

CHUNGHWA TELECOM CO LTD

Form 20-F

April 29, 2019

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 20-F

(Mark One)

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

or

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018

or

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

or

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

Date of event requiring this shell company report

For the transition period from _____ to _____

Commission file number 001-31731

Chunghwa Telecom Co., Ltd.

(Exact name of Registrant as specified in its charter)

Chunghwa Telecom Co., Ltd.

(Translation of Registrant's name into English)

Taiwan, Republic of China

(Jurisdiction of incorporation or organization)

21-3 Hsinyi Road, Section 1, Taipei, Taiwan, Republic of China

(Address of principal executive offices)

Fufu Shen

21-3 Hsinyi Road, Section 1, Taipei,
Taiwan, Republic of China
Tel: +886 2 2344-5488

Email: chtir@cht.com.tw

(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

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

Title of each class	Name of each exchange on which registered
Common Shares, par value NT\$10 per share	New York Stock Exchange*
American Depositary Shares, as evidenced by American Depositary Receipts, each representing 10 Common Shares	New York Stock Exchange

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

None

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

None

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

7,757,446,545 Common Shares

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes No

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

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

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

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

.

Large accelerated filer Accelerated filer Non-accelerated filer Emerging growth company

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

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

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

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

If “Other” has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow. Item 17 Item 18

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

Indicate by check mark whether the registrant has filed all documents and reports required to be filed by Sections 12, 13 or 15(d) of the Securities Exchange Act of 1934 subsequent to the distribution of securities under a plan confirmed by a court. Yes No

*Not for trading, but only in connection with the listing on the New York Stock Exchange of the American Depositary Shares

CHUNGHWA TELECOM CO., LTD.

FORM 20-F ANNUAL REPORT

FISCAL YEAR ENDED DECEMBER 31, 2018

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SUPPLEMENTAL INFORMATION

All references to “we,” “us,” “our” and “our company” in this annual report are to Chunghwa Telecom Co., Ltd. and our consolidated subsidiaries, unless the context otherwise requires. All references to “shares” and “common shares” are to our common shares, par value NT\$10 per share, and to “ADSs” are to our American depositary shares, each of which represents ten of our common shares. The ADSs are issued under the deposit agreement, as amended, supplemented or modified from time to time, originally dated as of July 17, 2003, among Chunghwa Telecom Co., Ltd. and the Bank of New York, and amended and restated on November 14, 2007, among Chunghwa Telecom Co., Ltd. and JP Morgan Chase Bank, as depository, and the holders and beneficial owners of American Depositary Receipts issued thereunder. All references to “Taiwan” are to the island of Taiwan and other areas under the effective control of the Republic of China. All references to “the government” or “the ROC government” are to the government of the Republic of China. All references to “the Ministry of Transportation and Communications” or “the MOTC” are to the Ministry of Transportation and Communications of the Republic of China. All references to “the National Communications Commission” or “the NCC” are to the National Communications Commission of the Republic of China. All references to the “Securities and Futures Bureau” are to the Securities and Futures Bureau of the Republic of China or its predecessors, as applicable. “ROC GAAP” means the generally accepted accounting principles of the Republic of China, “U.S. GAAP” means the generally accepted accounting principles of the United States, “IFRSs” means International Financial Reporting Standards as issued by the International Accounting Standards Board, and “Taiwan IFRSs” means the International Financial Reporting Standards as issued by the International Accounting Standards Board and endorsed by the Financial Supervisory Commission, or the FSC, which are required to be adopted by applicable companies in the ROC pursuant to the “Framework for Adoption of International Financial Reporting Standards by Companies in the ROC” promulgated by the FSC on May 14, 2009. Any discrepancies in any table between totals and sums of the amounts listed are due to rounding. Unless otherwise indicated, or the context otherwise requires, references in this annual report to financial and operational data for a particular year refer to the fiscal year of our company ending December 31 of that year.

When we refer to our “privatization” or our being “privatized” in this annual report, we mean our status as a non-state-owned entity after the government reduced its ownership of our outstanding common shares, including our common shares owned by entities majority-owned by the government, to less than 50%. We were privatized on August 12, 2005.

We publish our consolidated financial statements in New Taiwan dollars, the lawful currency of the Republic of China. In this annual report, “NT\$” and “NT dollars” mean New Taiwan dollars, “\$,” “US\$” and “U.S. dollars” mean United States dollars.

FORWARD-LOOKING STATEMENTS IN THIS ANNUAL REPORT MAY NOT BE REALIZED

This annual report contains forward-looking statements, including statements regarding:

- our business and operating strategies;
- our network expansion plans;
- our business, operations and prospects;
- our financial condition and results of operations;
- our dividend policy;
- the telecommunications industry regulatory environment in Taiwan; and
- future developments in the telecommunications industry in Taiwan.

These forward-looking statements are generally indicated by the use of forward-looking terminology such as “believe,” “expect,” “anticipate,” “estimate,” “plan,” “aim,” “seek,” “project,” “may,” “will” or other similar words that express an indication of actions or results of actions that may or are expected to occur in the future. These statements reflect our current views with respect to future events and are subject to risks, uncertainties and assumptions, many of which are beyond our control. The forward-looking statements are contained principally in the sections entitled “Item 3. Key Information—D. Risk Factors,” “Item 4. Information on the Company” and “Item 5. Operating and Financial Review and Prospects.” These statements are made under the “safe harbor” provisions of the U.S. Private Securities Litigation Reform Act of 1995. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy and financial needs. You should not place undue reliance on these statements, which apply only as of the date of this annual report. These forward-looking statements are based on our own information and on information from other sources we believe to be reliable. Actual results may differ materially from those expressed or implied by these forward-looking statements. Factors that could cause differences to include, but are not limited to, those discussed under “Item 3. Key Information—D. Risk Factors.” In light of these risks, uncertainties and assumptions, the forward-looking events discussed in this annual report might not occur and our actual results could differ materially from those anticipated in these forward-looking statements. The forward-looking statements made in this annual report relate only to events or information as of the date on which the statements are made in this annual report. Except as required by law, we undertake no obligation to update or revise publicly any forward-looking statements, whether as a result of new information, future events or otherwise, after the date on which the statements are made or to reflect the occurrence of unanticipated events. You should read this annual report completely and with the understanding that our actual future results may be materially different from what we expect.

PART I

ITEM 1. IDENTITY OF DIRECTORS, SENIOR MANAGEMENT AND ADVISERS

Not applicable.

ITEM 2. OFFER STATISTICS AND EXPECTED TIMETABLE

Not applicable.

ITEM 3. KEY INFORMATION

A. Selected Financial Data

The selected consolidated statements of comprehensive income data and consolidated cash flows data for the years ended December 31, 2016, 2017 and 2018, and the selected consolidated balance sheets data as of December 31, 2017 and 2018 set forth below are derived from our audited consolidated financial statements included elsewhere in this annual report and should be read in conjunction with, and are qualified in their entirety by reference to, our consolidated financial statements and the related notes. The selected consolidated statements of comprehensive income data and consolidated cash flows data for the years ended December 31, 2014 and 2015, and the selected consolidated balance sheet data as of December 31, 2014, 2015 and 2016 set forth below are derived from our audited consolidated financial statements, which are not included this annual report. The consolidated financial statements have been prepared and presented in accordance with IFRSs.

	Year Ended December 31					US\$
	2014	2015	2016	2017	2018	
	NT\$	NT\$	NT\$	NT\$	NT\$	
	(in billions, except for					
	per share and per ADS					
	data)					
Consolidated Statements of Comprehensive						
Income Data:						
Revenues	226.6	231.8	230.0	227.5	215.5	7.0
Operating costs	(148.4)	(148.1)	(147.6)	(146.8)	(139.6)	(4.5)
Gross profit	78.2	83.7	82.4	80.7	75.9	2.5
Operating expenses	(34.0)	(33.2)	(33.8)	(33.9)	(32.4)	(1.1)
Other income and expenses	0.6	(0.1)	(0.5)	(0.1)	0.1	—
Income from operations	44.8	50.4	48.1	46.7	43.6	1.4
Non-operating income and expenses ⁽¹⁾	1.8	1.6	1.3	1.3	1.4	—
Income before income tax	46.6	52.0	49.4	48.0	45.0	1.4
Income tax expense	(9.0)	(9.1)	(7.8)	(7.8)	(6.4)	(0.2)
Consolidated net income	37.6	42.9	41.6	40.2	38.6	1.2

Attributable to:

Stockholders of the parent	37.0	42.1	40.5	39.0	37.6	1.2
Noncontrolling interests	0.6	0.8	1.1	1.2	1.0	—
	37.6	42.9	41.6	40.2	38.6	1.2

Earnings per share:

Basic	4.77	5.42	5.22	5.03	4.84	0.16
Diluted	4.76	5.41	5.21	5.02	4.83	0.16

Earnings per ADS equivalent:

Basic	47.66	54.19	52.19	50.26	48.41	1.58
Diluted	47.58	54.06	52.11	50.19	48.35	1.58

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	As of December 31					US\$
	2014 NT\$	2015 NT\$	2016 NT\$	2017 NT\$	2018 NT\$	
	(in billions)					
Consolidated Balance Sheets Data:						
Working capital	6.9	13.3	17.5	15.4	28.5	0.9
Long-term investments ⁽²⁾	13.1	10.5	7.2	8.1	10.2	0.3
Property, plant and equipment	302.7	296.4	291.2	288.7	288.9	9.4
Investment properties	7.6	7.9	8.1	8.0	8.3	0.3
Intangible assets	42.8	50.4	47.4	54.9	50.9	1.7
Net defined benefit assets	0.0	0.0	0.9	—	1.2	—
Total assets	446.5	452.8	446.9	450.9	467.1	15.3
Short-term loans	0.6	0.1	0.1	0.1	0.1	—
Current portion of long-term loans	—	—	—	—	—	—
Long-term loans ⁽³⁾	1.9	1.7	1.6	1.6	1.6	0.1
Customers' deposits	4.8	4.7	4.6	4.7	4.7	0.2
Net defined benefit liabilities	6.5	7.1	1.5	2.7	3.5	0.1
Deferred revenue	3.4	3.6	3.5	3.6	—	—
Total liabilities	80.8	83.4	79.9	81.5	82.5	2.7
Net assets	365.7	369.4	367.0	369.4	384.5	12.6
Capital stock	77.6	77.6	77.6	77.6	77.6	2.5
Equity attributable to stockholders of the						
parent	360.8	364.3	360.7	360.9	374.7	12.2
Noncontrolling interests	4.9	5.1	6.3	8.5	9.9	0.3

	Year Ended December 31					US\$
	2014 NT\$	2015 NT\$	2016 NT\$	2017 NT\$	2018 NT\$	
	(in billions, except for					
	percentages and per share)					
Consolidated Cash Flows Data:						
Net cash provided by operating activities	71.4	76.3	65.0	70.9	66.4	2.2
Net cash used in investing activities	(27.3)	(30.4)	(21.7)	(36.7)	(32.6)	(1.1)
Net cash used in financing activities	(35.1)	(39.2)	(42.5)	(36.6)	(35.0)	(1.1)
Net increase (decrease) in cash and cash						
equivalents	9.0	6.7	0.8	(2.3)	(1.2)	—
Other Financial Data:						
Gross margin ⁽⁴⁾	35	% 36	% 36	% 35	% 35	% 35
Operating margin ⁽⁵⁾	20	% 22	% 21	% 21	% 20	% 20
Net margin ⁽⁶⁾	16	% 18	% 18	% 17	% 17	% 17
Capital expenditures	32.6	25.1	23.5	26.9	28.6	0.9
Depreciation and amortization	34.1	33.4	32.5	31.9	33.8	1.1
Cash dividends declared per share	4.8564	5.4852	4.9419	4.796	4.479	(7) 0.15 (7)

Stock dividends declared per share	—	—	—	—	—	—
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- (1) Includes interest income of NT\$288 million, NT\$306 million, NT\$189 million, NT\$205 million and NT\$197 million (US\$6.4 million) for the years ended December 31, 2014, 2015, 2016, 2017 and 2018, respectively, and interest expense of NT\$46 million, NT\$33 million, NT\$20 million, NT\$22 million and NT\$18 million (US\$0.6 million) for the years ended December 31, 2014, 2015, 2016, 2017 and 2018, respectively.
- (2) Data as of December 31, 2014, 2015, 2016 and 2017 included investments accounted for using equity method and noncurrent available-for-sale financial assets. Starting from 2018, upon initial application of IFRS 9 “Financial Instruments” (“IFRS 9”), the category includes investments accounted for using equity method, noncurrent financial assets at fair value through profit or loss and noncurrent financial assets at fair value through other comprehensive income. Please refer to note 5 to our consolidated financial statements included elsewhere in this annual report for further information regarding the initial application of IFRS 9.
- (3) Excludes current portion of long-term loans.
- (4) Represents gross profit divided by revenues.

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- (5) Represents income from operations divided by revenues.
- (6) Represents net income attributed to stockholders of the parent divided by revenues.
- (7) Dividends for 2018, which are calculated based on Taiwan IFRSs, were approved by the board of directors in March 2019 and are expected to be declared at our annual general stockholders' meeting scheduled on June 21, 2019.

Currency Translations and Exchange Rates

For the convenience of readers, NT dollar amounts used in this annual report for, and as of, the year ended December 31, 2018 have been translated into U.S. dollar amounts using US\$1.00=NT\$30.61, set forth in the statistical release of the Federal Reserve Board on December 31, 2018. The U.S. dollar translation appears in parentheses next to the relevant NT dollar amount. We make no representation that any New Taiwan dollar amounts or U.S. dollar amounts referred to in this annual report could have been or could be converted into U.S. dollars or NT dollars, as the case may be, at any particular rate or at all. On April 19, 2019, the exchange rate was NT\$30.82 to US\$1.00.

B. Capitalization and Indebtedness

Not applicable.

C. Reasons for the Offer and Use of Proceeds

Not applicable.

D. Risk Factors

Our business and operations are subject to various risks, many of which are beyond our control. If any of the risks described below actually occurs, our business, financial condition or results of operations could be seriously harmed.

Risks Relating to Our Company and the Taiwan Telecommunications Industry

Extensive regulation of our industry may limit our flexibility to respond to market conditions and competition, and our business may suffer.

As a telecommunications service provider in Taiwan, we are subject to extensive regulation. See “Item 4. Information on the Company—B. Business Overview—Regulation” for a discussion of the regulatory environment applicable to us. Any changes in the regulatory environment applicable to us may adversely affect our business, financial condition and results of operations.

For example, the NCC has been focused on promulgating rules related to digital convergence. On April 5, 2017 the NCC drafted “the Telecommunications Management Act” and “the Digital Communications Act” and submitted them to the Executive Yuan for review. On November 16, 2017, the Executive Yuan approved the drafts and submitted them to the Legislative Yuan. The Transportation Committee of the Legislative Yuan finished reviewing the drafts “the Digital Communications Act” and “the Telecommunications Management Act” on May 24, 2018 and March 14, 2019, respectively, but reserved four articles of “the Telecommunications Management Act” for further consultation among political parties. Two drafts might go through the entire Three Reading procedure in the seventh session of the ninth Legislative term. The draft covers the following key areas: (i) to reduce the entry barrier to the telecommunications markets by changing the original concession/approval system to the registration system; (ii) to make sure that the general market players shall have only ordinary obligations to the minimum necessary extent, provided that certain players possessing a dominant market position as published by the competent authority will be subject to more stringent control measures; (iii) to open the markets of domestic roaming, frequency transferring, frequency leasing, frequency lending or frequency sharing mechanisms; (iv) to scale down the range of assistance for telecommunications construction under the existing Telecommunications Act; and (iv) to introduce the internet governance principle whereby self-discipline and public-private partnership are to be the main governance mechanism for the internet. The new draft laws will reduce the entry barrier to the telecommunications market, which is expected to increase the competition in the market. Also, it is likely that the

Company will be regarded by the competent authority as possessing a dominant market position in specific telecommunication service markets and will therefore be subject to special obligations involving a higher level of control by the authority. In addition, the opening up of the markets of domestic roaming as well as flexible usage of frequencies in the new draft enable operators to share the resources; in view of the scale-down range of assistance for telecommunications construction under the existing Telecommunications Act, the difficulty in the developing infrastructure of telecommunications networks will be greatly increased.

We have been designated by the government as a dominant provider of fixed communications within the meaning of applicable telecommunications regulations, and as a result, we are subject to special additional requirements imposed by the NCC. For example, the regulation governing the setting and changing of tariffs allows non-dominant telecommunications service providers greater freedom to set and change tariffs within the range set by the government. If we are unable to respond effectively to tariff changes by our competitors, our competitiveness, market position and profitability will be materially and adversely affected.

In particular, future decreases in tariff rates could immediately and substantially decrease our revenues. As a dominant Type I service provider under the Republic of China Telecommunications Act, or Telecommunications Act, we are constrained in our ability to raise prices. For example, the NCC adopted several rounds of tariff reduction plan, resulting in a number of price reductions in the tariff structures relating to our domestic fixed communications and mobile communications services. On March 8, 2017, the NCC announced a new plan for tariff reductions effective from April 1, 2017 to March 31, 2020. The reduction plan applies to the wholesale tariffs for IP peering and domestic leased line services, and to the monthly fees for fixed-line broadband access services (excluding fiber-to-the-home, or FTTH, fiber-to-the-building, or FTTB, asymmetric digital subscriber line, or ADSL, and the services which downlink and uplink speeds both over 100 Mbps). See “Item 4. Information on the Company—B. Business Overview—Regulation” and “Item 5. Operating and Financial Review and Prospects—Overview—Tariff adjustments.” We cannot assure you that we will not be required to further reduce our tariffs again in the future. Any mandatory tariff reductions could have a material adverse effect on our revenues.

In addition, the relevant authority might require us to reduce tariffs over some services through other regulatory measures or administrative planning. For example, the NCC amended the article 14 and 17 of the Regulations Governing Network Interconnection among Telecommunications Enterprises on November 11, 2017, and announced “Upper Limit on Access Charge for the Third Generation Mobile Telecommunications Operators and Mobile Broadband Operators.” Pursuant to the amendment and the announcement, starting from November 1, 2017, the tariff in the mobile interconnection fees will decrease over a period of four years, except the telecommunication fees (including interconnection fees) for incoming international long distance, or ILD, calls remain subject to mutual agreement between operators. Furthermore, the NCC approved our new fixed communications network interconnection fees on September 26, 2018. The interconnection fees for local telephone and domestic long distance telephone remain the same, while the interconnection fees from the mobile network to local telephone decrease. The tariff is effective from January 1, 2019 to December 31, 2022. See “Item 5. Operating and Financial Review and Prospects—Overview—Tariff adjustments.” The regulatory framework within which we operate may limit our flexibility to respond to market conditions, competition or changes.

If we fail to comply with the regulations of the ROC Fair Trade Act, we may be investigated and fined.

As a provider of telecommunication products and services, our business operations are subject to the regulations of the ROC Fair Trade Act, or the FTA, which is administered and enforced by the ROC Fair Trade Commission, or the FTC. The FTA requires, among other things, that the marketing and promotional materials of a business to be true and not misleading. The FTA also prohibits a business from participating or engaging in a cartel or other anti-competitive conduct. The FTC has the authority under the FTA to investigate and, where appropriate, impose fines and penalties on a business that violates any regulations promulgated by the FTA. The consequences of any such violations could

have a material adverse effect on our business and results of operations. See “Item 4. Information on the Company—B. Business Overview—Regulation” for a discussion of the FTA applicable to us. We have been investigated and penalized by the FTC in the past and may continue to be investigated or penalized by the FTC in the future if we fail to comply with the relevant regulations. As the FTA provides the FTC broad discretion to interpret anti-competition actions and enforce the relevant clauses under the FTA, we are unable to predict whether the FTC would initiate investigations on any of our daily business activities or find us liable for violating the FTA in the future. The investigations of and penalties imposed by the FTC could interrupt our provision of products or services and have a negative impact on our reputation, business operations and results of operations.

If we do not or are unable to obtain and maintain the licenses to operate our business, our business prospects and future results of operations would be adversely affected.

We operate our businesses with approvals and licenses granted by the government. If these approvals or licenses are revoked or suspended or are not renewed, or if we are unable to obtain any additional licenses that we may need to operate or expand our business in the manner we desire, then our financial condition and results of operations, as well as our prospects, will suffer. For example, in November 2017, we obtained 4G mobile broadband services spectrum in 1800MHz and 2100MHz frequency bands, which are valid until the end of 2030 and 2033, respectively. Furthermore, the NCC may hold the auction for the license of the fifth generation, or 5G, mobile networks in 2020 or late 2019. If we are unable to successfully acquire and maintain the rights to use the licenses or frequency spectrums that we need for our future business operations, our business prospects and future results of operations may be materially and adversely affected.

Increasing market competition may adversely affect our growth and profitability by causing us to lose customers, charge lower tariffs or spend more on marketing.

As of the date of this annual report, there are five mobile network operators in Taiwan providing 4G mobile broadband services. Each mobile network operator, including us, has been offering aggressive promotional programs to attract consumers, such as unlimited low-priced data plans, when many mobile network operators around the world have eliminated unlimited data plans. We cannot assure you that we will be able to raise our revenues from 4G mobile broadband services in light of the intense market competition, which could have a material adverse effect on our business prospects and our future results of operations.

We also face increasing fixed broadband competition from cable operators. Cable operators have been using low-priced internet access packages to attract new customers in specific areas and buildings in Taiwan. The percentage of digitization of cable television networks by December 31, 2018 has already been 99.95%, which increased the availability of high-speed internet services from cable operators. Furthermore, after the NCC relaxed the zoning restrictions on service areas for cable operators on July 27, 2012, new cable operators started to attract subscribers with limited channels and lower fee charges. As a result, we could face increased competition for our broadband access services. If we are unable to compete successfully with the cable operators for broadband access services, our results of operations could be impacted.

As the mobile data access speeds have increased as technologies advanced, some of our customers have replaced fixed broadband services with high-speed mobile broadband services. Rates of customer growth have declined in our fixed broadband and mobile businesses and may decline further, which may bring about further decreases in tariff rates and necessitate increases in our selling and promotional expenses. Any of these developments could adversely affect our business, financial condition and results of operations.

In addition, our over the top, or OTT, business may not be able to compete with video streaming providers such as iQiyi, which invest extensively in contents and productions of original films and TV series. Although we have invited other OTT providers to provide contents onto our platform, we don't rule out that our OTT customers might be attracted by its massive and exclusive titles, and our OTT business growth might slow down and be limited.

Our ability to deliver services may be disrupted due to a systems failure, shutdown in our networks, earthquakes or other natural disasters.

Taiwan is susceptible to earthquakes and typhoons. However, we do not carry insurance to cover damage caused by earthquakes, typhoons or other natural disasters or any resulting business interruption. Our services are currently carried through our fixed and mobile communications networks, as well as through our transmission networks consisting of optical fiber cable, microwave, submarine cable and satellite transmission links, which could be vulnerable to damage or interruptions in operations due to natural disasters. For example, in 2018, we recorded losses on property, plant and equipment arising from natural disasters such as earthquakes and typhoons in the amount of approximately NT\$1.7 million (US\$0.06 million). The occurrence of natural disasters could impact our ability to deliver services and have a negative effect on our results of operations.

Furthermore, we might also be liable for losses claimed from our customers that were incurred from our failure to deliver our services. These potential liabilities could also have a material adverse effect on our results of operations.

We are subject to litigation or other legal proceedings that could expose us to substantial liabilities.

We are from time to time involved in various litigation, arbitration or administrative proceedings in the ordinary course of our business. Any such claims, whether with or without merit, asserted or threatened, could be time-consuming and expensive to defend and could divert our management's attention and resources. See "Item 4. Information on the Company—B. Business Overview—Legal Proceedings." We cannot predict the outcome of these proceedings, and we cannot assure you that if a judgment is rendered against us in any or all of these proceedings, our financial condition and results of operations would not be materially and adversely affected.

We depend on select personnel and could be affected by the loss of their services.

We depend on the continued service of our executive officers and skilled technical and other personnel. Our business could suffer if we lose the services of any of these personnel and cannot adequately replace them. In particular, we are not insured against the loss of any of our personnel. We may not be able to retain our present personnel or attract additional qualified personnel as and when needed. Moreover, we may be required to increase substantially the number of these employees in connection with any expansion, and there is intense competition for experienced personnel in the Taiwan telecommunications industry. The major three telecom operators in Taiwan, including us, are expanding the Information, Communication and Technology, or ICT, business and may increase the number of their employees as part of this expansion. In addition to telecom operators, some computer design companies and manufacturers are also expanding their business into this area and have been recruiting information technology related employees as well. We cannot assure you that we will be able to successfully attract and retain new information technology related employees. In addition, we may need to increase employee compensation levels in order to attract and retain personnel. We cannot assure you that the loss of the services of any of these personnel would not disrupt our business and operations and materially and adversely affect the quality of our services and harm our reputation.

We may not realize the benefits we expect from our investments, and this may materially and adversely affect our business, financial condition, results of operations and prospects.

We have made significant capital investments in our network infrastructure and information technology systems. In order to continue to develop our business and offer new and more sophisticated services, we intend to continue to invest in different areas as well as new technologies. The launch of new and commercially viable products and services is important to the success of our business. We expect to continue making substantial capital expenditures to further develop our range of services and products.

Commercial acceptance by consumers of the new and more sophisticated services we offer may not occur at the rate or level expected, and we may not be able to successfully adapt these services to effectively and economically meet our customers' demand, thus impairing the expected return from our investments.

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We cannot assure you that services enabled by the new technologies we are implementing, such as Internet of Things, or IoT, Software-Defined Networking, or SDN, Network Functions Virtualization, or NFV, LTE WLAN Aggregation, or LWA, License Assisted Access, or LAA, Voice over LTE, or VoLTE, Wi-Fi Calling, Artificial Intelligence, or AI, Augmented Reality, or AR, Virtual Reality, or VR will be accepted by the public to the extent required to generate an acceptable rate of return. In addition, we could face the risk of unforeseen complications in the deployment of these new services and technologies, and we cannot assure you that we will not exceed our estimate of the necessary capital expenditure to offer such services. New services and technologies may not be developed and/or deployed according to expected schedules or may not achieve commercial acceptance or be cost-effective.

The failure of any of our services to achieve commercial acceptance could result in additional capital expenditures or a reduction in profitability to the extent that we are required under applicable accounting standards to recognize a charge for impairment of assets. Any such charge could materially and adversely affect our financial condition and results of operations. We recognized an impairment loss for investment properties, equipment and intangible assets in the past. In 2018, we concluded that the recoverable amount representing the fair value less costs to sell investment properties was higher than the carrying amount. Therefore, we recognized a reversal of impairment loss of NT\$19 million (US\$0.6 million) and the amount was recognized only to the extent of impairment losses that had been recognized in prior years. In 2018, our subsidiary, SENAO, determined that certain licensed contracts were impaired and recognized an impairment loss on intangible assets of NT\$51 million (US\$1.7 million).

In addition, the NCC may hold the auction for the license of 5G mobile networks in 2020 or late 2019. If we acquire the frequency spectrum, we will need to pay concession fee for the right to use the license, and amortize the amount as our operating costs during the valid term, which could adversely affect our consolidated results of operations.

Furthermore, we cannot assure you that we will be able to continue to maintain control of and consolidate the results of operations of our minority-owned subsidiaries. For example, we consolidate the results of operations of our subsidiary, Senao International Co., Ltd., or Senao, because we have remained control over Senao's relevant activities and have control over the governance of the entity. Please refer to Note 3 and Note 15 to our consolidated financial statements included elsewhere in this annual report for details of the relationship between Senao and its parent company. We cannot assure you that we will be able to continue maintaining control over Senao's relevant activities. If we lose control of our minority-owned subsidiary, we will no longer be able to consolidate the results of operations of such subsidiary, which could adversely affect our consolidated results of operations and ability to meet the operating results guidance that we have projected.

We may also from time to time make equity investments in companies, but we cannot assure you of their profitability. We cannot assure you that losses related to our equity investments will not have a material adverse effect on our financial condition or results of operations.

Changes in technology may render our current technologies obsolete or require us to obtain licenses for introducing new services or make substantial capital investments, financing for which may not be available to us on favorable commercial terms or at all.

The telecommunications industry in Taiwan has been characterized by rapid increases in the diversity and sophistication of the technologies and services offered. As a result, we expect that we will need to constantly upgrade our telecommunications technologies and services in order to respond to competitive industry conditions and customer requirements. Developments of new technologies have rendered some less advanced technologies unpopular or obsolete. If we fail to develop, or obtain timely access to, new technologies and equipment, or if we fail to obtain the necessary licenses to provide services using these new technologies, we may lose our customers and market share and become less profitable.

In addition, the cost of implementing new technologies, upgrading our networks or expanding capacity could be significant. In particular, we have made and will continue to make substantial capital expenditures in the near future in order to effectively respond to technological changes, such as the continued expansion of our fiber optic networks and 4G mobile broadband networks. To meet the increasingly robust high-bandwidth requirements of digital convergence services, we continue to expand construction of fiber optic networks, including passive optical networks,

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or PONs, and optical distribution networks, or ODNs. Also, we continue to enhance our 4G mobile broadband coverage and capacity. In November 2017, we obtained 4G mobile broadband services spectrum in 1800MHz and 2100MHz frequency bands. After that, we own three consecutive 20MHz spectrum in 1800MHz, 2100MHz and 2600MHz frequency bands, which may provide higher data transmission rates. To the extent these expenditures exceed our cash resources, we will be required to seek additional debt or equity financing. Our ability to obtain additional financing on favorable commercial terms will depend on a number of factors. These factors include our financial condition, results of operations, cash flows and the prevailing market conditions in the domestic and international telecommunications industry, the cost of financing and conditions in the financial markets, and the issuance of relevant government and other regulatory approvals. Any inability to obtain the funding for our capital expenditures on commercially acceptable terms could jeopardize our expansion plans and materially and adversely affect our business prospects and future results of operations.

If new technologies adopted by us do not perform as expected, or if we are unable to effectively deliver new services based on these technologies in a commercially viable manner, our revenue growth and profitability will decline.

We are constantly evaluating new growth opportunities in the broader telecommunications industry. Some of these opportunities involve new services for which there are no proven markets, and may not develop as expected. Our ability to deploy and deliver these services will depend, in many instances, on new but unproven technologies. These new technologies may not perform as expected or generate an acceptable rate of return. In addition, we may not be able to successfully develop new technologies to effectively and economically deliver these services, or be able to compete successfully in the delivery of telecommunications services based on new technologies. Furthermore, the success of our IoT services is substantially dependent on the availability of applications and devices that are being developed by third-party developers, and on whether we will be able to achieve a sustainable business model. These applications or devices may not be sufficiently developed to support the deployment of our mobile data services. If we are unable to deliver commercially viable services based on the new technologies that we adopt, our financial condition and results of operations may be materially and adversely affected. In addition, we may need to cooperate with certain third parties to deliver these new services. To the extent these third parties fail to perform their obligations or we fail to thoroughly verify their qualifications and credentials, our ability to deliver these services or our financial condition and results of operations may be materially and adversely affected.

As an internet service provider, we may not be able to protect our customers and their information from cyber attacks, nor protect our services from disruptions due to cybersecurity breaches.

As an internet service provider, our system is susceptible to cybersecurity risks, including hijack attacks, phishing attacks, hacker's intrusions to steal customer's information and distributed denial-of-service (DDoS) attacks. Our online services such as e-bills and multiple payment options through the internet are also vulnerable to cyber attacks. These attacks may disrupt our services and cause leakage of our customers' personal information, which may result in significant damage and material adverse effect to our customers and our operations.

The Cyber Security Management Act approved by the Legislative Yuan on May 11, 2018 was subsequently promulgated by the President on June 6, 2018 and came into force on January 1, 2019. According to the Act, providers of critical infrastructure are required to establish, amend and implement the maintenance plan of cybersecurity, and report the result of the implementation to the NCC. It is likely that the NCC regard us as a provider of critical infrastructure in the communication area and then we will therefore be subject to these obligations. If we fail to comply with such requirements, we may be subject to administrative penalties. Furthermore, the European Union promulgated the General Data Protection Regulation, including strict requirements to protect the personal information of customers and suppliers from countries in the European Union. We cannot assure you that our data protection measures are sufficient to prevent any data leakage or disruption of our service due to cyber attacks. We may suffer negative consequences, such as remedial costs, increased cybersecurity protection costs, lost revenues,

litigation and reputational damage due to cyber attacks. See “Item 4. Information on the Company—B. Business Overview—Cybersecurity and Personal Information Protection.”

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Our largest stockholder may take actions that conflict with our public stockholders' best interests.

As of December 31, 2018, our largest shareholder, the government of the ROC, through the MOTC, owned approximately 35.29% of our outstanding common shares. Accordingly, the government, through its control over our board, as all non-independent board members were appointed by the MOTC, may continue to have the ability to control our business, including matters relating to:

- any sale of all or substantially all of our assets;
- the approval of our annual operation and projects budget;
- the composition of our senior management;
- the timing and distribution of dividends;
- the election of a majority of our directors; and
- our business activities and direction.

We cannot assure you that our largest shareholder will not take actions that impair our ability to conduct our business competitively or conflict with the best interests of our public stockholders.

Actual or perceived health risks related to mobile handsets and base stations could lead to decreased mobile service usage and difficulties in increasing network coverage and could expose us to potential liability.

According to some published reports, the electromagnetic signals from mobile handsets and cellular base stations may pose health risks or interfere with the operation of electronic equipment. Although the findings of those reports are disputed, actual or perceived risks of using mobile communications devices or of cellular base stations could have a material adverse effect on mobile service providers, including us. For example, our customer base could be reduced, our customers may reduce their usage of our mobile services, we could encounter difficulties in obtaining sites for additional cellular base stations required to expand our network coverage or we may be requested to reduce the number of existing cellular base stations. As a result, our mobile services business may generate less revenue and our financial condition and results of operations may be materially and adversely affected. In addition, we could be exposed to potential liability for any health problems caused by mobile handsets and base stations.

Investor confidence in us may be adversely impacted if we or our independent registered public accountants are unable to attest to or express an unqualified opinion on the effectiveness of our internal control over financial reporting.

We are subject to the reporting requirements of the SEC. The SEC, as directed by Section 404 of the U.S. Sarbanes-Oxley Act of 2002, adopted rules requiring U.S. public companies to include a report of management on our internal control over financial reporting in their annual reports that contain an assessment by management of the effectiveness of our internal control over financial reporting. The effectiveness of our internal control over financial reporting has been audited by Deloitte & Touche, an independent registered public accounting firm, which has also audited our consolidated financial statements for the year ended December 31, 2018. Deloitte & Touche has issued an attestation report on the effectiveness of our internal control over financial reporting in accordance with the standards of the Public Company Accounting Oversight Board (United States). See "Item 15. Controls and Procedures—Attestation Report of the Registered Public Accounting Firm."

While the management report included in this annual report concluded that our internal control over financial reporting was effective, we cannot assure you that our management will be able to conclude that our internal control over financial reporting is effective in future years. If in future years we fail to maintain effective internal control over financial reporting in accordance with the Sarbanes-Oxley Act, we could suffer a loss of investor confidence in the reliability of our consolidated financial statements, which in turn could negatively impact the trading price of our ADSs, and could result in lawsuits being filed against us by our stockholders or otherwise harm our reputation.

If we fail to maintain a good relationship with our labor unions, work stoppages or labor unrest could occur and the quality of our services as well as our reputation could suffer.

In accordance with the articles of association of Chunghwa Telecom Workers' Union, except for the chief manager of each department, most of our employees are members of our principal labor union, the Chunghwa Telecom Workers' Union. Since our incorporation in 1996, we have experienced disputes with our labor unions on such issues as employee benefits and retirement benefits in connection with our privatization as well as the right to protest. Despite having taken measures to improve relations, increase cooperation and ensure mutual benefit with our labor unions, such as increasing channels of communications by holding periodic labor resource review meetings and guaranteeing our labor unions a seat on our board of directors, we cannot assure you that we will be able to maintain a good relationship with our labor unions. Any deterioration in our relationship with our labor unions could result in work stoppages, strikes or threats to take such an action, which could disrupt our business and operations, materially and adversely affect the quality of our services and harm our reputation. As a result of a promotion in May 2018 that drove in a tremendous amount of customers, a number of our staff had to work overtime and we were found liable for violating the Republic of China Labor Standards Act in 18 incidents and were fined for an aggregate of NT\$5.4 million (approximately US\$0.2 million). We have appealed these decisions. Despite this series of incidents, we believe our relationship with our labor unions remains good, and the subsequent bonuses in response to the additional workload received support and positive feedback from our labor unions.

Any economic downturn or decline in the growth of the population in Taiwan may materially and adversely affect our financial condition, results of operations and prospects.

