ASEEE</u> US\$ (Note 4)	<u>UGPL</u> US\$ (Note 4)
Assets				
Cash and cash equivalents		\$ 11,685	\$ 776	\$ 3,635
Trade and other receivables		12,409	192	1,963
Inventories		13,503	369	8
Property, plant and equipment		22,842	45,522	17,554
Intangible assets		4,310	9,721	391
Others		7,949	10,628	3,314
Liabilities				
Trade and other payables		(7,499)	(4,456)	(7,285)
Borrowings and bonds payables		(31,813)	(45,851)	(6,377)
Others		<u>(4,972)</u>	<u>(9,705)</u>	<u>(2,130)</u>
Fair value of identifiable net assets acquired		<u>\$ 28,414</u>	<u>\$ 7,196</u>	<u>\$ 11,073</u>

The initial accounting for the acquisition of UGPL was tentative as of December 31, 2019. In addition, a call option on the remaining 40% non-controlling interests was also stipulated in the equity transfer agreement and recognized by the Group under the line item of financial assets at FVTPL.

b. Non-controlling interest

Non-controlling interests of SPIL were measured at fair value at the acquisition date by using market approach based on the valuation multiples of comparable companies and the discount rate for lack of marketability. The significant unobservable inputs is the discount rate for lack of marketability of 25%.

Non-controlling interests of AMPI and ASEEE were measured at their proportionate share of the fair value of AMPI's and ASEEE's identifiable net assets, respectively.

Non-controlling interests of UGPL were measured at fair value at the acquisition date by using market approach incorporating transaction prices of comparable companies and the discount rate for lack of control. The significant unobservable inputs is the discount rate for lack of control of 31%. As

above-mentioned, such non-controlling interests measurements were tentative as of December 31, 2019.

c. Goodwill recognized on acquisitions

	<u>SPIL</u> NT\$	<u>AMPI</u> NT\$	<u>ASEEE</u> NT\$	<u>UGPL</u> NT\$
Consideration transferred	\$ 168,440,585	\$ 250,000	\$ -	\$ 313,057
Add: Fair value of investments previously owned	-	315,925	117,609	-
Add: Non-controlling interests	3,582,866	416,716	105,464	142,494
Less: Fair value of identifiable net assets acquired	<u>(132,033,220)</u>	<u>(849,863)</u>	<u>(215,233)</u>	<u>(331,192)</u>
Goodwill recognized on acquisition	<u>\$ 39,990,231</u>	<u>\$ 132,778</u>	<u>\$ 7,840</u>	<u>\$ 124,359</u>

	<u>AMPI</u> US\$ (Note 4)	<u>ASEEE</u> US\$ (Note 4)	<u>UGPL</u> US\$ (Note 4)
Consideration transferred	\$ 8,358	\$ -	\$ 10,467
Add: Fair value of investments previously owned	10,563	3,932	-
Add: Non-controlling interests	13,932	3,526	4,764
Less: Fair value of identifiable net assets acquired	<u>(28,414)</u>	<u>(7,196)</u>	<u>(11,073)</u>
Goodwill recognized on acquisition	<u>\$ 4,439</u>	<u>\$ 262</u>	<u>\$ 4,158</u>

The goodwill from acquisitions mainly represents the control premium. In addition, the consideration paid for acquisitions effectively included amounts attributed to the benefits of expected synergies, such as revenue growth and future market expansions. These benefits are not recognized separately from goodwill because they do not meet the recognition criteria for identifiable intangible assets.

The goodwill recognized on acquisition is not expected to be deductible for tax purpose.

As of December 31, 2019, the Group has completed the identification of the difference between the cost of the investment and the Group's share of the net fair value of identifiable assets and liabilities of AMPI and ASEEE. Due to the necessary valuations and calculations not yet finalized, the initial accounting for the acquisition of UGPL was tentative based on the Group's and the independent professional's best estimates as of December 31, 2019.

d. Net cash outflow (inflow) on acquisition of subsidiaries

	<u>SPIL</u> NT\$	<u>AMPI</u> NT\$	<u>ASEEE</u> NT\$	<u>UGPL</u> NT\$
Consideration paid in cash	\$ 168,440,585	\$ 250,000	\$ -	\$ 313,057
Less: Payable for consideration representing the ordinary shares originally held by ASE	(53,109,760)	-	-	-
Less: Cash and cash equivalent acquired	<u>(20,088,970)</u>	<u>(349,496)</u>	<u>(23,197)</u>	<u>(108,718)</u>
Net cash outflow (inflow) on acquisition of subsidiaries	<u>\$ 95,241,855</u>	<u>\$ (99,496)</u>	<u>\$ (23,197)</u>	<u>\$ 204,339</u>

	<u>AMPI</u>	<u>ASEEE</u>	<u>UGPL</u>
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Consideration paid in cash	\$ 8,358	\$ -	\$ 10,467
Less: Cash and cash equivalent acquired	<u>(11,685)</u>	<u>(775)</u>	<u>(3,635)</u>
Net cash outflow (inflow) on acquisition of subsidiaries	<u>\$ (3,327)</u>	<u>\$ (775)</u>	<u>\$ 6,832</u>

e. Impact of acquisitions on the results of the Group

The results of operations since the acquisition date were included in the consolidated statements of comprehensive income and were as follows:

	SPII	AMPI	ASEEE	UGPL
	(For the Period from April 30, 2018 through December 31, 2018)	(For the Period from April 30, 2019 through December 31, 2019)	(For the Period from April 26, 2019 through December 31, 2019)	(For the Period from October 31, 2019 through December 31, 2019)
	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>	<u>NT\$</u>
Operating revenue	<u>\$ 61,247,727</u>	<u>\$ 704,243</u>	<u>\$ (1,159)</u>	<u>\$ 39,080</u>
Net profit (loss)	<u>\$ 7,627,382</u>	<u>\$ (217,163)</u>	<u>\$ (469,598)</u>	<u>\$ (11,995)</u>

	AMPI	ASEEE	UGPL
	(For the Period from April 30, 2019 through December 31, 2019)	(For the Period from April 26, 2019 through December 31, 2019)	(For the Period from October 31, 2019 through December 31, 2019)
	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>	<u>US\$ (Note 4)</u>
Operating revenue	<u>\$ 23,545</u>	<u>\$ (39)</u>	<u>\$ 1,307</u>
Net loss	<u>\$ (7,261)</u>	<u>\$ (15,700)</u>	<u>\$ (401)</u>

Had these business combinations been in effect at the beginning of each annual reporting period and the investments originally accounted for using the equity method, as disclosed in Notes 14 and 26, been remeasured to their fair value as of January 1 of each respective annual reporting period, the Group's operating revenues and profit for the year would have been NT\$397,261,461 thousand and NT\$25,687,447 thousand for the year ended December 31, 2018, and NT\$413,782,708 thousand (US\$13,834,260 thousand) and NT\$18,030,506 thousand (US\$602,825 thousand) for the year ended December 31, 2019, respectively. This pro-forma information is for illustrative purposes only and is not necessarily an indication of the operating revenue and results of operations of the Group that actually would have been achieved had the acquisition been completed at the beginning of each annual reporting period, nor is it intended to be a projection of future results.

In determining the pro-forma operating revenue and profit for the year had each subsidiary been acquired at the beginning of each respective annual reporting period, the management:

- 1) Calculated the depreciation of property, plant and equipment and the amortization of intangible assets acquired on the basis of the fair values at the initial accounting for the business combination rather than the carrying amounts recognized in the respective pre-acquisition financial statements;

and

- 2) Calculated borrowing costs based on the funding status, credit ratings and debt/equity ratios of the Group after the business combination.

31. DISPOSAL OF SUBSIDIARIES

The Group disposed of its subsidiary, Kun Shan Ding Yue Real Estate Development Co., Ltd. (“KSDY”), in June 2017 and, as a result, the Group lost its control over KSDY.