We conduct most of our operations and generate most of our revenues in Taiwan. As a result, any decline in the Taiwan economy or a decline in the growth of the population in Taiwan may materially and adversely affect our financial condition, results of operations and prospects. In particular, Taiwan's economy is highly dependent on the technology industry, and any downturn in the global technology industry may have a material adverse effect on Taiwan's economy, which in turn, could adversely affect the demand for our products and services. There have also been concerns over the armed conflicts, civil unrest and geopolitical uncertainty in the Middle East, and Asia Pacific (particularly the South China Sea), which has resulted or could result in higher volatility on oil prices and capital markets, and the economic slowdown in Mainland China, which could have a material adverse effect on economies around the world. There have also been concerns over the forecast for global economic slowdown, the attitude of the US Federal Reserve toward interest rate setting, the dispute on trade imbalances from the US and China, the UK severely economic recession as result of the no-deal Brexit of the United Kingdom from the European Union, all of which could cause turbulence in the international and Taiwan's financial markets as well.

As our business is dependent on economic growth, any uncertainty or further deterioration in economic conditions could have a material adverse effect on our financial condition and results of operations. We cannot assure you that economic conditions in Taiwan will continue to improve in the future or that our business and operations will not be materially and adversely affected by deterioration in the Taiwan economy.

We face substantial political risks associated with doing business in Taiwan, particularly due to domestic political events and the tense relationship between the ROC and the People's Republic of China, which could adversely affect our financial condition and results of operations.

Our principal executive offices and substantially all of our assets are located in Taiwan, and substantially all of our revenues are derived from our operations in Taiwan. Accordingly, our business, financial condition and results of operations and the market price of our common shares and the ADSs may be affected by changes in ROC governmental policies, taxation, inflation or interest rates and by social instability and diplomatic and social developments in or affecting Taiwan which are outside of our control. Taiwan has a unique international political

status. Since 1949, Taiwan and the Chinese mainland have been separately governed. The People's Republic of China, or PRC, claims that it is the sole government in China and that Taiwan is part of China.

In addition, the PRC government has refused to renounce the use of military force to gain control over Taiwan. Past developments in relations between the ROC and the PRC have on occasion depressed the market prices of the securities of companies in the ROC. Relations between the ROC and the PRC and other factors affecting military, political or economic conditions in Taiwan could materially and adversely affect our financial condition and results of operations, as well as the market price and the liquidity of our securities. In addition, the complexities of the relationship between the ROC and PRC require companies involved in cross-strait business operations to carefully monitor their actions and manage their relationships with both ROC and PRC governments. In the past, companies in the ROC, including us, have received minor sanctions such as travel restrictions or minor monetary fines by the ROC and/or PRC governments. We cannot assure you that we will be able to successfully manage our relationships with the ROC and PRC governments for our cross-strait business operations, which could have an adverse effect on our ability to expand our business and conduct cross-strait business operations.

Any future outbreak of contagious diseases may materially and adversely affect our business and operations, as well as our financial condition and results of operations.

Any future outbreak of contagious diseases, such as avian influenza, Zika virus, dengue fever or Ebola virus, may disrupt our ability to adequately staff our business and may generally disrupt our operations. If any of our employees is suspected of having contracted any contagious disease, we may under certain circumstances be required to quarantine such employees and the affected areas of our premises. As a result, we may have to temporarily suspend part or all of our operations. Furthermore, any future outbreak may restrict the level of economic activity in affected regions, including Taiwan, which may adversely affect our business and prospects. As a result, we cannot assure you that any future outbreak of contagious diseases would not have a material adverse effect on our financial condition and results of operations.

Stockholders may have more difficulty protecting their interests under the laws of the ROC than they would under the laws of the United States.

Our corporate affairs are governed by our Articles of Incorporation, the Telecommunications Act, and by the laws governing corporations incorporated in the ROC. See “—Extensive regulation of our industry may limit our flexibility to respond to market conditions and competition, and our business may suffer.” The rights of stockholders and the responsibilities of management and the members of the board of directors of Taiwan companies are different from those applicable to a corporation incorporated in the United States. For example, controlling or major stockholders of Taiwan companies do not owe fiduciary duties to minority stockholders. As a result, holders of our common shares and ADSs may have more difficulties in protecting their interests in connection with actions taken by our management or members of our board of directors than they would as public stockholders of a United States corporation.

Our actual financial results may differ materially from our published guidance.

Starting in 2013, we continued to voluntarily publish our operating results guidance on an annual basis in accordance with the Taiwan IFRSs. We may from time to time update our operating results guidance after evaluating the effects of any changes to the estimates and assumptions that we used to calculate our projections of our operating results. Our projections are based on a number of estimates and assumptions that are inherently subject to significant uncertainties and contingencies, including the risk factors described in this annual report. In particular, our projections are forward-looking statements that are necessarily speculative in nature, and it can be expected that one or more of the estimates on which the projections were based will not materialize or will vary significantly from actual results, and such variances will likely increase overtime. For example, our revenue, operating income, net income and EPS for 2018 were lower than our published guidance.

Our results of operations and financial condition under Taiwan IFRSs may differ materially from our reported results of operations and financial condition under IFRSs.

While we have adopted Taiwan IFRSs for ROC reporting purposes, we adopt IFRSs for certain filings with the SEC, including our annual reports on Form 20-F. Taiwan IFRSs differs from IFRSs in certain significant respects, including to the extent that any new or amended standards or interpretations applicable under IFRSs may not be timely endorsed by the FSC. Furthermore, the dividends for 2018 that are expected to be declared at our 2019 annual general stockholders' meeting are calculated based on Taiwan IFRSs. It is difficult for us to determine the differences between Taiwan IFRSs and IFRSs on our financial statements as any new or amended standards or interpretations applicable under IFRSs may not be timely endorsed by the FSC.

Risks Relating to Ownership of Our ADSs and Common Shares

The value of your investment may be reduced by future sales of our ADSs or common shares by us, by the government of the ROC or by other stockholders.

The government may continue to sell our common shares. Sales of substantial amounts of ADSs or common shares by the government or any other stockholder in the public market, or the perception that future sales may occur, could depress the prevailing market price of our ADSs and common shares.

The market value of your investment may fluctuate due to the volatility of, and government intervention in, the Taiwan securities market.

Our common shares are traded on the TWSE, which has a smaller market capitalization and is more volatile than the securities markets in the United States and many European countries. The market value of our ADSs may fluctuate in response to the fluctuation of the trading price of our common shares on the TWSE. The TWSE has experienced substantial fluctuations in the prices and trading volumes of listed securities, and there are currently limits on the range of daily price movements. During 2018, the TWSE Index reached a low of 9,478.99 on December 26, 2018, and peaked at 11,253.11 on January 23, 2018. On April 19, 2019, the TWSE Index closed at 10,968.50. The TWSE has experienced certain problems, including market manipulation, insider trading and payment defaults. The recurrence of these or similar problems could have a material adverse effect on the market price and liquidity of the securities of Taiwan companies, including our ADSs and common shares, in both the domestic and the international markets.

In response to declines and volatility in the securities markets in Taiwan, the government of the ROC formed the National Financial Stabilization Fund to support these markets through open market purchases of shares in Taiwan companies from time to time. The details of the transactions of the National Financial Stabilization Fund have not been made public. In addition, the government's Labor Insurance Fund and other funds associated with the government have in the past purchased, and may from time to time purchase, shares of Taiwan companies listed on the TWSE or other markets. As a result of these activities, the market price of common shares of Taiwan companies may have been and may currently be higher than the prices that would otherwise prevail in the open market. Market intervention by government entities, or the perception that such activity is taking place, may take place or has ceased, may cause sudden movements in the market prices of the securities of Taiwan companies, which may affect the market price and liquidity of our common shares and ADSs.

We may be sanctioned or lose our licenses for violations of limits on foreign ownership of our common shares, and these limits may materially and adversely affect our ability to obtain financing.

The Telecommunications Act limits foreign ownership of our common shares. Prior to March 1, 2006, the MOTC, as the competent authority under the Telecommunications Act, had the power to prescribe the limits on foreign ownership of our common shares. After the formation of the NCC on March 1, 2006, the NCC replaced the MOTC as the competent authority under the Telecommunications Act pursuant to the National Communications Commission Organization Act, or the Organization Act. The NCC and the MOTC reached an agreement on foreign ownership of Chunghwa Telecom, so an announcement issued by the MOTC on December 28, 2007 stipulated that direct holdings by foreign investors in Chunghwa Telecom cannot exceed 49% of our outstanding share capital and the total direct and indirect holdings by foreign investors cannot exceed 55% of our outstanding share capital. As of April 19, 2019, foreign direct holdings of our outstanding share capital is at 17.45%. If we fail to comply with the applicable foreign ownership limitations, our licenses to operate some of our businesses could be revoked. Moreover, we cannot predict the manner in which the NCC will exercise its authority over us, or whether NCC will lower the foreign ownership cap at any time.

If we are deemed to be in violation of our foreign ownership limitations, any consequences arising from such violation may materially and adversely affect us. Moreover, since we are unable to control ownership of our common shares or ADSs representing our common shares, and because we have no ability to stop transfers among stockholders, or force particular stockholders to sell their shares, we may be subject to monetary fine or lose our licenses through no fault of our own. In that event, our business could be disrupted, our reputation could be damaged and the market price of our ADSs and common shares could decline. These limitations may also materially and adversely affect our ability to obtain adequate financing to fund our future capital requirements or to obtain strategic partners, and alternate forms of financing may not be available on terms favorable to us or at all.

Restrictions on the ability to deposit our common shares into our ADS program may adversely affect the liquidity and price of the ADSs.

The ability to deposit shares into our ADS program is restricted by ROC law, under which no person or entity, including you and us, may deposit our common shares into our ADS program unless the Securities and Futures Bureau has not objected within a prescribed period following the filing with it of an application to do so, except for the deposit of the common shares into our ADS program and for the issuance of additional ADSs in connection with:

- distribution of share dividends or free distribution of our common shares;
- exercise of preemptive rights of ADS holders applicable to the common shares evidenced by our ADSs in the event of capital increases for cash; or
- purchases of our common shares in the domestic market in Taiwan by the investor directly or through the depository and delivery of such shares or delivery of our common shares held by such investors to the custodian for deposit into our ADS program, subject to the following conditions: (a) the depository may accept deposit of those shares and issue the corresponding number of ADSs with regard to such deposits only if the total number of ADSs outstanding after the deposit does not exceed the number of ADSs previously approved by the Securities and Futures Bureau, plus any ADSs issued pursuant to the events described above; and (b) this deposit may only be made to the extent previously issued ADSs have been cancelled.

As a result of the limited ability to deposit common shares into our ADS program, the prevailing market price of our ADSs on the New York Stock Exchange, or NYSE, may differ from the prevailing market price of the equivalent number of our common shares on the TWSE.

You will be more restricted in your ability to exercise voting rights than the holders of our common shares, which may diminish your influence over our corporate affairs and may reduce the value of your ADSs.

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

Generally, ADS holders will not be able to exercise voting rights attached to the underlying securities on an individual basis. Under the deposit agreement, the voting rights attached to the underlying securities must be exercised as to all matters subject to a vote of stockholders collectively in the same manner, except in the case of an election of directors. The election of our directors is by means of cumulative voting. In the event the depository does not receive voting instructions from ADS holders in accordance with the deposit agreement, our chairman or his or her designee will be entitled to vote the common shares represented by the ADSs in the manner he or she deems appropriate at his or her discretion, which may not be in your interest.

Your right to participate in any future rights offerings may be limited, which may cause dilution to your holdings.

We may from time to time distribute rights to our stockholders, including rights to acquire our securities. Under the deposit agreement, the depositary will not offer you those rights unless the distribution to ADS holders of both the rights and any related securities are either registered under the U.S. Securities Act of 1933, as amended, or the Securities Act, or exempt from registration under the Securities Act. We are under no obligation to file a registration statement with respect to any such rights or securities or to endeavor to cause such a registration statement to be declared effective. Moreover, we may not be able to establish an exemption from registration under the Securities Act. Accordingly, you may be unable to participate in our rights offerings and may experience dilution in your holdings.

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

Changes in exchange controls that restrict your ability to convert proceeds received from your ownership of ADSs may have an adverse effect on the value of your investment.

Your ability to convert proceeds received from your ownership of ADSs depends on existing and future exchange control regulations of the ROC. Under the current laws of the ROC, an ADS holder or the depositary, without obtaining further approvals from the Central Bank of the ROC (Taiwan) or any other governmental authority or agency of the ROC, may convert NT dollars into other currencies, including U.S. dollars, in respect of:

- the proceeds of the sale of common shares represented by ADSs or received as share dividends with respect to the common shares and deposited into the depositary receipt facility; and
- any cash dividends or distributions received from the common shares represented by ADSs.

In addition, the depositary may also convert into NT dollars incoming payments for purchases of common shares for deposit in the depositary receipt facility against the creation of additional ADSs. If you withdraw the common shares underlying your ADSs and become a holder of our common shares, you may convert into NT dollars subscription payments for rights offerings. The depositary may be required to obtain foreign exchange approval from the Central Bank of the ROC (Taiwan) on a payment-by-payment basis for conversion from NT dollars into foreign currencies of the proceeds from the sale of subscription rights of new common shares. Although it is expected that the Central Bank of the ROC (Taiwan) will grant approval as a routine matter, required approvals may not be obtained in a timely manner, or at all.

Under the ROC Foreign Exchange Control Law, the Executive Yuan of the ROC may, without prior notice but subject to subsequent legislative approval rendered within ten days from such imposition, impose foreign exchange controls or other restrictions in the event of, among other things, a material change in domestic or international economic conditions which might threaten the stability of the domestic economy in Taiwan.

You are required to register with the TWSE and appoint several local agents in Taiwan if you withdraw common shares from our ADS facility and become our stockholder, which may make your ownership burdensome.

If you are a non-ROC person and wish to withdraw common shares represented by your ADSs from our ADS facility and hold those common shares, you are required under the current laws and regulations of the ROC to appoint an agent, also referred to as a tax guarantor, in the ROC for filing tax returns and making tax payments. A tax guarantor must meet certain qualifications set by the Ministry of Finance of the ROC and, upon appointment, becomes a guarantor of your ROC tax obligations. If you wish to repatriate profits derived from the sale of withdrawn common shares or cash dividends or interest on funds derived from the withdrawn common shares, you will be required to submit evidence of your appointment of a tax guarantor and the approval of the appointment by the ROC tax authorities. You may not be able to appoint and obtain approval for a tax guarantor in a timely manner.

In addition, under the current laws of the ROC, you will be required to be registered as a foreign investor with the TWSE for making investments in the ROC securities market prior to your withdrawal and holding of common shares represented by the ADSs. You will be required to appoint a local agent in Taiwan to, among other things, open a securities trading account with a local securities brokerage firm and a bank account to remit funds, exercise stockholders' rights and perform other functions as holders of ADSs may designate. You must also appoint a local bank to act as custodian for handling confirmation and settlement of trades, safekeeping of securities and cash proceeds and reporting and declaration of information. Without the relevant registration and appointment of the local agent and custodian and the opening of a securities trading account and bank account, you will not be able to hold, subsequently sell or otherwise transfer our common shares withdrawn from the ADS facilities on the TWSE.

ITEM 4. INFORMATION ON THE COMPANY

A. History and Development of the Company

Our legal and commercial name is Chunghwa Telecom Co., Ltd. We were officially established on July 1, 1996 as part of the privatization efforts by the government of the ROC and operate under the Statute of Chunghwa Telecom Co., Ltd. Prior to our formation, we were operating as a business unit of the Directorate General of Telecommunications, which was formerly the NCC. The common shares of the Company have been listed on the TWSE under the number "2412" since October 2000 and its ADSs have been listed on the NYSE under the symbol "CHT" since July 2003. We were privatized as a result of a secondary ADS offering and concurrent domestic auction of our common shares on August 12, 2005, as the ownership by the government of the ROC was reduced to less than 50%. The privatization has enabled us to develop our business and respond to changing market conditions more rapidly and efficiently. Today, we are the largest full telecommunication service provider in Taiwan. Our principal executive offices are located at 21-3 Hsinyi Road, Section 1, Taipei, Taiwan, ROC, and our telephone number is (886) 2-2344-5488. Our website address is <https://www.cht.com.tw>. The information on our website does not form a part of this annual report. Our agent for service of process in any suit or proceeding arising out of or relating to our shares, ADSs, American depository receipt, or ADR, and deposit agreement in the United States is CT Corporation System, 111 Eighth Avenue, New York, NY 10011.

We are the largest telecommunications service provider in Taiwan and one of the largest in Asia in terms of revenue. As an integrated telecommunications service provider, our principal services include:

- domestic fixed communications services, including local and domestic long distance telephone services, broadband access services, local and domestic long distance leased line services, Wi-Fi services, MOD services, domestic data services and other domestic services;
- mobile communications services, including mobile voice and data services, sales of mobile handsets, tablets, data cards and other mobile services;
- internet services, including data communication services, such as HiNet, application value-added services, or VAS, and services provided to the government;
- international fixed communications services, including ILD telephone services, international leased line services, international data services, satellite services and other international services; and
- other services, including non-telecom services.

In addition to these traditional telecommunication services, we also focus on selected ICT services and advanced development.

We enjoy leading positions across a number of areas in terms of both revenues and customers. We are Taiwan's largest fixed communications services provider as well as Taiwan's largest mobile communications service provider. We are also Taiwan's largest broadband access and internet service provider. As for the IPTV service, our MOD service is one

of the popular video platforms in Taiwan. In 2018, our revenues were NT\$215.5 billion (US\$7.0 billion), our consolidated net income was NT\$38.6 billion (US\$1.2 billion) and our basic earnings per share was NT\$4.84 (US\$0.16).

In 2018, we made capital expenditures totaling NT\$28.6 billion (US\$0.9 billion). See “Item 5. Operating and Financial Review and Prospects—B. Liquidity and Capital Resources—Capital Expenditures” for a detailed discussion of our capital expenditures.

Competitive Strengths

We believe that our primary competitive strengths are:

- our position as an integrated, full-service telecommunications provider as well as ICT service provider and our premium brand and broad customer base in Taiwan; and
- our capital resources and technology.

We are an integrated full-service telecommunications provider as well as ICT service provider and have premium brand and broad customer base in Taiwan.

We are the largest telecommunications service provider in Taiwan with a leading position in fixed communications services, mobile communications services and internet services. We are also a major ICT service provider in areas such as information security and Big Data analysis.

Broad range of communications products and services. We believe that our ability to provide an attractive and comprehensive range of both telecommunications services and ICT total solution to our business and residential customers. In addition, we are able to offer innovative customized ICT services and competitive tariff packages to meet the specific needs of our customers.

Broad network coverage. In order to provide higher bandwidth services for our customers, we have been constructing our fiber to the x, or FTTx, network since 2003. We have successfully migrated many of our customers from ADSL service to FTTx service, which offers even higher speeds by using fiber optic technology. As of December 31, 2018, network coverage of FTTx with speeds of 100 Mbps and higher was approximately 91.3%. In addition, our mobile communications network provides nationwide coverage. Our large mobile spectrum allocation together with our extensive network coverage positions us well for the continued expansion of our mobile services in Taiwan. We are also continuing to build our Wi-Fi network to offload mobile network capacity in residential areas and public areas where subscriber density and usage is high, such as urban areas, airports and convenience stores.

Brand awareness, distribution channels and customer service. Our principal brands “Chunghwa Telecom,” “emome” and “HiNet” have a reputation for quality and reliability. We serve our large customer base through our extensive customer service network in Taiwan. See “—B. Business Overview—Marketing, Sales and Distribution—Sales and Distribution.” We are continuing to transform our retail stores while increasing the number of our service centers throughout Taiwan. Our extensive sales and distribution channels help us attract additional customers and develop new business opportunities. We eagerly enhance user experience at different channels. We integrate our website and offline channels, with our Big Data capability, to accelerate development of our Online-to-Offline business. In addition, by leveraging our capability to analyze Big Data, we are able to adopt marketing initiatives to target different customer groups’ interests and preferences and increase the effectiveness of our cross-marketing efforts of our products and services to our existing and potential customers.

In 2018, we obtained several domestic and international awards which recognized our service quality, corporate governance and our fulfillment of corporate social responsibility. In the Reader’s Digest Trusted Brands Awards, we have stood out and won the Platinum Award of Telecom Company in Taiwan for 14 consecutive years since 2005. We also have been awarded The Asset Corporate Platinum Award by The Asset Magazine for six consecutive years since 2013. In addition, we were also awarded Taiwan Mobile Service Provider as well as Taiwan Data Center Services Provider of the Year in 2018 Frost & Sullivan Best Practices Awards.

Operational expertise. Our management and employees have extensive operating experience and technical knowledge for future growth of emerging businesses. We also believe we will continue to attract and retain high-quality information technology talents.

We have the capital resources and technology to retain our leading position.

Strong capital structure. We believe we have great financial resources in Taiwan. Our low debt-to-equity capital structure, together with our strong operating cash flows, provides us with the flexibility and resources to invest in capital intensive and growing businesses. We continue enhancement of our existing 4G mobile broadband networks, our expansion of FTTx broadband access services, IP-based MOD/OTT services, fixed-line/mobile VAS, ICT-related services and service platforms. In addition, we also deploy Pre-5G Narrowband-IoT and LTE Cat-M1 networks for IoT applications. We will also continue to make investments in or to acquire other companies to enhance our emerging businesses and to further expand our business.

Advanced network technology. By the end of 2018, more than 48% of households in Taiwan can enjoy ultra-fast connectivity with our FTTH network within a week after subscribers' application. We aim to achieve network coverage of FTTx with speed of 1 Gbps to 90% by 2020. In 2018, we also continued to enhance our 4G mobile broadband networks. Our investment in network infrastructure places us in a position to capture a significant share of the internet and high-speed data transmission market. We have launched Internet Protocol version 6, or IPv6, services for our 4G mobile broadband and fixed broadband internet services since February and May 2018, respectively. Before 2018, our IPv6 capable was less than 1%. According to Taiwan Information Center, or TWNIC, IPv6 statistics, IPv6 capable for our 4G mobile broadband services and HiNet services was around 67% and 20% by the end of 2018, respectively. We are the best choice for enterprises and content providers to deploy IPv6 in Taiwan, because we have accumulated rich experience in IPv6 technology and maintenance.

Research and development expertise. In 2018, our research and development expenses accounted for 1.7% of our revenues. See "Item 5. Operating and Financial Review and Prospects—C. Research and Development, Patents and Licenses—Research and Development" for descriptions about areas of our research and development. We believe our focus on research and development will allow us to efficiently develop and deploy new technologies and services ahead of our competitors.

Business Strategies

Our key strategic objectives are to maintain our position as a leading integrated telecommunications services provider in Taiwan and to enhance our profit margins of ICT services by leverage our strengths of research and development.

Consistent with our strategic objectives, we have developed the following business strategies:

Focus on our core strengths while expanding our scope of services to capture new growth opportunities

We endeavor to maintain our strong market position in telecommunication business and seek to expand the scope of our business beyond network services by offering service platforms and VAS to capture new opportunities and generate revenue growth, such as IoT platforms. We also continue to advance our MOD/OTT service platform which offers digital contents, live broadcasting, subscription video on demand, or SVoD, services.

Broadband services: We strive to maintain our broadband market share. We typically realize higher average revenue per user, or ARPU, for our FTTx internet services, and we expect to continue to offer various incentives for our FTTx customers to upgrade to 300Mbps~1Gbps or even higher speed FTTx services in 2019. We are continuing the build-out of our FTTx infrastructure, and we believe these efforts will help us maintain our competitive advantage for broadband services. A high-quality broadband network is also essential for our high-definition MOD services. By offering 4K services, we enable our customers to enjoy quality content via our MOD platform. We leverage our robust cloud infrastructure to offer IPTV/OTT services and stay abreast with international trends.

We also endeavor to improve our MOD business by facilitating the overall TV operational environment and created a single channel subscription mechanism to encourage user-centric viewing. We have been building relationships with content providers and service providers to offer attractive content and services. Our strategy on MOD/VOD/OTT services is to enrich content, including by providing movies, drama, and TV series for SVOD, to leverage our existing base of fixed broadband and 4G mobile broadband subscribers to boost our MOD and OTT subscribers. Our Hami Video VOD platform started to strengthen its content offering in the first quarter of 2019, including the introduction of various Hollywood blockbuster movies and simultaneous airing of popular TV drama from China and Korea. We also started to cooperate with production studios to produce TV dramas for simultaneous premiere on our various platforms.

Mobile Communications: We launched 4G mobile broadband services in 2014. We expect to acquire 5G spectrum in 2020. Our strategy for mobile services includes the following initiatives:

- Maintaining 4G mobile broadband network quality to increase ARPU;
- Reallocating resources to guide mobile subscriptions toward high-end plans;
- Maintaining ample Wi-Fi hotspots to offer more wireless internet access service and to offload data traffic from our mobile networks; we had offered more than 57 thousand Wi-Fi hotspots by the end of 2018; and
- Offering Pre-5G service in 2018 with Narrowband-IoT and LTE Cat-M1 technology, and leveraging our technology capabilities and cooperating with potential partners to explore opportunities for future 5G IoT business development.

Internet services: Our strategy for internet services is to continue to build on the success of our HiNet internet services and enhance our internet application VAS, such as Security Operation Center, or SOC, Internet Data Center, or IDC and cloud services. Our Panchiao IDC, the largest internet data center in Taiwan, commenced operations since July 2016, and we have started the third phase rack installation to meet increasing demands from various industries including financial industry and international content providers. In 2019, we will continue to promote our IDC, cloud and information security services to help our business customers to decrease management costs; we will also launch new services related to AI, Big Data and Smart Health.

Emerging services: We continue to leverage our core telecommunication infrastructure and services to expand ICT services, including intelligent energy network service, or iEN. In addition, we are developing in-house Blockchain, AI and AR capability, and FinTech for future commercialization as well as cooperating with partners to develop an IoT ecosystem across various industries. We plan to set 500 thousand IoT devices connected with our IoT platform by the end of 2019 in Taiwan. With the strength and reliability of our technologies and services, we believe that we have the competitive advantages to continue expanding our ICT services in the future. Furthermore, we have teamed up with banking, insurance and retail partners to set up a preparatory office for internet-only bank license application. We are expecting to win the license in 2019 and launch internet-only bank services in early 2020.

Emphasize quality of service and customer satisfaction

Quality of service is critical in attracting and retaining customers and enhancing our long-term profitability. In order to continually enhance and improve the quality of our services, we have, in addition to the quality assurance function of our regular operating units, established a number of dedicated task forces to monitor our network performance. Our senior management sets our quality evaluation criteria and regularly reviews the quality of our performance.

In order to ensure that our quality of service will translate into strong customer loyalty, we continue to focus on and invest in the provision of a full range of services that emphasize customer care from the point of sale onward. Our corporate customer services cover small, medium-sized and large enterprises. To improve the quality of our customer services, we implemented a customer relationship management system, which encompasses a customer complaint system, a business information database for the use of our call centers, and a Big Data system to enhance our sales and market analysis efforts. For example, we leverage our capability to analyze Big Data in identifying locations for

constructing base stations and target groups for marketing our services.

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In addition, we offer 24-hour customer service, including consolidated billing for all services and online bill payment service at our website.

Improve operational and cost efficiency

We have historically been focused, and will continue to focus, on cost control. We continue to improve our operational and cost efficiency by migrating to more advanced networks and sophisticated operational support systems.

Our long-term goal is to optimize our capital expenditures by focusing on investing in innovative products and services with attractive return profiles. To catch up with the fast evolution of digital devices and network applications, we continue the construction of our fiber-based fixed-line and mobile network to increase the network bandwidth and enhance operational efficiencies. We continue to enhance mobile network and construct high capacity Wi-Fi/Fiber-Wireless networks to offload mobile network traffic. We will continue to leverage our core telecommunication infrastructure and services to expand the ICT business, including cloud services, IoT, enterprise total solutions and government projects.

Expand our business through alliances, acquisitions and investments

We continuously expand our business in growth areas, such as ICT services, through alliances, acquisitions and investments. We believe that our experience, operational scale and large customer base make us an attractive ally for other service providers.

Alliances. We have formed and will continue to pursue alliances with content providers, multimedia service platform providers, customer premises equipment providers, internet portal operators, and ICT solutions partners to diversify our business operations and enhance our service offerings. Starting in May 2018, our CEO served as the Chairman of Taiwan Smart City Solutions Alliance, which helps the development of a smart city in Taiwan. In November 2018, we participated in the Industry Conference & Exhibition held by Next Generation Mobile Networks, in Vancouver, Canada, with other Taiwanese companies and institutions, to show independent research and development capability of 5G in Taiwan. In Mobile World Congress held in February 2019, we entered into a memorandum with Nokia and Ericsson and aim to complete 5G function verification in 2019 and pre-commercialize in 2020.

Acquisition and Investments. We have focused our acquisition strategy on making acquisitions of companies that we believe to be complementary to our long-term strategic goals. We have focused our investment strategy on the development of new businesses and the enhancement of our operational efficiency. Recently we have entered into the following notable transactions:

Chunghwa Leading Photonics Tech Co., Ltd., or CLPT, was founded in July 2016, and we hold 75% of its equity interests. CLPT's management team came from our Telecommunication Laboratories. The company has the fabrication and packaging technology for development and application on indium-gallium-arsenide photodetector.

CHT Security Co., Ltd., or CHT Security, was founded in December 2017, and we hold 80.27% of its equity interests. CHT Security's management team came from our Cyber Security Department of Data Communications Business Group. The company currently provides network certification services, management consulting services, data processing services, computer equipment installation, wholesale and retail of information software and electronic supply services.

One of our consolidated subsidiaries, Chunghwa Precision Test Tech Co., Ltd., or CHPT, a semiconductor testing company, was listed on the General Stock Market of the Taipei Exchange (formerly known as Gre Tai Securities

Market) since March 24, 2016. Benefitting from its advanced technology and one-stop shopping service, CHPT's business continued to grow in the past few years. On March 23, 2018, we announced our plan to dispose of 1.5 million common shares of CHPT to fund future investment. After the completion of disposal, our ownership interest in CHPT will decrease from 38.30% to 33.72%. By the end of 2018, we have disposed 1.3 million common shares of CHPT and our ownership interest in CHPT was 34.25%.

In the first quarter of 2018, we formed a three-to-five year e-sports development strategy with 4Gamers Entertainment Inc., or 4Gamers, the largest e-sports platform in Taiwan. In July 2018, we completed a strategic investment in 4Gamers and obtained a board seat. In addition to sponsoring various major e-sports events, we also established an e-sports broadcasting zone within our MOD platform to further attract e-sports fans and younger customers. In the future, we plan to further our presence in the e-sports industry and explore various new e-sports related business model with 4Gamers, as well as replicate our success in Taiwan to ASEAN countries such as Vietnam and Thailand.

Chunghwa PChome Fund I Co., Ltd. and Cornerstone Ventures Co., Ltd. were founded in October 2018, and we hold 50% and 49% of their equity interests, respectively. We invest these two companies to develop digital life and e-commerce ecosystem.

Pursuant to the government's southbound development policy, we set up an office in Indonesia in January 2019. In the mid- to long-term, we plan to seek cooperation with local telecommunication partners in the ASEAN countries to capitalize on the strong market potential, facilitate Taiwanese companies to develop in those countries and explore opportunities for investment and merger and acquisition.

Going forward, we will focus on digital economy and innovative businesses and may consider making other equity investments and acquisitions that we believe are complementary to our business and strategic goals. By cooperating with other companies and leveraging our advantages, we strive to gain market share in the IoT business. Additionally, we are expecting to acquire internet-banking license with our information security and Big Data capability, which may lead us to expand business in digital banking and Fintech markets. Furthermore, we will continue to explore opportunities to strengthen our cooperation with companies in ASEAN countries and expand our geographic footprint, either in traditional telecommunication business, ICT or IoT businesses.

Maintain focus on maximizing stockholder value

We are committed to maximizing stockholder value and intend to maintain a sustainable dividend policy. Under the ROC Company Act, companies are allowed to distribute special cash dividend from capital surplus. In addition, the accumulated legal reserve that we had set aside in previous years has amounted to the aggregate par value of our outstanding share capital. Therefore, according to relevant regulations, we are not required to appropriate profits to our legal reserve starting from 2015. With the approval of our board of directors in March 2019, our payout ratio was 97.9% in 2018 after adjusting for unappropriated earnings. See "Item 8. Financial Information—A. Consolidated Statements and Other Financial Information."

B. Business Overview

Our Principal Lines of Business

Our core business segments are our domestic fixed communications business, mobile communications business, internet business and international fixed communications business.

Domestic Fixed Communications Business

The provision of domestic fixed communications services is one of our principal business activities. Our domestic fixed communications business includes local telephone services and domestic long distance telephone services, broadband access services, local and domestic long distance leased line services, Wi-Fi services, MOD services, and other domestic services including ICT services. We also provide interconnection with our fixed-line network to other mobile and fixed-line operators. Our revenues from domestic fixed communications services were NT\$72.8 billion and NT\$71.1 billion and NT\$66.8 billion (US\$2.2 billion), respectively, in 2016, 2017 and 2018, representing 31.6%,

31.3% and 31.0% of our total revenue in such periods.

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Local Telephone

The following table sets forth our revenues from local telephone services for the periods indicated.

	Year Ended December 31			
	2016	2017	2018	US\$
	NT\$	NT\$	NT\$	(in
		(in		millions)
		billions)		
Local telephone revenues:				
Usage	12.9	11.3	9.9	322.2
Subscription	15.9	15.7	15.3	499.2
Interconnection	0.8	0.7	0.6	20.5
Pay telephone	0.2	0.2	0.2	5.1
Other	1.8	1.7	1.6	53.7
Total	31.6	29.6	27.6	900.7

We provide local telephone services to approximately 10.42 million customers in Taiwan. Our fixed-line network reaches virtually all homes and businesses in Taiwan. Revenues from local telephone services comprised 13.8%, 13.0% and 12.8% of our total revenues in 2016, 2017 and 2018, respectively. Approximately 73.7% of our local telephone customers as of December 31, 2018 were residential customers. We are currently the leader of the local telephone service market, with an average subscriber market share of approximately 93.5%, 93.3% and 93.0% in 2016, 2017 and 2018, respectively.

The following table sets forth information with respect to our local telephone customers and penetration rates as of the dates indicated.

	As of December 31		
	2016	2017	2018
	(in thousands, except percentages and per		
	household data)		
Taiwan population ⁽¹⁾	23,540	23,571	23,589
Fixed line customers:			
Residential	8,067	7,883	7,675
Business	2,872	2,804	2,746
Total	10,939	10,687	10,421
Penetration rate (as a percentage of the population)	46.5 %	45.3 %	44.2 %
Lines in service per household	0.94	0.91	0.88

(1) Data from the Department of Population, Ministry of the Interior, ROC.

With the continued development of internet technologies, demand for local customer lines has been declining. The number of fixed-line customers decreased by 2.0% in 2016 compared to 2015, 2.3% in 2017 compared to 2016 and 2.5% in 2018 compared to 2017. We attribute the decrease in fixed-line customers to a general industry-wide trend of migrating from fixed-line services to internet telephony services and VoIP applications.

The following table sets forth information with respect to local telephone usage for the periods indicated.

	Year Ended December 31		
	2016	2017	2018
	(in millions, except percentages)		
Minutes from local calls ⁽¹⁾⁽²⁾	9,481	8,335	7,200
Growth rate (compared to the same period in the prior year)	(9.8)%	(12.1)%	(13.6)%

(1) Includes minutes from local calls made on pay telephones and minutes from fixed line-to-mobile calls.

(2) Calls to our HiNet internet service, which are recorded as part of our internet services, are not included in our local call minutes or revenues.

Minutes from local calls decreased in 2016, 2017 and 2018 due to the impact of mobile substitution and increased use of voice over internet protocol, or VoIP, applications.

We charge our local telephone service customers a monthly fee and a usage fee. We also charge separate fees for some VAS. The monthly fees for our primary tariff plans are NT\$70 for residential customers and NT\$295 for business customers. Our primary peak time usage fee is NT\$1.6 for three minutes, and our off-peak usage fee is NT\$1.0 for ten minutes. Our usage fees are the same for residential and business customers.

The following table sets forth information with respect to the average local telephone usage charge per minute for the periods indicated.

	Year Ended		
	December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
Average local telephone usage fee (per minute)	1.37	1.37	1.37
Growth rate (compared to the same period in the			
prior year)	(1.4)	—	—

Average per minute usage charges remained relatively stable from 2017 to 2018.

Domestic Long Distance Telephone

We provide domestic long distance telephone services in Taiwan. Total revenues from domestic long distance telephone services were NT\$2.9 billion, NT\$2.6 billion and NT\$2.4 billion (US\$0.1 billion) in 2016, 2017 and 2018, respectively, representing 1.3%, 1.2% and 1.1% of our total revenues in such periods. This decrease was mainly due to the continuous decline in call minutes resulting from the migration to mobile services and increased use of VoIP applications. Our average market share by minutes in the domestic long distance market was approximately 83.0%, 82.7% and 82.9% in 2016, 2017 and 2018, respectively.