- a. Gain on disposal of subsidiaries

	NT\$
Total consideration	\$ 7,046,464
Net assets disposed of	<u>(1,457,007)</u>
Gain on disposal of KSDY	<u>\$ 5,589,457</u>

- b. Analysis of assets and liabilities on the date control was lost

	NT\$
Current assets	
Cash and cash equivalents	\$ 29,133
Inventories related to real estate business	<u>1,427,874</u>
Net assets disposed of	<u>\$ 1,457,007</u>

32. EQUITY TRANSACTION WITH NON-CONTROLLING INTERESTS

- a. USIE

In January 2018, the shareholders’ meeting of USIE resolved to repurchase its own outstanding 3,738 thousand ordinary shares at US\$17.49 per share, and, as a result, the Group’s shareholdings in USIE increased from 96.9% to 98.6%. The transaction was accounted for as an equity transaction since the transaction did not change the Group’s control over USIE and capital surplus decreased by NT\$1,127,632 thousand in 2018. In February 2018, the board of directors of USIE resolved February 26, 2018 was the record date for capital reduction and then the repurchased ordinary shares were subsequently cancelled.

In July 2019, the shareholders’ meeting of USIE resolved to repurchase its own outstanding 7,378 thousand ordinary shares at US\$14.30 per share, and, as a result, the Group’s shareholdings in USIE increased from 95.42% to 98.72%. The transaction was accounted for as an equity transaction since the transaction did not change the Group’s control over USIE and capital surplus decreased by NT\$1,625,448 thousand (US\$54,345 thousand) in 2019. In July 2019, the board of directors of USIE resolved July 23, 2019 was the record date for capital reduction and then the repurchased ordinary shares were subsequently cancelled.

- b. ASEN and SZ

In March 2018, ASE’s board of directors resolved to acquire 40% shareholdings of ASEN from NXP B.V. at US\$127,113 thousand by its subsidiary, J&R Holding. In addition, in August 2018, J&R

Holding's board of directors further resolved to sell 30% shareholdings of ASEN to Beijing Unis Capital Management Co., Ltd. at US\$95,335 thousand. The aforementioned transaction resulted the Group's shareholdings in ASEN to increase from 60% to 70%, and such transactions were accounted for as an equity transaction since the Group did not cease to have control over ASEN. The Group recognized a decrease in capital surplus by NT\$622,811 thousand in 2018.

In July 2019, ASE's board of directors resolved to acquire 30% shareholdings of ASEN from Beijing Unis Capital Management Co., Ltd. at US\$97,748 thousand by its subsidiary, J&R Holding. In addition, in July 2019, SPIL's board of directors also resolved to acquire 30% shareholdings of SZ from Tibet Zixi Electronic Technology Co., Ltd. at US\$162,870 thousand by its subsidiary, SPIL (Cayman) Holding Limited. Both the aforementioned transactions resulted the Group's shareholdings in ASEN and SZ to increase from 70% to 100%, and such transactions were accounted for as an equity transaction since the Group did not cease to have control over ASEN and SZ. The Group recognized a decrease in capital surplus by NT\$2,650,950 thousand (US\$88,631 thousand) in 2019.

c. ASEEE

As disclosed in Note 14, ASE purchased ASEEE's 150,000 thousand ordinary shares at par value through its capital increase by cash at NT\$1,500,000 thousand (US\$50,150 thousand) in May 2019. In July 2019, ASE further purchased all of ASEEE's ordinary shares held by TDK in the amount of US\$6,000 thousand. The Group eventually held 100% shareholdings of ASEEE and recognized a decrease in capital surplus by NT\$128,805 thousand (US\$4,306 thousand).

d. Others

In January 2017, USI completed its cash capital increase of NT\$1,000,000 thousand and the Group's shareholdings in USI increased from 75.2% to 75.7% since the Group did not proportionally subscribe for additional new shares. The transaction was accounted for as an equity transaction since the transaction did not change the Company's control over USI and capital surplus increased by NT\$3,055 thousand in 2017.

In July 2018, ASE and UGTW's board of directors have approved to acquire the outstanding ordinary shares of USIINC and USI at NT\$35 and NT\$18 per ordinary shares, respectively. ASE and UGTW also purchased the ordinary shares from dissenting shareholders in August 2018 and recognized an increase in capital surplus by NT\$9,530 thousand. UGTW and ASE completed the acquisition of USI and USIINC's remaining outstanding ordinary shares in 2018 and 2019, respectively, and recognized a decrease in capital surplus by NT\$28,152 thousand in 2018 and an increase in capital surplus by NT\$142 thousand (US\$5 thousand) in 2019.

USISH repurchased its own 13,037 thousand outstanding ordinary shares during the year ended December 31, 2019 and, as a result, the Group's shareholdings in USISH increased from 74.6% to 77.7%. The transaction was accounted for as an equity transaction since the Group did not cease to have control over USISH and capital surplus decreased by NT\$334,719 thousand (US\$11,191 thousand).

33. CASH FLOWS INFORMATION

a. Non-cash investing activities

In addition to other notes, the Group entered into the following non-cash investing activities which were not reflected in the consolidated statements of cash flows:

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Payments for property, plant and equipment				
Purchase of property, plant and equipment	\$ 23,677,682	\$ 39,092,238	\$ 63,073,887	\$ 2,108,789
Increase in other non-current assets	90,560	402,255	68,560	2,292
Decrease (increase) in other payables	982,260	1,942,259	(6,254,579)	(209,113)
Capitalized borrowing costs	<u>(51,262)</u>	<u>(50,309)</u>	<u>(77,715)</u>	<u>(2,598)</u>
	<u>\$ 24,699,240</u>	<u>\$ 41,386,443</u>	<u>\$ 56,810,153</u>	<u>\$ 1,899,370</u>
Proceeds from disposal of property, plant and equipment				
Consideration from disposal of property, plant and equipment	\$ 1,487,334	\$ 1,133,435	\$ 441,444	\$ 14,759
Decrease (increase) in other receivables	<u>876</u>	<u>(5,791)</u>	<u>7,495</u>	<u>251</u>
	<u>\$ 1,488,210</u>	<u>\$ 1,127,644</u>	<u>\$ 448,939</u>	<u>\$ 15,010</u>
Payments for investment properties				
Purchase of investment properties	\$ 186,535	\$ 125,853	\$ 2,532	\$ 85
Capitalized borrowing costs	<u>(13)</u>	<u>(89)</u>	<u>-</u>	<u>-</u>
	<u>\$ 186,522</u>	<u>\$ 125,764</u>	<u>\$ 2,532</u>	<u>\$ 85</u>
Payments for other intangible assets				
Purchase of other intangible assets	\$ 277,825	\$ 537,659	\$ 1,350,908	\$ 45,166
Decrease in other payables	<u>60,159</u>	<u>40,106</u>	<u>60,160</u>	<u>2,011</u>
	<u>\$ 337,984</u>	<u>\$ 577,765</u>	<u>\$ 1,411,068</u>	<u>\$ 47,177</u>
Net cash inflow from disposal of subsidiaries				
Consideration from disposal of subsidiaries	\$ 7,046,464	\$ -	\$ -	\$ -
Increase in other payables	3,552	-	-	-
Cash and cash equivalents disposed of	<u>(29,133)</u>	<u>-</u>	<u>-</u>	<u>-</u>
	<u>\$ 7,020,883</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

b. Changes in liabilities arising from financing activities

For the year ended December 31, 2017

	Short-term borrowings	Bonds payable	Long-term borrowings	Total
	NT\$	NT\$	NT\$	NT\$
Balance at January 1, 2017	\$ 20,955,522	\$ 36,999,903	\$ 53,115,563	\$ 111,070,988
Financing cash flows	(2,038,993)	(1,123,972)	(16,473,381)	(19,636,346)
Non-cash changes				
Bonds conversion	-	(11,650,369)	-	(11,650,369)
Amortization of issuance cost	-	319,463	5,790	325,253
Effects of foreign currency exchange	(954,058)	(1,402,245)	(1,241,344)	(3,597,647)
Balance at December 31, 2017	<u>\$ 17,962,471</u>	<u>\$ 23,142,780</u>	<u>\$ 35,406,628</u>	<u>\$ 76,511,879</u>