We provide so-called “intelligent” network services over our domestic long distance network, including toll-free calling and virtual private networks, or VPN, services and others. We also focus on offering our customers an increasing number of VAS with flexible tariff packages.

Broadband Access

We provide broadband internet access through connections based on our FTTx and ADSL technologies. Our revenues from our broadband access services in 2016, 2017 and 2018 were NT\$19.0 billion, NT\$18.7 billion and NT\$18.3 billion (US\$0.6 billion), respectively. We provide broadband access services to other internet service providers that do not have their own network infrastructure, and as a result, our broadband customers also include some customers that use only our broadband data access lines and choose another provider for internet service provider, or ISP, services.

From 2016 to 2018, we continued accelerating our high-speed FTTx household coverage. We offer various promotional packages to encourage more migration of our FTTx subscribers to higher speed FTTx service. In 2018, FTTx revenue reached 92.8% of our total broadband revenue.

Our subscriber market share of Taiwan's broadband market was approximately 74.3%, 72.5% and 70.8% in 2016, 2017 and 2018, respectively.

The following table sets forth our broadband service customers as of each of the dates indicated.

	Year Ended December		
	31		
	2016	2017	2018
FTTx service customers (in thousands)	3,484	3,552	3,603
ADSL service customers (in thousands)	992	916	880

We have experienced competition in broadband from cable operators and other fixed-line operators. In addition, as faster wireless technologies, such as 4G LTE, have been deployed, some customers have replaced fixed broadband services with high-speed mobile broadband services. Our strategy is to continue the deployment of higher speed FTTx network so as to maintain our competitiveness.

Charges for our FTTx and ADSL services include one-time installation charges and monthly subscription fees. These charges vary based on connection speed.

The following table sets forth our ARPU for each of the periods indicated.

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
ARPU for broadband services per month ⁽¹⁾	717	718	709
ARPU for FTTx services per month ⁽²⁾	811	801	785

(1) ARPU for our broadband services per month is calculated as the sum of (a) broadband access revenues for the relevant period divided by the average of the number of our broadband access customers on the first and last days of the period divided by the number of months in the relevant period and (b) HiNet ISP service revenues divided by the average of the number of HiNet ISP service subscribers on the first and last days of the period divided by the number of months in the relevant period.

(2) ARPU for FTTx services per month is calculated as the sum of (a) FTTx access revenues for the relevant period divided by the average of the number of our FTTx access customers on the first and last days of the period divided by the number of months in the relevant period and (b) HiNet FTTx ISP service revenues divided by the average of the number of HiNet FTTx ISP service subscribers on the first and last days of the period divided by the number of months in the relevant period.

Our overall broadband ARPU increased in 2017 mainly due to our successful strategy in migration mentioned above. Our overall broadband ARPU decreased in 2018 mainly due to increased competition in the market and the mandatory tariff reduction. For more details of the NCC's mandatory tariff reduction, please see "Item 5. Operating and Financial Review and Prospects—Overview—Tariff adjustments."

Leased Line Services—Local and Domestic Long Distance

We are the leading provider of domestic leased line services in Taiwan. Leased line services involve offering exclusive lines that allow point-to-point connection for voice and data traffic. Leased lines are used by business customers to assemble their own private networks and by telecommunications service providers to establish networks to offer telecommunications services.

We provide data transmission services to major corporate customers in Taiwan. We also provide leased lines to other mobile and fixed-line service operators for interconnection with our fixed-line network and for connection within their networks. Our local and domestic long distance leased line services revenues were NT\$4.3 billion, NT\$4.3 billion and NT\$4.2 billion (US\$0.1 billion) in 2016, 2017 and 2018, respectively. Although the bandwidth leased to third parties increased, the revenue decreased year over year mainly due to the decline in rental fees.

Wi-Fi Services

As of December 31, 2016, 2017 and 2018, we had a total of approximately 2.6 million, 2.7 million and 2.7 million residential and business customers that leased our access points, respectively. In addition, we had more than 57 thousand hot spots in public areas by the end of 2018, such as convenience stores, airports and international convention centers, where our smartphone subscribers can access our Wi-Fi network and help to offload mobile data network traffic.

MOD Services

Using video streaming technology through a set top box that connects to our FTTx and ADSL data connections, our MOD customers can access TV programs, video-on-demand, OTT, and other services. We had over 206, including 188 high definition, or HD, broadcasting channels and over 35,000 hours of on-demand programs. In addition to our regular packaged offerings, we also offer SVoD services for film and drama. Furthermore, starting from 2017, our MOD platform successively offers OTT services such as KKTv, FOX+ and Netflix. As of December 31, 2018, we had 2.01 million MOD customers, including 1.27 thousand SVoD subscribers.

Our MOD revenues from 2016 to 2018 were NT\$2.4 billion, NT\$2.5 billion and NT\$3.3 billion (US\$106 million) in 2016, 2017 and 2018, respectively. The increase in revenue from 2016 to 2018 was mainly due to the increase in the number of IPTV and SVoD subscribers, which was attribute to the enhancement of local and exclusive contents. We are pleased to see that our IPTV customers continued to sign up for additional SVoD programs and OTT services.

ICT and Other Services

Our ICT and other services in domestic fixed communications business include ICT services and corporate solutions. See “Emerging Services.”

Mobile Communications Business

Mobile communications services are one of our principal business activities. Our mobile communications services include mobile services, sales of mobile handsets, tablets and data cards and ICT and other mobile services.

Mobile Services

We are Taiwan’s largest provider of mobile services in terms of both revenues and customers. In 2016, we generated revenues of NT\$78.8 billion, or 34.3% of our total revenues, from mobile services. In 2017, we generated revenues of NT\$75.8 billion, or 33.3% of our total revenues, from mobile services. In 2018, we generated revenues of NT\$63.9 billion (US\$2.1 billion), or 29.7% of our total revenues, from mobile services.

Our ARPU per month decreased to NT\$595 in 2017 from NT\$598 in 2016 mainly due to market competition. Our ARPU per month further decreased to NT\$506 in 2018 mainly due to more fierce competition and the adoption of IFRS 15. See “—Competition—Mobile Communications.” Please refer to Note 5 of our consolidated financial statements included elsewhere in this annual report for details of application of new IFRSs.

	Year Ended December 31			
	2016	2017	2018	US\$
	NT\$	NT\$	NT\$	(in
		(in		millions)
		billions)		
Mobile services revenues:				
Usage ⁽¹⁾	33.0	29.2	21.3	695.2
Interconnection	2.7	2.1	1.3	42.4
Mobile VAS	41.5	43.2	40.1	1,309.2
Other	1.6	1.3	1.2	40.9
Total mobile services	78.8	75.8	63.9	2,087.7

(1) Includes monthly fees.

We are still the largest mobile operator in Taiwan in terms of revenues and number of customers, although the two smaller new entrances, Asia Pacific Telecom Co., Ltd., or APTG, and Taiwan Star Telecom Corporation Ltd., or T-Star, continue to offer low-priced data plans to gain customers. We had 10.6 million mobile customers, including 9.5 million and 1.1 million subscribers for 4G and 3G services, respectively, for a market share of approximately 37.7% of total mobile customers and approximately 36.3% of total mobile services revenues in Taiwan, as of December 31, 2018.

In October 2013, we obtained a 4G mobile broadband services spectrum of 10 MHz paired spectrum in the 900 MHz frequency band and 25 MHz paired spectrum in the 1800 MHz frequency band. We paid NT\$39.1 billion to the government for the spectrum. The license is valid until December 31, 2030. We have launched 4G mobile broadband services in May 2014.

In December 2015, we obtained an additional spectrum for 4G mobile broadband services of 30 MHz paired spectrum in the 2500MHz and 2600MHz frequency bands, and we paid NT\$10.0 billion to the government. The license is valid until December 31, 2033. We put these 2500MHz and 2600MHz frequency bands into use on March 24, 2016.

In November 2017, we further obtained spectrum for 4G mobile broadband services of 5 MHz paired spectrum in the 1800 MHz frequency band and 20 MHz paired spectrum in the 2100 MHz frequency band, and we paid NT\$10.9 billion to the government. The license is valid until December 31 of 2030 and 2033, respectively.

Our 3G service license has expired in December 2018, and we have ceased our 3G service afterward.

By the end of 2018, we commercially launched roaming services with 482 networks in 197 countries, including 201 LTE roaming partners in 103 countries. Meanwhile, we offer diverse and competitive roaming services in order to meet customers' demand. By strategically cooperating with the chief mobile companies, ultimately we won high reputation and the best brand value in roaming market.

The following table sets forth information regarding our mobile service operations and our mobile customer base for the periods indicated.

	As of or for the Year Ended		
	December 31		
	2016	2017	2018
Taiwan population (in thousands) ⁽¹⁾	23,540	23,571	23,589
Total mobile revenues in Taiwan (in billions) ⁽²⁾	NT\$211.9	NT\$201.2	\$NT176.1
Annualized churn rate ⁽³⁾	22.80 %	21.98 %	18.37 %
Minutes of usage (in millions of minutes):			
Incoming	9,953	8,424	6,939
Outgoing	10,245	8,722	7,272
Average minutes of usage per user per month ⁽⁴⁾⁽⁵⁾	153	135	108

(1) Data from the Department of Population, Ministry of the Interior, ROC.

(2) Data from the statistical monthly release by the NCC, in the ROC, which include mobile revenues from 2G, 3G and 4G mobile broadband services.

(3) Measuring the rate of customer disconnections from mobile service, determined by totaling the monthly churn rate, which is determined by dividing a) our aggregate voluntary and involuntary deactivations during the month by b) the average number of customers during the month (calculated by averaging the number of customers at the beginning of the month and the end of the month). The calculation includes both prepaid and postpaid customers.

(4) The number of mobile customers is based on the number of SIM cards.

(5) Average minutes of use per user per month is calculated by dividing the total minutes of use during the period by the average of the number of our mobile customers on the first and last days of the period and dividing the result by the number of months in the relevant period.

The total mobile customers in Taiwan had reached approximately 29.2 million as of December 31, 2018. Mobile penetration was approximately 123.9% on the same date. The overall mobile services market experienced a decrease of 12.5% in revenues in 2018 mainly due to the low-priced data plans owing to market competition.

We offer incentives, such as mobile handset subsidies for the immediate purchase, when new customers agree to sign a service contract with us or when existing customers renew their contracts with us ranging from 12 months to 30 months.

Our tariffs for post-paid mobile customers primarily consist of usage fees and monthly fees. We also offer discounts on usage fees for calls made between our mobile customers to encourage subscription to our mobile service.

As of December 31, 2018, we had approximately 1.5 million prepaid customers, representing approximately 14.6% of our total mobile customers. Prepaid customers do not pay monthly fees but pay a higher usage charge on a per second basis. Once the prepayment has been fully utilized, a prepaid customer can make additional prepayments to continue the service. Alternatively, the customer may convert to become a post-paid customer while retaining the same telephone number.

Sales of Mobile Handsets, Tablets and Data Cards

We engage in the distribution and sales of mobile handsets, tablets and data cards for use on our mobile network to customers through our directly-owned stores, our website, our subsidiary Senao, and also through third-party retailers. See “Marketing Strategy—Distribution Channels” and “Sales and Distribution” in “—Marketing, Sales and Distribution.”

ICT and Other Services

Our ICT and other services in our mobile communications business include ICT services and corporate solutions. See “Emerging Services.”

Internet Business

Our internet business includes data communication services, application VAS and services provided to the government. Our revenues from internet business represented 12.2%, 12.7% and 13.8% of our revenues in 2016, 2017 and 2018, respectively. In 2018, our revenues from internet business as a percentage of our revenues increased mainly due to the increase in revenues generated from services such as HiLink, IDC, information security and IoT.

Data Communication Services

Our data communication service includes HiNet, our brand name as an ISP, and HiLink, a VPN service for enterprises. The following table sets forth HiNet’s subscribers as of each of the dates indicated.

	As of December 31		
	2016	2017	2018
	(in thousands)		
Total internet subscribers in Taiwan	6,099	6,113	6,112
HiNet subscribers:			
HiNet FTTx subscribers	3,221	3,294	3,341
HiNet ADSL subscribers	539	439	343
HiNet dial-up subscribers	413	400	387
Other access technology subscribers	2	1	1
Total HiNet subscribers	4,175	4,134	4,072

Our ISP service subscribers decreased from 2016 to 2018 mainly due to the competition from cable broadband operators and substitution by mobile broadband services. We are still the largest ISP in Taiwan, with a subscriber market share of 66.6% among 390 ISPs in ROC as of December 31, 2018. As of December 31, 2018, approximately 82.2% of our broadband customers were also HiNet subscribers, using HiNet as their ISP, and 92.0% of our FTTx service customers subscribe HiNet ISP service.

Application VAS and Services Provided to the Government

Application VAS and services provided to the government includes services regarding to IDC, cloud computing, information security and IoT. See “Emerging Services.” In 2017, we developed an open IoT application platform featured with functions of cloud computing, Big Data analysis, artificial intelligence and augmented reality, etc. to enlarge the cooperation with IoT industry as well as strengthen its domestic ecosystem. We will continue to explore

new IoT applications such as remote water control, smart metering, smart lighting and smart agriculture.

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International Fixed Communications Business

Our international fixed communications business includes ILD telephone services, international leased line services, satellite services and ICT and other international services.

ILD Telephone Services

We provide ILD telephone services in Taiwan. Total revenues from ILD telephone services comprised 3.8%, 3.2% and 3.0% of our revenues in 2016, 2017 and 2018, respectively. Our ILD telephone revenues decreased by 16.4% to NT\$7.4 billion in 2017, and further decreased by 11.2% to NT\$6.6 billion (US\$0.2 billion) in 2018, primarily due to the intense competition from VoIP-based ILD service providers and free VoIP applications. Our average market share of the ILD market by minutes was approximately 55.8%, 62.5% and 70.3% in 2016, 2017 and 2018, respectively. Our ILD services consist primarily of international direct dial services and the wholesale of ILD traffic. The wholesale of ILD outgoing traffic accounted for 63.7% of our total ILD outgoing minutes in 2018. We provide wholesale ILD services to international simple resale, or ISR, operators that do not possess their own telephone network or infrastructure.

International calls to our top five destinations represented 43.5% of our outgoing ILD call traffic in 2018, including Mainland China, Philippines, Indonesia, the United States and Japan. International calls from our top five destinations represented 64.8% of our incoming ILD call traffic in 2018, including Canada, Mainland China, Belgium, Korea and the United States.

The following table sets forth information with respect to usage of our ILD services for the periods indicated.

	Year Ended December		
	31		
	2016	2017	2018
	(in millions, except incoming/outgoing ratio)		
Incoming minutes	787	756	650
Outgoing minutes	1,022	854	765
Total minutes	1,809	1,610	1,415
Incoming/outgoing ratio	0.77	0.89	0.85

Total incoming call volume decreased by 3.9% from 2016 to 2017, and further decreased by 14.0% in 2018, mainly due to the intensified market competition from VoIP-based ILD service providers, free VoIP applications and other ILD service providers. Similarly, due to this intensified competition, total outgoing call volume decreased by 16.4% from 2016 to 2017 and further decreased by 10.4% in 2018.

We pay for the use of networks of carriers in foreign destinations for outgoing international calls and receive payments from foreign carriers for the use of our network for incoming international calls. Traditionally, these payments have been made pursuant to settlement arrangements under the general auspices of the International Telecommunications Union. Settlement payments are generally denominated in U.S. dollars and are made on a net basis.

Leased Line Services—International

We are a leading provider of international leased line services in Taiwan. Leased line services involve offering exclusive lines that allow point-to-point connection for voice and data traffic. Leased lines are used by business customers to assemble their own private networks and by telecommunications service providers to establish networks to offer telecommunications services.

We provide data transmission services to major corporate customers in Taiwan. Since August 2001, licenses have been awarded to a total of five undersea cable operators, including us, to engage in leased line services. Rental fees for ILD leased line are generally based on transmission speed and distance. We continue to experience a decline in rental fees for international leased lines, partly as a result of competition from other international leased line service providers. In response, we continue to implement marketing and service campaigns to retain our high-value corporate customers. Our international leased line services revenues were NT\$1.8 billion, NT\$1.9 billion and NT\$2.2 billion (US\$70.8 million) in 2016, 2017 and 2018, respectively, mainly due to our expansion to the overseas markets and growing consumer demand.

Satellite Services

We entered into a contract with ST-2 Satellite Ventures Pte., Ltd. on March 12, 2010 to lease capacity on the ST-2 satellite. The lease term is 15 years. Please refer to Note 40 to our consolidated financial statements included elsewhere in this annual report for further details.

In addition, we have two satellite communication centers that enable us to provide TV broadcast, satellite VAS and backup systems for use in major emergencies. We also provide satellite services to Southeast Asia.

ICT and Other Services

Our ICT and other services in our international fixed communications business include corporate solution services. See “Emerging Services.”

Others

Our other business segment includes our non-telecom services, including semiconductor testing components and printed circuit board sales made by our subsidiary, CHPT, and property development and management services provided by our subsidiary, Light Era Development Co., Ltd., or Light Era.

Emerging Services

The revenues from our ICT business are classified in “ICT and Other Services” of each business segment besides internet business. We are offering ICT total solutions by integrating our capabilities of cloud computing, information security, Big Data, IoT and customization expertise. In 2019, we will continue to promote out IDC, cloud and information security services to help our business customers to decrease management costs.

Our iEN service helps companies and corporations implement energy-saving measures through computer-driven data analysis. Besides, we also help household as well as enterprise to build an automatic interior environment in areas including security, parking and communications.

We also provide Content Delivery Network, or CDN, service. This service is effective in speeding the delivery of content of websites with high traffic. The closer the CDN server is to the user geographically, the faster the content will be delivered to the user. We provide CDN service to internet content providers to ensure stable quality when programs are broadcasted. We will expedite CDN construction to enhance digital convergence product competitiveness.

Interconnection

We provide interconnection of our fixed line network and mobile network with other operators.

The following table sets forth our interconnection fee revenues and costs for the periods indicated. These revenues and costs are included, depending on the nature of the call made, in domestic fixed communications or mobile communications revenues and expenses, respectively.

	Year Ended December 31			
	2016	2017	2018	
	NT\$	NT\$	NT\$	US\$
	(in billions)		(in millions)	
Interconnection fee revenues:				
Fixed line	0.9	0.8	0.7	23.2
Mobile	2.7	2.1	1.3	42.4
Interconnection costs:				
Fixed line	1.6	1.2	0.8	25.9
Mobile	3.0	2.5	1.9	61.9

The interconnection rate between fixed-line customers and other fixed-line customers is NT\$0.32 per minute during peak times and NT\$0.09 per minute during off-peak times. The interconnection rate for calls initiated by mobile customers to fixed-line customers is NT\$0.4851 per minute during peak times and NT\$0.2531 per minute during off-peak times. See “Item 5. Operating and Financial Review and Prospects—Overview—Tariff adjustments.”

The NCC mandated a mobile interconnection rate reduction over a period of four years starting from November 2017 from NT\$1.15 per minute to NT\$0.571 per minute. Therefore, our mobile interconnection revenues and costs decreased from 2016 to 2018.

Currently, for fixed-line-to-mobile calls, (i) the fixed-line network operators have the right to set the rates of telecommunication fees and to be charged to customers; (ii) fixed-line network operators have to pay interconnection fees to mobile network operators in accordance with the interconnection rate prescribed by the NCC. In addition, we are specifically required by the NCC to pay transition fees on top of the interconnection fees mentioned in (ii) from January 1, 2011 to January 1, 2017.

Fixed interconnection costs decreased from 2016 to 2018 mainly due to (1) decreasing transition fees year over year, (2) reduction of mobile interconnection rate for fixed-line-to-mobile calls, and (3) decreasing traffic volume.

In accordance with governmental regulations, the contracts governing our interconnection arrangements must specifically address a number of prescribed issues. For example, our interconnection charge should reflect our costs with respect to the network elements used. In addition, cost increases are subject to approval by the regulatory authorities. We expect that our interconnection contracts will generally be reviewed annually, although we may also enter into long-term contracts. See “Regulation—Telecommunications Act—Interconnection Arrangements.”

Marketing, Sales and Distribution

Marketing Strategy

In order to retain and expand our large customer base and to encourage our customers to increase their use of our services and products, we continue to focus our marketing strategy on the following areas.

Services and Products. We continually develop new VAS and products based on different market segments, with the aim of increasing our high-usage customers and enhancing customer loyalty.

Pricing and Promotions. We design flexible pricing packages that allow customers to select, and design special promotional packages to encourage usage.

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Distribution Channels. We seek to broaden our distribution reach by strengthening our cross-industry alliances and marketing relationships. Furthermore, to expand our sales channels more effectively, we also implement an external sales agent system by collaborating with Senao, Synnex Technology International Corporation and Tsann Kuen Trans-Nation Group, which collaborations enable us to get closer to every customer. In addition, we have set a website to improve our operational efficiency and to reach more young people.

Business Customers. We devote an account manager to serve corporate customers and develop customized solutions for their needs. In addition, we continually update and expand our service offerings so that we can remain a one-stop services provider to our corporate customers, including providing ICT products such as Big Data analysis, information security and cloud computing to help our corporate customers improve their efficiency and competitiveness.

Branding. We are committed to further strengthening the Chunghwa Telecom brand and image as well as strengthening and expanding market recognition of our specialized product brands, such as HiNet, emome and Hami. We plan to leverage our leading market position and status to strengthen the overall advantage of our product brands.

Sales and Distribution

As of December 31, 2018, we had 17 operations offices for operations, 469 service centers and 6 customer service call centers for sales and customer service. In addition, in 2018, we enhanced user interface and user experience and simplified transaction process on our website to improve customers' experience, and visits to our website were over 39 million times, with 40% growth rate compared with that in 2017.

We also had 268 Senao exclusive service stores as of December 31, 2018. In January 2007, we acquired 31.33% equity ownership of Senao, a major distributor of mobile handsets in Taiwan. Senao has been listed on the TWSE under the number "2450" since May 2001. Our equity ownership in Senao decreased from 31.33% as of January 15, 2007 to 27.79% as of March 31, 2019. Our investment in Senao enhanced our mobile handset distribution and sales capabilities. Besides, customers can subscribe for our broadband service, MOD service and other services at Senao retail stores. See "Item 7. Major Stockholders and Related Party Transactions—B. Related Party Transactions" for a discussion of the agreement between the parent company and Senao about our business cooperation.

Competition

We face competition in virtually all aspects of our business.

Domestic Fixed Communications

- **Local and domestic long distance telephone services:** Revenue from local and domestic long distance telephone service of telecommunication services providers has continuously decreased in the past years primarily due to mobile and VoIP substitution. Competition from mobile data service providers increased significantly due to the popularity of smart mobile devices and mobile applications such as LINE and WeChat. Although there are other providers of fixed communications, including TWM Broadband, New Century Infocomm Tech. Co., Ltd. and APTG, competition from these providers was not significant in the past few years.

Leased line services: Major competitors in this field are four fixed line operators including TWM Broadband, New Century Infocomm Tech. Co., Ltd., APTG and Taiwan Optical Platform Co., Ltd. The leased line services providers primarily compete on the basis of price and the bandwidth speed of services.

Broadband access services: Major competitors in this field are five multiple-system operators, or MSOs, including Kbro Co., Ltd., China Network Systems Co., Ltd., TWM Broadband, Taiwan Fixed Network Co., Ltd. and Taiwan Optical Platform Co., Ltd., and one fiber broadband service provider, namely Taiwan Intelligent Fiber Optic Network. With the increasing speed of mobile data service, we also face fierce competition from mobile data providers. The broadband access service providers primarily compete on the basis of price and the bandwidth speed of services.

MOD services: Major competitors in this field include five cable TV MSOs, 27 independent cable TV operators as well as OTT service providers. The different service providers compete on the basis of price and the multimedia content offered along with the ability to offer converged services by offering comprehensive solutions including data communications, voice communications and multimedia content.

Mobile Communications

There are five mobile operators in Taiwan, including Chunghwa Telecom, Taiwan Mobile, Far EasTone, T-Star, and APTG. All of these five operators have 4G mobile broadband licenses. In addition to the big three, T-Star and APTG underwent mergers and acquisitions in order to compete in the market for 4G mobile broadband services. T-Star merged with VIBO Telecom Inc., a former 3G operator, in October 2014, while APTG merged with Ambit Corporation, one of the 4G mobile broadband license winners, in December 2015, with APTG as the surviving company. Each 4G mobile broadband network operator has been providing promotional programs to attract consumers, including unlimited data plans. In recent years, T-Star and APTG provided unlimited data plans with extremely low prices, and indeed acquired many subscribers. In 2018, the big three also offered unlimited low-priced data plans to maintain their market share.

In addition to the mobile network operators, the NCC has issued a total of 14 mobile virtual network operator, or MVNO, licenses, which allow operators without a spectrum allocation to provide mobile services by leasing the capacity and facilities of a mobile service network from a licensed mobile service provider.

We compete in the mobile services market primarily on the basis of premium brand, price, quality of service, network reliability and attractiveness of service packages. See “Network Infrastructure—Mobile Services Network” for a discussion on our advantage of 4G mobile broadband services spectrum.

Internet

Our primary competitors in internet services are other internet services providers, including SeedNet and TWM Broadband. We compete in the internet services market primarily on the basis of price, technology, speed of transmission, amount of bandwidth available for use, network coverage and VAS.

International Fixed Communications

Our major competitors are TWM Broadband, New Century Infocomm Tech. Co., Ltd. and APTG, which have provided fixed-line services since June 2001. These operators are primarily focused on ILD services and corporate customer services, which typically generate higher revenue than residential customers.

There are four submarine cable licenses granted by NCC since August 2001, including East Asia Network Inc., owned by Telstra, Reach Cable Networks Limited, owned by PCCW Global, FLAG Telecom Taiwan Services Limited, owned by GCX Corporation, and Taiwan International Gateway Corporation, offering international leased line services to the other fixed-line operators, internet service providers and ISR operators.

Our ILD services compete with ILD resale services and VoIP services such as those provided by mobile applications.

Emerging Services

Our major competitors in ICT services are system integration service providers, including HwaCom Systems Inc., MiTAC Information Technology Corp., NEC Taiwan Ltd., Acer Incorporated, Tatung Company, SYSTEX Corporation, SYSCOM Group, IBM Corporation, HP Company, Stark Technology Inc., Amazon.com Inc. and Advantech Co., Ltd.

Network Infrastructure

Our network infrastructure consists of transmission networks that convey voice and data traffic, switching networks that route traffic between networks, and mobile, internet, leased line and data switching networks.

We purchase most of our network equipment from well-known international suppliers. As part of the purchase contract, these suppliers deliver and install the equipment for us. We also purchase from local suppliers a variety of components such as transmission lines, switches, telephone sets, MOD set-top boxes, and radio transmitters.

Approximately 12,759 of our employees were engaged in network infrastructure development, maintenance, operations and planning as of December 31, 2018.

Transmission Networks

As of December 31, 2018, our transmission networks consisted of approximately 2.6 million fiber kilometers of fiber optic cable for trunking and approximately 9.7 million fiber kilometers of fiber optic cable for local loop.

Due to the emergence of Packet Transport Network, or PTN, technology, a cost-effective method for transmitting data services, we began the deployment of PTN in 2013. Due to the high utilization of our existing Re-configurable Optical Add-Drop Multiplexer, or ROADM, network, we began to introduce Optical Transport Network, or OTN, to meet the demand of 100G wavelength services in 2014. We had completed the deployment of 154 wavelength OTN and 2,620 GbE PTN in 2018. We had a trial of 36 wavelengths using 200Gbps per wavelength transmission technology in 2018. This trial verified the scalability of the OTN to meet the explosive bandwidth demand.

As part of our strategic focuses on the internet and data markets, our local loop connections mainly adopt FTTx technology. This enables us to provide broadband services, such as MOD, high-speed internet access and VPN. As of December 31, 2018, we have constructed approximately 9.1 million FTTx ports. Our FTTx service can offer high-speed broadband internet access rates up to 1 Gbps. For low bandwidth demand, we use ADSL technology to provide the internet connection services for the customers.

Switching Networks

Domestic telecommunications network. Our domestic public switched telephone network currently consists of 19 message areas connected by a long distance network. As of December 31, 2018, we had 38 long distance exchanges, which are interconnection points between our telecommunications network and approximately 16.9 million telephone lines, which reached virtually all homes and businesses in Taiwan.

We currently have intelligent networks installed over our public switched telephone networks for our domestic long distance and international networks, as well as a local intelligent network in the Taipei, Taichung and Kaohsiung metropolitan areas. Our intelligent network is designed to facilitate the use of VAS by providing more information about calls and allowing greater management of those calls.

As of December 31, 2018, our Next Generation Network, or NGN core network capacity consisted of 1,580,000 local telephone subscribers, comprising 780,000 Session Initiation Protocol-based, or SIP-based, and 790,000 Access Gateway-based, or AG-based, subscribers.

Our NGN Managed IP backbone network consists of an inner core network and an outer core network. We owned high-speed NGN Managed IP backbone network by the end of 2018 with 12 sets of 4Tbps switch routers for the inner core network and more than 34 sets of 4Tbps/1.6Tbps switch routers for the outer core network. The bandwidth of the network is approximately 2,060 Gbps as of the end of 2018. We believe this network will enable us to meet the increasing demand for NGN services, such as VoIP, and all managed services, including MOD and VPN.

International network. Our international transmission infrastructure consists of both submarine cable and satellite transmission systems, which link our national network directly to 85 telecommunications service providers in 36 international destinations.

International calls are routed between Taiwan and international destinations through one of our two international switching centers, one located in Taipei and the other in Kaohsiung. Each center had time-division multiplexing, or TDM, international gateway switches and NGN international gateway switch. We had a trunk capacity of 149,820 channels in total as of December 31, 2018.

In 2018, we started to build the Southeast Asia-Japan 2 Submarine Cable, or SJC2, with several Asian telecom companies. The cable will feature up to eight pairs of high capacity optical fiber with a total capacity of 144 Terabits per second. Its high capacity allows it to support high bandwidth intensive requirements such as the IoTs, robotics, analytics and AR or VR applications. As of December 31, 2018, we had invested in 21 submarine cables, 10 of which land in Taiwan. We had increased the capacity of each of our current submarine cables, increasing our aggregate total capacity from 5,028 Gbps in 2017 to 9,706 Gbps in 2018.

Mobile Services Network

Our mobile services network consists of:

- cell sites, which are physical locations equipped with a base station consisting of transmitters, receivers and other equipment used to communicate through radio channels with customers' mobile handsets within the range of a cell;
- BSC (base station controllers) for RNC (radio network controller) for 3G, which connect to, and control, the base station within each cell site;
- cellular switching service centers for 3G, which control the base station controllers and the processing and routing of telephone calls;
- GGSN (gateway GPRS support nodes), which connect our GPRS network to the internet;
- SGSN (serving GPRS support nodes), which connect the GPRS network to the base station controllers;
- MME (mobility management entity), which connects the base station to our 4G core network that is responsible for control side;
- S GW (Serving Gateway), which connects the base stations to our 4G core network that is responsible for data side;
- PDN GW (Packet Data Network Gateway), which connects our 4G core network to the internet; and
- transmission lines, which link (i) with respect to the 3G/4G network, the mobile switching service centers, MME, S GW, base station controllers, base stations and the public switched telephone network, and (ii) with respect to the GPRS/4G core network, the base station controllers, the support nodes, PDN GW and the internet.

In May 2014, we launched our 4G mobile broadband services with 10 MHz paired spectrum in the 900 MHz frequency band and 25 MHz paired spectrum in the 1800 MHz frequency band. In December 2015, we obtained an additional spectrum for 4G mobile broadband services of 30 MHz paired spectrum in the 2500 MHz and 2600 MHz frequency bands. In June 2017, we implement four frequency band CA technology into our 1800/2600 MHz frequency band base stations that is expected to increase users' downlink speed over 500 Mbps. In November 2017,

we further obtained spectrum for 4G mobile broadband services of 5 MHz paired spectrum in the 1800 MHz frequency band and 20 MHz paired spectrum in the 2100 MHz frequency band. After that, we own three consecutive 20MHz spectrum in 1800MHz, 2100MHz and 2600MHz frequency bands, which may provide higher data transmission rates.

We have also installed an intelligent network on our existing mobile services network infrastructure, which enable us to provide additional functions, such as prepaid and VPN services as well as a wide range of VAS.

Internet Network

HiNet, our internet service provider, has the largest internet access network in Taiwan, with 34 points of presence approximately 5,516,000 broadband remote access server ports and a backbone bandwidth of approximately 8,937 Gbps as of December 31, 2018. We aim to achieve HiNet's points of presence and backbone bandwidth to approximately 10,937 Gbps by the end of 2019.

HiNet's broadband backbone network consists of an inner core network and an outer core network. [We had high-speed internet protocol backbone network by the end of 2018 with 24 sets of 46Tbps/30Tbps /28.8Tbps/12.8Tbps/10.24Tbps/4.48Tbps switch routers for the inner core network and more than 54 sets of 10.56Tbps/5.28Tbps/4Tbps/2.64Tbps/1.6Tbps switch routers for the outer core network. We also built CDN to meet the needs of Internet/OTT services. Our CDN consists of 14 domestic and four overseas point-of-presences and the total capacity is approximately 950 Gbps. We believe these networks will enable us to meet the increasing demand for our internet services.

HiNet's total international connection bandwidth is 1,482 Gbps as of December 31, 2018. As we expect that internet traffic flows to and from the United States will continue to increase, we have been continuously expanding our bandwidth to the United States. We also endeavor to increase our links to other countries, including Japan, Korea, Hong Kong, Singapore, Mainland China, Malaysia, Thailand and the United Kingdom.

Leased Line and Data Switching Networks

We operate leased line networks on both a managed and unmanaged basis. In addition, we operate a number of switched digital networks used principally for the provision of packet-switched, frame relay, asynchronous transfer mode technology and a multi-protocol label switching internet protocol VPN. As of December 31, 2018, we had 308 frame relay ports, 854 asynchronous transfer mode ports and approximately 109,702 multi-protocol label switching internet protocol VPN virtual ports.

Our data networks support a variety of transmission technologies, including frame relay, asynchronous transfer mode and Ethernet technology. We have also built up our HiLink VPN that combines internet protocol and asynchronous transfer mode technologies. The advantage of HiLink VPN based on multi-protocol label switching technology is that it can carry different classes of services, such as video, voice and data together to provide services with various qualities of service, high-performance transmission and fast forward solution in an enhanced security network. HiLink VPN can be accessed by xDSL/FTTx/NG-SDH and can include built-in mechanisms that can deal with overlapping internet protocol addresses. Therefore, the network potentially is less costly and requires less management for business applications.

Cybersecurity and Personal Information Protection

The implementation of our Cybersecurity strategy is based on risk management Framework of ISO27005, which including risk identification, risk analysis, Privacy Impact Analysis, risk assessment, risk handing and monitoring. All

risk treatment plans are reviewed and amended in accordance with the international trend of cybersecurity and governmental regulations, and we also put results of annual audit program and external threats discovered by our SOC into consideration.

According to our Risk Management Regulation, our risk management committee track our risk status on a monthly basis. When a risk is greater than our risk appetite, or where there is a major crisis, the convener of risk management committee will report to our audit committee, and if necessary, report to our board of directors. In 2018, we reported our management policy and information security of our Big Data to our audit committee. In the same year, there are no penalties ruled by the competent authorities resulted from information security or information leakage events. For more information, please refer to our website

<https://www.cht.com.tw/en/home/cht/about-cht/corporate-governance/risk-management>. The information on our website does not form a part of this annual report.

In addition, these policies and procedures have been defined in operational rules for all of our business and service contracts. These documents are available to internal use for all of our employees.

The aforementioned information security strategy and action solution as well as key performance indicators are required our president's approval. Our senior executive vice president of business, concurrently served as our chief information security officer and data protection officer, convenes regular meetings in order to conduct reviews and the procedure of improvements. In addition, the board of directors engaged in the discussion and review of information security/cybersecurity and personal information protection strategy.

To prevent increasing cyber risks and threats, we have established CHT SOC, which is responsible for security controls, and threats of smart detection and intelligence, quick incidents response since 2013.

To comply with the Cyber Security Management Act, we also have implemented the measures described below.

Responsibilities, accountabilities and reporting lines are systemically defined in all divisions and group companies.

We implement social engineering drill annually to enhance security awareness for all personnel.

All of the high-availability systems in our data centers are deployed with firewall and Intrusion Prevention System, or IPS. We also provided DDoS mitigation solution to defend against hackers' attacks.

All of the information systems and websites are scanned for vulnerabilities and a dedicated team of information security experts is responsible for conducting penetration testing on our information system, websites and Apps, to prevent leakage of customer information.

System developers of our company, including outsource developers, are required to attend secure coding training courses and obtain relevant certifications.

We have enhanced the firewall policy and adopted minimum principle to limit the IPs and ports access control, in order to reduce intrusion risk from hackers.

We have enhanced our system access controls including, among other measures, by using two-factor authentication and by limiting daily operational access to dedicated terminals in a separate network.

We have enhanced the retention and monitoring for all system, database, and applications logs as an additional information security measure and our managers review system logs and inquiry records on a daily basis.

We implement adverse situation drills annually to ensure the established and implemented Business Continuity Planning are valid and effective. In addition, we participate in drills held by the government regularly.

We actively cooperate with industries, the government, and academic sectors in order to exchange the information and foresee relevant threats and perform early preventions necessitated.

All systems, data centers, personnel, environmental and managing procedures which are involving sensitive data, resources, and critical infrastructure services continuously obtain ISO27001/ISO27011 third-party certification.

In addition, our cloud services have obtained CSA STAR Certification.

To prevent harm on personality rights, the Personal Information Protection Act, or PIPA, governs all the collection, processing and use of personal information, and it applies to all individuals, legal entities, and enterprises. We have conducted inventory checks of personal information that we currently hold, established standard operating procedures, or SOP, to comply with the requirements under PIPA, and have taken information security measures to protect the data. We have posted a copy of our privacy policy on our website at https://www.cht.com.tw/home/cht/-/media/Web/PDF/Sustainability/Social/CHT_Privacy_Policy.pdf?la=en. The information on our website does not form a part of this annual report.

To comply with the PIPA, we implemented a series of measures to avoid the leakage of customers' information:

- According to our personal data safety and awareness plan, all of our employees are required to take training programs and to pass the awareness test once a year.
- Documents containing customer's personal information are labeled "highly confidential."
- We required our branch offices to implement a drill in personal data leakage incident handling once a year.
- Any access to the system including personal information should be monitored and recorded, and these records will be reviewed by relevant supervisors regularly.
- We have developed a Segregation of Duties, or SoD, requirement to avoid unauthorized behavior. Relevant supervisors are asked to review access authorization of systems, and to ensure compliance with SoD.
- Our auditing department completes an annual audit plan and regularly audits information circulation in each department on customer information management and protection.
- We enforced customer service center and call center to comply with BS10012 and obtain the BS10012 certification.

Property, plant and equipment

Our property, plant and equipment consist mainly of telecommunications equipment, land and buildings located throughout Taiwan. Although we have a significant amount of land and buildings throughout Taiwan, most of our properties are for operational use and only a small part of them are for investment purposes, which were classified as "investment properties" in our consolidated financial statements included in this annual report. Notes 17 and 18 to our consolidated financial statements, included elsewhere in this annual report, provide additional details as to our "Property, plant and equipment" and "Investment properties," respectively. See "Item 3. Key Information—D. Risk Factors—Our ability to deliver services may be disrupted due to a systems failure, shutdown in our networks, earthquakes or other natural disasters" for a discussion of environmental issues that may affect utilization of our assets.

We are now focusing on rental income and will continue seeking development opportunities from the ROC central and local government urban planning programs to increase the value of our land, buildings and equipment. We have received approximately NT\$587.9 million (US\$19.2 million) in rental income from properties in 2018. We are also developing a commercial building in Nangang, Taipei City, and three staff dormitories in Taipei, New Taipei and Taoyuan City to attract and maintain the outstanding human resource. Our subsidiary Light Era will also develop in areas such as smart city and smart operations center.

Insurance

We do not carry comprehensive insurance for our properties or any insurance for business disruptions. We do; however, maintain in-transit insurance for key materials, such as cables, equipment and equipment components. We do not carry insurance for the ST-2 satellite since we only lease it for our operations instead of owning the satellite.

Employees

Please refer to “Item 6. Directors, Senior Management and Employees—D. Employees” for a discussion of our employees.

Our Pension Plans

Currently, we offer two types of employee retirement plans—our defined contributions plan and defined benefits plan—which are administered in accordance with the Republic of China Labor Standards Act and the Republic of China Labor Pension Act.

Legal Proceedings

From time to time, we are involved in various legal and arbitration proceedings of a nature considered to be in the ordinary course of our business. It is our policy to provide for reserves related to these legal matters when it is probable that a liability has been incurred and the amount is reasonably estimable. From time to time, we have also been assessed fines by various government agencies such as the NCC and FTC, but none of these fines have had a significant effect on our financial condition or results of operations.

Except as disclosed in our annual report, we believe that we have not been involved in any legal or arbitration proceedings during 2016, 2017 and 2018 that would have a significant effect on our financial condition or results of operations; however, we cannot give you any assurance with respect to the ultimate outcome of any asserted claims against us or legal or arbitration proceedings involving us.

Capital Expenditures

See “Item 5. Operating and Financial Review and Prospects—B. Liquidity and Capital Resources—Capital Expenditures” for a discussion of our capital expenditures.

Enforceability of Judgments in Taiwan

We are a company limited by shares and incorporated under the ROC Company Act. All of our directors, executive officers and some of the experts named in this annual report are residents of Taiwan and a substantial portion of our assets and the assets of those persons are located in Taiwan. As a result, it may not be possible for investors to effect service of process upon us or those persons outside of Taiwan, or to enforce against them judgments obtained in courts outside of Taiwan. We have been advised by our ROC counsel that in their opinion any final judgment obtained against us in any court other than the courts of the ROC in connection with any legal suit or proceeding arising out of or relating to the ADSs will be enforced by the courts of the ROC without further review of the merits only if the court of the ROC in which enforcement is sought is satisfied that:

- the court rendering the judgment has jurisdiction over the subject matter according to the laws of the ROC;
- the judgment and the court procedure resulting in the judgment are not contrary to the public order or good morals of the ROC;
- if the judgment was rendered by default by the court rendering the judgment, we, or the above-mentioned persons, were duly served within a reasonable period of time in accordance with the laws and regulations of the jurisdiction of the court or process was served on us with judicial assistance of the ROC; and
- judgments at the courts of the ROC are recognized and enforceable in the court rendering the judgment on a reciprocal basis.

A party seeking to enforce a foreign judgment in the ROC would be required to obtain foreign exchange approval from the Central Bank of the ROC (Taiwan) for the payment out of Taiwan of any amounts recovered in connection

with the judgment denominated in a currency other than NT dollars if a conversion from NT dollars to a foreign currency is involved.

Regulation

Regulatory Authorities

Prior to March 1, 2006, we were under the supervision of the MOTC and the Directorate General of Telecommunications. On March 1, 2006, the NCC was formed in accordance with the Organization Act, which was intended to transfer regulatory authority over the Taiwan telecommunications industry from the MOTC and the Directorate General of Telecommunications to the NCC.

Under the National Communications Commission Organization Act, or the Organization Act, the NCC was comprised of seven commissioners, which are full-time positions. The premier of the Executive Yuan shall nominate the commissioners and appoint one of them to serve as chairperson, and one as vice chairperson. The nomination shall be approved and appointed by the Legislative Yuan. The tenure of the commissioners is four years, and the commissioners may be re-appointed to serve a consecutive term. Accordingly, now there are seven commissioners, including the chairperson Ting-I Chan and the vice chairperson Po-Tsung Wong. The chairperson began serving on August 1, 2016, and the vice chairperson began serving on August 1, 2018.

In accordance with the Organization Act, the NCC is responsible for:

- formulating, implementing and interpreting telecommunications laws and regulations;
- issuing telecommunications licenses and regulating the operation of telecommunications industry participants;
- assessing and testing telecommunication systems and equipment;
- drafting and promulgating technical standards for telecommunications and broadcasting;
- classifying and censoring the contents of telecommunications and broadcasting;
- managing telecommunications and media resources in Taiwan;
- maintaining competition order in the telecommunication and broadcasting industries;
- governing technical standards in connection with the safety of information communications;
- managing and facilitating the resolution of disputes pertaining to the Taiwan telecommunications and broadcasting industries;
- managing offshore matters relating to Taiwan's telecommunications and broadcasting industries including matters of international cooperation;
- managing funds allocated for the development of Taiwan's telecommunications and broadcasting industries;
- monitoring, investigating and determining matters in relating to Taiwan's telecommunications and broadcasting industries;
- enforcing restrictions under telecommunications and broadcasting laws and punishing violators; and
- supervising other matters in relation to communications and media.

Telecommunications Act

The Telecommunications Act and the regulations under the Telecommunications Act establish the framework and govern the various aspects of the Taiwan telecommunications industry, including:

- licensing of telecommunications services;
- telecommunication numbers;
- restrictions on dominant telecommunications service providers;
- tariff control and price cap regulation;

- accounting separation system;
- interconnection arrangements;
- bottleneck facilities;
- spectrum allocation;
- provision of universal services;
- equal access;
- number portability;
- local loop unbundling;
- co-location; and
- ownership limitations.

Each of these aspects is described below. The Telecommunications Act also establishes a non-auction pricing system for assignment of radio frequencies.

Licensing of Telecommunications Services

Type I and Type II Service Providers

Under the Telecommunications Act, telecommunications service providers are classified into two categories:

Type I. Type I service providers are providers that install network infrastructures, such as network transmission, switching and auxiliary equipment for the provision of telecommunications services. Type I services include fixed-line services such as local, domestic long distance and ILD services, as well as interconnection, leased line, ADSL and satellite services and wireless services such as mobile, including mobile data and trunked radio services.

Type II. Type II service providers are defined as all telecommunications service providers other than Type I service providers. Type II services are divided into special services and general services. Special services include simple voice resale, E.164 internet telephony service, Non-E.164 internet telephony service, international telecommunications services that provide to unspecific customers by leasing international circuit and other services specified by the MOTC before March 1, 2006 or by the NCC from March 1, 2006. General services include any Type II service other than special services.

Until 1996, we were the sole provider of Type I services in Taiwan. In 1996, the government opened the market for mobile, paging and trunked radio, mobile data and digital low power cordless telephone services. In 1998, the government opened the market for fixed-line and mobile satellite services. As of July 16, 2018, there are 83 Type I services providers in total.

Granting of Licenses

Type I

Type I service providers are more closely regulated than Type II service providers. The government has broad powers to limit the number of providers and their business scope and to ensure that they meet their facilities roll-out obligations. Under the Telecommunications Act, Type I service providers are subject to pre-licensing merit review of their business plans and tariff rates.

Pursuant to the Telecommunications Act, licenses for Type I services were granted through a three-step procedure. Applicants shall submit an application, business proposal and other specified documents to the competent authority to apply for the establishment of its operation. Once the applicants have been reviewed and approved or awarded the bid, the competent authority would issue the concession to the applicants for the establishment of its

operation. After the applicants complete the construction and establishment of its operation in the designated region within the prescribed time frame, and proceed with company registration as required by law, they can apply for technical inspection. Upon passing the technical inspection, the applicants are granted a Type I license by the competent authority.

The Telecommunications Act further authorizes the competent authority, now the NCC, to promulgate separate regulations governing each Type I service, including the business scope of the Type I service provider, as well as the procedures and conditions for granting special permits and the length of the period of the special permits of each Type I service. Accordingly, licenses for different Type I services may have different minimum paid-in capital requirements for applicants and varying durations.

Each holder of a Type I license will pay a fee ranging from 0.5% to 2% of their annual revenues or their bid price ratio multiplied by their annual revenues generated from the particular Type I service for which a license has been granted.

Fixed Line Services. Under the Telecommunications Act, the Regulations for Administration on Fixed Network Telecommunications Business govern the issuance of fixed-line service licenses and the business scope of fixed-line providers. Fixed-line service licenses are subdivided into the following categories, and we conduct our fixed line services with a license for integrated services.

- integrated services, including local, domestic long distance and ILD telephone services;
- local telephone services;
- domestic long distance telephone services;
- ILD telephone services; and
- local, domestic long distance and ILD leased line services.

Licenses for local telephone and integrated services are valid for 25 years. Licenses for domestic long distance and ILD telephone services are valid for 20 years. Licenses for leased line services are valid for 15 years. If the service provider wishes to continue operating, the service provider needs to apply for a license renewal to the NCC between nine months and six months before the expiration of their license. The minimum paid-in capital requirements for integrated services providers that applied for a license before June 30, 2004, between July 1, 2004 and January 31, 2008 and on or after February 1, 2008 are NT\$21 billion, NT\$8.4 billion and NT\$6.4 billion, respectively. The minimum paid-in capital requirements for both domestic and ILD telephone service providers that applied for a license between July 1, 2004 and January 31, 2008 and on or after February 1, 2008 are NT\$1.05 billion and NT\$800 million, respectively. The minimum paid-in capital requirements for international undersea leased cable service providers that applied for a license before June 30, 2004, between July 1, 2004 and January 31, 2008, between February 1, 2008 and June 30, 2013 and on or after July 1, 2013 are NT\$420 million, NT\$420 million, NT\$320 million, and NT\$300 million, respectively. The minimum paid-in capital requirement for local telephone service providers that applied for a license between July 1, 2004 and January 31, 2008 and on or after February 1, 2008 are NT\$6.3 billion and NT\$4.8 billion, respectively, multiplied by the Local Network Operation Weights for the regions in which local network managerial rights have been granted to the service provider. The Local Network Operation Weights are calculated as the population of the region as a proportion of the entire population of Taiwan and are announced by the competent authority every three years. If an applicant for a license is also a Type I service provider, it will need to combine the minimum paid-in-capital requirements for all relevant services.

In March 2000, the government granted three new concessions to fixed-line services providers for integrated services. Recipients of these concessions are required to apply for a network construction permit to deploy broadband local access networks. Each recipient of these concessions is required to have the capacity for 150,000 customers before it is able to apply for a fixed-line license to launch its proposed services. The three fixed-line service providers have since obtained fixed-line licenses and are required to achieve the capacity for one million customers by the sixth year following the date of the grant of the network construction permit awarded. Operators that applied for integrated

service provider licenses before June 30, 2004, between July 1, 2004 and January 31, 2008 and on or after February 1, 2008 must achieve a capacity for 1.0 million, 0.4 million and 0.3 million customers, ports or a combination of both, respectively, by the fourth year following the date of the grant of the network construction permit.

Mobile Broadband Services. Pursuant to the Regulations for Administration of Mobile Broadband Businesses, the 4G mobile broadband service providers must obtain the concession license issued by the NCC before providing 4G mobile broadband services. The license granted for the application in 2013 is valid from the license issue date until December 31, 2030 and the license granted for the application in 2015 is valid from the license issue date until December 31, 2033. The license of 1800 MHz and 2100 MHz granted for the application in 2017 is valid from the license issue date until December 31, 2030, and December 31, 2033, respectively. The operation area of 4G mobile broadband services covers throughout the ROC.

The minimum paid-in capital for operating the mobile broadband services is NT\$6 billion. If an applicant also operates another business of Type I telecommunications enterprise, the minimal paid-in capital required for operating the mobile broadband services and the other Type I telecommunications services shall be determined by aggregating the paid-in capital of the entity required for operating the mobile broadband services and that of the entity required for operating the other Type I telecommunications services.

The mobile broadband services licenses were released for the first time in 2013, and we received the license on April 30, 2014. As a result, we started to launch the mobile services on May 29, 2014. The mobile broadband services licenses were released for bidding for a second time in 2015, and we received the license to operate these frequency bands on March 23, 2016. On November 15, 2017, the NCC completed the third round of bidding on the mobile broadband services licenses, and we were one of the winning bidders. We have obtained the license on April 11, 2018.

Satellite Services. Pursuant to the Regulations for Administration on Satellite Communication Services promulgated by the NCC governs the issuance of satellite services licenses and the business scope of satellite service providers. Satellite services licenses are subdivided into fixed satellite services licenses and mobile satellite services licenses.

The satellite services license should be valid for a term of 10 years starting from the date when such license is granted. If the service provider wants to renew its satellite services license before the expiry of the 10-year term, such service provider needs to file a renewed application with the NCC within the period from 9 months to 6 months before the expiry date of the original satellite license. The valid term of the renewed satellite license will be 10 years. Minimum paid-in capital requirements for fixed satellite service providers and mobile satellite service providers are NT\$100 million and NT\$500 million, respectively. If an applicant applies to operate fixed satellite services and mobile satellite services at the same time, its minimum paid-in capital should be calculated separately. The same also applies to an applicant who operates another business of Type I telecommunications enterprise at the same time.

We currently hold a fixed satellite services license, valid from December 10, 2018 to December 9, 2028.

Type II

The Telecommunications Act was amended in 1996 to open the market for all Type II services. Under the Regulations for Administration on Type II Telecommunications Business, Type II services are divided into special services and general services. Special services include simple resale, network telephone service of E.164 and non-E.164 user numbers (VoIP), international leased circuit and other services specified by the governing authority. General services include any Type II service other than special services. The policy for granting a Type II service license is as follows:

- there is no limit on the number of licenses to be issued;
- licenses are granted by the NCC; and
- no bidding procedure is required.

We hold a license to operate all Type II services. Type II service licenses issued before November 15, 2005 are valid for ten years and may be renewed by submitting an application within two months prior to the expiration date. Type II service licenses issued or renewed on or after November 15, 2005 are valid for three years and may be renewed during the period commencing two months prior to the expiration date. There is no minimum paid-in capital requirement for Type II service providers. Our license to operate Type II services is included in our license to operate integrated services, and is valid from July 29, 2000 to July 28, 2025.

Under the Type II Telecommunications Enterprise Permit Fee Schedule, operators of simple resale or network telephone services of E.164 or non-E.164 user numbers must pay an annual license fee equal to 1% of annual revenues generated from these services during the previous year. Type II service operators providing services other than simple resale or network telephone services of E.164 or non-E.164 user numbers must pay license fees ranging from NT\$6,000 to NT\$150,000 depending on their respective paid-in capital. For operators who operate over two or more businesses, their license fee shall be separately calculated but jointly collected. These regulations do not apply to integrated services providers who are permitted to provide Type II services without additional Type II Licenses.

Telecommunications Numbers

According to the Telecommunications Act, numbering codes, subscriber numbers, identification numbers and other telecommunication numbers will be distributed and managed by the NCC. These telecommunication numbers may not be used or changed without approval by the NCC. In order to maintain effective use of available telecommunication numbers, the Telecommunications Act empowers the NCC to reallocate and retrieve assigned telecommunication numbers and to collect a usage fee for distributed telecommunication numbers. According to the Regulations for Usage Fees of Specific Telecommunications Numbers, telecommunications service providers have to pay 70% of revenues collected from the auctioning off and selection of “golden numbers” and the standard usage rates for “special identification numbers” in use.

Restrictions on Dominant Telecommunications Services Providers

Under the Telecommunications Act, the regulations governing dominant telecommunications services providers apply only to Type I service providers. A Type I service provider is deemed to be dominant if it meets any of the following criteria and was declared by the MOTC or now the NCC as dominant:

- controls key basic telecommunications infrastructure;
- has dominant power over market price; or
- has more than a 25% market share in terms of customers or revenues.

We have been declared by the former competent authority MOTC as a dominant Type I service provider for fixed-line, and so far there is no any dominant Type I service provider for 4G mobile broadband services. Under the Telecommunications Act, a dominant Type I service provider must not engage in the following activities:

- directly or indirectly hinder a request for interconnection with its proprietary technology by other Type I service providers;
- refuse to release to other Type I service providers the calculation methods of its interconnection fees and other relevant materials;
- improperly determine, maintain or change its tariffs or means of services;
- reject, without due cause, a request for leasing network components by other Type I service providers;
- reject, without due cause, a request for leasing lines by other service providers or customers;
- reject, without due cause, a request for negotiation or testing by other service providers or customers;
- reject, without due cause, a request for negotiation for co-location by other service providers;
- discriminate, without due cause, against other service providers or customers; or

• abuse its position as a dominant provider, or engage in other unfair competition activities as determined by the regulatory authorities.

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In addition, a dominant Type I service provider is subject to special regulations limiting its tariff changes.

Tariff Control and Price Cap Regulation

Under the Administrative Regulation Governing Tariffs of Type I Telecommunications Enterprises, a dominant Type I service provider must submit its proposed adjustment in primary tariffs and promotional packages including primary tariffs to the NCC for approval at least 14 days prior to the date of the proposed tariff changes and announce such change on media, website and business locations on the day after the NCC grants the approval. The tariff change will come into effect seven days after the announcement.

Primary tariffs include:

- for fixed line local telephone services: monthly fees, usage fees, monthly rental fees of leased lines, pay telephone usage fees and internet connection service fees;
- for fixed line domestic long distance telephone services: monthly rental fees of leased lines;
- for fixed line ILD telephone services: leased line monthly rental fees;
- for wireless services, including 3G mobile services: monthly rental fees and the prepaid communication charges;
- the wholesale price enacted in accordance with this regulation; and
- other fees or tariffs announced by the NCC.

In addition, a dominant Type I service provider is required to set wholesale prices for the provision of its telecommunication services to other telecommunications enterprises. Factors affecting the determination and adjustments of the wholesale price include the establishment, change, cancellation and connection fees. These telecommunication services and their suitable targets, all of which are subject to annual reviews by the NCC, include:

- interface circuits (local and long distance) between internet access service providers and customers for Type I and Type II service providers;
- interface circuits (local and long distance) between internet access service providers for Type I and Type II service providers that are internet access service providers;
- interconnection circuits between Type I service providers and between Type I and Type II service providers of ISR and E.164 VoIP services;
- DSL-family (xDSL) circuits for fixed line service providers and internet service providers;
- other local and long distance data circuits for Type I and Type II service providers; and
- broadband internet interconnection for Type I and Type II service providers that are internet access service providers.

The initial wholesale prices set by a dominant Type I service provider may be the retail price less fees and expenses which need not be incurred, but shall not be higher than its promotional pricing. Changes in the wholesale price charged by a dominant Type I service provider may not be greater than (i) the retail price less fees and expenses which need not to be incurred but not greater than the promotional pricing; or (ii) the annual growth rate of the consumer price index in Taiwan minus the constant set by the NCC, whichever is the lower. The Administrative Regulations Governing Tariffs of Type I Telecommunications Enterprises further prohibits a dominant Type I service provider from practicing unfair competition against other telecommunications enterprises.

In addition, changes in tariffs charged by dominant Type 1 service providers (notwithstanding the type of their respective services) may not, in any event, be greater than the annual growth rate of the consumer price index in Taiwan adjusted by a set constant, which will be periodically determined and announced by the NCC. For example, if:

- the annual growth rate of the consumer price index in Taiwan minus the set constant is positive, the increased percentage of tariffs must not exceed such positive figure;
- the annual growth rate of the consumer price index in Taiwan minus the set constant is negative, the decreased percentage of tariffs must be at least the absolute value of such negative figure, and the tariffs used in the given year must not be higher than the decreased tariff; and
- the annual growth rate of the consumer price index in Taiwan minus the set constant equals to zero, no increase in tariffs is allowed to be made by any Type I service providers.

On March 8, 2017, the NCC announced that effective from April 1, 2017 to March 31, 2020:

- the set constant to be applied to the tariff adjustment for the fixed line integrated services is 3.19% and covers the following:
 - dominant providers of local network services and long-distance network services in Type I service tariffs of the following:
 - the monthly fee for fixed-line broadband access services (excluding FTTH, FTTB, ADSL, and the services which downlink and uplink speeds both over 100 Mbps)
- the set constant to be applied to the tariff adjustment for the fixed line integrated services is 5.1749% and covers the following:
 - dominant providers of local network services and long-distance network services in Type I service tariffs of the following:
 - wholesale prices of the following:
 - the monthly fee for leased lines services (including local and domestic long distance leased lines) between internet service providers and their customers
 - the monthly fee for leased lines services (including local and domestic long distance leased lines) between an internet service provider and another internet service provider
 - the monthly fee for the interconnection (including local and domestic long distance lines) between a Type 1 telecommunication service provider and another Type 1 telecommunication service provider; the monthly fee for the interconnection (including local and domestic long distance lines) between a Type 1 telecommunication service provider and a Type 2 telecommunication service provider who provides simple resale and network telephone service of E.164 user numbers
 - the monthly fee for other local and domestic long distance leased lines
 - the interconnection fee for internet bandwidth interconnection
- the set constant to be applied to the tariff adjustment for other Type 1 telecommunication services is the annual growth rate of the consumer price index in Taiwan, no increase in tariffs is allowed.

In comparison, all non-dominant Type I service providers are only required to fully disclose and notify the public of their proposed tariff adjustments and promotional packages, through the media, websites, and at all business premises, in an appropriate manner, and to report to the NCC prior to the date of the proposed tariff change, with respect to all tariffs.

Type II service providers are free to establish their own tariff schemes, but are required to notify the NCC and the public upon adoption and upon any subsequent adjustments.

Accounting Separation System

The Telecommunications Act requires that a Type I service provider, including one who concurrently offers Type II services, separately calculate the profits and losses for its different services and prohibits any cross-subsidization among services that will impede fair competition.

Interconnection Arrangements

The Telecommunications Act requires all Type I service providers to allow other Type I service providers access to their networks. It further requires Type I service providers, within three months upon request by the other Type I service provider, to reach an agreement on the relevant terms for the interconnection. Prices charged for interconnection must be based on cost. If the parties fail to reach an agreement within three months, the NCC may, either at the request of the parties or on its own accord, arbitrate and determine the interconnection terms for the parties. The Telecommunications Act authorizes the Directorate General of Telecommunications or, from March 1, 2006, the NCC to issue rules and regulations pertaining to interconnection.

The Regulations Governing Network Interconnection among Telecommunications Enterprises establishes the basis for determining the interconnection charge of a dominant Type I service provider, which shall be reviewed every four years. The interconnection charge of a dominant Type I service provider shall be reviewed by the NCC in advance, and the NCC has the right to modify the rate.

A dominant fixed-line service provider shall unbundle its network elements. The unbundled network elements shall contain the following:

- local loops;
- local switch transmission equipment;
- local trunks;
- toll switch transmission equipment;
- long distance trunks;
- international switch transmission equipment;
- network interfaces;
- directory equipment and services; and
- signaling network equipment.

Unless otherwise provided by the laws, interconnection charge of the providers for the mobile broadband business should be calculated based on the decrees issued by NCC. The foregoing shall apply, mutatis mutandis, to the calculation and reviewing method of the interconnection charge of the dominant providers for fixed communication services.

Unbundled network components of the providers for the mobile broadband business include:

- mobile telecommunications trunks;
- mobile telecommunications base stations;
- controlling equipment of mobile telecommunications base stations;
- mobile telecommunications switch transmission equipment; and
- other items recognized by the NCC.

The Regulations Governing Network Interconnection among Telecommunications Enterprises specifies the charges for network interconnection among Type I service providers as follow:

Before January 1, 2011, except for international communications, tariffs for communications between a mobile telecommunications network and a fixed-line network were collected from the call-originating subscribers by the call-originating service provider pursuant to the tariff schedules set by the mobile communication service provider, and revenues or any uncollectible accounts from such tariffs went to the mobile service provider. However, from January 1, 2011, although the tariffs shall still be paid by the call-originating subscribers, the tariff schedules are set by the call-originating network service provider, and revenues or any uncollectible accounts from such tariff shall go to the call-originating service provider. During the transition period from January 1, 2011 to December 31, 2016, we, as a dominant Type I fixed-line service provider, shall pay extra transition fee in addition to access charges to the mobile communications service providers.

Tariffs for communications between mobile telecommunications networks shall be paid by the call-originating subscribers pursuant to the tariff schedules set by the call-originating service providers, and the revenues or any uncollectible accounts from such tariffs shall go to the call-originating service providers.

Tariffs for communications between fixed-line network will be determined by the following principles:

Tariffs for communications between the local telephone networks shall be paid by the call- originating subscribers pursuant to the tariff schedules set forth by the call-originating service providers, and revenues or any uncollectible accounts from such tariffs shall be allocated to the call-originating service providers;

Tariff schedules for local telephone network subscribers using domestic long-distance telephone services shall be set by the domestic long-distance telephone service provider and tariffs shall be collected from local telephone network subscribers using domestic long-distance telephone services. Revenues or any uncollectible accounts from such tariffs shall be allocated to the domestic long-distance telephone service providers; and

Tariff schedules for local telephone network subscribers using international long-distance telephone services shall be set by the international long-distance telephone service provider and collected from local telephone network subscribers using international long-distance telephone services. Revenues or any uncollectible accounts from such tariffs shall be allocated to the international long-distance telephone service providers.

Tariffs schedules for communications between satellite mobile networks and between satellite mobile networks and fixed-line communications networks or mobile communications networks shall both be set by the call-originating service providers. Revenues or any uncollectible accounts from such the tariffs shall go to the call-originating service providers.

Tariffs schedules for communications between the E. 164 VoIP networks provided by the Type I service providers and mobile telecommunications networks, or local telephone networks, or satellite mobile networks shall be set by the call-originating service providers. Revenues or any uncollectible accounts from such tariffs shall go to the call-originating service providers.

Bottleneck Facilities

Under the Telecommunications Act, when a Type I service provider cannot construct bottleneck facilities within a reasonable period of time or substitute those facilities with other available technologies, it may request for co-location on a fee basis from the owner of the facilities located at the bottleneck of the relevant telecommunications network. The owner of the facilities so requested may not reject these requests without due cause. The NCC has the authority to prescribe facilities as bottleneck facilities, and has prescribed bridges, tunnels, lead-in tubes and telecommunications chambers located within buildings and horizontal and vertical telecommunications cables and lines as bottleneck facilities in relation to fixed-line telecommunications networks. The NCC, in an announcement on December 21, 2006, has defined local loop facilities as the “bottleneck” of the telecommunications network. Therefore, as a Type I service provider, we can only charge other local telephone service providers at cost for local loop services. The rental tariff is derived from a cost basis and must be approved by the NCC each year.

Spectrum Allocation

The MOTC is responsible for allocating all radio related frequencies primarily according to the standards set by the International Telecommunications Union. The NCC is responsible for the licensing of operators to use these frequencies.

On October 30, 2013, NCC completed the bidding process for the spectrum to provide 4G mobile broadband services and a total of 270MHz of FDD spectrum over 700MHz, 900MHz, and 1800MHz frequency bands have been assigned to six nominated bidders, including us, and the licenses will expire in December 2030. The spectrum for 4G mobile broadband services was released adhering to the principle of technological neutrality. On December 7, 2015, the NCC completed a second round of bidding on 4G mobile broadband spectrum. A total of 190 MHz spectrum of the 2500 MHz and 2600 MHz frequency bands were assigned to four nominated bidders, including us, and the licenses will expire in December 2033. On November 15, 2017, the NCC completed a third round of bidding on 4G mobile broadband spectrum. A total of 130MHz of FDD spectrum over 1800MHz and 2100MHz frequency bands have been assigned to four nominated bidders, Far EasTone, Taiwan Mobile, T-Star and us, and the licenses will expire in December 2030 and 2033, respectively.

Provision of Universal Services

Under the Telecommunications Act, a Type I service provider may be required by the NCC, to provide universal telecommunications services in remote or unprofitable areas. These services include voice communication services, such as public phones, and data communication services, such as internet provision for libraries and public primary and secondary schools. All Type I service providers and certain Type II service providers designated by the NCC, will be required to contribute a fixed portion of their annual revenues to a universal services fund. Such a fund will be used to compensate for any losses, bad debts and management fees incurred by the relevant Type I service provider in providing the universal services. All providers of universal services cannot refuse any request for service, unless for legitimate reasons, and cannot charge more than the predetermined tariffs.

Equal Access

As a result of the liberalization of Taiwan's telecommunications industry, a Type I service provider, including a local network services provider and a mobile broadband services provider, is required to provide its customers with equal access to the long-distance and international telephone services provided by other service providers. A Type I service provider may provide equal access through pre-selection or call-by-call selection. When a customer makes a call using call-by-call selection, such customer has the option to select a service provider by dialing the network identification prefix assigned to the service provider of his choice. This will result in the automatic selection of the preferred service provider for the provision of relevant telecommunication services. The pre-selection function allows any customer to select in advance a long distance or international service provider of his or her choice. When such customer makes a call using this function, the communications network will automatically interconnect to the long distance or international network previously selected by such customer.

Number Portability

According to the Telecommunications Act and the Regulations Governing Number Portability, Type I service providers shall provide number portability service which enables customers to retain their existing local and toll free fixed-line telephone numbers or mobile phone numbers when they switch from the original Type I service provider to other Type I service providers. Meanwhile, Type I service providers shall mutually grant each other number portability services on a reciprocal basis, and shall conform in accordance with the principle of impartiality and reasonableness, and shall not be discriminatory.

Co-location

We have been declared by the governmental authority as a dominant Type I service provider for fixed-line services. According to the Telecommunication Act, the Regulations for Administration on Fixed Network Telecommunications Business and the Regulations Governing Network Interconnection among Telecommunications Enterprises, if any other service provider requests for co-location, we must negotiate with them, unless otherwise provided by laws or regulations.

Ownership Limitations

The Telecommunications Act limits foreign ownership of our common shares. Since March 1, 2006, the NCC has replaced the MOTC as the competent authority under the Telecommunications Act, and had the power to prescribe the limits on foreign ownership of our common shares. After the NCC and the MOTC reached an agreement, the MOTC issued an announcement on December 28, 2007, stipulated that direct holdings by foreign investors cannot exceed 49% of our outstanding share capital, and the total direct and indirect holdings by foreign investors cannot exceed 55% of our outstanding share capital.

Fair Trade Act

The requirements and restrictions under the Telecommunication Act regarding price control, IP peering, equal access and accounting separation regulates certain competitive activities among telecommunication industries and aims to reduce the occurrence of anti-competition activities.

By comparison to the Telecommunications Act, the Fair Trade Act, or the FTA, plays a more comprehensive role in regulating all matters relating to competition between enterprises. The Fair Trade Act seeks to deter and prevent anti-competitive conduct by granting the Fair Trade Commission's powers to investigate and to impose penalties.

The Fair Trade Act is administered and enforced by the Fair Trade Commission, or the FTC, which has independent administration rights granted to it under the Fair Trade Act and is empowered to impose disciplinary actions for fair trade matters. The Fair Trade Commission may initiate an investigation either on its own account in accordance with its discretion granted by the Fair Trade Act or upon receipt of a complaint.

Regulation on Telecommunications Enterprise with Monopoly Status

The term "monopoly" used in the FTA refers to the circumstance where an enterprise conducts its business operation in a relevant market without facing any competition or where an enterprise is able to dominate the relevant market and block competition in the market. If there are two or more enterprises within the same market that do not engage in any price competition with each other, the whole group of non-competing enterprises should be deemed as a single monopoly enterprise in the market.

According to the FTA, an enterprise or a group of enterprises will not be considered as monopolistic enterprise(s) if none of the following circumstances exists:

- the market share of the enterprise in a relevant market reaches one-half of the market;
- the combined market share of two enterprises in a relevant market reaches two-thirds of the market; and
- the combined market share of three enterprises in a relevant market reaches three-fourths of the market.

If the market share of any respective enterprise does not reach one-tenth of the relevant market or if the amount of the enterprise's total sales in the preceding fiscal year is less than the amount which the authority announces, such enterprise shall not be considered as a monopolistic enterprise in the relevant market. Notwithstanding the above, the FTC has the ultimate discretion to consider an enterprise as a monopolistic enterprise upon any other events evidencing such enterprise's capability to affect the supply and demand in relevant market or eliminate competition.

Under the FTA, any enterprise with monopoly status is prohibited from engaging in any of the following activities:

- directly or indirectly, by using any unfair method to prevent any other enterprises from competing;
- improperly set, maintain or change the price for goods or the remuneration for services;
- forcing the enterprise's trading counterpart to give preferential treatment without justification; or

abusing its market power.

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According to the FTC's Explanation on Regulations Governing Telecommunication Industry, a telecommunications enterprise with monopoly status is likely to be involved with the following activities regulated by the FTA: conducting predatory pricing, price squeezing, cross-subsidies, price discrimination, blocking access to essential facilities, inappropriate preference or differential treatment and entering into long-term agreements to restrict the ability to change counterparties.

If the FTC finds an enterprise liable for violation of regulations governing monopoly, the FTC could impose a monetary fine of not more than NT\$100,000,000 each time. If the FTC finds such violation is serious, it may further impose a monetary fine exceeding the NT\$100,000,000 but up to 10% of the total sales of the enterprise in the preceding fiscal year. The responsible person of such enterprise may be sentenced to imprisonment of not more than three years.

Regulations on Combination Between Telecommunications Enterprises

The term "merger" used in the FTA refers to any of the following circumstances:

- where an enterprise and another enterprise are merged into one;
- where any enterprise holds or acquires more than one-third of total voting shares or capital of another enterprise;
- where any enterprise is assigned by or leases from another enterprise the whole or the major part of the business or properties of such other enterprise;
- where any enterprise operates jointly with another enterprise on a regular basis or is entrusted by another enterprise to operate the latter's business; or
- where any enterprise directly or indirectly controls the business operation or the appointment or discharge of personnel of another enterprise.