For the year ended December 31, 2018

	Short-term Borrowings	Bonds Payable	Long-term Borrowings	Total
	NT\$	NT\$	NT\$	NT\$
Balance at January 1, 2018	\$ 17,962,471	\$ 23,142,780	\$ 35,406,628	\$ 76,511,879
Net financing cash flows	22,327,813	(6,185,600)	85,510,959	101,653,172
Non-cash changes				
Acquisition through business combinations (Note 30)	3,619,858	4,457,191	16,080,125	24,157,174
Bonds conversion	-	(4,457,191)	-	(4,457,191)
Reclassification for the application of IFRS 9	(1,301,994)	-	-	(1,301,994)
Amortization of issuance cost	-	28,756	188,217	216,973
Effects of foreign currency exchange	655,321	-	712,400	1,367,721
Balance at December 31, 2018	<u>\$ 43,263,469</u>	<u>\$ 16,985,936</u>	<u>\$137,898,329</u>	<u>\$198,147,734</u>

For the year ended December 31, 2019

	Short-term Borrowings (including financial liabilities for hedging)	Bonds Payable	Long-term Borrowings	Lease Liabilities	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
Balance at January 1, 2019	\$ 47,163,103	\$ 16,985,936	\$137,898,329	\$ -	\$ 202,047,368
Adjustments on initial application of IFRS 16 (Note 3)	-	-	-	6,084,729	6,084,729
Adjusted balance at January 1, 2019	47,163,103	16,985,936	137,898,329	6,084,729	208,132,097
Net financing cash flows	(4,683,142)	19,279,033	1,144,731	(636,556)	15,104,066
Interest under operating activities	-	-	-	1,766	1,766
Non-cash changes					
Lease liabilities	-	-	-	536,216	536,216
Acquisition through business combinations (Note 30)	656,820	245,664	1,523,968	81,649	2,508,101
Amortization of issuance cost	-	11,522	189,151	-	200,673
Lease modifications	-	-	-	(239,321)	(239,321)
Reclassification of borrowings from short-term to long-term	(1,499,000)	-	1,499,000	-	-
Effects of foreign currency exchange	(1,065,452)	-	(1,176,581)	(19,559)	(2,261,592)
Balance at December 31, 2019	<u>\$ 40,572,329</u>	<u>\$ 36,522,155</u>	<u>\$ 141,078,598</u>	<u>\$ 5,808,924</u>	<u>\$223,982,006</u>

	Short-term Borrowings (including financial liabilities for hedging)	Bonds Payable	Long-term Borrowings	Lease Liabilities	Total
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Balance at January 1, 2019	\$ 1,576,834	\$ 567,902	\$ 4,610,442	\$ -	\$ 6,755,178
Adjustments on initial application of IFRS 16 (Note 3)	-	-	-	203,435	203,435
Adjusted balance at January 1, 2019	1,576,834	567,902	4,610,442	203,435	6,958,613
Net financing cash flows	(156,574)	644,568	38,272	(21,282)	504,984
Interest under operating activities	-	-	-	59	59
Non-cash changes					
Lease liabilities	-	-	-	17,928	17,928
Acquisition through business combinations (Note 30)	21,960	8,213	50,952	2,730	83,855
Amortization of issuance cost	-	385	6,324	-	6,709
Lease modifications	-	-	-	(8,002)	(8,002)
Reclassification of borrowings from short-term to long-term	(50,117)	-	50,117	-	-
Effects of foreign currency exchange	(35,622)	-	(39,338)	(654)	(75,614)
Balance at December 31, 2019	<u>\$ 1,356,481</u>	<u>\$ 1,221,068</u>	<u>\$ 4,716,769</u>	<u>\$ 194,214</u>	<u>\$ 7,488,532</u>

34. CAPITAL MANAGEMENT

The capital structure of the Group consists of debt and equity. The Group manages its capital to ensure that entities in the Group will be able to continue as going concerns while maximizing the return to shareholders through the optimization of the debt and equity balance. Key management personnel of the Group periodically reviews the cost of capital and the risks associated with each class of capital. In order to balance the overall capital structure, the Group may adjust the amount of dividends paid to shareholders, the number of new shares issued or repurchased, and the amount of new debt issued or existing debt redeemed.

The Group is not subject to any externally imposed capital requirements except those discussed in Note 21.

35. FINANCIAL INSTRUMENTS

a. Fair value of financial instruments that are not measured at fair value

1) Fair value of financial instruments not measured at fair value but for which fair value is disclosed

Except bonds payable measured at amortized cost, the management considered that the carrying amounts of financial assets and financial liabilities not measured at fair value approximate their fair values. The carrying amounts and fair value of bonds payable as of December 31, 2018 and 2019, respectively, were as follows:

	Carrying Amount		Fair Value	
	NT\$	US\$ (Note 4)	NT\$	US\$ (Note 4)
December 31, 2018	\$ 16,985,936		\$ 17,126,752	
December 31, 2019	36,522,155	\$ 1,221,068	36,766,117	\$ 1,229,225

2) Fair value hierarchy

The aforementioned fair value hierarchy of bonds payable was Level 3 which was determined based on discounted cash flow analysis with the applicable yield curve for the duration. The significant unobservable inputs is discount rates that reflected the credit risk of various counterparties.

b. Fair value of financial instruments that are measured at fair value on a recurring basis

1) Fair value hierarchy

	<u>Level 1</u> NT\$	<u>Level 2</u> NT\$	<u>Level 3</u> NT\$	<u>Total</u> NT\$
<u>December 31, 2018</u>				
Financial assets at FVTPL				
Derivative financial assets				
Swap contracts	\$ -	\$ 1,557,714	\$ -	\$ 1,557,714
Forward exchange contracts	-	32,070	-	32,070
Non-derivative financial assets				
Quoted ordinary shares	5,151,255	-	-	5,151,255
Open-end mutual funds	581,800	-	-	581,800
Unquoted preferred shares	-	-	275,000	275,000
Private-placement funds	-	-	200,123	200,123
Hybrid financial assets				
Private-placement convertible bonds	-	100,496	-	100,496
	<u>\$ 5,733,055</u>	<u>\$ 1,690,280</u>	<u>\$ 475,123</u>	<u>\$ 7,898,458</u>
Financial assets at FVTOCI				
Investments in equity instruments				
Unquoted ordinary shares	\$ -	\$ -	\$ 540,730	\$ 540,730
Limited partnership	-	-	39,669	39,669
Investments in debt instruments				
Unsecured subordinate corporate bonds	-	-	1,016,924	1,016,924
	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 1,597,323</u>	<u>\$ 1,597,323</u>
Financial liabilities at FVTPL				
Derivative financial liabilities				
Swap contracts	\$ -	\$ 29,058	\$ -	\$ 29,058
Forward exchange contracts	-	7,597	-	7,597
	<u>\$ -</u>	<u>\$ 36,655</u>	<u>\$ -</u>	<u>\$ 36,655</u>