If any merger between or among multiple enterprises falls within any of the following circumstances, a prior approval granted by the FTC shall be required:

- as a result of the merger, the enterprise will own at least one-third of the total market share;
- there is any enterprise involved with the merger has one-fourth of the market share; or
- the aggregate sales amount for the preceding fiscal year of the enterprises and the entities controlled by or affiliated with such enterprise involved with the merger exceeds the threshold amount publicly announced by the FTC from time to time.

Once the telecommunications enterprise files the merger application with the FTC, the FTC will evaluate the pros and cons of the merger by weighing the potential economic efficiency against the disadvantage of reduced competition. If the FTC finds the potential economic efficiency generated from the merger should be able to offset the disadvantage of reduced competition caused, the FTC will grant the approval for the merger. Furthermore, the FTC may, when granting an approval, impose certain conditions or undertakings on the applicants to ensure that the overall economic benefit to be generated from the merger outweighs the disadvantage of the reduction in competition.

Regulations on Concerted Action (Cartel) in Telecommunication Industry

The term "concerted action (cartel)" as used in the FTA means the competing enterprises at the same production and/or marketing stage, by means of contract, agreement or any other form of mutual understanding, jointly determine the price of goods or services, quantity, technology, products, facilities, trading counterparts, or trading territory with respect to such goods and services, or any other behavior that restrict each other's business activities, resulting in an impact on the market function with respect to production, trade in goods, or supply and demand of services. The FTC may assume a concerted action exists based on the market condition, the feature of goods or services, cost and profit, and the economic feasibility for enterprises to conduct concerted action.

Under the FTA, enterprises are prohibited from engaging in any concerted actions unless the FTC holds the concerted action may be beneficial to the overall economy and public interest.

According to the FTC's Explanation on Regulations Governing Telecommunication Industry, a telecommunications enterprise may be able to involve with the following concerted actions: entering into common pricing agreements, restriction of output and market segregation, concerted refusal to deal, or entering into agreements for exchange of information.

If the FTC finds an enterprise liable for violation of regulations governing concerted action (cartel), the FTC could impose a monetary fine of not more than NT\$100,000,000 each time. If the FTC finds such violation is serious, it may further impose a monetary fine exceeding the NT\$100,000,000 but up to 10% of the total sales of the enterprise in the preceding fiscal year.

Regulations on Restrict Competition in Telecommunication Industry

The FTA prohibits any enterprise from conducting any of the following activities that may restrict competition:

- forcing another enterprise to discontinue supply, purchase or other business transactions with a particular enterprise for the purpose of injuring such particular enterprise;
- treating another enterprise discriminatively without justification;
- preventing competitors from participating or engaging in competition by inducing customers with low price or other illegal inducements;
 - forcing another enterprise to refrain from competing in price, or to take part in a merger, or a concerted action, or to perform vertical restrictions by coercion, inducement with interest, or other improper methods;
 - or
 - setting improper restrictions on its trading counterparts' business activity as the condition to reach business engagement.

If any enterprise violates the regulations governing unfair competition, the FTC may order it to cease therefrom, rectify its conduct or take necessary corrective action within the time prescribed in the order; in addition, the FTC may assess upon such enterprise an administrative fine of not less than NT\$100,000 nor more than NT\$50,000,000. Should such enterprise fail to cease therefrom, rectify the conduct or take any necessary corrective action after the lapse of the prescribed period, the FTC may continue to order such enterprise to cease therefrom, rectify the conduct or take any necessary corrective action within the time prescribed in the order, and each time may successively assess thereupon an administrative fine of not less than NT\$200,000 nor more than NT\$100,000,000 until its ceasing therefrom, rectifying its conduct or taking the necessary corrective action.

Regulations on the Representations or Symbol Used by Telecommunications Enterprise on Goods or in Advertisement

The FTA prohibits any enterprise from making or using false or misleading representations or symbol as to price, quantity, quality, content, production process, production date, valid period, method of use, purpose of use, place of origin, manufacturer, place of manufacturing, processor, place of processing on goods, or any items which attract customers or in advertisements, or in any other way making known to the public.

If an enterprise violates the applicable provisions under the FTA that prohibit false or misleading representations, the FTC may order it to cease therefrom, rectify its conduct or take necessary corrective action within the time prescribed in the order; in addition, the FTC may assess upon such enterprise an administrative fine of not less than NT\$50,000 nor more than NT\$25,000,000. Should such enterprise fail to cease therefrom, rectify the conduct or take any necessary corrective action after the lapse of the prescribed period, the FTC may continue to order such enterprise to cease therefrom, rectify the conduct or take any necessary corrective action within the time prescribed in the order,

and each time may successively assess thereupon an administrative fine of not less than NT\$100,000 nor more than NT\$50,000,000 until its ceasing therefrom, rectifying its conduct or taking the necessary corrective action.

Other Regulations

In addition to the competitive activities expressly regulated by the FTA, the enterprise shall further be prohibited from conducting any fraudulent activity or significantly unfair activity that may impact the trade order.

Personal Information Protection Act

Under the Personal Information Protection Act, or PIPA, every individual or governmental or non-governmental agencies, including us, should be subject to certain requirements and restrictions for collecting, processing or using personal data. The definition of “personal data” is extended to cover a broad scope, including name, birthday, ID, special features, fingerprints, marriage status, family, education, occupation, medical records, medical history, genetic information, sex life, health examination report, criminal records, contact information, financial status, social activities, and any other data which is sufficient to directly or indirectly identify a specific person. If we fail to comply with the PIPA, we may be subject to serious punishment for civil claims, criminal offenses and administrative liabilities: the ceiling of the aggregate compensation amount for damages payable in a single case will be up to NT\$200 million or the actual value of loss arising from our violation provided the amount of actual value of such loss is higher than NT\$200 million; the defendant may be subject to an imprisonment of up to five years; and the penalty for administrative liabilities will be up to NT\$500,000 for each violation, and may be imposed consecutively if such violation continues.

C. Organizational Structure

Set forth below is a diagram indicating our organization structure as of March 31, 2019.

D. Property, Plant and Equipment

Please refer to “—B. Business Overview” for a discussion of our property, plant and equipment.

ITEM 4A. UNRESOLVED STAFF COMMENTS

None.

ITEM 5. OPERATING AND FINANCIAL REVIEW AND PROSPECTS

You should read the following discussion of our financial condition and results of operations together with the consolidated financial statements and the notes to such statements included in this annual report.

For the convenience of readers, NT dollar amounts used in this section for, and as of, the year ended December 31, 2018 have been translated into U.S. dollar amounts using US\$1.00=NT\$30.61, set forth in the statistical release of the Federal Reserve Board on December 31, 2018. The U.S. dollar translation appears in parentheses next to the relevant NT dollar amount.

Overview

A number of recent and expected future developments have had, and in the future may have, a material impact on our financial condition and results of operations. These developments include:

- changes in our revenue composition and sources of revenue growth;
- tariff adjustments;
 - capital expenditures as a result of technological improvements and changes in our business;
- personnel expenses; and
- taxation.

Each of these developments is discussed below.

Changes in our revenue composition and sources of revenue growth

Our domestic fixed communications business revenues are derived primarily from the provision of local, domestic long distance, broadband access, leased line service, MOD, and other domestic services including ICT, cloud services, corporate solution services, billing handling services and the leasing of real estate properties. In addition, we also derive fixed-line revenues from providing interconnection services to other carriers. Our revenues from mobile communications business are principally derived from the provision of mobile services, sales of mobile handsets, tablets and data cards and other mobile services. Our revenues from internet business are generated principally from HiNet internet service, data communication services, internet VAS, internet data center, and other internet services including ICT and cloud services. Our revenues from international fixed communications business are derived primarily from ILD, international leased line, international data services, satellite services, and other international services. Our other revenues are principally derived from non-telecom services.

The table below sets forth the revenues from our principal lines of business as a percentage of total revenues for the periods indicated.

	Year Ended December 31		
	2016	2017	2018
Revenues:			
Domestic fixed communications business	31.6 %	31.3 %	31.0 %
Mobile communications business	48.2	48.1	46.9
Internet business	12.2	12.7	13.8
International fixed communications business	6.3	5.9	6.2
Others	1.7	2.0	2.1
Total	100.0%	100.0%	100.0%

Our domestic fixed communications business has been an important source of revenue over the last three years. We derive domestic fixed communications revenue from the provision of FTTx and ADSL access services that provides

customers with data access lines. Revenue from domestic fixed communication decreased as a percentage of our total revenue in 2017 mainly due to the decline of domestic long distance and local call service revenue because of mobile and VoIP substitution, and mandatory reductions in tariffs for FTTx and ADSL services. The percentage further decreased in 2018, mainly attributable to the decline of domestic long distance and local call service revenue mentioned above, and the decrease in ICT revenues. We believe that domestic fixed communications business will continue to generate a significant portion of our revenues.

Revenues from our mobile communications business was a major contributor to our revenues over the last three years. In 2017, Revenue from mobile communications business decreased as a percentage of our total revenue mainly due to the decline in voice revenue, which was partially offset by the increase in mobile VAS revenue and revenue from our sales of mobile handsets, tablets and data cards. In 2018, the percentage of total revenues derived from mobile communications business further decreased mainly attributable to the decline in service revenue, due to market competition and free VoIP applications. We believe that our mobile communications business will continue to generate a significant portion of our revenues.

Our internet business was another important source of revenues over the last three years. We derived internet business revenues from the provision of data communication services, application VAS and services provided to the government. In 2017 and 2018, the percentage of revenues from internet services within total revenues increased mainly due to the increase in revenues generated from services such as IDC, HiLink, information security and IoT.

We derived our international fixed communications revenues mainly from ILD telephone services and international ICT services. Revenues from our international fixed communications business as a percentage of our total revenues decreased from 2016 to 2017, because our ILD telephone services revenue continued to decline due to VoIP substitution. In 2018, the percentage of total revenues derived from international fixed communications business increased mainly attributable to the increase in international leased line revenues, international data revenues and ICT revenues.

Our other revenues increased from 2016 to 2018, and the increase was mainly due to operating growth derived from one of our subsidiaries, CHPT, a semiconductor testing company.

Tariff adjustments

We adjust our tariffs and offer promotional packages from time to time primarily in response to market conditions. We also from time to time are required to adjust our pricing in line with domestic regulations.

On March 8, 2017, the NCC announced a plan for tariff reductions effective from April 1 2017 to March 31, 2020. The reduction plan applies to the wholesale tariffs for IP peering and domestic leased line services, which was subject to a reduction by Δ CPI—5.1749%, and to the monthly fees for fixed-line broadband access services (excluding FTTH, FTTB, ADSL, and the services which downlink and uplink speeds both over 100 Mbps), which was subject to a reduction by Δ CPI—3.19%. The Δ CPI for 2018 that was used for the tariff reduction starting from April 1, 2019 was 1.35%. In response to the tariff reduction plan announced by the NCC and to further support the government's policy with respect to the development of digital economy, we voluntarily adopted a more aggressive tariff reduction rate for our IP peering service. We do not expect such tariff reduction to have a material adverse impact on our results of operations.

In addition, on August 23, 2017, the NCC determined that, starting from November 2017, our tariff in the mobile interconnection fees should be reduced from NT\$1.15 per minute to NT\$0.571 per minute in four years.

Furthermore, the NCC approved our new fixed communications network interconnection fees on September 26, 2018. The interconnection fees for local telephone and domestic long distance telephone remain the same, while the interconnection fees from mobile network to local telephone decrease, from NT\$0.4851 to NT\$0.4383 per minute during peak times and from NT\$0.2531 to NT\$0.2148 per minute during off-peak times. The tariff is effective from January 1, 2019 to December 31, 2022.

Besides mandatory tariff reduction mentioned above, we, from time to time, voluntarily implemented tariff adjustments in our broadband and mobile businesses in the past few years to consolidate our market share.

Capital expenditures as a result of technological improvements and changes in our business

In recent years, we have focused on modernizing and upgrading our mobile services network and on developing our FTTx network, which enables transmission of digital information at a high bandwidth over fiber loops. Constructing fiber networks in new buildings and areas with demand for 500 Mbps and 1 Gbps per household, and 10 Gbps for enterprise in the near future is our priority. In order to achieve this goal, we may invest in new equipment with 10 Gbps Gigabit-capable Passive Optical Network technology in 2019. Our long-term goal is to optimize our capital expenditures by focusing on investing in innovative products and services with attractive return profiles. We evaluate our investment opportunities by benchmarking them against internal return requirements.

Personnel expenses

Personnel expenses constitute a significant portion of our operating costs and expenses. In 2016, 2017 and 2018, personnel expenses represented 26.4%, 26.2% and 27.3% of our total operating costs and expenses, respectively, and pension costs represented 1.9%, 1.9% and 2.1% of our total operating costs and expenses, respectively. The table below sets forth information regarding our personnel expenses and as a percentage of our total operating costs and expenses for the periods indicated.

	Year Ended December 31							
	2016		2017		2018			
	(in billions of NT\$, except percentages)							
Personnel expenses:								
Salaries	26.0	14.3 %	25.8	14.3 %	26.2	15.2 %		
Insurance	2.7	1.5	2.7	1.5	2.7	1.6		
Pension	3.4	1.9	3.4	1.9	3.6	2.1		
Other ⁽¹⁾	15.7	8.7	15.5	8.5	14.5	8.4		
Total personnel expenses	47.8	26.4 %	47.4	26.2 %	47.0	27.3 %		
Total operating costs and expenses	181.4	100.0%	180.7	100.0%	172.0	100.0%		

(1) Includes employees' compensation.

At the time of our privatization, we settled all of our then existing defined benefit pension obligations in full. After completing our privatization on August 12, 2005, all of our continuing employees were deemed to have commenced employment as of August 12, 2005 for seniority purposes under our pension plans in effect after privatization. Under applicable ROC regulations, upon our privatization, the MOTC assumed the obligation to make annuity payments to all of our employees that retired before our privatization.

Taxation

The income tax rate for profit-seeking enterprises is 20% in the ROC. Prior to 2018, the income tax rate for profit-seeking enterprises was 17% in the ROC. We benefit from tax incentives, including tax credits of up to 15% of some of our research and development expenses in accordance with the Statute for Innovating Industries.

After-tax earnings generated from January 1, 1998 and not distributed to stockholders as dividends in the following year were assessed with a 10% unappropriated earnings tax. According to the amendment to the Income Tax Law, the rate of the ROC unappropriated earnings tax is adjusted from 10% to 5% against our unappropriated earnings generated from January 1, 2018 and the allowed tax credit (against our earnings generated since January 1, 2018) is

canceled. Such amendment will apply to our annual tax filings made starting January 1, 2019. See “Item 10. Additional Information—E. Taxation—ROC Taxation—Dividends.” Under IFRSs, the 5% tax on unappropriated earnings is accrued during the year the earnings arise and adjusted to the extent that distributions are approved by the stockholders in the following year. In 2018, due to the reversal of the 10% unappropriated earnings tax accrued in 2017, which was much higher than that accrued of the 5% unappropriated earnings tax in 2018, net unappropriated earnings tax accrued in 2018 was lower than that accrued in 2017. As a result, our effective tax rate decreased from 16.3% in 2017 to 14.2% in 2018 mainly due to the adjustment of tax rate of unappropriated earnings tax.

Critical Accounting Policies

Summarized below are our accounting policies that we believe are both important to the portrayal of our financial results and involve the need for management to make estimates about the effect of matters that are uncertain in nature. Actual results may differ from these estimates, judgments and assumptions. Certain accounting policies are particularly critical because of their significance to our reported financial results and the possibility that future events may differ significantly from the conditions and assumptions underlying the estimates used and judgments made by our management in preparing our financial statements. The following discussion should be read in conjunction with the consolidated financial statements and related notes, which are included in this annual report.

Revenue Recognition

We identify the performance obligations in the contract with the customers, allocates transaction price to each performance obligation and recognizes revenue when performance obligations are satisfied.

Sales of products are recognized as revenue when we deliver products and the customer accepts and controls the product. Except for the consumer electronic products such as mobile devices sold in channel stores which are usually in cash sale, we recognize revenues and corresponding trade notes and accounts receivable for sale of other electronic devices.

Usage revenues from fixed-line services (including local, domestic long distance and international long distance telephone services), cellular services, internet and data services, and interconnection and call transfer fees from other telecommunications companies and carriers are billed in arrears and are recognized based upon seconds or minutes of traffic processed when the services are provided in accordance with contract terms. The usage revenues and corresponding trade notes and accounts receivable are recognized monthly.

Other revenues are recognized as follows: (a) one-time subscriber connection fees (on fixed-line services) are first recognized as contract liabilities and revenues are recognized subsequently over the average expected customer service periods, (b) monthly fees (on fixed-line services, mobile, Internet and data services) and related receivables are accrued monthly, and (c) prepaid services (fixed-line, mobile, Internet and data services) are recognized as contract liabilities upon collection considerations from customers and are recognized as revenues subsequently based upon actual usage by customers.

Where we enter into transactions which involve both the provision of telecommunications service bundled with products such as handsets, total consideration received from products and telecommunications service in these arrangements are allocated based on their relative stand-alone selling price. The amount of sales revenue recognized for products is not limited to the amount paid by the customer for the products. When the amount of sales revenue recognized for products exceeded the amount paid by the customer for the products, the difference is recognized as contract assets. Contract assets are reclassified to accounts receivable when the amounts become collectible from customers subsequently. When the amount of sales revenue recognized for products was less than the amount paid by the customer for the products, the difference is recognized as contract liabilities and revenues are recognized subsequently when the telecommunications service are provided.

For project business contracts, if a substantial part of our promise to customers is to manage and coordinate the various tasks and assume the risks of those tasks to ensure the individual goods or services are incorporated into the combined output, they are treated as a single performance obligation since we provide a significant integration service. We recognize revenues and corresponding accounts receivable when the project business contract is completed and accepted by customers.

For service contracts such as maintenance and warranties, customers simultaneously receive and consume the benefits provided by us; thus revenues and corresponding accounts receivable of service contracts are recognized over the related service period.

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When another party is involved in providing goods or services to a customer, we are acting as a principal if we control the specified good or service before that good or service is transferred to a customer; otherwise, we are acting as an agent. When we are acting as a principal, gross inflow of economic benefits arising from transactions is recognized as revenue. When we are acting as an agent, revenue is recognized in the amount of commission.

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

- We had transferred to the buyer the significant risks and rewards of ownership of the goods;
- We retained neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- The amount of revenue could be measured reliably;
- It was probable that the economic benefits associated with the transaction would flow to us; and
- The costs incurred or to be incurred in respect of the transaction could be measured reliably.

Revenue was measured at the fair value of the consideration received or receivable and represents amounts for goods sold in the normal course of business, net of sales discounts and volume rebates. For trade notes and accounts receivables due within one year from the balance sheet date, as the nominal value of the consideration to be received approximates its fair value and transactions were frequent, fair value of the consideration was not determined by discounting all future receipts using an imputed rate of interest.

Where we entered into transactions which involve both the provision of telecommunications service bundled with products such as handsets, total consideration received from products and telecommunications service in these arrangements were allocated and measured using units of accounting within the arrangement based on their relative fair values limited to the amount paid by the customer for the products. Relative fair values were based on the selling prices of handsets on a standalone basis and the monthly fees provided in the subscription contracts.

Revenue from a contract to provide services was recognized by reference to the stage of completion of the contract.

Our project agreements were mainly to provide one or more equipment or services to customers. In order to fulfill the agreements, another party might be involved in some agreements. We considered the following factors to determine whether we were a principal of the transaction: whether we were the primary obligation provider of the agreements, our exposures to inventory risks and the discretion in establishing prices, etc. The determination of whether we were a principal or an agent would affect the amount of revenue recognized by us. Only when we were acting as a principal, gross inflows of economic benefits arising from transactions was recognized as revenue.

Impairment of Trade notes and Accounts Receivable

The provision for impairment of trade notes and accounts receivable is based on assumptions about risk of default and expected loss rates. We use judgment in making these assumptions and in selecting the inputs to the impairment calculation, based on our past experience, current market conditions as well as forward-looking information at the end of each reporting period. For details of the key assumptions and inputs used, please refer to Note 11 to our consolidated financial statements included elsewhere in this annual report. Where the actual future cash flows are less than expected, a material impairment loss may arise.

We recognize lifetime Expected Credit Loss (ECL) for trade notes and accounts receivable. 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.

The expected credit losses on receivables are estimated using a provision matrix by reference to past default experience of the customers and an analysis of the customers' current financial positions, as well as the forward-looking indicators such as macroeconomic business indicator. When there are pieces of evidence indicating that the counterparty is in evasion, bankruptcy, deregistration of its company or the accounts receivable are over two years past due and the recoverable amount cannot be reasonably estimated, we write off the trade notes and accounts receivable. For accounts receivable that have been written off, we continue to engage in enforcement activity to attempt to recover the receivables due. Where recoveries are made, these are recognized in profit or loss.

Prior to 2018, when there was objective evidence showing indications of impairment, we considered the estimation of future cash flows. The amount of impairment would be measured as the difference between the carrying amount and the present value of estimated future cash flows discounted by the original effective interest rates of the financial assets. However, as the impact from discounting short-term receivables was not material, the impairment of short-term receivables was measured at the difference between the carrying amount and the estimated undiscounted future cash flows. Where the actual future cash flows were lower than expected, a material impairment loss might arise.

We maintained an allowance for doubtful accounts for estimated losses that resulted from the inability of our customers to make required payments. When determining the allowance, we considered the probability of recoverability based on past customers default experience and their credit status, and economic and industrial factors. Credit risks were assessed based on historical write-offs, net of recoveries, and an analysis of the aged accounts receivable balances with allowances generally increasing as the receivable ages. Accounts receivable might be fully reserved when specific collection issues were known to exist, such as pending bankruptcy or catastrophes. The analysis of receivables was performed monthly, and the allowances for doubtful accounts were adjusted through expense accordingly.

Provision for inventory valuation and obsolescence

Inventories are stated at the lower of cost or net realizable value. Estimates of net realizable value are based on the most reliable evidence available at the time the estimates are made at the end of the reporting period. These estimates take into consideration fluctuations of price or cost directly relating to events occurring after the end of the period to the extent that such events confirm conditions existing at the end of the period. Inventory write-downs are determined on an item by item basis, except for those similar items which could be categorized into the same groups. We use the inventory holding period and turnover as the evaluation basis for inventory obsolescence losses.

Useful Lives of Long-Lived Assets

A significant portion of our total assets consists of long-lived assets, primarily property, plant and equipment and definite-lived intangibles. We estimate the useful lives of property, plant and equipment and other long-lived assets with finite lives in order to determine the period of time over which depreciation and amortization expenses should be recorded. The useful lives are estimated at the time assets are acquired and are based on historical experience with similar assets as well as the anticipated technological evolution or other environmental changes. Further, we review the estimated useful lives of long-lived assets at the balance sheet date. If technological changes were to occur more rapidly than anticipated or in a different form than anticipated, the useful lives assigned to these assets may need to be shortened, resulting in the recognition of increased depreciation and amortization in the relevant periods.

Control over Subsidiaries

Some entities are our subsidiaries although we only own less than 50% ownership interest in these entities. After considering our absolute size of holding in the entity and the relative size of and the dispersion of shares owned by the other stockholders, and the contractual arrangements between us and other investors, potential voting interests and the

written agreement between stockholders, the management concluded that we have a sufficiently dominant voting interest to direct the relevant activities of the entity and to have control over the governance of the entity and therefore we have control over these entities.

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Investments in Unconsolidated Companies

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

Investments accounted for using the equity method include investments in associates and interests in joint ventures. Under the equity method, an investment in an associate or joint venture is initially recognized at cost and adjusted thereafter to recognize our share of profit or loss and other comprehensive income of the associate and joint venture as well as the distribution received.

When we reduce our ownership interest in an associate or a joint venture but we continue to use the equity method, we reclassify to profit or loss the proportion of the gain or loss that had previously been recognized in other comprehensive income relating to that reduction in ownership interest if that gain or loss would be reclassified to profit or loss on the disposal of the related assets or liabilities.

Any excess of the cost of acquisition over our share of the fair value of the identifiable net assets and liabilities of an associate and joint venture at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment and shall not be amortized. Any excess of our 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.

We assess the impairment of investments accounted for using the equity method whenever triggering events or changes in circumstances indicate that an investment may be impaired and carrying value may not be recoverable. The entire carrying amount of the investment, including goodwill, is tested for impairment as a single asset by comparing its recoverable amount with its carrying amount. We measure the impairment based on the projected future cash flow of the investees, the underlying assumptions for which had been formulated by such investees' internal management team, taking into account sales growth and capacity utilization. Any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized to the extent that the recoverable amount of the investment subsequently increases.

Some of our equity investments are classified as financial assets at fair value through other comprehensive income, or FVOCI. On initial recognition, we may make an irrevocable election to designate investments in equity instruments as at FVOCI; however, designation at FVOCI 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 FVOCI 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, it will be transferred to retained earnings.

Some of our other equity investments are mandatorily classified as financial asset at fair value through profit or loss, or FVTPL. Financial assets mandatorily classified as at FVTPL include investments in equity instruments which are not designated as at FVOCI.

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 does not incorporate any dividend earned on the financial asset.

For the assets and liabilities measured at fair value without quoted prices in active markets, our management determines the appropriate valuation techniques for the fair value measurements and whether to engage third party qualified appraisers based on the related regulations and professional judgments. Information about the valuation techniques and inputs used in determining the fair value of various assets and liabilities, please refer to Note 39 to our consolidated financial statements included elsewhere in this annual report. If the actual changes of inputs in the future differ from expectation, the fair value may vary accordingly. We update inputs periodically to monitor the appropriateness of the fair value measurement.

Prior to 2018, some of our equity investments were classified as available-for-sale, or AFS, financial assets including: listed stocks, emerging market stocks, and unlisted stocks. Among these investments, those that had a quoted market price in an active market are classified as AFS and measured at fair value at the end of each reporting period; the others that did not have a quoted market price in an active market and whose fair value could not be reliably measured are measured at cost less any identified impairment losses at the end of each reporting period. If, in a subsequent period, the fair value of the financial assets could be reliably measured, the financial assets were remeasured at fair value. The difference between the carrying amount and the fair value was recognized in other comprehensive income. Any impairment losses were recognized in profit or loss.

Changes in the carrying amount of AFS monetary financial assets relating to changes in foreign currency exchange rates, interest income calculated using the effective interest method and dividends on AFS equity investments were recognized in profit or loss. Other changes in the carrying amount of AFS financial assets were recognized in other comprehensive income and would be reclassified to profit or loss when the investment was disposed of or was determined to be impaired.

The process of assessing whether a particular investment's net realizable value was less than its carrying cost requires a significant amount of judgment. We periodically evaluate these investments based on quoted market prices, if available, the financial condition of the investee company, economic conditions in the industry and our intent and ability to hold the investment for a long period of time. If quoted market prices were not available, we estimated the fair value using the recoverable amounts in consideration of the financial condition of the investee company. This information might be based on information that we requested from the investee companies and might not be subject to the same disclosure and audit requirements as required of non-foreign private issuers, and as such, the reliability and accuracy of the information might vary. If we deemed the fair value of an investment to be less than the carrying value based on the above factors, and the decline in value was deemed to be other than temporary, we recorded the difference as impairment in the period of occurrence. In 2016, we recognized impairment losses of NT\$577 million for the investments classified as AFS financial assets.

Impairment of long-lived assets, intangible assets and incremental costs of obtaining contracts

We assess the impairment of long-lived assets and intangible assets whenever triggering events or changes in circumstances indicate that the asset may be impaired and carrying value may not be recoverable. Indications we consider important which could trigger an impairment review include, but are not limited to, the following:

External sources of information:

- during the period, an asset's market value has declined significantly more than what would be expected as a result of the passage of time or normal use.
- significant changes with an adverse effect on the entity have taken place during the period, or will take place in the near future, in the technological, market, economic or legal environment in which the entity operates or in the market to which an asset is dedicated.
- market interest rates or other market rates of return on investments have increased during the period, and those increases are likely to affect the discount rate used in calculating an asset's value in use and decrease the asset's recoverable amount materially.
- the carrying amount of the net assets of the entity is more than its market capitalization.

Internal sources of information:

- evidence is available of obsolescence or physical damage of an asset.
- significant changes with an adverse effect on the entity have taken place during the period, or are expected to take place in the near future, in the extent to which, or manner in which, an asset is used or is expected to be used.
- evidence is available from internal reporting that indicates that the economic performance of an asset is, or will be, worse than expected.

When an indication of impairment is identified for long-lived assets and intangible assets other than goodwill, any excess of the carrying amount of an asset over its recoverable amount is recognized as a loss. If the recoverable amount increases in a subsequent period, the amount previously recognized as impairment would be reversed and recognized as a gain. However, the adjusted amount may not exceed the carrying amount that would have been determined, as if no impairment loss had been recognized.

Impairment loss from the assets related to incremental cost of obtaining contracts is recognized to the extent that the carrying amount of the assets exceeds the remaining amount of consideration that we expect to receive in exchange for related goods or services less the costs which relate directly to providing those goods or services.

Goodwill represents the excess of the consideration paid for business acquisition over the fair value of identifiable net assets acquired. Goodwill is tested for impairment at least annually, or if an event occurs or circumstances change which indicates that the fair value of goodwill is below its carrying amount, an impairment loss is recognized. A subsequent reversal of such impairment loss is not allowed.

In 2016, we determined that some of our telecommunications equipment and miscellaneous equipment were impaired and recognized an impairment loss of NT\$596 million.

In 2016, 2017 and 2018, we determined that some of our investment properties' recoverable amount which represented the fair value less costs to sell of some land and buildings was higher than the carrying amount and recognized reversals of impairment loss of NT\$148 million, NT\$11 million and NT\$19 million (US\$0.6 million), respectively.

In 2017, our subsidiary, SENA0, evaluated that the goodwill that arose in the acquisition of Youth and its subsidiaries and concluded the recoverable amount of the goodwill was lower than the carrying value and recognized an impairment loss of NT\$9 million.

In 2018, our subsidiary, SENA0, evaluated and determined that the recoverable amount of certain licensed contract was nil and recognized the impairment loss of NT\$51 million (US\$1.7 million).

Pension Benefits

Payments to defined contribution retirement benefit plans are recognized as an expense when employees 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. Actuarial assumptions comprise the discount rate, rate of employee turnover, and long-term average future salary increase. Changes in economic circumstances and market conditions will affect these assumptions and may have a material impact on the amount of the expense and the liability.

Service cost (including current service cost and gains or losses on settlements) and net interest on the net defined benefit liability (asset) are recognized as employee benefits expense in the period they occur. Remeasurement, comprising (a) actuarial gains and losses; and (b) the return on plan assets, excluding amounts included in net interest on the net defined benefit liability (asset), is recognized in other comprehensive income in the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss.

Net defined benefit liability (asset) represents the actual deficit (surplus) in our defined benefit plans. 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.

Curtailment or settlement gains or losses on the defined benefit plan are recognized when the curtailment or settlement occurs.

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Accounting for Income Taxes

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

The current tax is based on taxable profit for the year. Taxable profit differs from profit as reported in the consolidated statements of comprehensive income because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. The liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period. Income tax on unappropriated earnings is accrued during the period the earnings arise and adjusted to the extent that distributions are approved by the stockholders in the following year. Adjustments of prior years' tax liabilities are added to or deducted from the current year's tax provision.

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 the 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 a taxable temporary difference arising from 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 carry forwards and unused tax credits from purchase of machinery, equipment and technology, and research and development expenditures 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, and interests in joint ventures, except where we are able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments 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 the 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 asset to be recovered. A previously unrecognized deferred tax asset is also reviewed at the end of each reporting period 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 assets and liabilities are measured at the tax rates that are expected to apply in the period in which the liability is settled or the asset realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax assets and liabilities reflects the tax consequences that would follow from the manner in which we expect, at the end of the reporting period, to recover or settle the carrying amount of the assets and liabilities.

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

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.

A. Operating Results

The following table sets forth our revenues, operating costs and expenses, income from operations and other financial data for the periods indicated.

	Year Ended December 31			
	2016 NT\$	2017 NT\$	2018 NT\$	US\$
	(in billions)			
Revenues:				
Domestic Fixed Communications	72.8	71.1	66.8	2.2
Mobile communications	110.8	109.4	100.9	3.3
Internet	28.1	28.9	29.8	1.0
International fixed communications	14.4	13.6	13.4	0.4
Others	3.9	4.5	4.6	0.1
Total revenues	230.0	227.5	215.5	7.0
Operating costs	147.6	146.8	139.6	4.5
Operating expenses:				
Marketing	25.5	25.4	23.2	0.8
General and administrative	4.5	4.6	4.6	0.2
Research and development	3.8	3.9	3.7	0.1
Expected credit loss	—	—	0.9	—
Total operating expenses	33.8	33.9	32.4	1.1
Other income and expenses	(0.5)	(0.1)	0.1	—
Income from operations	48.1	46.7	43.6	1.4
Non-operating income and expenses	1.3	1.3	1.4	—
Income before income tax	49.4	48.0	45.0	1.4
Income tax expense	7.8	7.8	6.4	0.2
Consolidated net income	41.6	40.2	38.6	1.2
Attributable to:				
Stockholders of the parent	40.5	39.0	37.6	1.2
Noncontrolling interests	1.1	1.2	1.0	—

The following table sets forth our revenues, operating costs and expenses, income from operations and other financial data as a percentage of our total revenues for the periods indicated.

	Year Ended December 31		
	2016	2017	2018
	(as percentages of total revenues)		
Revenues:			
Domestic fixed communications	31.6 %	31.3 %	31.0 %
Mobile communications	48.2	48.1	46.9
Internet	12.2	12.7	13.8
International fixed communications	6.3	5.9	6.2
Others	1.7	2.0	2.1
Total revenues	100.0 %	100.0 %	100.0 %
Operating costs	64.2 %	64.6 %	64.8 %
Operating expenses:			
Marketing	11.1	11.2	10.8
General and administrative	2.0	2.0	2.1
Research and development	1.6	1.7	1.7
Expected credit loss	—	—	0.4
Total operating expenses	14.7	14.9	15.0
Other income and expenses	(0.2)	—	0.1
Income from operations	20.9	20.5	20.3
Non-operating income and expenses	0.6	0.6	0.6
Income before income tax	21.5	21.1	20.9
Income tax expense	3.4	3.4	3.0
Consolidated net income	18.1 %	17.7 %	17.9 %
Attributable to:			
Stockholders of the parent	17.6 %	17.2 %	17.4 %
Noncontrolling interests	0.5 %	0.5 %	0.5 %

Each of our operating segments is managed separately because each represents a strategic business unit that serves a different market. We measure our segment performances mainly based on revenues and income before income tax.

The year ended December 31, 2018 compared with the year ended December 31, 2017

Revenues

Our revenues decreased by 5.3% from NT\$227.5 billion in 2017 to NT\$215.5 billion (US\$7.0 billion) in 2018, primarily due to the decrease in revenues generated from mobile communications and domestic fixed communications.

Domestic fixed communications

Domestic fixed communications revenues accounted for 31.3% and 31.0% of our revenues in 2017 and 2018, respectively. Our domestic fixed communications revenues decreased by 6.2% from NT\$71.1 billion in 2017 to

NT\$66.8 billion (US\$2.2 billion) in 2018 primarily due to a decrease in local and domestic long distance telephone revenues and a decrease in ICT revenues generated by enterprises and government, which were partially offset by growth in MOD revenues.

Local telephone services. Our local telephone revenues decreased from NT\$29.6 billion in 2017 to NT\$27.6 billion (US\$0.9 billion) in 2018 with a 13.6% decline in traffic volume from 8.3 billion minutes in 2017 to 7.2 billion minutes in 2018. The decline in traffic volume was primarily due to the traffic migration from fixed-line services to internet telephone services and VoIP applications. We expect this trend to continue as broadband and mobile services become more popular in Taiwan.

Domestic long distance telephone services. Our domestic long distance telephone revenues decreased by 8.4% from NT\$2.6 billion in 2017 to NT\$2.4 billion (US\$0.1 billion) in 2018. This decrease was mainly due to the increased use of VoIP applications.

Broadband access. The number of our FTTx customers increased from approximately 3.6 million in 2017 to 3.6 million in 2018. Revenues generated from broadband access slightly decreased from NT\$18.7 billion in 2017 to NT\$18.3 billion (US\$0.6 billion) in 2018, mainly due to increased competition in the market and the mandatory tariff reduction.

Domestic leased line. Our tariffs for overall leased line services continued to decrease due to competition from other fixed-line operators, as well as the continued migration of domestic leased line customers to high-speed broadband services. Revenues generated from domestic leased line services slightly decreased from NT\$4.3 billion in 2017 to NT\$4.2 billion (US\$0.1 billion) in 2018.

MOD. Revenues generated from our MOD services increased by 27.7% from NT\$2.5 billion in 2017 to NT\$3.3 billion (US\$0.1 billion) in 2018. This increase was due to the increase in the number of IPTV and SVoD subscribers.

Domestic ICT and other services. Other revenues decreased by 17.5% from NT\$13.4 billion in 2017 to NT\$11.0 billion (US\$0.4 billion) in 2018. This decrease was mainly due to the decreased revenue from ICT projects.

Mobile communications

Revenues from our mobile communications business accounted for 48.1% and 46.9% of our revenues in 2017 and 2018, respectively. Revenues from our mobile communications business decreased by 7.7% from NT\$109.4 billion in 2017 to NT\$100.9 billion (US\$3.3 billion) in 2018. This decrease was due to the decline in mobile service revenues and was partially offset by growth in sales of mobile handsets, tablets and data cards.

Mobile services. Revenues from our mobile services accounted for 33.3% and 29.7% of our revenues in 2017 and 2018, respectively. Revenues from our mobile services decreased by 15.7% from NT\$75.8 billion in 2017 to NT\$63.9 billion (US\$2.1 billion) in 2018 due to market competition, mobile voice traffic decline, and the adoption of IFRS 15. The decrease in mobile voice telecommunication traffic was mainly due to migration to free VoIP applications. Please refer to Note 5 to our consolidated financial statements included elsewhere in this annual report for details of application of new IFRSs.

Sales of mobile handsets, tablets and data cards. Revenues from our sales of mobile handsets, tablets and data cards accounted for 14.2% and 16.6% of our revenues in 2017 and 2018, respectively. Revenues from our sales of mobile handsets, tablets and data cards increased by 10.9% from NT\$32.2 billion in 2017 to NT\$35.7 billion (US\$1.2 billion) in 2018 mainly due to the increase in the unit price of handsets and the adoption of IFRS 15. Please refer to Note 5 to our consolidated financial statements included elsewhere in this annual report for details of application of new IFRSs.

Internet

Revenues from internet business accounted for 12.7% and 13.8% of our revenues in 2017 and 2018, respectively. Revenues from our internet services increased by 3.1% from NT\$28.9 billion in 2017 to NT\$29.8 billion (US\$1.0 billion) in 2018 mainly due to the increase in revenues generated from services such as IDC, HiLink, information security and IoT.

International fixed communications

International fixed communications revenues accounted for 5.9% and 6.2% of our revenues in 2017 and 2018, respectively. Our international fixed communications revenues decreased by 0.9% from NT\$13.6 billion in 2017 to NT\$13.4 billion (US\$0.4 billion) in 2018. This decrease was mainly due to the decrease in revenues generated from ILD telephone service.

ILD telephone services. Our ILD telephone revenues decreased by 11.2% from NT\$7.4 billion in 2017 to NT\$6.6 billion (US\$0.2 billion) in 2018 due to the migration to VoIP-based ILD service providers and free VoIP applications.

International leased line and international data services. Our international leased line and international data revenues increased by 12.8% from NT\$3.9 billion in 2017 to NT\$4.4 billion (US\$0.1 billion) in 2018. The increase was mainly due to our expansion to overseas markets and increased demand for our international leased line, IP Transit and VPN services.

International ICT and other services. Our international ICT and other revenues increased by 12.7% from NT\$1.7 billion in 2017 to NT\$1.9 billion (US\$0.1 billion) in 2018. The increase was mainly due to the increase in ICT revenues.

Others

Other revenues accounted for 2.0% and 2.1% of our revenues in 2017 and 2018, respectively. Our other revenues increased from NT\$4.5 billion in 2017 to NT\$4.6 billion (US\$0.1 billion) in 2018. The increase was mainly due to operating growth derived from one of our subsidiaries, CHPT, a semiconductor testing company.

Operating Costs

Our operating costs include depreciation and amortization expenses, personnel expenses, cost of goods sold, interconnection and service costs, marketing expenses, costs of materials and maintenance and spectrum usage and license fees.

Our operating costs decreased by 5.0% from NT\$146.8 billion in 2017 to NT\$139.6 billion (US\$4.5 billion) in 2018. This decrease was primarily due to a decrease of NT\$6.3 billion (US\$0.2 billion) in cost of goods sold, a decrease of NT\$1.5 billion (US\$0.1 billion) in ICT costs, a decrease of NT\$0.9 billion (US\$28.7 million) in interconnection and service costs and a decrease of NT\$0.4 billion (US\$11.8 million) in personnel expenses. The decrease was partially offset by an increase of NT\$0.3 billion (US\$9.7 million) in depreciation and amortization expenses and an increase of NT\$1.6 billion (US\$0.1 billion) in marketing expense primarily due to the application of IFRS 15. Please refer to Note 5 to our consolidated financial statements included elsewhere in this annual report for details of application of new IFRSs.

Operating Expenses

Our operating expenses decreased by 4.3% from NT\$33.9 billion in 2017 to NT\$32.4 billion (US\$1.1 billion) in 2018.

Marketing

Our marketing expenses, which include personnel expenses, expenses relating to advertising and marketing-related activities and provision for bad debt, decreased by 8.6% from NT\$25.4 billion in 2017 to NT\$23.2 (US\$0.8 billion) billion in 2018. This decrease was primarily due to a decrease in marketing expenses and reclassification of provision

for bad debt as expected credit loss resulting from the application of new IFRSs in 2018. Please refer to Note 5 to our consolidated financial statements included elsewhere in this annual report for details of application of new IFRSs.

General and administrative

Our general and administrative expenses remained stable at NT\$4.6 billion (US\$0.2 billion) in 2017 and 2018.

Research and development

Our research and development expenses decreased by 4.1% from NT\$3.9 billion in 2017 to NT\$3.7 billion (US\$0.1 billion) in 2018. This decrease was primarily due to a decrease in professional service expenses. In 2017 and 2018, we did not capitalize on any research and development expenses as intangible assets because there were no research and development expenses related to development or the development phase of an internal project.

Expected credit loss

Due to the application of IFRS 9 in 2018, we reflected the provision for credit loss primarily related to trade notes and accounts receivable in the “Expected credit loss” whereas such was previously reflected in our marketing expenses.

Operating Costs and Expenses by Business Segment

	Domestic Fixed	Mobile	International Fixed	Others	Adjustment	Total
	Communications	Communications	InterneCommunications	Others	Adjustment	Total
	(in billions of NT\$)					
For the year ended December 31,						
2018						
Operating costs and expenses	65.7	87.6	21.9	14.7	12.2	(30.1) 172.0
Depreciation and amortization	15.0	13.8	3.1	1.4	0.5	— 33.8
For the year ended December 31,						
2017						
Operating costs and expenses	68.9	99.0	22.1	14.9	11.5	(35.7) 180.7
Depreciation and amortization	15.6	11.0	3.4	1.5	0.4	— 31.9

Domestic fixed communications

Our domestic fixed communications costs and expenses decreased by 4.6% from NT\$68.9 billion in 2017 to NT\$65.7 billion (US\$2.1 billion) in 2018, primarily due to a decrease of NT\$1.9 billion (US\$0.1 billion) in ICT costs, a decrease of NT\$0.6 billion (US\$19.2 million) in depreciation and amortization expenses, and a decrease of NT\$0.6 billion (US\$19.6 million) in personnel expenses.

Mobile communications

Our mobile communications operating costs and expenses decreased by 11.5% from NT\$99.0 billion in 2017 to NT\$87.6 billion (US\$2.9 billion) in 2018. This decrease was primarily due to a decrease of NT\$6.3 billion (US\$0.2 billion) in cost of goods sold, a decrease of NT\$4.6 billion (US\$0.2 billion) in intersegment leased line costs, a decrease of NT\$0.5 billion (US\$16.0 million) in personnel expenses, and a decrease of NT\$0.5 billion (US\$15.4 million) in interconnection costs. The decrease in our operating costs and expenses was partially offset by an increase of NT\$2.8 billion (US\$91.0 million) in depreciation and amortization expenses.

Internet

Our internet operating costs and expenses decreased by 0.6% from NT\$22.1 billion in 2017 to NT\$21.9 billion (US\$0.7 billion) in 2018. This decrease was primarily due to a decrease of NT\$0.5 billion (US\$15.0 million) in intersegment leased line costs, and a decrease of NT\$0.3 billion (US\$8.8 million) in depreciation and amortization expenses. The decrease in our operating costs and expenses was partially offset by an increase of NT\$0.6 billion (US\$18.9 million) in ICT costs.

International fixed communications

Our international fixed communications costs and expenses decreased by 1.5% from NT\$14.9 billion in 2017 to NT\$14.7 billion (US\$0.5 billion) in 2018. The decrease was primarily due to a decrease of NT\$0.2 billion (US\$7.8 million) in international settlement costs.

Others

The costs and expenses from our other business increased by 5.2% from NT\$11.5 billion in 2017 to NT\$12.2 billion (US\$0.4 billion) in 2018. The increase was primarily due to an increase in operating costs and expenses from our subsidiaries, Honghwa International Co., Ltd., or Honghwa, and CHPT due to the business growth of these two entities.

Other Income and Expenses

We recorded net other expense of NT\$0.1 billion in 2017 and net other income of NT\$0.1 billion (US\$4.0 million) in 2018, respectively. The difference between 2017 and 2018 was primarily due to the compensation payment from government in 2018.

Income from Operations and Operating Margin

As a result of the foregoing, our income from operations decreased by 6.5% from NT\$46.7 billion in 2017 to NT\$43.6 billion (US\$1.4 billion) in 2018. Our operating margin decreased from 20.5% in 2017 to 20.3% in 2018.

The following table sets forth certain information regarding our revenues and income before income tax by business segment for the periods indicated.

	Domestic		International		Others	Adjustment	Total
	Fixed	Mobile	Fixed	International			
	Communications	Communications	Interne	Communications			
	(in billions of NT\$)						
For the year ended December 31, 2018							
Revenues from external customers	66.8	100.9	29.8	13.4	4.6	—	215.5
Intersegment service revenues	17.1	1.7	4.0	2.3	5.0	(30.1)	—
	83.9	102.6	33.8	15.7	9.6	(30.1)	215.5
Segment income before income tax	18.3	15.3	12.0	1.0	(1.6)	—	45.0
For the year ended December 31, 2017							

Revenues from external customers	71.1	109.4	28.9	13.6	4.5	—	227.5
Intersegment service revenues	22.5	2.0	4.2	2.4	4.6	(35.7)	—
	93.6	111.4	33.1	16.0	9.1	(35.7)	227.5
Segment income before income tax	24.9	12.4	11.1	1.0	(1.4)	—	48.0

As a result of the foregoing, segment income before tax for our domestic fixed communications business decreased by 26.7% from NT\$24.9 billion in 2017 to NT\$18.3 billion (US\$0.6 billion) in 2018; segment income before tax for our mobile communications business increased by 23.3% from NT\$12.4 billion in 2017 to NT\$15.3 billion (US\$0.5 billion) in 2018; segment income before tax for our internet business increased by 7.4% from NT\$11.1 billion in 2017 to NT\$12.0 billion (US\$0.4 billion) in 2018; segment income before tax for our international fixed communications business remained stable at NT\$1.0 billion (US\$33.5 million) in 2017 and 2018; and segment loss for our other business segments increased by 6.4% from NT\$1.4 billion in 2017 to NT\$1.6 billion (US\$50.7 million) in 2018.

Non-operating Income and Expenses

Our non-operating income increased from NT\$1.3 billion in 2017 to NT\$1.4 billion (US\$44.0 million) in 2018. The increase was primarily due to an increase in share of the profit of associates and joint ventures accounted for using equity method.

Income Tax

Our income tax was NT\$7.8 billion and NT\$6.4 billion (US\$0.2 billion) in 2017 and 2018, respectively. Our effective tax rate was 16.3% in 2017 and 14.2% in 2018. The decrease in our effective tax rate from 2017 to 2018 was primarily due to a decrease in the tax rate on unappropriated earnings. See “Item 5. Operating and Financial Review and Prospects—Overview—Taxation” for a discussion of the change in tax rate.

Net Income

As a result of the foregoing, our net income attributable to stockholders of the parent was NT\$39.0 billion and NT\$37.6 billion (US\$1.2 billion) in 2017 and 2018, respectively. Our net margin increased from 17.2% in 2017 to 17.4% in 2018.

The year ended December 31, 2017 compared with the year ended December 31, 2016

Revenues

Our revenues decreased by 1.1% from NT\$230.0 billion in 2016 to NT\$227.5 billion in 2017, primarily due to the decrease in revenues generated from mobile communications and domestic fixed communications.

Domestic fixed communications

Domestic fixed communications revenues accounted for 31.6% and 31.3% of our revenues in 2016 and 2017, respectively. Our domestic fixed communications revenues decreased by 2.3% from NT\$72.8 billion in 2016 to NT\$71.1 billion in 2017 primarily due to a decrease in local and domestic long distance telephone revenues and a decrease in broadband access revenue, which were partially offset by growth in ICT revenues generated by enterprises and government and MOD service revenues.

Local telephone services. Our local telephone revenues decreased from NT\$31.6 billion in 2016 to NT\$29.6 billion in 2017 with a 12.1% decline in traffic volume from 9.5 billion minutes in 2016 to 8.3 billion minutes in 2017. The decline in traffic volume was primarily due to the traffic migration from fixed-line services to internet telephone services. We expect this trend to continue as broadband and mobile services become more popular in Taiwan.

Domestic long distance telephone services. Our domestic long distance telephone revenues decreased by 7.6% from NT\$2.9 billion in 2016 to NT\$2.6 billion in 2017. This decrease was mainly due to the increased use of VoIP applications.

Broadband access. The number of our FTTx customers increased from approximately 3.5 million in 2016 to approximately 3.6 million in 2017. Revenues generated from broadband access slightly decreased from NT\$19.0 billion in 2016 to NT\$18.7 billion in 2017, mainly due to increased competition in the market and the mandatory tariff reduction.

Domestic leased line. Our tariffs for overall leased line services continued to decrease due to competition from other fixed-line operators, as well as the continued migration of domestic leased line customers to high-speed broadband services. Revenues generated from domestic leased line services remained flat at NT\$4.3 billion in 2016 and 2017.

MOD. Revenues generated from our MOD services increased by 8.3% from NT\$2.4 billion in 2016 to NT\$2.5 billion in 2017. This increase was due to the increase in the number of IPTV and SVoD subscribers.

Domestic ICT and other services. Other revenues increased by 6.4% from NT\$12.6 billion in 2016 to NT\$13.4 billion in 2017. This increase was mainly due to the increased revenue from ICT projects.

Mobile communications

Revenues from our mobile communications business accounted for 48.2% and 48.1% of our revenues in 2016 and 2017, respectively. Revenues from our mobile communications business decreased by 1.3% from NT\$110.8 billion in 2016 to NT\$109.4 billion in 2017. This decrease was due to the decline in mobile voice telecommunication revenues was partially offset by growth in mobile VAS revenues and sales of mobile handsets, tablets and data cards. The decrease in mobile voice telecommunication traffic was mainly due to migration to free VoIP applications.

Mobile services. Revenues from our mobile services accounted for 34.2% and 33.3% of our revenues in 2016 and 2017, respectively. Revenues from our mobile services decreased by 2.6% from NT\$78.8 billion in 2016 to NT\$ 75.8 billion in 2017 due to a decrease in mobile voice telecommunication revenues from NT\$37.3 billion in 2016 to NT\$32.6 billion in 2017, which was partially offset by the growth in mobile VAS revenues.

Sales of mobile handsets, tablets and data cards. Revenues from our sales of mobile handsets, tablets and data cards accounted for 13.4% and 14.2% of our revenues in 2016 and 2017, respectively. Revenues from our sales of mobile handsets, tablets and data cards increased by 4.4% from NT\$30.8 billion in 2016 to NT\$32.2 billion in 2017 mainly due to the increase in the unit price of handsets, even though the number of handsets sold slightly decreased.

Internet

Revenues from internet business accounted for 12.2% and 12.7% of our revenues in 2016 and 2017, respectively. Revenues from our internet services increased by 2.9% from NT\$28.1 billion in 2016 to NT\$28.9 billion in 2017 mainly due to the increase in revenues generated from services such as IDC, HiNet, HiLink, information security and IoT.

International fixed communications

International fixed communications revenues accounted for 6.3% and 5.9% of our revenues in 2016 and 2017, respectively. Our international fixed communications revenues decreased by 6.1% from NT\$14.4 billion in 2016 to NT\$13.6 billion in 2017. This decrease was mainly due to the decrease in revenues generated from ILD telephone service.

ILD telephone services. Our ILD telephone revenues decreased by 16.4% from NT\$8.8 billion in 2016 to NT\$7.4 billion in 2017 due to the migration to VoIP-based ILD service providers and free VoIP applications.

International leased line and international data services. Our international leased line and international data revenues increased by 5.6% from NT\$3.7 billion in 2016 to NT\$3.9 billion in 2017. The increase was mainly due to our expansion to overseas markets and increased demand for our international leased line, IP Transit and VPN services.

International ICT and other services. Our international ICT and other revenues remained flat at NT\$1.7 billion in 2016 and 2017.

Others

Other revenues accounted for 1.7% and 2.0% of our revenues in 2016 and 2017, respectively. Our other revenues increased by 17.0% from NT\$3.9 billion in 2016 to NT\$4.5 billion in 2017. The increase was mainly due to operating

growth derived from one of our subsidiaries, CHPT, a semiconductor testing company.

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Operating Costs

Our operating costs include depreciation and amortization expenses, personnel expenses, cost of goods sold, interconnection and service costs, marketing expenses, costs of materials and maintenance and spectrum usage and license fees.

Our operating costs decreased by 0.5% from NT\$147.6 billion in 2016 to NT\$146.8 billion in 2017. This decrease was primarily due to a decrease of NT\$1.8 billion in interconnection and service costs and a decrease of NT\$0.8 billion in depreciation expenses. The decrease was partially offset by an increase of NT\$1.0 billion in ICT costs, and an increase of NT\$0.8 billion in cost of goods sold.

Operating Expenses

Our operating expenses increased by 0.1% from NT\$33.8 billion in 2016 to NT\$33.9 billion in 2017.

Marketing

Our marketing expenses, which include personnel expenses, expenses relating to advertising and marketing-related activities and provision for bad debt, decreased by 0.6% from NT\$25.5 billion in 2016 to NT\$25.4 billion in 2017. This decrease was primarily due to decreases of provision for bad debt and rental expenses. The decrease was partially offset by an increase of advertising and marketing-related expenses and an increase of personnel expenses.

General and administrative

Our general and administrative expenses increased by 2.0% from NT\$4.5 billion in 2016 to NT\$4.6 billion in 2017. This increase was primarily due to an increase in personnel expenses.

Research and development

Our research and development expenses increased by 2.7% from NT\$3.8 billion in 2016 to NT\$3.9 billion in 2017. This increase was primarily due to an increase in professional service expenses. In 2016 and 2017, we did not capitalize on any research and development expenses as intangible assets because there were no research and development expenses related to development or the development phase of an internal project.

Operating Costs and Expenses by Business Segment

	Domestic		International		Adjustment	Total
	Fixed	Mobile	Fixed	Others		
	Communications					
	Communications		Interne			
	(in billions of NT\$)					
For the year ended December 31,						
2017						
Operating costs and expenses	68.9	99.0	22.1	14.9	11.5	(35.7) 180.7

Depreciation and amortization	15.6	11.0	3.4	1.5	0.4	—	31.9
For the year ended December 31,							
2016							
Operating costs and expenses	70.3	99.1	22.1	16.0	10.6	(36.7)	181.4
Depreciation and amortization	16.4	10.6	3.6	1.5	0.4	—	32.5
Domestic fixed communications							

Our domestic fixed communications costs and expenses decreased by 2.1% from NT\$70.3 billion in 2016 to NT\$68.9 billion in 2017, primarily due to a decrease of NT\$0.8 billion in depreciation and amortization expenses, a decrease of NT\$0.7 billion in interconnection costs, and a decrease of NT\$0.6 billion in personnel expenses. The decrease in our operating costs and expenses was partially offset by an increase of NT\$0.8 billion in ICT costs.

Mobile communications

Our mobile communications operating costs and expenses decreased by 0.04% from NT\$99.1 billion in 2016 to NT\$99.0 billion in 2017. This decrease was primarily due to a decrease of NT\$1.0 billion in marketing expenses, a decrease of NT\$0.5 billion in intersegment internet VAS costs, and a decrease of NT\$0.4 billion in interconnection costs. The decrease in our operating costs and expenses was partially offset by an increase of NT\$0.8 billion in cost of goods sold from our subsidiary, Senao, an increase of NT\$0.7 billion in maintenance expenses, and an increase of NT\$0.4 billion in depreciation and amortization expenses.

Internet

Our internet operating costs and expenses remained stable at NT\$22.1 billion in 2016 and 2017.

International fixed communications

Our international fixed communications costs and expenses decreased by 7.0% from NT\$16.0 billion in 2016 to NT\$14.9 billion in 2017. The decrease was primarily due to a decrease of NT\$1.1 billion in international settlement costs.

Others

The costs and expenses from our other business increased by 9.1% from NT\$10.6 billion in 2016 to NT\$11.5 billion in 2017. The increase was primarily due to an increase in operating costs and expenses from our subsidiaries, Honghwa International Co., Ltd., or Honghwa, and CHPT due to the business growth of these two entities.

Other Income and Expenses

We recorded net other expense of NT\$0.5 billion in 2016 and NT\$0.1 billion in 2017, respectively. The difference between 2016 and 2017 was primarily due to the impairment losses on some telecommunications equipment of NT\$0.6 billion in 2016.

Income from Operations and Operating Margin

As a result of the foregoing, our income from operations decreased by 2.9% from NT\$48.1 billion in 2016 to NT\$46.7 billion in 2017. Our operating margin decreased from 20.9% in 2016 to 20.5% in 2017.

The following table sets forth certain information regarding our revenues and income before income tax by business segment for the periods indicated.

	Domestic		International		Adjustment	Total
	Fixed	Mobile	Fixed	Others		
	Communications	Communications	Interne	Communications		
	(in billions of NT\$)					
For the year ended December 31,						

2017							
Revenues from external customers	71.1	109.4	28.9	13.6	4.5	—	227.5
Intersegment service revenues	22.5	2.0	4.2	2.4	4.6	(35.7)	—
	93.6	111.4	33.1	16.0	9.1	(35.7)	227.5
Segment income before income tax	24.9	12.4	11.1	1.0	(1.4)	—	48.0
For the year ended December 31,							
2016							
Revenues from external customers	72.8	110.8	28.1	14.4	3.9	—	230.0
Intersegment service revenues	22.7	2.5	4.7	2.7	4.1	(36.7)	—
	95.5	113.3	32.8	17.1	8.0	(36.7)	230.0
Segment income before income tax	25.7	13.9	10.7	1.1	(2.0)	—	49.4
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As a result of the foregoing, segment income before tax for our domestic fixed communications business decreased by 3.0% from NT\$25.7 billion in 2016 to NT\$24.9 billion in 2017; segment income before tax for our mobile communications business decreased by 10.7% from NT\$13.9 billion in 2016 to NT\$12.4 billion in 2017; segment income before tax for our internet business increased by 3.6% from NT\$10.7 billion in 2016 to NT\$11.1 billion in 2017; segment income before tax for our international fixed communications business decreased by 6.3% from NT\$1.1 billion in 2016 to NT\$1.0 billion in 2017; and segment loss for our other business segments decreased by 27.0% from NT\$2.0 billion in 2016 to NT\$1.4 billion in 2017.

Non-operating Income and Expenses

Our non-operating income remained stable at NT\$1.3 billion in 2016 and 2017.

Income Tax

Our income tax was NT\$7.8 billion and NT\$7.8 billion in 2016 and 2017, respectively. Our effective tax rate was 15.8% in 2016 and 16.3% in 2017. The increase in our effective tax rate from 2016 to 2017 was primarily due to an increase in the 10% tax on unappropriated earnings.

Net Income

As a result of the foregoing, our net income attributable to stockholders of the parent was NT\$40.5 billion and NT\$39.0 billion in 2016 and 2017, respectively. Our net margin decreased from 17.6% in 2016 to 17.2% in 2017.

B. Liquidity and Capital Resources

Liquidity

The following table sets forth the summary of our cash flows for the periods indicated:

	Year Ended December 31			
	2016	2017	2018	
	NT\$	NT\$	NT\$	US\$
	(in billions)			
Net cash provided by operating activities	65.0	70.9	66.4	2.2
Net cash used in investing activities	(21.7)	(36.7)	(32.6)	(1.1)
Net cash used in financing activities	(42.5)	(36.6)	(35.0)	(1.1)
Effect of exchange rate changes	0.0	0.1	0.0	0.0
Net increase in cash and cash equivalents	0.8	(2.3)	(1.2)	0.0
Cash and cash equivalents at end of year	31.1	28.8	27.6	0.9

Our primary source of liquidity is cash flow from operations, which represents operating profit adjusted for non-cash items, primarily depreciation and amortization and changes in current assets and liabilities. Notes 22 and 23 to our consolidated financial statements, included elsewhere in this annual report, provide additional details as to our bank loans. We believe that our working capital is sufficient to meet our present cash flow requirements.

In 2018, we generated NT\$66.4 billion (US\$2.2 billion) in net cash from operating activities as compared to NT\$70.9 billion in 2017. The decrease was primarily due to an increase in cash outflows for inventories, income tax paid and contribution to the pension funds. The decrease was partially offset by an increase in cash inflows relating to contracts balances of customers.

In 2017, we generated NT\$70.9 billion in net cash from operating activities as compared to NT\$65.0 billion in 2016. The increase was primarily due to a decrease in cash outflows for the contribution to the pension funds, a decrease in cash outflows from accounts receivables, and a decrease in cash outflows relating to income tax from operating activities.

In 2016, we generated NT\$65.0 billion in net cash from operating activities as compared to NT\$76.3 billion in 2015. The decrease was primarily due to a decrease in income from our operations, an increase in cash outflows for the contribution to the pension funds according to the minimum contribution requirement in accordance with the revised Labor Standards Law of the ROC which was effective from 2016, and an increase in cash outflows relating to income tax from operating activities.

Historically, net cash from operating activities has been sufficient to cover our capital expenditures, including ongoing expansion and modernization of our networks.

In 2018, net cash used in investing activities was NT\$32.6 billion (US\$1.1 billion), a decrease from NT\$36.7 billion in 2017. The change was primarily due to a one-time payment of NT\$10.9 billion in 2017 for acquiring the 4G mobile broadband spectrum, an increase in acquisition of property, plant and equipment, an increase in acquisition of time deposits and negotiable certificates of deposit with maturities of more than three months, and a decrease in proceeds from disposal of held-to-maturity financial assets in 2017.

In 2017, net cash used in investing activities was NT\$36.7 billion, an increase from NT\$21.7 billion in 2016. The change was primarily due to a one-time payment of NT\$10.9 billion in 2017 for acquiring the 4G mobile broadband spectrum, and an increase in acquisition of property, plant and equipment.

In 2016, net cash used in investing activities was NT\$21.7 billion, a decrease from NT\$30.4 billion in 2015. The change was primarily due to a one-time payment of NT\$10.0 billion in 2015 for acquiring the 4G mobile broadband spectrum in the auction held by the NCC, but there was no such cash outflows in 2016.

In 2018, our net cash used in financing activities totaled NT\$35.0 billion (US\$1.1 billion), which mainly reflected NT\$37.2 billion in dividends paid during that period.

In 2017, our net cash used in financing activities totaled NT\$36.6 billion, which mainly reflected NT\$38.3 billion in dividends paid during that period.

In 2016, our net cash used in financing activities totaled NT\$42.5 billion, which mainly reflected NT\$42.6 billion in dividends paid during that period.

Capital Resources

We have historically financed our capital expenditure requirements with our cash flows from operations and some bank loans. In future years, we have capital expenditure requirements for the ongoing expansion and upgrade of our networks, including 4G mobile broadband, FTTx, service platforms, IDC and IoT. We also expect to make dividend payments on an ongoing basis. See “Item 8. Financial Information—A.” Consolidated Statements and Other Financial Information.” Furthermore, we may require working capital from time to time to finance purchases of materials for our maintenance and other overhead expenses. We expect to primarily rely on cash generated from operations and, to a lesser extent, loans from commercial banks to meet our planned capital expenditures, make our planned dividend payments, repay debts and fulfill other commitments over the next twelve months.

As of December 31, 2018, our primary source of liquidity was NT\$27.6 billion (US\$0.9 billion) in cash and cash equivalents. In addition, the unused line of credit for unsecured and secured bank loans amounted to NT\$46.3 billion (US\$1.5 billion) and NT\$1.3 billion (US\$43.8 million), respectively, as of December 31, 2018.

As of December 31, 2018, our subsidiary, Chunghwa Sochamp Technology Inc., had short-term unsecured loans of NT\$70 million (US\$2.3 million) at interest rates ranging from 2.15% to 2.35%.

As of December 31, 2018, our subsidiary, Chunghwa Leading Photonics Tech Co., Ltd., had short-term unsecured loans of NT\$30 million (US\$1.0 million) at interest rates ranging at 1.35%.

As of December 31, 2018, our subsidiary Light Era had long-term secured loans in the amount of NT\$1.6 billion (US\$52.3 million) due in 2021 with an interest rate at 0.92%.

As part of the government's effort to upgrade the existing telecommunications infrastructure, we and other public utility companies were required by the ROC government to contribute a total of NT\$1.0 billion to a Piping Fund, administered by the Taipei City Government. This fund is used to finance various telecommunications infrastructure projects. We accounted for the contribution as other financial assets on our consolidated balance sheets.

Note 41 to our consolidated financial statements included elsewhere in this annual report provides a description of the assets that are pledged as collateral for long-term bank loans and contract deposits.

Capital Expenditures

Substantially all of our capital expenditures in 2016, 2017 and 2018 were made for operations in the ROC. We have financed our capital expenditures using cash flow from operations and bank loans. The following table sets forth a summary of our capital expenditures for the periods indicated.

	Year Ended December 31							
	2016		2017		2018			
	(in billions of NT\$, except percentages)							
Capital Expenditures:								
Domestic fixed communications business	9.9	42 %	11.7	44 %	12.7	44 %		
Mobile communications business	9.0	38	9.7	36	10.7	37		
Internet business	2.7	12	2.8	10	2.7	10		
International fixed communications								
business	1.1	5	1.6	6	1.4	5		
Others	0.8	3	1.1	4	1.1	4		
Total capital expenditures	23.5	100 %	26.9	100 %	28.6	100 %		

The following table sets forth a summary of our planned capital expenditures for the year ending December 31, 2019.

	Year Ending December 31, 2019		
	(in billions of NT\$, except percentages)		
Capital Expenditures:			
Domestic fixed communications business	13.6	47	%
Mobile communications business	7.6	26	
Internet business	3.2	11	
International fixed communications business	1.5	5	
Others	3.1	11	
Total capital expenditures	29.0	100	%

We expect our total capital expenditures to be approximately NT\$29.0 billion in 2019. Our capital expenditures for 2019 are planned to be allocated to our 4G LTE network deployment, FTTx network expansion, service platforms,

cloud computing, IoT and IDC construction. We expect to finance these capital expenditures with our cash flows from operations and bank loans.

Inflation

We do not believe that inflation in Taiwan has had a material impact on our results of operations in 2016, 2017 and 2018.

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Recent Accounting Pronouncements

Major differences between IFRSs and Taiwan IFRSs

While we have adopted Taiwan IFRSs for ROC reporting purposes, we adopt IFRSs for certain filings with the SEC, including our annual reports on Form 20-F for the year ended December 31, 2013 and thereafter.

Taiwan IFRSs differs from IFRSs in certain significant respects, including to the extent that any new or amended standards or interpretations applicable under IFRSs may not be timely endorsed by the FSC. Therefore, these pronouncements will not be applicable to Taiwan IFRSs until endorsed by the FSC. Some of the major differences between IFRSs and Taiwan IFRSs that are relevant to us as of the date of this annual report are set forth below.

The “income taxes on unappropriated earnings” should be recognized at the year of earnings under IFRSs, while it should be recognized at the year of distribution under Taiwan IFRSs.

- Prior to incorporation, according to the laws and regulations applicable to state-owned enterprises in Taiwan, we recorded revenue from fixed-line service at the time the connection service was performed or the prepaid card was sold. Upon incorporation, net assets greater than capital stock was credited as additional paid-in capital. Part of our additional paid-in capital was from unearned revenues from fixed-line services as of that date. Under IFRSs, following the revenue recognition guidance, the above service revenue should be treated as deferred income and recognized over the time when the service is continuously provided or as consumed. Therefore, upon our first adoption of IFRSs, we should retrospectively decrease additional paid-in capital while increase unappropriated earnings on the transition date of January 1, 2012. There is no difference in the recognition of unearned revenues or deferred income between IFRSs and Taiwan IFRSs. However, according to the guidance released by the TWSE in March 2012, which is a part of Taiwan IFRSs, the additional paid-in capital under ROC GAAP that is not specifically promulgated under Taiwan IFRSs should not be adjusted on the transition date of January 1, 2012. Therefore, we retain such additional paid-in capital under Taiwan IFRSs.

It is difficult for us to determine the differences between Taiwan IFRSs and IFRSs on our financial statements as any new or amended standards or interpretations applicable under IFRSs may not be timely endorsed by the FSC.

Other recent accounting pronouncements under IFRSs

For a summary of new standards, amendments and interpretations issued under IFRSs but not effective for 2018 and which have not been adopted early by us, see Note 5 to our consolidated financial statements included elsewhere in this annual report. Furthermore, we have identified and implemented changes to our accounting systems, processes and internal controls to meet the reporting and disclosure requirements of IFRS 16 effective from January 1, 2019.

C. Research and Development, Patents and Licenses

Research and Development

Our research and development efforts are focused on the development of advanced network services and operation technologies as well as the development of core technologies for the domestic telecommunications market. For 2016, 2017 and 2018, our research and development expenses were NT\$3.8 billion, NT\$3.9 billion and NT\$3.7 billion (US\$0.1 billion), or approximately 1.6%, 1.7% and 1.7% of our revenues, respectively.

As of March 31, 2019, we had 2,483 researchers focusing on the following areas:

◆Intelligent Broadband Networking: ST-2 satellite and 5G coexistence solution, the first 3GPP compliant 5G connection in Taiwan, Multi-access Edge Computing, or MEC solution, 4G base station fault prediction technology, pioneering SDN-based ICT Infrastructure solutions;

◆Cloud Computing: software-defined data center solution, Cloud Native Platform, public cloud service;

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Intelligent Business: our official website, our official APP, AI technology support Call Center Application System, Order and Billing Management System, IT Technical assessment of internet banking, Smart Voice Control Service platform;
Information Security Application: digital identity solution, enterprise cybersecurity protection solution;
Artificial Intelligence and Big Data: solution of Big Data Analytics, Customer Journey Analytics, speech recognition, image recognition, natural language processing, Deep Learning platform, social media monitoring and analytics;
IoT: IoT Smart Platform, smart city solution, NB-IoT terminal equipment solution, health cloud service, Intelligence Video Surveillance System, travel time prediction service, fleet management service, Abnormal Driving Trajectory Analysis System; and
Convergence Services: MOD Service, smart content caching service, Hami Pay VISA payment and coupon service, Intelligent eSIM service, enterprise sponsored data service, enterprise Wi-Fi service, AR platform, remote collaboration service.

With our consistent investment in research and development, we have developed a number of advanced network services, operation technologies and VAS which successfully support our business operations and expansion, including our FTTx deployment, security, mobile payment, smart home, enterprise ICT solution, cloud business and operation supporting system, and various IoT services, such as ITS, iEN, intelligent video surveillance, or IVS, and the solution of industry 4.0. As of December 31, 2018, we have been granted 189 domestic patents and 14 foreign patents.

D. Trend Information

See “—Overview” for a discussion of the most significant recent trends that have had, and in the future may have, a material impact on our results of operations, financial condition and capital expenditures. In addition, see discussions included in this Item for a discussion of known trends, uncertainties, demands, commitments or events that we believe are reasonably likely to have a material effect on our net operating revenues, income from continuing operations, profitability, liquidity or capital resources, or that would cause reported financial information not necessarily to be indicative of future operating results or financial condition.

E. Off-Balance Sheet Arrangements

There are no off-balance sheet arrangements that are material to investors.

F. Tabular Disclosure of Contractual Obligations

Set forth below are our total contractual obligations as of December 31, 2018.

Payments Due by Period				
Total	Less	1-3	3-5	More
	than	years	years	than

	1 Year		5 years		
	(in billions of NT\$)				
Contractual Obligations⁽¹⁾					
Short-term loans	0.1	0.1			
Long-term loans	1.6		1.6		
Obligations related to ST-2 satellite	1.4	0.2	0.4	0.4	0.4
Operating leases ⁽²⁾	10.5	3.4	4.7	1.7	0.7
Total	13.6	3.7	6.7	2.1	1.1

(1) Unfunded defined benefit obligation is not included as the schedule of payments is difficult to determine. We made pension contributions of approximately NT\$4.4 billion (US\$0.1 billion) in 2018 and expected to made pension contributions of approximately NT\$2.2 billion (US\$0.1 billion) in 2019. See Note 28 to our consolidated financial statements for additional details regarding our pension plan.