	Level 1		Level 2		Level 3		Total	
	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)
December 31, 2019								
Financial assets at FVTPL								
Derivative financial assets								
Forward exchange contracts	\$ -	\$ -	\$ 104,308	\$ 3,487	\$ -	\$ -	\$ 104,308	\$ 3,487
Swap contracts	-	-	56,561	1,891	-	-	56,561	1,891
Call option	-	-	-	-	24,556	821	24,556	821
Non-derivative financial assets								
Quoted ordinary shares	3,460,123	115,685	-	-	-	-	3,460,123	115,685
Open-end mutual funds	662,290	22,143	-	-	-	-	662,290	22,143
Private-placement funds	-	-	-	-	603,718	20,184	603,718	20,184
Unquoted preferred shares	-	-	-	-	377,440	12,619	377,440	12,619
	<u>\$ 4,122,413</u>	<u>\$ 137,828</u>	<u>\$ 160,869</u>	<u>\$ 5,378</u>	<u>\$ 1,005,714</u>	<u>\$ 33,624</u>	<u>\$ 5,288,996</u>	<u>\$ 176,830</u>
Financial assets at FVTOCI								
Investments in equity instruments								
Unquoted ordinary shares	\$ -	\$ -	\$ -	\$ -	\$ 565,028	\$ 18,891	\$ 565,028	\$ 18,891
Unquoted preferred shares	-	-	-	-	158,718	5,306	158,718	5,306
Limited partnership	-	-	-	-	32,157	1,075	32,157	1,075
Investments in debt instruments								
Unsecured subordinate corporate bonds	-	-	-	-	1,014,872	33,931	1,014,872	33,931
Trade receivables, net	-	-	-	-	2,029,690	67,860	2,029,690	67,860
	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 3,800,465</u>	<u>\$ 127,063</u>	<u>\$ 3,800,465</u>	<u>\$ 127,063</u>
Financial liabilities at FVTPL								
Derivative financial liabilities								
Swap contracts	\$ -	\$ -	\$ 862,581	\$ 28,839	\$ -	\$ -	\$ 862,581	\$ 28,839
Forward exchange contracts	-	-	110,990	3,711	-	-	110,990	3,711
	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 973,571</u>	<u>\$ 32,550</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 973,571</u>	<u>\$ 32,550</u>

For the financial assets and liabilities that were measured at fair value on a recurring basis, there were no transfers between Level 1 and Level 2 of the fair value hierarchy during the years ended December 31, 2018 and 2019.

2) Reconciliation of Level 3 fair value measurements of financial assets

For the year ended December 31, 2018

Financial Assets	Financial Assets at FVTPL		Financial Assets at FVTOCI		Total
	Equity Instruments	Equity Instruments	Equity Instruments	Debt Instruments	
	NTS	NTS	NTS	NTS	NTS
Balance at January 1	\$ -	\$ 908,549	\$ 1,080,000		\$ 1,988,549
Recognized in profit or loss	(2,313)	-	-	-	(2,313)
Recognized in other comprehensive income (included in unrealized losses on financial assets at FVTOCI)	-	(224,172)	(63,076)		(287,248)
Purchases	477,436	105,000	-		582,436
Disposals	-	(208,978)	-		(208,978)
Balance at December 31	<u>\$ 475,123</u>	<u>\$ 580,399</u>	<u>\$ 1,016,924</u>		<u>\$ 2,072,446</u>

For the year ended December 31, 2019

Financial Assets	FVTPL		FVTOCI				Total	
	Equity Instruments		Equity Instruments		Debt Instruments		NTS	US\$ (Note 4)
	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)		
Balance at January 1	\$ 475,123	\$ 15,885	\$ 580,399	\$ 19,405	\$ 1,016,924	\$ 34,000	\$ 2,072,446	\$ 69,290
Recognized in profit or loss	3,431	115	-	-	-	-	3,431	115
Recognized in other comprehensive income								
Included in unrealized losses on financial assets at FVTOCI	-	-	(216,121)	(7,226)	(2,052)	(69)	(218,173)	(7,295)

(Continued)

Financial Assets	FVTPL		FVTOCI				Total	
	Equity Instruments		Equity Instruments		Debt Instruments			
	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)	NTS	US\$ (Note 4)
Effects of foreign currency exchange	\$ (14,368)	\$ (481)	\$ (5,695)	\$ (190)	\$ -	\$ -	\$ (20,063)	\$ (671)
Net increase in trade receivables	-	-	-	-	3,171,205	106,025	3,171,205	106,025
Trade receivables factoring	-	-	-	-	(1,141,515)	(38,165)	(1,141,515)	(38,165)
Purchases	541,528	18,105	409,985	13,707	-	-	951,513	31,812
Disposals	-	-	(12,665)	(424)	-	-	(12,665)	(424)
Balance at December 31	<u>\$1,005,714</u>	<u>\$ 33,624</u>	<u>\$ 755,903</u>	<u>\$ 25,272</u>	<u>\$3,044,562</u>	<u>\$ 101,791</u>	<u>\$4,806,179</u>	<u>\$ 160,687</u>

(Concluded)

- 3) Valuation techniques and assumptions applied for the purpose of measuring fair value
- a) Valuation techniques and inputs applied for the purpose of measuring Level 2 fair value measurement

Financial Instruments	Valuation Techniques and Inputs
Derivatives - swap contracts and forward exchange contracts	Discounted cash flows - Future cash flows are estimated based on observable forward exchange rates at balance sheet dates and contract forward exchange rates, discounted at rates that reflected the credit risk of various counterparties.
Private-placement convertible bonds	Discounted cash flows - Future cash flows are estimated based on observable stock prices at balance sheet dates and contract conversion prices, discounted at rates that reflected the credit risk of various counterparties.

- b) Valuation techniques and inputs applied for the purpose of measuring Level 3 fair value measurement

The fair value of unquoted ordinary shares, unquoted preferred shares, limited partnership and private-placement funds were determined by using market approach and asset-based approach. The significant unobservable inputs were the discount rates for lack of marketability of 20% to 30%. If the discount rates for lack of marketability to the valuation model increased by 1% to reflect reasonably possible alternative assumptions while all other variables held constant, the fair value of unquoted shares would have decreased approximately by NT\$7,700 thousand and NT\$7,200 thousand (US\$241 thousand) as of December 31, 2018 and 2019, respectively.

The fair values of the unsecured subordinate corporate bonds were determined using income approach based on a discounted cash flow analysis. The significant unobservable input was the discount rate that reflects the credit risk of the counterparty. If the discount rate increased by 0.1% while all other variables held constant, the fair value of the bonds would have decreased approximately by NT\$7,000 thousand and NT\$6,000 thousand (US\$201 thousand) as of December 31, 2018 and 2019, respectively.

The fair value of accounts receivables measured at FVTOCI are determined based on the present value of future cash flows that reflect the credit risk of counterparties. Since the discount effect was not significant, the Group measured its fair value by using the nominal values.

The fair value of the call option was determined using Black-Scholes Options Pricing Model, of which the significant unobservable input was the discount rate for lack of marketability of 20%. If the discount rate increased by 0.1% while all other variables held constant, the fair value of the call option would have decreased approximately by NT\$855 thousand (US\$29 thousand) as of December 31, 2019.

c. Categories of financial instruments

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
<u>Financial assets</u>			
FVTPL			
Mandatorily at FVTPL	\$ 7,898,458	\$ 5,288,996	176,830
Measured at amortized cost (Note 1)	139,866,736	139,668,804	4,669,636
FVTOCI			
Equity instruments	580,399	755,903	25,272
Debt instruments	1,016,924	1,014,872	33,931
Trade receivables, net	-	2,029,690	67,860
<u>Financial liabilities</u>			
FVTPL			
Held for trading	36,655	973,571	32,550
Financial liabilities for hedging	3,899,634	3,233,301	108,101
Measured at amortized cost (Note 2)	286,035,732	310,187,110	10,370,681

Note 1: The balances included financial assets measured at amortized cost which comprised cash and cash equivalents, trade and other receivables and other financial assets.

Note 2: The balances included financial liabilities measured at amortized cost which comprised short-term borrowings, trade and other payables, bonds payable and long-term borrowings.

d. Financial risk management objectives and policies

The derivative instruments used by the Group were to mitigate risks arising from ordinary business operations. All derivative transactions entered into by the Group were designated as either hedging or trading. Derivative transactions entered into for hedging purposes must hedge risk against fluctuations in foreign exchange rates and interest rates arising from operating activities. The currencies and the amount of derivative instruments held by the Group must match its hedged assets and liabilities denominated in foreign currencies.

The Group's risk management department monitored risks to mitigate risk exposures, reported unsettled position, transaction balances and related gains or losses to the Group's chief financial officer on monthly basis.

1) Market risk

The Group's activities exposed it primarily to the financial risks of changes in foreign currency exchange rates and interest rates. Gains or losses arising from fluctuations in foreign currency exchange rates of a variety of derivative financial instruments were approximately offset by those of hedged items. Interest rate risk was not significant due to the cost of capital was expected to be fixed.

There had been no change to the Group's exposure to market risks or the manner in which these risks were managed and measured.

a) Foreign currency exchange rate risk

The Group had sales and purchases as well as financing activities denominated in foreign currency which exposed the Group to foreign currency exchange rate risk. The Group entered into a variety of derivative financial instruments to hedge foreign currency exchange rate risk to minimize the fluctuations of assets and liabilities denominated in foreign currencies.

The carrying amounts of the Group's foreign currency denominated monetary assets and liabilities (including those eliminated upon consolidation) as well as derivative instruments which exposed the Group to foreign currency exchange rate risk at each balance sheet date are presented in Note 40.

The Group was mainly subject to the impact from the exchange rate fluctuation in US\$ and JPY against NT\$ or CNY. 1% is the sensitivity rate used when reporting foreign currency exchange rate risk internally to key management personnel and represents management's assessment of the reasonably possible change in foreign currency exchange rates. The sensitivity analysis included financial assets and liabilities and inter-company receivables and payables within the Group. The changes in profit before income tax due to a 1% change in US\$ and JPY both against NT\$ and CNY would be NT\$101,000 thousand, NT\$129,000 thousand and NT\$82,000 thousand (US\$2,742 thousand) for the years ended December 31, 2017, 2018 and 2019, respectively. Hedging contracts and hedged items have been taken into account while measuring the changes in profit before income tax. The abovementioned sensitivity analysis mainly focused on the foreign currency monetary items at the end of each year. As the year-end exposure did not reflect the exposure for the years ended December 31, 2017, 2018 and 2019, the abovementioned sensitivity analysis was unrepresentative of those respective years.

Hedge accounting

The Group's hedging strategy was to lift foreign currency borrowings to avoid 100% exchange rate exposure from its equity instruments denominated in foreign currency, which was designated as fair value hedges. Hedge adjustments were made to totally offset the foreign exchange gains or losses from those equity instruments denominated in foreign currency when they were evaluated based on the exchange rates on each balance sheet date.

The source of hedge ineffectiveness in these hedging relationships was the material difference between the notional amounts of borrowings denominated in foreign currency and the cost of those equity instruments denominated in foreign currency. No other sources of ineffectiveness is expected to emerge from these hedging relationships.

b) Interest rate risk

Except a portion of long-term borrowings and bonds payable at fixed interest rates, the Group was exposed to interest rate risk because group entities borrowed funds at floating interest rates. Changes in market interest rates led to variances in effective interest rates of borrowings from which the future cash flow fluctuations arise. The Group utilized financing instruments with low interest rates and favorable terms to maintain low financing cost, adequate banking facilities, as well as to hedge interest rate risk.

The carrying amounts of the Group's financial assets and financial liabilities with exposure to interest rates at each balance sheet date were as follows:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Fair value interest rate risk			
Financial liabilities	\$ 17,485,561	\$ 41,952,056	\$ 1,402,610
Cash flow interest rate risk			
Financial assets	32,942,747	46,467,663	1,553,583
Financial liabilities	172,737,393	169,709,237	5,673,997

For assets and liabilities with floating interest rates, a 100 basis point increase or decrease was used when reporting interest rate risk internally to key management personnel. If interest rates had been 100 basis points (1%) higher or lower and all other variables held constant, the Group's profit before income tax for the years ended December 31, 2017, 2018 and 2019 would have decreased or increased approximately by NT\$24,000 thousand, NT\$1,398,000 thousand and NT\$1,232,000 thousand (US\$41,190 thousand), respectively. Hedging contracts and hedged items have been taken into account while measuring the changes in profit before income tax. The abovementioned sensitivity analysis mainly focused on the interest rate items at the end of each year. As the year-end exposure did not reflect the exposure for the years ended December 31, 2017, 2018 and 2019, the abovementioned sensitivity analysis was unrepresentative of those respective periods.

c) Other price risk

The Group was exposed to equity price risk through its investments in financial assets at FVTPL (except swap contracts and forward exchange contracts) and financial assets at FVTOCI. If equity price was 1% higher or lower, profit before income tax for the years ended December 31, 2017, 2018 and 2019 would have increased or decreased approximately by NT\$52,000 thousand, NT\$64,000 thousand and NT\$51,000 thousand (US\$1,705 thousand), respectively, and other comprehensive income before income tax for the years ended December 31, 2017, 2018 and 2019 would have increased or decreased approximately by NT\$13,000 thousand, NT\$16,000 thousand and NT\$8,000 thousand (US\$267 thousand), respectively.

2) Credit risk

Credit risk refers to the risk that counterparty will default on its contractual obligations resulting in financial loss to the Group. The Group's credit risk arises from cash and cash equivalents, trade and other receivables and other financial assets. The Group's maximum exposure to credit risk was the carrying amounts of financial assets in the consolidated balance sheets.

As of December 31, 2018 and 2019, the Group's five largest customers accounted for 36% and 37% of trade receivables, respectively. The Group transacts with a large number of unrelated customers and, thus, no concentration of credit risk was observed.

3) Liquidity risk

The Group manages liquidity risk by maintaining adequate working capital and banking facilities to fulfill the demand for cash flow used in the Group's operation and capital expenditure. The Group also monitors its compliance with all the loan covenants. Liquidity risk is not considered to be significant.

In the table below, financial liabilities with a repayment on demand clause were included in the earliest time band regardless of the probability of counter-parties choosing to exercise their rights. The maturity dates for other non-derivative financial liabilities were based on the agreed repayment dates.

To the extent that interest flows are floating rate, the undiscounted amounts were derived from the interest rates at each balance sheet date.

December 31, 2018

	<u>On Demand or Less than 1 Month</u>	<u>1 to 3 Months</u>	<u>3 Months to 1 Year</u>	<u>1 to 5 Years</u>	<u>More than 5 Years</u>
	NT\$	NT\$	NT\$	NT\$	NT\$
<u>Non-derivative financial liabilities</u>					
Non-interest bearing	\$ 33,156,044	\$ 34,493,000	\$ 6,899,093	\$ 57,375	\$ 196,523
Floating interest rate liabilities	15,762,004	7,127,606	25,510,718	131,014,040	-
Fixed interest rate liabilities	<u>7,677,097</u>	<u>4,811,536</u>	<u>242,461</u>	<u>13,621,814</u>	<u>4,367,546</u>
	<u>\$ 56,595,145</u>	<u>\$ 46,432,142</u>	<u>\$ 32,652,272</u>	<u>\$144,693,229</u>	<u>\$ 4,564,069</u>

December 31, 2019

	<u>On Demand or Less than 1 Month</u>	<u>1 to 3 Months</u>	<u>3 Months to 1 Year</u>	<u>1 to 5 Years</u>	<u>More than 5 Years</u>
	NT\$	NT\$	NT\$	NT\$	NT\$
<u>Non-derivative financial liabilities</u>					
Non-interest bearing	\$ 35,283,757	\$ 38,803,904	\$ 7,989,256	\$ 33,797	\$ 184,338
Obligation under leases	75,388	115,297	532,747	1,536,600	4,412,859
Floating interest rate liabilities	10,740,844	6,708,303	18,868,999	133,341,087	7,190,891
Fixed interest rate liabilities	<u>6,819,585</u>	<u>3,712,979</u>	<u>2,281,375</u>	<u>34,405,594</u>	<u>3,689,219</u>
	<u>\$ 52,919,574</u>	<u>\$ 49,340,483</u>	<u>\$ 29,672,377</u>	<u>\$169,317,078</u>	<u>\$ 15,477,307</u>