(2) Operating leases obligations are described in Note 36 to our consolidated financial statements included elsewhere in the annual report.

As of December 31, 2018, we had remaining commitments under non-cancelable contracts with various parties, including acquisition of lands and buildings of NT\$0.2 billion (US\$5.7 million) and acquisition of telecommunications equipment of NT\$15.8 billion (US\$0.5 billion). In addition, our subsidiary, CHPT, entered into a contract for the construction of its headquarters for NT\$1.6 billion in July 2017. We had made payment of NT\$0.6 billion (US\$18.5 million) under the contract as of March 31, 2019.

Foreign Exchange

Our revenues and costs and expenses are largely denominated in NT dollars. Our principal expenses denominated in foreign currencies are capital expenditures on telecommunications equipment and settlement payments for the use of networks of carriers in foreign countries for outgoing international calls. Settlement receipts have been a principal source of foreign currency for us. While future fluctuations of the NT dollar against foreign currencies could impact our financial condition and results of operations, we have not yet been materially affected in the past. See “Item 11. Quantitative and Qualitative Disclosures about Market Risk—Foreign Currency Risk” for further details.

G. Safe Harbor

See “Forward-Looking Statements in This Annual Report May Not Be Realized.”

ITEM 6. DIRECTORS, SENIOR MANAGEMENT AND EMPLOYEES

A. Directors and Senior Management

Our Articles of Incorporation provides for a board of directors consisting of seven to fifteen directors bestowed with a three-year tenure. The following table sets forth the name, age and position of each of our directors and such person’s position as of April 22, 2019. There is no family relationship among any of these persons. These directors have terms until June 23, 2019. Pursuant to the ROC Company Act, a person may serve as our director in his or her personal capacity or as the representative of another legal entity. A director who serves as the representative of a legal entity may be removed or replaced at any time at the discretion of that legal entity, and the replacement director may serve the remainder of the term of office of the replaced director. All of our non-independent directors are representatives of the MOTC.

Name	Age	Position
Chi-Mau Sheih	65	Chairman, chief executive officer, President and director
Mu-Han Wang	56	Director
Yu-Lin Huang	56	Director
Yi-Bing Lin	58	Director
Wei-Ming Chang	52	Director
Yih-Yu Lei	51	Director
Chin-Tsai Pan	58	Director
Jen-Ran Chen ⁽¹⁾	60	Director
Yu-Fen Lin ⁽¹⁾	48	Director
Kuo-Long Wu ⁽¹⁾	67	Director
Lo-Yu Yen ⁽¹⁾	64	Director
Chung-Chin Lu ⁽¹⁾	60	Director

(1)Independent director.

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Chi-Mau Sheih is the chairman, chief executive officer, president, and director of our company. Mr. Sheih assumed the role as our chairman and chief executive officer on April 22, 2019. He has served as the president and director of our company since January 2017. Mr. Sheih served as a senior executive vice president of our company from 2010 to 2017, the president of Southern Taiwan Business Group from 2007 to 2010, and the president of Central Taiwan Business Group from 2006 to 2007. Mr. Sheih holds an MBA degree from National Taiwan University.

Mu-Han Wang is a director of our company since November 2017. Dr. Wang is currently the Senior Counselor and concurrently the Director General of Department of Science and Technology Advisors of the MOTC. He holds a master's degree from Northwestern University and a Ph.D. degree from Purdue University, both in transportation engineering.

Yu-Lin Huang is a director of our company since February 2019. Dr. Huang is currently the political Deputy Minister of the MOTC. He is a professor of the Civil Engineering Department of the National Chiao Tung University. He was the Director General of the Construction Bureau of Taichung City. Dr. Huang holds a Ph.D. degree in Engineering from University of California in Berkeley. He specializes in infrastructure investment, project finance, and project management.

Yi-Bing Lin is a director of our company. Dr. Lin is the vice chancellor of the National Chiao Tung University of the University System of Taiwan, or the UST. He holds a Ph.D. degree in Computer Science and Engineering from University of Washington in Seattle.

Wei-Ming Chang is a director of our company since August 2017. Mr. Chang is also currently the director of the Department of Planning of the Directorate General of Budget, Accounting and Statistics at the Executive Yuan. Mr. Chang holds an MBA degree from Tamkang University in Taiwan.

Yih-Yu Lei is a director of our company since April 2017. Ms. Lei was a director and the chief operations officer of Gogoro Taiwan Ltd. where she was responsible for the company's operations including all logistics, legal affairs, intellectual property management and strategy, human resources and its overall global business development, partnerships and expansion. Ms. Lei holds master's degrees in Laws from University of Pennsylvania and National Taiwan University.

Chin-Tsai Pan is a director of our company. Mr. Pan is currently a representative of the Member's Convention of Chunghwa Telecom Workers Union and an engineer of our Southern Taiwan Business Group. Mr. Pan graduated from Kaohsiung Industrial High School.

JenRan Chen is currently an independent director of our company. Mr. Chen is currently the executive board director of Pixnet Digital Media Technology Co., Ltd., the largest social media in Taiwan, and has been invited to be an independent director and consultant for several IT companies and research institutes. He is the co-founder and ex-CEO of Yam, the very first Chinese search engine, and former president of Chinese Television System. Mr. Chen holds a master's degree in Sociology from National Taiwan University.

Yu-Fen Lin is an independent director of our company since June 2017. She is also an independent director of Bank SinoPac. Ms. Lin is the co-founder and managing partner of Lex& Honor Law offices. She is a transactional attorney with a board practice in business planning, corporate compliance and finance transactions. She holds bachelor's degrees of Laws and Arts from National Taiwan University.

Kuo-Long Wu is an independent director of our company. He is also an independent director of The Eslite Spectrum Co., ANZ Institutional Banking (Taiwan), and Sinyi Realty Inc. Mr. Wu is also currently the consultant of the National Information Infrastructure Enterprise Promotion Association. He was a board member of the Internet

Corporation for Assigned Names and Numbers from 2010 to 2016. Mr. Wu holds a master's degree in Computer Science from Columbia University.

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Lo-Yu Yen is an independent director of our company. Mr. Yen is the co-founder and principal of AAMA Taipei Cradle Program. He is also an independent director of ANZ Bank (Taiwan). Mr. Lo worked at international accounting and consulting firms in Taiwan, USA and Mainland China for 30 years. He holds a master's degree in Accounting from National Chengchi University. He has CPA certificates both in the ROC and the United States.

Chung-Chin Lu is an independent director of our company since June 2018. Dr. Lu is a Professor in the Department of Electrical Engineering, National Tsing Hua University, Taiwan. He holds a Ph.D. degree in Electrical Engineering from the University of Southern California, U.S.A.

The following persons served as directors on our board during 2018 but are no longer serving with us due to retirement and/or replacement.

Yu Cheng was the chairman, chief executive officer and director of our company. He is also an independent director of Formosa Petrochemical Co., Ltd., Formosa Taffeta Co., Ltd. and Formosa Advanced Technologies Co., Ltd. Mr. Cheng assumed the role as a director of our company in August 2016. He was the former CEO of Contemporary Taiwan Development Foundation. He also served as the editor-in-chief of Commercial Times from 2009 to 2016, the chairman of Radio Taiwan International from 2006 to 2008, the president of Taiwan Television Enterprise Ltd. from 2002 to 2006, as well as the commissioner and vice chairman of Fair Trade Commission of Executive Yuan from 1995 to 2002. Mr. Cheng holds an MBA degree from National Chengchi University.

Shin-Yi Chang was a director of our company. Mr. Chang is also currently the director of the accounting department at the MOTC. He holds an MBA degree from National Taiwan University.

Chen-Yuan Chang was a director of our company. Mr. Chang is also currently the Director General of Taiwan Railways Administration of the MOTC. Mr. Chang holds a Ph.D. degree in department of Traffic and Transportation from the National Chiao Tung University.

The following table sets forth the name, age and position of each of our executive officers and such person's position as of March 31, 2019. There is no family relationship among any of these persons.

Name	Age	Position
Shui-Yi Kuo	53	Chief financial officer and senior executive vice president
Kuo-Feng Lin	63	Senior executive vice president
Tian-Tsair Su	56	Senior executive vice president
Hong-Chan Ma	62	Senior executive vice president
Yuan-Kuang Tu	63	President of business group
Chau-Young Lin	56	President of business group
Li-Show Wu	60	President of business group
Ming-Shih Chen	63	President of business group
Hsueh-Lan Wu	60	President of business group
Rong-Syh Lin	53	President of business group
Wei-Kuo Hong	58	President of Telecommunication Training Institute

Shui-Yi Kuo is the chief financial officer and senior executive vice president of finance since August 2017. Mr. Kuo was the senior executive vice president of investment from March 2017 to August 2017. Prior to that, he served as the vice president of our Investment Department from November 2014 to March 2017, and the president of our subsidiary

Light Era from November 2013 to November 2014, and the vice president of our Accounting Department from March 2008 to November 2013. Mr. Kuo holds a master's degree in Accounting from National Chengchi University.

Kuo-Feng Lin is the senior executive vice president of technology since November 2016. Mr. Lin is also a director of Chunghwa Precision Test Tech. Co., Ltd. He was the president of our Mobile Business Group from May 2012 to November 2016. Prior to that, he served as the vice president of our Mobile Business Group from October 2009 to May 2012, and the president of Taipei Branch, Mobile Business Group from May 2007 to October 2009. Mr. Lin holds a bachelor's degree in Electronic Engineering from Provincial Taipei Institute of Technology.

Tian-Tsair Su is the senior executive vice president of administration since November 2017. Mr. Su was the vice president of our Corporate Planning Department from May 2013 to November 2017. Prior to that, he served as the assistant vice president of our Corporate Planning Department from June 2012 to May 2013, and the Managing Director of Corporate Planning Department of our International Business Group from June 2009 to June 2012. Mr. Su holds a master's degree in Electrical Engineering from National Cheng Kung University.

Hong-Chan Ma is the senior executive vice president of business since August 2018. Mr. Ma is also a director of CHIEF Telecom Inc. He was the president of our Data Communications Business Group from August 2015 to August 2018. Prior to that, he served as the vice president of our Marketing Department from September 2012 to August 2015, and the assistant vice president of our Marketing Department from January 2011 to September 2012. Mr. Ma holds a master's degree in Management Science from National Chiao Tung University in Taiwan.

Yuan-Kuang Tu is the president of our Northern Taiwan Business Group since November 2017. Dr. Tu is also a director of Senao. He was the president of our Mobil Business Group from November 2016 to November 2017. Prior to that, he served as the president of our Enterprise Business Group from March 2015 to November 2016, and the President of our Northern Taiwan Business Group from March 2012 to February 2015. Dr. Tu holds a Ph.D. degree in Electrical Engineering from National Taiwan University.

Chau-Young Lin is the president of our Southern Taiwan Business Group since March 2018. Dr. Lin was the vice president of our Enterprise Business Group from July 2016 to March 2018. Prior to that, he was the president of our Hsinchu Branch, Northern Taiwan Business Group from January 2015 to July 2016, and the deputy principal engineer of our Enterprise Business Group from September 2013 to January 2015. Dr. Lin holds a Ph.D. degree in Electronic Engineering from National Taiwan University of Science and Technology.

Li-Show Wu is the president of our Enterprise Business Group since January 2019. Ms. Wu was the chairman of Honghwa International Co., Ltd. from November 2017 to January 2019. Prior to that, she served as the senior executive vice president of administration from November 2016 to November 2017, and the vice president of our Marketing Department from August 2015 to November 2016. Ms. Wu holds a master's degree in Applied Mathematics from National Chiao Tung University in Taiwan.

Ming-Shih Chen is the president of our Mobile Business Group since November 2017. Dr. Chen is also a director of Senao. He was the president of our Northern Taiwan Business Group from March 2017 to November 2017. Prior to that, he served as the president of our International Business Group from November 2016 to March 2017, the vice president of our Data Communications Business Group from May 2012 to November 2016. Dr. Chen holds a Ph.D. degree in Electrical Engineering from National Tsing Hua University in Taiwan.

Hsueh-Lan Wu is the president of our International Business Group since November 2018. Ms. Wu was the vice president of our Enterprise Business Group from March 2018 to November 2018. Prior to that, she served as the vice president of our Marketing Department from November 2016 to March 2018, and the vice president of our Enterprise Business Group from November 2013 to November 2016. Ms. Wu holds a master's degree in Information Management from National Taiwan University.

Rong-Syh Lin is the president of our Data Communications Business Group since November 2018. Dr. Lin was the president of our Telecommunication Laboratories from November 2017 to November 2018. Prior to that, he served as the vice president of our Telecommunication Laboratories from February 2017 to November 2017, and the vice president of our Information Technology Department from July 2016 to February 2017. Dr. Lin holds a Ph.D. degree in Information Engineering from National Chiao Tung University in Taiwan.

Wei-Kuo Hong is the president of our Telecommunication Training Institute since November 2018. Dr. Hong was the vice president of our Telecommunication Training Institute from May 2017 to November 2018. Prior to that, he served as the assistant vice president of our Investment Department from May 2012 to May 2017, and the senior director of our Corporate Planning Department from March 2007 to May 2012. Dr. Hong holds a Ph.D. degree in Industrial Administration from National Tsing Hua University in Taiwan.

The following person served as our executive officer during 2018 but is no longer serving with us due to resignation and retirement.

Yung-Fong Song was the senior executive vice president of investment. Mr. Song was the President of Chunghwa Investment Co., Ltd. from January 2017 to August 2017. Prior to that, he served as Chairman of CIMB Advisory Taiwan from October 2011 to June 2016. Mr. Song holds an MBA degree from University of Iowa.

Hsiu-Gu Huang was a senior executive vice president. Mr. Huang was the president of our Enterprise Business Group from November 2016 to November 2017. Prior to that, he served as the senior executive vice president of technology from May 2013 to November 2016, and the president of our Enterprise Business Group from September 2008 to May 2013. Mr. Huang holds a master's degree in Management Science from National Chiao Tung University in Taiwan.

Chen-Huiung Tsai was the president of our Telecommunication Training Institute. Mr. Tsai was the vice president of our Human Resource Department from May 2014 to July 2017. Prior to that, he served as the vice president of our Administrative & Asset Management Department from November 2013 to May 2014, and the vice president of our Telecommunication Training Institute from September 2009 to November 2013. Mr. Tsai holds a bachelor's degree in Law from National Taiwan University.

Chih-Cheng Chien was the president of our International Business Group. Dr. Chien was the vice president of our International Business Group from May 2012 to March 2017. Prior to that, he served as the vice president of our Data Communications Business Group from February 2011 to May 2012, and the vice president of our Customer Services Department from January 2007 to February 2011. Dr. Chien holds a Ph.D. degree in Engineering Technology from National Taiwan University of Science and Technology.

B. Compensation

The board of directors has set up a compensation committee to be responsible for drafting, approving and periodically reviewing the compensation proposals for the directors and managers. See "C. Board Practices" for a discussion of our compensation committee.

• the chairman of our board of directors may receive a fixed monthly income of NT\$353,376 and a non-fixed income, including but not limited to performance-related bonuses or other rewards, which may not exceed his fixed income.

The chairman will not receive any additional compensation for his role as a director;

• our president may receive a fixed monthly income of NT\$345,524 and a non-fixed income, including but not limited to performance-related bonuses or other rewards, which may not exceed his fixed income. The president will not receive any additional compensation for his role as a director;

• independent directors who concurrently serve in military, public office or hold teaching or administrative post may receive a fixed monthly compensation of NT\$8,000, and those who do not concurrently serve in military or public office or hold teaching or administrative post may receive a monthly compensation of NT\$60,000; and

• directors who serve in military, public office or hold teaching or administrative post may receive a monthly compensation of NT\$8,500, and those directors who do not serve in military and public office or hold teaching or administrative post may receive a monthly compensation of NT\$30,000.

Our chairman and president to our board of directors, Chi-Mau Sheih and Yu Cheng (who served as our chairman and chief executive officer up to April 22, 2019), respectively, do not receive monthly compensation for acting as our directors because they receive salaries as employees.

The aggregate amount of compensation to our directors and executive officers in 2016, 2017 and 2018 was NT\$145,980,825, NT\$142,259,543 and NT\$131,525,410 (US\$4,296,811.8), respectively. The aggregate amount of compensation in 2018 includes a NT\$75,881,031 (US\$2,478,962.1) salary payment for directors and executive officers, a NT\$12,798,841 (US\$418,126.1) pension payment for executive officers, a NT\$38,215,538 (US\$1,248,465.8) bonus accrued for directors and a NT\$4,630,000 (US\$151,257.8) bonus accrued for executive officers. See “Item 10. Additional Information—B. Memorandum and Articles of Incorporation—Dividends and Distributions” for a discussion of the distribution of bonuses and earnings.

All of our non-independent directors are legal representatives of the MOTC. The bonus in the amount of NT\$40,750,052 (US\$1,331,266.0) was paid directly to the MOTC in 2018 because such earnings distributions are not the individual income of these directors. Independent directors will not receive any earnings distributions.

Pursuant to ROC disclosure rules, we have disclosed the compensation range of our directors and senior management for the fiscal year ended December 31, 2018 as follows, excluding bonus accrued for legal entity the MOTC:

Total Compensation	Directors
Below NT\$2,000,000	Chen-Yuan Chang ⁽¹⁾ , Shin-Yi Chang ⁽¹⁾ , Mu-Han Wang, Wei-Ming Chang, Yi-Bing Lin, Yih-Yu Lei, Kuo-Long Wu, Lo-Yu Yen, Jen-Ran Chen, Yu-Fen Lin, Chung-Chin Lu, Chin-Tsai Pan ⁽²⁾
NT\$2,000,000 to NT\$4,999,999	None
NT\$5,000,000 to NT\$9,999,999	Yu Cheng ⁽³⁾ , Chi-Mau Sheih ⁽⁴⁾
Over NT\$10,000,000	None
Total	14 people

(1) This person has ceased to be a director of our company due to replacement prior to March 31, 2019.

(2) As salary for serving as our employee.

(3) As salary for serving as our chief executive officer. Mr. Cheng retired on April 22, 2019.

(4) As salary for serving as our president.

Total Compensation	Senior Management
Below NT\$2,000,000	None
NT\$2,000,000 to NT\$4,999,999	Shui-Yi Kuo, Kuo-Feng Lin, Yung-Fong Song ⁽¹⁾⁽⁵⁾ , Hong-Chan Ma, Tian-Tsair Su, Yuan-Kuang Tu, Chau-Young Lin, Hsiu-Gu Huang, Ming-Shih Chen, Chih-Cheng Chien ⁽²⁾ , Hsueh-Lan Wu, Rong-Syh Lin, Wei-Kuo Hong
NT\$5,000,000 to NT\$9,999,999	Chi-Mau Sheih, Hui-Min Wang ⁽³⁾⁽⁵⁾ , Chen-Huiung Tsai ⁽⁴⁾⁽⁵⁾
Over NT\$10,000,000	None
Total	16 people

(1) This person has ceased to be a member of the senior management of our company due to resignation in October 2018.

(2) This person has ceased to be a member of the senior management of our company due to replacement in November 2018.

(3) This person has ceased to be a member of the senior management of our company due to retirement in February 2018.

(4) This person has ceased to be a member of the senior management of our company due to retirement in June 2018.

(5) Including retirement pension payment.

We accrued NT\$6,266,152 (US\$204,709) pension expense for executive officers mentioned above in 2018. See “Item 5. Operating and Financial Review and Prospects—Overview—Personnel expenses” and Note 28 to our consolidated financial statements included elsewhere in this annual report for descriptions about our pension plans. We do not have any service contracts with any directors providing for any benefits upon termination of employment.

C. Board Practices

We currently have 12 directors, including five independent directors. All of our directors were elected on June 24, 2016, except for Mr. Chi-Mau Sheih, Mr. Chin-Tsai Pan, Dr. Mu-Han Wang, Mr. Wei-Ming Chang, Ms. Yih-Yu Lei and Mr. Yu-Lin Huang as they were reassigned as a juristic-person director by MOTC prior to March 31, 2019, and except for one independent director, Chung-Chin Lu, elected on June 15, 2018, due to the original one resigning in August 2017. The term is until June 23, 2019, for each current director. Pursuant to the ROC Company Act, the directors may be removed from office at any time by a resolution adopted at a stockholders’ meeting. The chairman of our board of directors is elected by our directors. Our chairman presides at all meetings of our board of directors and also has the authority to act as our representative. We have not entered into any contract with any of our directors by which our directors are expected to receive benefits upon termination of their employment.

Our Articles of Incorporation provides for a board of directors consisting of seven to fifteen directors, one-fifth of whom shall be expert representatives. Pursuant to the ROC Company Act, the ROC Securities and Exchange Act and Article 12-1 of our Articles of Incorporation provides for the election of, starting from the fifth commencement of the board of directors, at least three independent directors out of the 7-to-15-member board. The term “independent director” may have a different meaning when used in Taiwan than in other jurisdictions. We have used a nominating process, with the stockholders choosing the independent directors from the list of nominees. With respect to certain material decisions to be made by our board of directors as specified in the ROC Securities and Exchange Act, including the adoption or amendment to our internal control system, material loans or guarantees, the issuance of equity-type securities, matters in which directors have personal interests, the appointment and discharge of auditors, approval of financial reports, the appointment and discharge of financial, accounting or internal auditing officers and other matters prescribed by the ROC FSC, the dissenting opinion or qualified opinion of an independent director is required to be noted in the minutes of the board of directors’ meeting.

Our audit committee was established in September 2004 in accordance with the rules set forth in the NYSE Listed Company Manual, and was comprised of three independent directors. See “Item 16G. Corporate Governance—Audit Committee.” Starting from the date of the annual general meeting in June 2013, we have established a new audit committee that replaces our supervisors and our old audit committee in accordance with Paragraph 1, Article 14-4 of the ROC Securities and Exchange Act and our Articles of Incorporation, and as a result, we simultaneously comply with the relevant rules of the NYSE Listed Company Manual and the relevant rules and regulations in the ROC. Accordingly, our audit committee is currently composed of all independent directors, namely Kuo-Long Wu, Lo-Yu Yen, Jen-Ran Chen, Yu-Fen Lin and Chung-Chin Lu to be the members of the audit committee.

Under the ROC Company Act, a person may serve as our director in his personal capacity or as the representative of another legal entity. A director who serves as the representative of a legal entity may be removed or replaced at any time at the discretion of that legal entity, and the replacement director may serve the remainder of the term of office of the replaced director. Except for our four independent directors, all of our directors are representatives of the MOTC.

The business address of our directors and executive officers is the same as our registered address.

Our audit committee should approve and deal following matters: (i) the adoption or amendment of the internal control system pursuant to Article 14-1 of the Securities and Exchange Act; (ii) the assessment of the effectiveness of the internal control system; (iii) the adoption or amendment, pursuant to Article 36-1 of the Securities and Exchange Act, of procedures governing material financial or operational actions, such as acquisition or disposal of assets and derivatives trading, loaning of funds to others, and endorsements or guarantees for others; (iv) a matter relating to the personal interest of a director; (v) a material asset or derivatives transaction; (vi) a matter relating to significant loan, endorsement or guarantee arrangement; (vii) the offering, issuance, or private placement of any equity-related securities; (viii) the designation or dismissal of an attesting CPA, or the compensation given thereto; (ix) the appointment or discharge of a financial, accounting, or internal auditing officer; (x) annual and semi-annual financial reports; (xi) the first and third quarter financial reports; (xii) communicating with our independent auditor; (xiii) negotiating the conflicts over our financial reports between our management and independent auditor; (xiv) discussing and reporting other financial information and required disclosure under the Securities Exchange Act of 1934 with our management and independent auditor; (xv) accounting firm’s annual audit and non-audit service items; (xvi) performing one-self review each year; (xvii) evaluating the fairness and rationality of merger and acquisition transactions pursuant to the Business Mergers And Acquisitions Act; and (xviii) any other material matter so required by the Company or the competent authorities. Our board of directors has concluded that Lo-Yu Yen is our audit committee financial expert.

In addition to our audit committee, we also have a corporate strategy committee. Our corporate strategy committee may be composed of five to nine directors. Currently, there are eight directors in the Committee. It is responsible for

reviewing and advising on the budgets, financial forecasts, capital requirements, matters related to investments, business license matters, corporate reorganization, development plans and other major issues affecting our development. The conclusions of the corporate strategy committee are considered at a subsequent board of directors meeting.

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The Article 14-6 of the ROC Securities and Exchange Act requires all listed companies to establish a compensation committee for directors, supervisors and managers' compensation, which includes salary, stock options and other rewards, as well as authorizes the Competent Authority (i.e., FSC) to enact a regulation on the authorities of the compensation committee and the qualifications of its members. Accordingly, our compensation committee is composed of three independent directors (Jen-Ran Chen, Lo-Yu Yen and Yu-Fen Lin) and is responsible for drafting, assessing and periodically reviewing the compensation proposals for the directors and managers, and should submit its recommendations to the board of directors for discussion. See "Item 10. Additional Information—B. Memorandum and Articles of Incorporation—Directors and Audit Committee."

In addition, our board of directors engages with management on information security/cybersecurity issues. See "Item 4. Information on the Company—B. Business Overview—Cybersecurity and Personal Information Protection."

In November 2003, the SEC approved changes to the NYSE's listing standards related to the corporate governance practices of listed companies. Under these rules, listed foreign private issuers, like us, must disclose any significant ways in which their corporate governance practices differ from those followed by NYSE-listed non-foreign private issuers under the NYSE's listing standards. See "Item 16G. Corporate Governance." A copy of the significant differences between our corporate governance practices and NYSE corporate governance rules applicable to non-foreign private issuers is also available on our website <http://www.cht.com.tw>. The information contained on our website is not a part of this annual report.

D. Employees

As of December 31, 2018, we had 32,709 employees on a consolidated basis. Approximately 99% of our employees were based in the ROC. The following table is a breakdown of our employees from 2016 to 2018 on a consolidated basis.

	2016	2017	2018
Employees			
Technical	15,760	16,010	15,760
Operations	15,417	15,468	15,096
Administrative	1,679	1,833	1,755
Total	32,856	33,311	32,611

The following table is a breakdown of our employees of Chunghwa Telecom Co., Ltd. from 2016 to 2018.

	2016	2017	2018
Employees			
Technical	13,195	13,078	12,759
Operations	8,191	8,120	8,096
Administrative ⁽¹⁾	1,277	1,271	1,279
Total	22,663	22,469	22,134

(1) Included directors of Chunghwa Telecom Co., Ltd. in according with the ROC requirements.

As of December 31, 2018, 79.1% of our employees of Chunghwa Telecom Co., Ltd. had university, graduate or post-graduate degrees. To improve our operational efficiency by reducing personnel costs, we offered a number of voluntary retirement programs between June 1, 2000 and December 31, 2014, which resulted in a reduction of approximately 14,386 employees.

As of December 31, 2018, approximately 99% of our employees on a non-consolidated basis were members of our principal labor union. Our collective agreement sets forth work rules, grievance procedures and provides for union participation in performance evaluations and promotion decisions. Our union members also occupy a majority of the seats on our employee welfare and pension fund committees. We will continue to maintain a good relationship with our labor unions. We strive to have good communication with our employees and the labor unions by inviting representatives of our labor unions to attend various meetings related to the performance of our employees.

Pursuant to our Articles of Incorporation, our employees are entitled to 1.7% to 4.3% of the distributable earnings as employee compensation. Our practice in the past to determine the amount of the compensation has been based on the operating results. In the third quarter of 2018, we distributed compensation to our employees of NT\$1.5 billion (US\$52.1 million).

E. Share Ownership

As of April 22, 2019, our directors and executive officers personally held an aggregate 342,325 shares of our common shares, representing around 0.004% of our outstanding common shares. The following table sets forth information with respect to the beneficial ownership of our common shares as of March 31, 2019 by each of our directors and executive officers.

Name	Number	%
Chi-Mau Sheih	72,054	*
Mu-Han Wang	—	—
Yu-Lin Huang	—	—
Yi-Bing Lin	—	—
Wei-Ming Chang	—	—
Yih-Yu Lei	—	—
Chin-Tsai Pan	2,000	*
Jen-Ran Chen	—	—
Yu-Fen Lin	—	—
Kuo-Long Wu	—	—
Lo-Yu Yen	—	—
Chung-Chin Lu	—	—
Shui-Yi Kuo	—	—
Kuo-Feng Lin	42,771	*
Tian-Tsair Su	32,341	*
Hong-Chan Ma	—	—
Yuan-Kuang Tu	81,305	*
Chau-Young Lin	12,888	*
Li-Show Wu	32,964	*
Ming-Shih Chen	25,641	*
Hsueh-Lan Wu	—	—
Rong-Syh Lin	40,361	*
Wei-Kuo Hong	—	—

* Stockholder beneficially owns less than 1.0% of our outstanding common shares.

Employee Stock Subscription Program

Under our Articles of Incorporation, we must reserve up to 10% to 15% of any new shares for subscription by our employees whenever we issue new shares for cash, unless otherwise approved by the central competent authority.

Our consolidated subsidiary, Senao, is publicly traded on the TWSE and resolved to grant the stock options plan for its employees to purchase common stock of Senao. As of December 31, 2016, 2017 and 2018, participants in Senao's stock incentive plan had outstanding stock options to purchase 6.6 million, 5.9 million and 5.3 million common shares of Senao, respectively.

Senao, transferred treasury stock to specific employees in 2017 and 2018.

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In 2015, 2017 and 2018, our consolidated subsidiary, CHIEF, which has been a public company since November 17, 2015, granted stock options to its employees entitling them to purchase common stock of CHIEF. As of December 31, 2016, 2017 and 2018, participants in CHIEF's stock incentive plan had outstanding stock options to purchase 1.9 million, 2.9 million and 1.9 million common shares of CHIEF.

CHIEF granted its employees the right to subscribe to new shares reserved for employees under cash injection in 2018.

In 2016 and 2017, CHPT, another consolidated subsidiary of ours, granted its employees the right to subscribe to new shares reserved for employees under cash injection.

See Note 34 to our consolidated financial statements, included elsewhere in this annual report, for additional details regarding share-based payment arrangements of Senao, CHIEF, and CHPT.

ITEM 7. MAJOR STOCKHOLDERS AND RELATED PARTY TRANSACTIONS

A. Major Stockholders

The following table sets forth information known to us with respect to the beneficial ownership of our shares (i) as of March 31, 2019, the most recent practicable date and (ii) as of certain book closure dates in each of the preceding three years, for the stockholders known by us to own at least 5.0% of our outstanding common shares. Beneficial ownership is determined in accordance with the SEC's rules.

Name	As of March 31, 2016		As of March 31, 2017		As of March 31, 2018		As of March 31, 2019	
	number	%	number	%	number	%	number	%
The ROC government ⁽¹⁾⁽²⁾	3,123,092,684	40.11	3,086,749,684	39.79	3,248,754,663	41.88	3,268,238,684	42.13
The MOTC	2,737,718,976	35.29	2,737,718,976	35.29	2,737,718,976	35.29	2,737,718,976	35.29
Shin Kong Life Insurance Co., Ltd ⁽²⁾	140,228,184	1.81	5,596,184	0.07	328,014,184	4.23	543,451,184	7.01
Fubon Life Assurance Co., Ltd ⁽²⁾	449,451,087	5.79	389,146,087	5.02	344,933,087	4.45	192,668,087	2.48

(1) Includes shares held through the MOTC and other government-controlled entities.

(2) The information as of July 19, 2015, July 23, 2016, July 25, 2017 and July 25, 2018, the latest book closure date, which were the most recent practicable dates for us to obtain complete ownership information.

As of March 31, 2019, 30 record holders held 23,503,659 ADSs (each representing ten common shares), which represents approximately 3.0% of our total outstanding common shares. Because many of these ADSs were held by brokers or other nominees, we cannot ascertain the exact number of beneficial shareholders with addresses in the

United States.

None of our shareholders has different voting rights from other shareholders. See “Item 10. Additional Information—B. Memorandum and Articles of Incorporation—Voting Rights.” We are not aware of any arrangement that may, at a subsequent date, result in a change of control of our company.

B. Related Party Transactions

We have not extended any loans or credit to any of our directors or executive officers, and we have not provided guarantees for borrowings by any of these persons. We have not entered into any fee-paying contract with any of these persons for them to provide services not within his or her capacity as a director or executive officer of our company, except that two of our directors who are also our employees receive salaries from our company in their capacity as our employees.

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Please refer to “Item 4. Information on the Company—A. History and Development of the Company” for a discussion of our alliances, acquisitions and investments. Please refer to Notes 3, 15, 16 and 40 to our consolidated financial statements included elsewhere in this annual report for descriptions of Chunghwa’s subsidiaries, investments accounted for using equity method, and related party transactions.

On April 1, 2007, Chunghwa entered into an agreement with Senao making Senao the exclusive distributor of mobile handsets to Chunghwa’s retail outlets. Under the terms of the agreement, Senao also provides mobile handset sales services in Chunghwa’s retail outlets, exclusively sells Chunghwa’s SIM cards in Senao’s own retail stores, and gets commission, subsidies of handset sold and warranties from Chunghwa. For the year ended December 31, 2018, Senao received NT\$6.6 billion (US\$0.2 billion) from Chunghwa. Chunghwa also sells mobile handsets and data cards to Senao. For the year ended December 31, 2018, Chunghwa sold mobile handsets and data cards to Senao that amounted to NT\$1.9 billion (US\$0.1 billion).

Honghwa contracted with Chunghwa to provide on-site sales services in Chunghwa’s retail stores and on-site equipment installation services to Chunghwa’s customers. Chunghwa paid Honghwa approximately NT\$5.4 billion (US\$0.2 billion) in 2018 for these services.

Chunghwa acquired network equipment and related supplies from Chunghwa System Integration for approximately NT\$1.3 billion (US\$42.2 million) in 2018.

Chunghwa paid Taiwan International Standard Electronics approximately NT\$1.0 billion (US\$33.0 million) in 2018 for the purchase of telecommunications exchange facilities and related supplies, and the maintenance expenses.

Terms and conditions of the foregoing transactions with related parties were not significantly different from transactions with non-related parties. When no similar transactions with non-related parties can be referenced, terms and conditions were determined in accordance with mutual agreements.

C. Interests of Experts and Counsel

Not applicable.

ITEM 8. FINANCIAL INFORMATION

A. Consolidated Statements and Other Financial Information

See Item 18 for a list of all consolidated financial statements filed as part of this annual report on Form 20-F.

We are not currently involved in material litigation or other proceedings that may have or have had in the recent past, significant effects on our financial position or profitability. See “Item 4. Information on the Company—B. Business Overview—Legal Proceedings.”

For our policy on dividend distributions, see “Item 10. Additional Information—B. Memorandum and Articles of Incorporation—Dividends and Distributions.” The following table sets forth the dividends declared on each of our common shares and in the aggregate for each of the years from 2014 to 2018. All of these dividends were paid, in the

fiscal year following the period with respect to which the dividends relate.

	Dividends Per	Total
	Common Share ⁽¹⁾	Dividends ⁽¹⁾
	NT\$	NT\$ in billions
Year ended December 31, 2014	4.8564	37.7
Year ended December 31, 2015	5.4852	42.6
Year ended December 31, 2016	4.9419	38.3
Year ended December 31, 2017	4.7960	37.2
Year ended December 31, 2018 ⁽²⁾	4.4790	34.7

(1) Cash dividend unless otherwise indicated.

(2) Dividends for 2018, which are calculated based on Taiwan IFRSs, were approved by the board of directors in March 2019 and are expected to be declared at our annual general stockholders' meeting scheduled on June 21, 2019. Our payout ratio was 97.9% in 2018 after the adjustment of unappropriated earnings.

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We are committed to maximizing stockholder value and intend to maintain a sustainable dividend policy, subject to a number of commercial factors, including the interests of our stockholders, cash requirements for future capital expenditures and investments, as well as relevant industry and market practice. The amount of our net income determined for purposes of calculating our annual dividend payout will be calculated based on Taiwan IFRSs, which may differ from the amount of our net income determined in accordance with IFRSs.

B. Significant Changes

Other than as disclosed elsewhere in this annual report, we have not experienced any significant changes since the date of the annual consolidated financial statements included in this annual report.

ITEM 9. THE OFFER AND LISTING

A. Offer and Listing Details

Market Price Information for Our Common Shares

Our common shares have been listed on the TWSE under the number “2412” since October 27, 2000. There is no public market outside Taiwan for our common shares. The table below shows, for the periods indicated, the high and low closing prices and the average daily volume of trading activity on the TWSE for our common shares. The closing price for our common shares on the TWSE on April 19, 2019 was NT\$109.50 per share.

Market Price Information for Our American Depositary Shares

Our ADSs have been listed on the NYSE under the symbol “CHT” since July 17, 2003. The outstanding ADSs are identified by the CUSIP number 17133Q502. The table below shows, for the periods indicated, the high and low closing prices and the average daily volume of trading activity on the NYSE for our ADSs. The closing price for our ADSs on the NYSE on April 18, 2019 was US\$35.40 per ADS. Each of our ADSs represents the right to receive ten shares.