	<u>On Demand or Less than 1 Month</u>	<u>1 to 3 Months</u>	<u>3 Months to 1 Year</u>	<u>1 to 5 Years</u>	<u>More than 5 Years</u>
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
<u>Non-derivative financial liabilities</u>					
Non-interest bearing	\$ 1,179,664	\$ 1,297,356	\$ 267,110	\$ 1,130	\$ 6,163
Obligation under leases	2,520	3,855	17,812	51,374	147,538
Floating interest rate liabilities	359,105	224,283	630,859	4,458,077	240,418
Fixed interest rate liabilities	<u>228,004</u>	<u>124,138</u>	<u>76,275</u>	<u>1,150,304</u>	<u>123,344</u>
	<u>\$ 1,769,293</u>	<u>\$ 1,649,632</u>	<u>\$ 992,056</u>	<u>\$ 5,660,885</u>	<u>\$ 517,463</u>

Further information for maturity analysis of obligation under leases was as follows:

	<u>Less than 1 Year</u>	<u>1 to 5 Years</u>	<u>5 to 10 Years</u>	<u>10 to 15 Years</u>	<u>15 to 20 Years</u>	<u>More than 20 Years</u>
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
Obligation under leases	<u>\$ 723,432</u>	<u>\$ 1,536,600</u>	<u>\$ 1,454,128</u>	<u>\$ 856,825</u>	<u>\$ 712,696</u>	<u>\$ 1,389,210</u>
	<u>Less than 1 Year</u>	<u>1 to 5 Years</u>	<u>5 to 10 Years</u>	<u>10 to 15 Years</u>	<u>15 to 20 Years</u>	<u>More than 20 Years</u>
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
Obligation under leases	<u>\$ 24,187</u>	<u>\$ 51,374</u>	<u>\$ 48,617</u>	<u>\$ 28,647</u>	<u>\$ 23,828</u>	<u>\$ 46,446</u>

The amounts included above for floating interest rate instruments for non-derivative financial liabilities were subject to change if changes in floating interest rates differ from those estimates of interest rates determined at each balance sheet date.

The following table detailed the Group's liquidity analysis for its derivative financial instruments. The table was based on the undiscounted contractual net cash inflows and outflows on derivative instruments settled on a net basis, and the undiscounted gross cash inflows and outflows on those

derivatives that require gross settlement. When the amounts payable or receivable are not fixed, the amounts disclosed have been determined by reference to the projected interest rates as illustrated by the yield curves at each balance sheet date.

	On Demand or Less than 1 Month NT\$	1 to 3 Months NT\$	3 Months to 1 Year NT\$
<u>December 31, 2018</u>			
Net settled			
Forward exchange contracts	\$ 2,040	\$ 1,620	\$ -
Gross settled			
Forward exchange contracts			
Inflows	\$ 2,580,194	\$ 466,489	\$ -
Outflows	<u>(2,556,607)</u>	<u>(460,725)</u>	<u>-</u>
	<u>23,587</u>	<u>5,764</u>	<u>-</u>
Swap contracts			
Inflows	14,136,620	9,214,500	38,160,316
Outflows	<u>(13,946,583)</u>	<u>(8,650,320)</u>	<u>(36,596,419)</u>
	<u>190,037</u>	<u>564,180</u>	<u>1,563,897</u>
	<u>\$ 213,624</u>	<u>\$ 569,944</u>	<u>\$ 1,563,897</u>
	On Demand or Less than 1 Month NT\$	1 to 3 Months NT\$	3 Months to 1 Year NT\$
<u>December 31, 2019</u>			
Net settled			
Forward exchange contracts	\$ (74,864)	\$ (13,246)	\$ -
Gross settled			
Forward exchange contracts			
Inflows	\$ 9,296,123	\$ 4,420,233	\$ 230,354
Outflows	<u>(9,248,333)</u>	<u>(4,392,070)</u>	<u>(227,848)</u>
	<u>47,790</u>	<u>28,163</u>	<u>2,506</u>
Swap contracts			
Inflows	10,187,215	15,025,154	34,327,100
Outflows	<u>(10,163,964)</u>	<u>(15,032,603)</u>	<u>(34,773,848)</u>
	<u>23,251</u>	<u>(7,449)</u>	<u>(446,748)</u>
	<u>\$ 71,041</u>	<u>\$ 20,714</u>	<u>\$ (444,242)</u>

	On Demand or Less than 1 Month	1 to 3 Months	3 Months to 1 Year
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
<u>December 31, 2019</u>			
Net settled			
Forward exchange contracts	\$ (2,503)	\$ (443)	\$ -
Gross settled			
Forward exchange contracts			
Inflows	310,803	147,784	7,701
Outflows	<u>(309,205)</u>	<u>(146,843)</u>	<u>(7,618)</u>
	<u>1,598</u>	<u>941</u>	<u>83</u>
Swap contracts			
Inflows	340,595	502,345	1,147,680
Outflows	<u>(339,818)</u>	<u>(502,594)</u>	<u>(1,162,616)</u>
	<u>777</u>	<u>(249)</u>	<u>(14,936)</u>
	<u>\$ 2,375</u>	<u>\$ 692</u>	<u>\$ (14,853)</u>

36. RELATED PARTY TRANSACTIONS

Balances and transactions within the Group had been eliminated upon consolidation. Details of transactions between the Group and other related parties were disclosed as follows:

a. Related parties

In addition to those disclosed in Note 14, the related parties were as follows:

Related Parties	Relationship with the Company
ASE Cultural and Educational Foundation	Substantial related party

- b. The Group contributed NT\$100,000 thousand (US\$3,343 thousand) to ASE Cultural and Educational Foundation in 2017, 2018 and 2019, respectively, for environmental charity in promoting the related domestic environmental protection and public service activities (Note 38).
- c. As disclosed in Note 32, USIE repurchased its own 1,283 thousand and 2,805 thousand ordinary shares from the Group's key management personnel with approximately NT\$653,244 thousand and NT\$1,247,187 thousand (US\$41,698 thousand) in February 2018 and July 2019, respectively.
- d. In 2019, ASE purchased real estate properties from associates with the amount of NT\$2,326,000 thousand (US\$77,767 thousand), which was primarily based on the independent professional appraisal reports and has been fully paid in September 2019.

f. Compensation to key management personnel

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Short-term employee benefits	\$ 860,631	\$ 1,041,216	\$ 1,027,191	\$ 34,343
Post-employment benefits	2,858	3,884	2,208	74
Share-based payments	<u>-</u>	<u>9,145</u>	<u>134,544</u>	<u>4,498</u>
	<u>\$ 863,489</u>	<u>\$ 1,054,245</u>	<u>\$ 1,163,943</u>	<u>\$ 38,915</u>

The compensation to the Group's key management personnel was determined according to personal performance and market trends.

37. ASSETS PLEDGED AS COLLATERAL OR FOR SECURITY

The following assets were provided as collateral for bank borrowings, tariff guarantees of imported raw materials or collateral:

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Inventories related to real estate business	\$ 4,796,126	\$ 6,063,303	\$ 202,718
Property, plant and equipment	-	138,831	4,642
Investment properties	6,680,017	12,167,772	406,813
Long-term prepayments for lease	6,515,576	-	-
Other financial assets (including current and non-current)	<u>496,902</u>	<u>637,775</u>	<u>21,323</u>
	<u>\$ 18,488,621</u>	<u>\$ 19,007,681</u>	<u>\$ 635,496</u>

38. SIGNIFICANT CONTINGENT LIABILITIES AND UNRECOGNIZED COMMITMENTS

In addition to those disclosed in other notes, significant commitments and contingencies of the Group as of each balance sheet date were as follows:

- a. As of December 31, 2018 and 2019, unused letters of credit of the Group were approximately NT\$634,000 thousand and NT\$394,000 thousand (US\$13,173 thousand), respectively.
- b. As of December 31, 2018 and 2019, the Group's commitments to purchase property, plant and equipment were approximately NT\$17,039,458 thousand and NT\$25,119,371 thousand (US\$839,832 thousand), respectively, of which NT\$2,339,308 thousand and NT\$5,145,345 thousand (US\$172,028 thousand) had been prepaid, respectively. As of December 31, 2018 and 2019, the commitment that the Group has contracted for the construction related to our real estate business were approximately NT\$888,052 thousand and NT\$1,393,859 thousand (US\$46,602 thousand), respectively.
- c. As of December 31, 2019, letters of credits were provided to customs by banks for the importation of goods, and the banking facilities granted to the Group were approximately NT\$952,001 thousand (US\$31,829 thousand).
- d. In consideration of corporate social responsibility for environmental protection, the board of directors of ASE, in December 2013, approved contributions to be made in the next 30 years, at a total amount of

NT\$3,000,000 thousand (US\$100,301 thousand), at the minimum, to environmental protection efforts in Taiwan. In February 2019 and January 2020, the board of directors of ASE approved to contribute NT\$100,000 thousand (US\$3,343 thousand) to ASE Cultural & Educational Foundation for environmental charity in promoting the related domestic environmental protection and public service activities continuously.

39. OTHERS

- a. Broadcom Corporation, Broadcom Singapore PTE, Ltd. and Broadcom Limited (collectively, “Broadcom”), have filed a request for arbitration, which the Group received in May 2019, with the American Arbitration Association in dispute over an indemnity clause within the Semiconductor Packaging Agreement (the “Agreement”) entered into by Broadcom and SPIL in September 2012. The Agreement stipulates that in the event the packaging products provided by SPIL infringe upon third party patent rights and cause Broadcom to suffer losses, SPIL must indemnify Broadcom for loss suffered. Based on the Agreement, Broadcom has requested that SPIL indemnify Broadcom in connection with the patent infringement between Broadcom and Tessera Technologies, Inc. As of the date that the consolidated financial statements were authorized for issue, such patent infringement proceeding was settled in the amount of US\$5,000 thousand which was recognized under the line item of other operating income and expenses, net for the year end December 31, 2019.
- b. There were five employees and a waste disposal supplier of a subsidiary in China accused by China People’s Procuratorate (the “Procuratorate”) for committing the crime of environmental pollution in 2018. During the trial, the Procuratorate claimed that the subsidiary should also be charged with corporate crime which caused the subsidiary received a change and addition indictment in October 2019. As of the date that the consolidated financial statements were authorized for issue, the trial proceeding is pending Procuratorate’s judgments and, therefore, the final results could not be reliably measured.
- c. On December 20, 2013, the Kaohsiung Environmental Protection Bureau (the “KEPB”) imposed an administrative fine of NT\$102,014 thousand (the “Original Fine”) upon ASE for violation of the Water Pollution Control Act. After ASE sought administrative remedies against the Original Fine, the Original Fine has been revoked by final judgment of Supreme Administrative Court on June 8, 2017, and KEPB is ordered to refund the Original Fine to ASE. On December 27, 2019, KEPB refunded NT\$55,062 thousand (US\$1,841 thousand) to ASE. On February 10, 2020, KEPB re-imposed an administrative fine of NT\$46,952 thousand (US\$1,570 thousand) (the “New Fine”) upon ASE and offset the New Fine by the remaining amount which shall be refunded to ASE. Therefore, no additional payment that ASE should make for the New Fine. On March 12, 2020, ASE has filed an administrative appeal against the New Fine.
- d. In December 2019, USISH entered into an equity acquisition agreement with Financiere AFG S.A.S. (“FAFG”). USISH contemplates to pay approximately US\$403,125 thousand (the final consideration will be adjusted according to the equity acquisition agreement) through USIFR and issue approximately its own 25,596 thousand new ordinary shares (at CNY12.81 per share) to acquire 100% shareholdings (79,848 thousand ordinary shares outstanding) of FAFG. The aforementioned transaction is still pending for the related authorities’ approval.

40. SIGNIFICANT ASSETS AND LIABILITIES DENOMINATED IN FOREIGN CURRENCIES

The following information was aggregated by the foreign currencies other than functional currencies of the group entities and the exchange rates between foreign currencies and respective functional currencies were disclosed. The significant financial assets and liabilities denominated in foreign currencies were as follows:

	Foreign Currencies (In Thousand)	Exchange Rate	Carrying Amount (In Thousand)
December 31, 2018			
Monetary financial assets			
US\$	\$ 3,730,484	US\$1=NT\$30.715	\$ 114,581,814
US\$	1,299,391	US\$1=CNY6.8632	39,910,801
JPY	4,412,591	JPY1=NT\$0.2782	1,227,583
JPY	6,568,657	JPY1=US\$0.0091	1,827,400
Monetary financial liabilities			
US\$	3,361,523	US\$1=NT\$30.715	103,249,185
US\$	1,216,654	US\$1=CNY6.8632	37,369,521
JPY	7,401,621	JPY1=NT\$0.2782	2,059,131
JPY	7,035,704	JPY1=US\$0.0091	1,957,333
December 31, 2019			
Monetary financial assets			
US\$	4,125,872	US\$1=NT\$29.98	123,693,628
US\$	1,189,539	US\$1=CNY6.9762	35,662,384
JPY	13,889,872	JPY1=NT\$0.2760	3,833,605
JPY	771,392	JPY1=US\$0.0092	212,904
Monetary financial liabilities			
US\$	3,823,359	US\$1=NT\$29.98	114,624,313
US\$	1,211,472	US\$1=CNY6.9762	36,319,926
JPY	14,628,543	JPY1=NT\$0.2760	4,037,478
JPY	815,929	JPY1=US\$0.0092	225,197

The significant realized and unrealized foreign exchange gain (loss) were as follows:

Functional Currencies	For the Year Ended December 31						
	2017		2018			2019	
	Exchange Rate	Net Foreign Exchange Gain (Loss) NT\$	Exchange Rate	Net Foreign Exchange Loss NT\$	Exchange Rate	Net Foreign Exchange Gain (Loss) NT\$ US\$ (Note 4)	
US\$	US\$1=NT\$29.76	\$ (244,802)	US\$1=NT\$30.715	\$ (67,476)	US\$1=NT\$29.98	\$ (84,177)	\$ (2,814)
NT\$		4,130,243		(849,234)		1,203,823	40,248
CNY	CNY1=NT\$4.5545	(337,630)	CNY1=NT\$4.4753	(120,005)	CNY1=NT\$4.2975	14,055	470
		<u>\$ 3,547,811</u>		<u>\$(1,036,715)</u>		<u>\$ 1,133,701</u>	<u>\$ 37,904</u>

41. OPERATING SEGMENTS INFORMATION

The Group has the following reportable segments: Packaging, Testing and EMS. The Group packages bare semiconductors into finished semiconductors with enhanced electrical and thermal characteristics; provides testing services, including front-end engineering testing, wafer probing and final testing services; engages in the designing, assembling, manufacturing and sale of electronic components and telecommunications equipment motherboards. Information about other business activities and operating segments that are not reportable are combined and disclosed in "Others." The Group engages in other activities such as substrate production as well as sale and leasing of real estate properties.

The accounting policies for segments are the same as those described in Note 4. The measurement basis for resources allocation and performance evaluation is based on profit before income tax.

a. Segment revenues and operation results

	Packaging	Testing	EMS	Others	Adjustments and Eliminations	Total
	NTS	NTS	NTS	NTS	NTS	NTS
For the year ended December 31, 2017						
Revenue from external customers	\$ 126,225,119	\$ 26,157,277	\$ 133,948,016	\$ 4,110,796	\$ -	\$ 290,441,208
Inter-group revenue (Note 1)	4,911,026	184,707	47,119,404	8,383,640	(60,598,777)	-
Segment revenue	131,136,145	26,341,984	181,067,420	12,494,436	-	351,039,985
Interest income	43,744	48,532	269,640	214,265	(269,310)	306,871
Interest expense	(1,969,562)	(11,920)	-	(62,714)	269,310	(1,774,886)
Depreciation and amortization	(19,105,457)	(6,476,743)	(2,133,253)	(1,489,731)	-	(29,205,184)
Share of the profit or loss of associates and joint ventures	568,291	(42,509)	-	-	-	525,782
Impairment loss	(218,214)	(72,798)	-	(473,869)	-	(764,881)
Segment profit before income tax	12,065,304	6,904,067	6,883,327	5,167,965	-	31,020,663
Expenditures for segment assets	17,769,612	4,507,097	850,235	550,738	-	23,677,682
December 31, 2017						
Investments accounted for using the equity method	48,566,333	187,418	-	-	-	48,753,751
For the year ended December 31, 2018						
Revenue from external customers	178,308,222	35,903,202	151,890,384	4,990,613	-	371,092,421
Inter-group revenues (Note 1)	3,531,431	212,310	58,836,465	7,637,053	(70,217,259)	-
Segment revenues	181,839,653	36,115,512	210,726,849	12,627,666	-	441,309,680
Interest income	166,761	55,108	354,343	352,232	(462,233)	466,211
Interest expense	(3,647,601)	(101,338)	-	(249,180)	462,233	(3,535,886)
Depreciation and amortization	(29,491,977)	(9,560,610)	(2,065,590)	(1,570,726)	-	(42,688,903)
Share of the profit or loss of associates and joint ventures	(456,846)	(23,398)	-	-	-	(480,244)
Impairment loss	(654,081)	-	-	-	-	(654,081)
Segment profit before income tax	17,866,431	7,952,484	6,225,984	(107,221)	-	31,937,678
Expenditures for segment assets	22,787,190	12,991,023	2,529,771	784,254	-	39,092,238
December 31, 2018						
Investments accounted for using the equity method	9,152,290	160,018	-	-	-	9,312,308
Contract assets	3,488,372	1,000,128	-	-	-	4,488,500
For the year ended December 31, 2019						
Revenue from external customers	198,916,897	42,658,686	165,789,479	5,817,122	-	413,182,184
Inter-group revenues (Note 1)	5,370,963	231,399	60,638,567	7,431,399	(73,672,328)	-
Segment revenues	204,287,860	42,890,085	226,428,046	13,248,521	-	486,854,512
Interest income	186,291	90,091	249,487	284,458	(260,646)	549,681
Interest expense	(3,403,475)	(545,609)	(255,404)	(243,013)	260,646	(4,186,855)
Depreciation and amortization	(33,456,831)	(12,379,703)	(2,534,825)	(2,095,482)	-	(50,466,841)
Share of the profit or loss of associates and joint ventures	75,303	39,852	67,120	-	-	182,275
Impairment loss	(601,066)	(141)	-	-	-	(601,207)
Segment profit before income tax	7,572,763	10,321,537	6,082,106	(696,595)	-	23,279,811
Expenditures for segment assets	35,462,305	23,966,051	2,770,129	875,402	-	63,073,887
December 31, 2019						
Investments accounted for using the equity method	8,867,316	1,123,490	2,094,401	-	-	12,085,207
Contract assets	4,162,124	1,735,192	-	-	-	5,897,316
	Packaging	Testing	EMS	Others	Adjustments and Eliminations	Total
	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)	US\$ (Note 4)
For the year ended December 31, 2019						
Revenue from external customers	\$ 6,650,515	\$ 1,426,235	\$ 5,542,945	\$ 194,487	\$ -	\$ 13,814,182
Inter-group revenues (Note 1)	179,571	7,736	2,027,368	248,459	(2,463,134)	-
Segment revenues	6,830,086	1,433,971	7,570,313	442,946	-	16,277,316
Interest income	6,228	3,012	8,341	9,511	(8,714)	18,378
Interest expense	(113,791)	(18,242)	(8,539)	(8,124)	8,714	(139,982)
Depreciation and amortization	(1,118,583)	(413,899)	(84,748)	(70,060)	-	(1,687,290)
Share of the profit or loss of associates and joint ventures	2,518	1,332	2,244	-	-	6,094
Impairment loss	(20,096)	(4)	-	-	-	(20,100)
Segment profit before income tax	253,185	345,086	203,348	(23,291)	-	778,328
Expenditures for segment assets	1,185,634	801,272	92,615	29,268	-	2,108,789
December 31, 2019						
Investments accounted for using the equity method	296,467	37,562	70,023	-	-	404,052
Contract assets	139,155	58,014	-	-	-	197,169

Note 1: Inter-group revenues were eliminated upon consolidation.

Note 2: The disaggregated product and service type from the Group's contract with customer is the same as those disclosed in above reportable segment.

b. Revenue from major products and services

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
Packaging service	\$ 126,225,119	\$ 178,308,222	\$ 198,916,897	\$ 6,650,515
Testing service	26,157,277	35,903,202	42,658,686	1,426,235
Electronic components manufacturing service	133,948,016	151,890,384	165,789,479	5,542,945
Others	<u>4,110,796</u>	<u>4,990,613</u>	<u>5,817,122</u>	<u>194,487</u>
	<u>\$ 290,441,208</u>	<u>\$ 371,092,421</u>	<u>\$ 413,182,184</u>	<u>\$ 13,814,182</u>

c. Geographical information

The Group's revenue from external customers by location of headquarter and information about its non-current assets by location of assets are detailed below.

1) Net revenues from external customers

	For the Year Ended December 31			
	2017	2018	2019	
	NT\$	NT\$	NT\$	US\$ (Note 4)
United States	\$ 196,462,345	\$ 230,791,164	\$ 245,521,027	\$ 8,208,660
Taiwan	35,413,647	45,630,792	51,244,470	1,713,289
Asia	30,201,332	56,031,108	75,938,364	2,538,896
Europe	26,445,240	36,844,258	38,613,132	1,290,977
Others	<u>1,918,644</u>	<u>1,795,099</u>	<u>1,865,191</u>	<u>62,360</u>
	<u>\$ 290,441,208</u>	<u>\$ 371,092,421</u>	<u>\$ 413,182,184</u>	<u>\$ 13,814,182</u>

2) Non-current assets

	December 31		
	2018	2019	
	NT\$	NT\$	US\$ (Note 4)
Taiwan	\$ 229,944,505	\$ 239,532,971	\$ 8,008,458
China	59,058,239	68,747,648	2,298,484
Others	<u>25,686,256</u>	<u>26,645,450</u>	<u>890,854</u>
	<u>\$ 314,689,000</u>	<u>\$ 334,926,069</u>	<u>\$ 11,197,796</u>

Non-current assets exclude financial instruments, post-employment benefit assets, and deferred tax assets.

d. Major customers

Except customer A from which the operating revenues generated from packaging and EMS segments were NT\$83,873,393, NT\$92,117,839 thousand and NT\$103,987,781 thousand (US\$3,476,689 thousand) for the years ended December 31, 2017, 2018 and 2019, respectively, and customer B from which the operating revenues generated from packaging and testing segments was NT\$44,653,072 thousand (US\$1,492,914 thousand) for the year ended December 31, 2019, the Group did not have other single customer from which the operating revenues exceeded 10% of operating revenues for the years ended December 31, 2017, 2018 and 2019.