As of April 19, 2019, a total of 23,121,788 ADSs and 7,757,446,545 common shares (including those represented by ADSs) were outstanding. With certain limited exceptions, holders of shares that are not ROC persons are required to hold these shares through a brokerage or custodial account in the ROC.

B. Plan of Distribution

Not applicable.

C. Markets

The principal trading market for our common shares is the TWSE and the principal trading market for our ADSs is the NYSE.

D. Selling Stockholders

Not applicable.

E. Dilution

Not applicable.

F. Expenses of the Issue

Not applicable.

ITEM 10. ADDITIONAL INFORMATION

A. Share Capital

Not applicable.

B. Memorandum and Articles of Incorporation

Set forth below is information relating to our capital structure, including brief summaries of material provisions of our Articles of Incorporation, the ROC Securities and Exchange Law, the ROC Company Act, and the Telecommunications Act, all as currently in effect. The following summaries are qualified in their entirety by reference to our Articles of Incorporation, the ROC Securities and Exchange Law, the ROC Company Act, and the Telecommunications Act.

Objects and Purpose

The scope of business of Chunghwa Telecom Co., Ltd. as set forth in Article 2 of our Articles of Incorporation, includes (i) telecommunications Enterprise Type 1 and Type 2 businesses pursuant to the Telecommunications Act of the ROC, (ii) installation of the computer equipment and radio-frequency equipment whose operation is controlled by the telecommunication business, (iii) telecommunications equipment wholesale, retail and engineering businesses, (iv) engineering and operation of information software and information process service businesses, (v) apparatus and electric appliance installation and construction business, (vi) television program production, distribution and commercial business, (vii) broadcasting program distribution and commercial business, (viii) the third party payment business, (ix) water pipe construction business, (x) machinery and equipment manufacturing business, (xi) traffic signal installation and construction, and traffic labels construction business, (xii) medical device wholesale and retail business, and (xiii) other businesses, except any business requiring a special permit or otherwise restricted by law or regulation.

General

Under our Articles of Incorporation, our authorized capital was NT\$120,000,000,000 divided into 12,000,000,000 common shares, with a par value of NT\$10 per share. We have set aside 200,000,000 common shares from the aforementioned common shares for the exercise of any future issuances of stock warrants, preferred shares with warrants, and bonds with warrants. Our paid-in capital is NT\$77,574,465,450 divided into 7,757,446,545 common shares. We currently do not have any other equity in the form of preferred shares, bonds or otherwise outstanding as of the date of this annual report.

The MOTC, on behalf of the government of the ROC, owned approximately 35.29% of our outstanding common shares as of December 31, 2018. The remainder of our outstanding shares is held by public stockholders and other investors.

Directors and Audit Committee

Our Articles of Incorporation provide for a board of directors consisting of seven to fifteen directors, and one-fifth of these directors shall be professionals of domain knowledge. See “Item 6. Directors, Senior Management and Employees—C. Board Practices.” Pursuant to Article 14-4 of the ROC Securities and Exchange Act, for a company that

has established an audit committee, unless otherwise provided for by law, the provisions regarding supervisors in the ROC Securities and Exchange Act, the ROC Company Act, and other laws and regulations shall apply mutatis mutandis to the audit committee.

Under the ROC Company Act, our board of directors, in conducting our business, shall act in accordance with laws and regulations, our Articles of Incorporation and the resolutions adopted at the meetings of stockholders. Where any resolution adopted by our board of directors contravenes laws, our Articles of Incorporation and the resolutions adopted at the meetings of stockholders, thereby causing loss or damage to us, all directors taking part in the adoption of such resolution shall be liable to compensate us for such loss or damage; however, those directors whose disagreement appears on record or is expressed in writing shall be exempted from liability.

If our board of directors decides, by resolution, to commit any act in violation of any law or our Articles of Incorporation, any of our independent directors or any stockholder who has continuously held our shares for a period of one year or longer may request our board of directors to discontinue such act. One or more stockholders who have held 1% or more of the total number of our outstanding shares for six months or a longer time may send a written request to require an independent director to bring an action on our behalf against a director for losses suffered by us as a result of unlawful actions. In addition, if our stockholders' meeting resolves to institute an action against a director, we shall, within 30 days from the date of such resolution, institute the action. In case of a lawsuit between us and a director, an independent director shall act on our behalf, unless otherwise provided by law; and our stockholders meeting may also appoint some other person to act on our behalf in a lawsuit.

According to the ROC Company Act, our board of directors owes fiduciary duty to us. Our directors are liable for the damages to be sustained by us if they breach their fiduciary duty. In addition, a director, his or her spouse, a blood relative within the second degree of kinship, or any company which has a controlling or subordinate relation with him or her, has a personal interest in a matter to be discussed at the meeting of the board of directors, and the director shall specify such conflict; if the conflict may cause damages to the company, the director shall abstain from voting on the matter, and shall not serve as a proxy and vote on behalf of another director.

According to our Articles of Incorporation, the remuneration and compensation of the directors shall be determined by the board of directors based on the participation and the contribution of each director in the business operation of the Company and referencing the regular standards of other corporations in the similar industry. Our Articles of Incorporation do not impose a mandatory retirement age for our directors. Furthermore, our Articles of Incorporation do not impose a shareholding qualification for each director. According to our Code of Ethics, we may not extend any loan to our directors.

Dividends and Distributions

At each annual general stockholders' meeting, our board of directors submits to the stockholders for their approval any proposal for the distribution of dividend or the making of any other distribution to stockholders from our net income for the preceding fiscal year. All common shares outstanding and fully paid as of the relevant record date are entitled to share equally in any dividend or other distribution so approved. Dividends may be distributed in cash, in the form of common shares or a combination of the two, as determined by the stockholders at the meeting.

We are not permitted to distribute dividends or make other distributions to stockholders in any year in which we do not have any net income or unappropriated earnings (excluding reserves). The ROC Company Act also requires that 10% of our annual net income, less prior years' losses and outstanding tax, if any, be set aside as a legal reserve until the accumulated legal reserve equals our paid-in capital. We may also set aside special reserve by the resolution of our stockholders' meeting. In addition, our Articles of Incorporation provide that at least 50% of the remaining portion of the net income, less accumulated losses, outstanding taxes, the legal reserve and any special reserve, plus accumulated retained earnings from prior years will be distributed as dividends to stockholders. Under our Articles of Incorporation, not less than 50% of the total amount of the distributed dividends must be in cash, but if the cash dividends to be distributed are less than NT\$0.10 per share, the dividends may be distributed in the form of shares. The actual percentage of distribution would take actual profitability of the year, capital budgeting, and status of

finance into consideration, and would be executed following a resolution of shareholders' meeting.

Pursuant to our current Articles of Incorporation, in annual profit-making year, we should distribute 1.7% to 4.3% of profit as employees' compensation, and not more than 0.17% of profit should be distributed as directors' compensation; however, if we have any accumulated losses, an amount to offset losses should be reserved in advance.

Under the ROC Company Act, if we do not incur a loss, we are permitted to make distributions on a pro rata basis to our stockholders of additional common shares or cash by the legal reserve, the premium derived from the issuance of new shares and the income from endowments received by us. We are allowed to make the above distributions to our stockholders by legal reserve only if the legal reserve exceeds 25% of our paid-in capital. Furthermore, subject to the provision under our Articles of Incorporation, such distribution should firstly be made by the premium derived from the issuance of new shares.

Changes in Share Capital

Under the ROC Company Act, any change in our authorized share capital requires an amendment to our Articles of Incorporation, which in turn requires approval at our stockholders' meeting. Authorized but unissued common shares may be issued, subject to applicable ROC law, upon terms as our board of directors may determine.

Preemptive Rights

Under the ROC Company Act and our Articles of Incorporation, when we issue new shares for cash, unless otherwise approved by the central competent authority, our employees have rights to subscribe for between 10% and 15% of the new issue, and we have rights to restrain the shares subscribed by employees from being transferred within a specific period of time, which should not be longer than two years. Except for the shares reserved in accordance with the ROC Company Act, we are required to inform our existing shareholders of their rights to subscribe for additional shares pro rata to their respective shareholding and to note that the shareholders will lose their pre-emptive right if they fail to subscribe for the new shares within the prescribed period. In the event that there is any new share that has not been subscribed by the existing shareholders or our employees pursuant to their respective pre-emptive rights, we may offer such shares to other investors through public offering or private negotiation with any person designated by us.

In addition, in accordance with the ROC Securities and Exchange Act, a public company that intends to offer new shares for cash must offer to the public at least 10% of the shares to be sold except in certain limited circumstances. This percentage can be increased by a resolution passed at a stockholders' meeting, held in accordance with the Company Act and our Articles of Incorporation which would diminish the number of new shares subject to the preemptive rights of existing stockholders.

Meetings of Stockholders

Pursuant to the ROC Securities and Exchange Act, as a listed company, we must hold a general shareholders' meeting within six months after the end of each fiscal year and may not seek any extension for such meeting. These meetings are generally held in New Taipei City, Taiwan. Special stockholders' meetings may be convened by resolution of the board of directors, or by the board of directors upon the written request of any stockholder or stockholders who have held 3% or more of the issued shares continuously for one year or longer, or, according to the new amendments of the ROC Company Act, taking effect on November 1, 2018, by the stockholders who have held over 50% of the issued shares continuously for three months or longer. Stockholders' meetings may also be convened by an independent director. Notice in writing of general meetings of stockholders, stating the place, time and agenda must be dispatched to each stockholder at least 30 days, in the case of general meetings, and 15 days, in the case of special meetings, before the date set for each meeting. Except in certain circumstances described below, a majority of the holders of all issued and outstanding common shares present at a stockholders' meeting constitutes a quorum for meetings of stockholders. Stockholders of 1% or more of the total number of our outstanding shares are entitled to submit, during the period of time prescribed by us no less than ten days, one proposal each year for consideration at our annual general stockholders' meeting in accordance with the ROC Company Act.

Voting Rights

As previously required by the ROC Company Act, our Articles of Incorporation provide that a holder of common shares has one vote for each common share. Cumulative voting applies to the election of our directors. The election of independent and non-independent directors should be held simultaneously while the ballots for the election of directors and independent directors are cast separately. According to Article 146-1 of the Insurance Act of the ROC, insurance companies that hold our shares may not be our directors or vote for the election of our directors.

In general, a resolution can be adopted by the holders of at least one-half of the common shares represented at a stockholders' meeting at which the holders of more than half of all issued and outstanding common shares are present. Under the ROC Company Act, the approval by at least one-half of the common shares represented at a stockholders' meeting in which a quorum of at least two-thirds of all issued and outstanding common shares are represented is required for major corporate actions, including:

- amendment to our Articles of Incorporation;
- entering into, modification or termination of any contracts regarding leasing of all business, outsourcing of operations or joint operations;
- transfer of the whole or substantial part of our business or assets;
- taking over of the whole of the business or assets of any other company which would have significant impact on our operations;
- distribution of any share dividend;
- dissolution;
- merger or spin-off; and
- dismissing of directors.

Alternatively, the ROC Company Act provides that in the case of a public company, such as us, a resolution may be adopted by the holders of at least two-thirds of the common shares represented at a meeting of stockholders at which holders of at least one-half of issued and outstanding common shares are present.

A stockholder may be represented at a general or special meeting by proxy if a valid proxy form, which is printed by the company, is delivered to us five days before the commencement of the general or special stockholders' meeting. Except for trust enterprises or share registrar approved by the Securities and Futures Bureau of the FSC, where one person is appointed as proxy by two or more stockholders who together hold more than 3% of the total issued common shares, the votes of those stockholders in excess of 3% of the outstanding common shares shall not be counted. Alternatively, if the stockholder would like to exercise its voting right at a general or special meeting but cannot be present at the meeting in person, we have set up an electronic voting mechanism for such stockholder to exercise voting right. The stockholder is not allowed to exercise voting right through electronic voting mechanism if such stockholder fails to revoke the granted proxy (if any) at least two days prior to the general or special meeting.

At the time of any vote, if a director of a public company has pledged more than half of the holding at the time the director was elected, such director will not be allowed to exercise the voting rights with respect to the number of shares pledged in excess of the half of the number of shares that such director held in such public company at the time the director was elected. The maximum number of shares ineligible for voting pursuant to the provision above cannot exceed half of the number of shares that such director held in such public company at the time the director was elected. In addition, any shares that were ineligible for voting pursuant to the above provision would not count as being present for such vote.

Any stockholder who has a personal interest in the matter under discussion at a stockholders' meeting, the outcome of which may impair our interests, shall not vote or exercise voting rights on behalf of another stockholder; however, the shares held by such stockholder may be counted as present for calculation of attendance quorum.

Holders of our ADSs generally will not be able to exercise voting rights on the common shares underlying ADSs on an individual basis.

Other Rights of Stockholders

Under the ROC Company Act and the Business Mergers and Acquisitions Act, dissenting stockholders are entitled to appraisal rights in certain major corporate actions, such as a planned transfer of the whole or part of the business or a

proposed merger by us. A dissenting stockholder may request us to purchase back all of the shares owned by the stockholder at a fair price determined by mutual agreement or determined by the court if a mutual agreement cannot be reached. For example, if we propose to split up or to consolidate or merge with another

company, stockholders may exercise their appraisal rights by serving a written notice or raising his objection verbally with a record prior to or during the related stockholders' meeting. Moreover, a stockholder has the right to file a petition in the court for annulment of any resolution adopted at a stockholders' meeting where the procedures for convening the stockholders' meeting or the method of adopting the resolutions at the meeting is contrary to law or our Articles of Incorporation.

We have adopted a nomination procedure for election of directors as stipulated in the ROC Company Act which provides that stockholders holding 1% or more of our total issued shares may submit to us a list of candidates for directors, including independent directors, along with relevant information and supporting documents.

Register of Stockholders and Record Dates

Our share registrar, Yuanta Securities Co., Ltd., maintains our register of stockholders at its offices in Taipei City, Taiwan. Under the ROC Company Act, we may, by giving advance public notice, set a record date and close the register of stockholders for a specified period in order for us to determine the stockholders or pledgees that are entitled to rights pertaining to the common shares. The specified period starting from such record date (to determine the entitled stockholders or pledgees) required is as follows:

- general stockholders' meeting—60 days;
- special stockholders' meeting—30 days; and
- relevant record date for distribution of dividends or other entitlements—5 days.

Annual Consolidated Financial Statements

At least ten days before the annual general stockholders' meeting, our annual consolidated financial statements prepared in accordance with Taiwan IFRSs, the business report, and the earnings distribution or losses offsetting proposal, must be available at our principal office in Taipei City, Taiwan for inspection by the stockholders.

Transfer of Common Shares

In accordance with our Articles of Incorporation, all of our shares are currently issued and transferred in book-entry form instead of issuing physical share certificates. After the book closure date, the Taiwan Depository & Clearing Corporation, or the TDCC, will deliver the names and addresses of the shareholders as of the book closure date to our registrar, Yuanta Securities Co., Ltd. Only shareholders as of the book closure date can assert shareholder rights against us.

Acquisition of Our Own Common Shares

Under the ROC Company Act, with minor exceptions, we cannot acquire our own common shares. Any common shares acquired by us, under certain of such minor exceptions, must be sold at the market price within six months after their acquisition.

In addition, under the ROC Securities and Exchange Act, a company whose shares are listed on the TWSE or traded on the Taipei Exchange (formerly known as Gre Tai Securities Market) may, pursuant to a board resolution adopted by a majority consent at a meeting attended by more than two-thirds of the directors and pursuant to the procedures prescribed by the Securities and Futures Bureau of the FSC, purchase its shares for the following purposes on the TWSE, the Taipei Exchange or by a tender offer:

- (1) for transfers of shares to its employees;
- (2)

for conversion into shares from bonds with warrants, preferred shares with warrants, convertible bonds, convertible preferred shares or certificates of warrants issued by us; and

(3) for maintaining its credit and its stockholders' equity, provided that the shares so purchased shall be cancelled thereafter.

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The total shares purchased by us shall not exceed 10% of its total issued and outstanding shares. In addition, the total amount for purchase of the shares shall not exceed the aggregate amount of the retained earnings, the premium from shares issues and the realized portion of the capital surplus.

The shares purchased by us pursuant to items (1) and (2) above shall be transferred to the intended transferees within three years after the purchase; otherwise the same shall be cancelled. For the shares to be cancelled pursuant to item (3) above, we shall complete amendment registration for such cancellation within six months after the purchase.

The shares purchased by us shall not be pledged or hypothecated. In addition, we may not exercise any stockholders' rights attaching to these shares. Under the ROC Company Act, we may transfer the treasury stock to our employees and impose transfer restrictions on the shares up to two years.

Liquidation Rights

In the event of our liquidation, the assets remaining after payment of all debts, liquidation expenses and taxes will be distributed pro rata to the stockholders in accordance with the relevant provisions of the ROC Company Act.

Substantial Stockholders and Transfer Restrictions

The ROC Securities and Exchange Act currently requires for public companies that (i) each director, supervisor, manager, as well as their respective spouses, minor children and nominees, and substantial stockholder (i.e., a stockholder who together with his or her spouse, minor children or nominees, holds more than 10% of the shares of a public company) to report any change in that person's shareholding to the issuer of the shares on a monthly basis and (ii) each director, supervisor, manager or substantial stockholder holding such common shares for more than a six month period to report his or her intent to transfer any shares listed on the TWSE or traded on the Taipei Exchange (formerly known as Gre Tai Securities Market) to the Securities and Futures Bureau of the FSC at least three days before the intended transfer, unless the number of shares to be transferred each day is no more than 10,000 shares. ADS holders holding more than 10% of our common shares, including common shares represented by ADSs, may be subject to the above-mentioned obligations.

In addition, the number of shares that can be sold or transferred on the TWSE or the Taipei Exchange (formerly known as Gre Tai Securities Market) by any person subject to the restrictions described above on any given day may not exceed:

- 0.2% of the outstanding shares of the company in the case of a company with no more than 30 million outstanding shares;
- 0.2% of 30 million shares plus 0.1% of the outstanding shares exceeding 30 million shares in the case of a company with more than 30 million outstanding shares; or
- in any case, 5% of the average daily trading volume (number of shares) on the TWSE or the Taipei Exchange for the ten consecutive trading days preceding the reporting day on which day the director, supervisor, manager or substantial stockholder or their respective spouse, minor child or nominee reports the intended share transfer to the Securities and Futures Bureau.

These restrictions do not apply to block trading, auction sale, purchase by auction, after-hours trading and sales or transfers of our ADSs. However, these restrictions will apply to sales of common shares upon withdrawal.

C. Material Contracts

We have not entered into any material contracts other than in the ordinary course of business and other than those described elsewhere in this annual report.

D. Exchange Controls

Foreign Investment and Exchange Controls in Taiwan

We have extracted from publicly available documents the information presented in this section. Please note that citizens of the PRC and entities organized in the PRC are subject to special ROC laws, rules and regulations, which are not discussed in this section.

General

Historically, foreign investments in the securities market of Taiwan were restricted. However, commencing in 1983, the Taiwan government has from time to time enacted legislation and adopted regulations to make foreign investment in the Taiwan securities market possible. Initially, only overseas investment trust funds of authorized securities investment trust enterprises established in Taiwan were permitted to invest in the Taiwan securities market. Since January 1, 1991, qualified foreign institutional investors are allowed to make investments in the Taiwan listed securities market. Since March 1, 1996, overseas Chinese, non-resident foreign institutional and individual investors (other than qualified foreign institutional investors), called “general foreign investors,” are permitted to make direct investments in the Taiwan securities market.

Foreign Investment in Taiwan Securities Market

On December 28, 1990, the Executive Yuan, the cabinet of the ROC government, approved guidelines drafted by the Securities and Futures Commission (the predecessor of the Securities and Futures Bureau), which, since January 1, 1991, has allowed direct foreign investment in Taiwan’s securities that are listed on the TWSE or other Taiwan securities approved by the Securities and Futures Bureau by certain eligible qualified foreign institutional investors.

In addition to qualified foreign institutional investors, certain individual and foreign institutional investors which meet certain qualifications set by the Securities and Futures Bureau may invest in the shares of TWSE-listed companies, the Taipei Exchange (formerly known as Gre Tai Securities Market) traded companies, emerging market companies or other Taiwan securities approved by the Securities and Futures Bureau up to a limit of US\$50 million (in the case of institutional investors) and US\$5 million (in the case of individual investors) after obtaining permission from the TWSE.

On September 30, 2003 and June 15, 2004, the Securities and Futures Bureau issued amendments to the “Guideline Governing Investment in Securities by Overseas Chinese and Foreign Nationals” and relevant regulations, in which the Securities and Futures Bureau lifted certain restrictions and simplified the procedures required for foreign investments in Taiwan’s securities market. The amendment focuses mainly on the following aspects:

• The concept of “qualified foreign institutional investors” no longer exists. Foreign investors are reclassified as “off-shore foreign institutional investors,” “on-shore foreign institutional investors,” “off-shore general foreign investors,” and “on-shore general foreign investors” based on whether they are institutions or natural persons, and whether they have presences in Taiwan.

• For foreign investors to invest in Taiwan’s securities market, registration with the TWSE, instead of the approval of the Securities and Futures Bureau, is required. The TWSE may withdraw or rescind the registration if the application documents submitted by foreign investors are untrue or incomplete, or if any material violation of the relevant regulations exists.

• Off-shore foreign investors may provide the securities they hold as the underlying shares of depositary receipts and act as selling stockholders in depositary receipts offerings.

•

Off-shore foreign institutional investors are required to appoint their agent or nominee to attend the stockholders' meeting of the invested company.

Currently, subject to the specific restriction imposed by relevant regulations, the off-shore foreign institutional investors may invest in the Taiwan securities market without any amount of restriction. However, a ceiling will be separately determined by the Securities and Futures Bureau after consultation with the Central Bank of the ROC (Taiwan) for investment by offshore overseas Chinese and foreign individual investors.

Foreign Investment Approval

Other than:

foreign institutional investors;

foreign individual investors; and

investors in overseas convertible bonds and depositary receipts, foreign investors who wish to make direct investments in the shares of Taiwan companies may submit a “foreign investment approval” application to the Investment Commission of the Ministry of Economic Affairs of Taiwan or other government authority to qualify for benefits granted under the Statute for Investment by Foreign Nationals. The Investment Commission or other government authority reviews each foreign investment approval application and approves or disapproves the application after consultation with other governmental agencies. Any non-Taiwan person possessing a foreign investment approval may remit capital for the approved investment and repatriate annual net profits and interests and cash dividends attributable to an approved investment. Stock dividends, investment capital and capital gains attributable to the investment may be repatriated with approval of the Investment Commission or other government authority.

In addition to the general restrictions against direct investment by non-Taiwan persons in Taiwan companies, non-Taiwan persons are currently prohibited from investing in prohibited industries in Taiwan under the Negative List promulgated by the Executive Yuan from time to time. The prohibition on direct foreign investment in the prohibited industries in the Negative List is absolute with the consequence of certain specific exemption from the application of the Negative List. Under the Negative List, some other industries are restricted so that non-Taiwan persons may directly invest only up to a specified level and with the specific approval of the relevant authority which is responsible for enforcing the legislation which the negative list is intended to implement. The telecommunication industry is a restricted industry under the Negative List.

Depositary Receipts

In April 1992, the Securities and Futures Bureau began allowing Taiwan companies listed on the TWSE, with the prior approval of the Securities and Futures Bureau, to sponsor the issuance and sale of depositary receipts evidencing depositary shares. In December 1994, the ROC Ministry of Finance began allowing companies whose shares are traded on the Taipei Exchange (formerly known as Gre Tai Securities Market) also to sponsor the issuance and sale of depositary receipts evidencing depositary shares representing shares of its capital stock. Approvals for these issuances are still required.

After the issuance of a depositary share, a holder of the depositary receipt evidencing the depositary shares may request the depositary issuing the depositary share to cause the underlying shares to be sold in Taiwan and to distribute the proceeds of the sale to or to withdraw the shares and deliver the shares to the depositary receipt holder. A citizen of the PRC is not permitted to withdraw and hold our shares.

If you are an offshore foreign institutional investor holding the depositary receipts, you must register with the TWSE as a foreign investor before you will be permitted to withdraw the shares represented by the depositary receipts. In addition to obtaining registration with the TWSE, you must also (i) appoint a qualified local agent to, among other things, open a securities trading account with a local securities brokerage firm and a bank account to remit funds, exercise stockholders’ rights and perform other functions as holders of ADSs may designate, (ii) appoint a custodian bank to hold the securities and cash proceeds, confirm transactions, settle trades and report and declare other relevant information; and (iii) appoint a tax guarantor as guarantor for the full compliance of the withdrawing depositary receipt holder’s tax filing and payment obligations in the ROC. A depositary receipt holder not registered as a foreign investor with the TWSE, or not has made the necessary appointments as outlined above, will be unable to hold or subsequently transfer the shares withdrawn from the depositary receipt facility.

No deposits of shares may be made in a depositary receipt facility and no depositary shares may be issued against deposits without specific Securities and Futures Bureau approval, unless they are:

- (i) stock dividends;
- (ii) free distributions of shares;
- (iii) due to the exercise by the depositary receipt holder preemptive rights in the event of capital increases for cash; or
- (iv) if permitted under the deposit agreement and custody agreement and within the amount of depositary receipts which have been withdrawn, due to the direct purchase by investors or purchase through the depositary on the TWSE or the Taipei Exchange (formerly known as Gre Tai Securities Market) or delivery by investors of the shares for deposit in the depositary receipt facility. In this event, the total number of depositary receipts outstanding after an issuance cannot exceed the number of issued depositary receipts previously approved by the Securities and Futures Bureau of the FSC in connection with the offering plus any ADSs issued pursuant to the events described in (i), (ii) and (iii) above.

An ADS holder or the depositary, without obtaining further approvals from the Central Bank of the ROC (Taiwan) or any other governmental authority or agency of the ROC, may convert NT dollars into other currencies, including U.S. dollars, in respect of:

- the proceeds of the sale of common shares represented by ADSs or received as share dividends with respect to the common shares and deposited into the depositary receipt facility; and
- any cash dividends or distributions received from the common shares.

In addition, the depositary may also convert into NT dollars incoming payments for purchases of common shares for deposit in the depositary receipt facility against the creation of additional ADSs. If you withdraw the common shares underlying your ADSs and become a holder of our common shares, you may convert into NT dollars subscription payment for rights offerings. The depositary may be required to obtain foreign exchange payment approval from the Central Bank of the ROC (Taiwan) on a payment-by-payment basis for conversion from NT dollars into foreign currencies of the proceeds from the sale of subscription rights of new common shares. Although it is expected that the Central Bank of the ROC (Taiwan) will grant approval as a routine matter, required approvals may not be obtained in a timely manner, or at all.

Exchange Controls

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

Aside from trade-related foreign exchange transactions, Taiwan companies and residents may remit to and from Taiwan foreign currencies of up to US\$50 million (or its equivalent) and US\$5 million, (or its equivalent), respectively, in each calendar year. These limits apply to remittances involving a conversion between New Taiwan dollars and U.S. dollars or other foreign currencies. A requirement is also imposed on all private enterprises to register all medium and long-term foreign debt with the Central Bank of the ROC (Taiwan).

In addition, a foreign person without an alien resident card or an unrecognized foreign entity may remit to and from Taiwan foreign currencies of up to US\$100,000 per remittance if required documentation is provided to Taiwan authorities. This limit applies only to remittances involving a conversion between New Taiwan dollars and U.S. dollars or other foreign currencies.

E. Taxation

ROC Taxation

The discussion below describes the principal ROC tax consequences of the ownership and disposition of ADSs representing common shares and of common shares. It applies to you only if you are:

- an individual who is not a citizen of the ROC, who owns ADSs or common shares and who is not physically present in Taiwan for 183 days or more during any calendar year; or

- a corporation or a non-corporate body that is organized under the laws of a jurisdiction other than the ROC for profit-making purposes and has no fixed place of business or other permanent establishments in Taiwan.

You should also consult your tax advisors concerning the tax consequences of owning ADSs and common shares in the ROC and any other relevant taxing jurisdiction to which they are subject.

Dividends

Dividends declared by us out of our retained earnings and distributed to you are subject to ROC withholding tax, currently at the rate of 21%, pursuant to the amendment to the Standards of Withholding Rates for Various Incomes promulgated by the Ministry of Finance of the ROC effective from January 1, 2018, on the amount of the distribution in the case of cash dividends or on the par value of the common shares in the case of stock dividends. However, a 10% ROC unappropriated earnings tax paid by us on our undistributed after-tax earnings, if any, may provide a credit of up to 10% of the gross amount of any dividends declared out of such earnings that would reduce the 21% ROC withholding tax imposed on these distributions. The allowed tax credit is 50% of the unappropriated earnings tax paid by us.

According to the amendment to the Income Tax Law, the rate of the ROC unappropriated earnings tax is adjusted from 10% to 5% against our unappropriated earnings generated from January 1, 2018 and the allowed tax credit (against our earnings generated since January 1, 2018) is canceled. Such amendment will apply to our annual tax filings made starting from January 1, 2019.

Share or cash dividends paid by us out of our capital surplus which are derived from the issuance of shares at a premium are not subject to ROC withholding tax. According to the rulings of Ref. Tai-Tsai-Hsuei-Tzi-09504509440 issued by the Ministry of Finance of the ROC, if a company reduces its share capital and redeems for cash its outstanding common shares issued to the company's stockholders by capitalization of capital surplus, those premiums under the capitalized capital surplus derived from re-evaluation of assets, sale of lands and/or merger with other enterprises shall be deemed as the gain in the stockholders' capital investment, and shall be deemed as stockholders' dividend income (or investment revenue) and be subject to ROC income tax.

As the legal reserve is set-aside from company's profit earnings (after tax) in accordance with Article 237 of the ROC Company Act, receipt of distribution of legal reserve shall be deemed as stockholders' dividend income (or investment revenue) and be subject to ROC income tax collected by way of withholding at the time of distribution, currently at the rate of 21%, unless a lower withholding rate is provided under a tax treaty between the ROC and the jurisdiction where the non-ROC stockholder is a resident.

Capital Gains

Gains from the sale of property in the ROC are generally subject to ROC income tax. Effective January 1, 2016, capital gain on the sale of common shares, including common shares withdrawn from the ADS facility, received by a non-resident individual or non-resident entity is no longer subject to the capital gain tax and is further exempted from

alternative minimum tax, or the AMT.

Sales of ADSs by you are regarded as transactions relating to property located outside the ROC and thus any gains derived therefrom are currently not subject to ROC income tax.

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Preemptive Rights

Distributions of statutory preemptive rights for common shares in compliance with ROC law are not subject to any ROC tax. Proceeds derived from sales of statutory preemptive rights evidenced by securities are subject to securities transaction tax at the rate of 0.3% of the gross amount received. Proceeds derived from sales of statutory preemptive rights which are not evidenced by securities are subject to capital gains tax at the rate of 20% of the gains realized if the seller is a non-ROC resident regardless of whether the non-ROC resident is an individual or entity.

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

Securities Transaction Tax

A securities transaction tax, at the rate of 0.3% of the gross amount received, payable by the seller will be withheld upon a sale of common shares in Taiwan. Transfers of ADSs are not subject to ROC securities transaction tax. According to a letter issued by the Ministry of Finance of the ROC in 1996, withdrawal of common shares from the deposit facility will not be subject to ROC securities transaction tax.

Estate Taxation and Gift Tax

ROC estate tax is payable on any property within Taiwan of a deceased person who is a non-resident individual, and ROC gift tax is payable on any property within Taiwan donated by any such person. Under ROC estate and gift tax laws, common shares issued by Taiwan companies are deemed located in Taiwan regardless of the location of the owner. It is not clear whether the ADSs will be regarded as property located in Taiwan under ROC estate and gift tax laws. Starting from May 12, 2017, estate tax is payable at rates ranging from 10% of the first NT\$50,000,000 to 20% of amounts over NT\$100,000,000, and gift tax is payable at rates ranging from 10% of the first NT\$25,000,000 to 20% of amounts over NT\$50,000,000.

Tax Treaty

The ROC does not have an income tax treaty with the United States. On the other hand, the ROC has income tax treaties with Indonesia, Israel, Singapore, South Africa, Australia, Vietnam, New Zealand, Malaysia, Macedonia, Swaziland, the Netherlands, United Kingdom, Gambia, Senegal, Sweden, Belgium, Denmark, Paraguay, Hungary, France, India, Slovakia, Germany, Thailand, Eswatini, Luxembourg, Kiribati, Austria, Italy, Japan, Canada and Poland, which may limit the rate of ROC withholding tax on dividends paid with respect to common shares in Taiwan companies. It is unclear whether if you hold ADSs, you will be considered to hold common shares for the purposes of these treaties. Accordingly, if you may otherwise be entitled to the benefits of the relevant income tax treaty, you should consult your tax advisors concerning your eligibility for the benefits with respect to the ADSs.

Unappropriated Earnings Tax

Under the ROC Income Tax Act, a 10% unappropriated earnings tax will be imposed on a company for its after-tax earnings generated after January 1, 1998 which are not distributed in the following year. The unappropriated earnings tax so paid will further reduce the retained earnings available for future distribution. When the company declares dividends out of those retained earnings, up to a maximum amount of 10% of the declared dividends may be credited against the 21% withholding tax imposed on the non-resident holders of its shares. The allowed tax credit is to 50% of the unappropriated earnings tax paid by us.

According to the amendment to the Income Tax Law, the rate of the ROC unappropriated earnings tax is adjusted from 10% to 5% against our unappropriated earnings generated from January 1, 2018 and the allowed tax credit (against our earnings generated since January 1, 2018) is canceled. Such amendment will apply to our annual tax filings made starting from January 1, 2019.

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U.S. Federal Income Tax Considerations for U.S. Holders

The following is a summary of certain U.S. federal income tax consequences of the ownership and disposition of our shares and ADSs as of the date hereof. The discussion set forth below is applicable to beneficial owners of our shares or ADSs that hold the shares or ADSs as capital assets and that are U.S. holders (defined below) and non-residents of the ROC. You are a U.S. holder if you are:

- an individual who is a citizen or resident of the United States;
- a corporation or other entity taxable as a corporation for U.S. federal income tax purposes created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate the income of which is subject to U.S. federal income taxation regardless of its source;
- a trust that is subject to the primary supervision of a court within the United States and one or more U.S. persons have the authority to control all substantial decisions of the trust; or
- a trust that has a valid election in effect under applicable U.S. Treasury regulations to be treated as a U.S. person.

This summary is based on the provisions of the Internal Revenue Code of 1986, as amended (the “Code”), and regulations, rulings and judicial decisions thereunder as of the date hereof, and such authorities may be replaced, revoked or modified so as to result in U.S. federal income tax consequences different from those discussed below. It is for general purposes only and you should not consider it to be tax advice. In addition, it is also based in part on representations made by the depositary and assumes that the deposit agreement and any related agreement will be performed in accordance with their terms. This summary does not represent a detailed description of all the U.S. federal income tax consequences to you in light of your particular circumstances and does not address the effects of any state, local or non-U.S. tax laws (or other U.S. federal tax consequences, such as U.S. federal estate or gift tax consequences or the Medicare tax on net investment income). In addition, it does not represent a detailed description of the U.S. federal income tax consequences applicable to you if you are subject to special treatment under the U.S. federal income tax laws, including if you are:

- a dealer in securities or currencies;
- a trader in securities if you elect to use a mark-to-market method of accounting for your securities holdings;
- a financial institution or an insurance company;
- a regulated investment company;
- a real estate investment trust;
- a tax-exempt organization;
- a person liable for alternative minimum tax;
- a person holding shares or ADSs as part of a hedging, integrated or conversion transaction, constructive sale or straddle;
- a person required to accelerate the recognition of any item of gross income with respect to our shares or ADSs as a result of such income being recognized on an applicable financial statement;
- a person owning, actually or constructively, 10% or more of our stock (by vote or value);
- a partnership or other pass-through entity for U.S. federal income tax purposes; or
- a person whose “functional currency” is not the U.S. dollar.

We cannot assure you that a later change in law will not alter significantly the tax considerations that we describe in this summary. If a partnership (or other entity treated as a partnership for U.S. federal income tax purposes) holds our shares or ADSs, the tax treatment of a partner will generally depend upon the status of the partner and the activities of the partnership. If you are a partner of a partnership holding our shares or ADSs, you should consult your tax advisor.

You should consult your own tax advisor concerning the particular U.S. federal income tax consequences to you of the ownership and disposition of the shares or ADSs, as well as the consequences to you arising under the laws of any other taxing jurisdiction.

In general, for U.S. federal income tax purposes, a U.S. holder who is the beneficial owner of an ADS will be treated as the owner of the shares underlying such ADS. Deposits or withdrawals of shares, actually or constructively, by U.S. holders for ADSs will not be subject to U.S. federal income tax.

Taxation of Dividends

The gross amount of distributions (other than certain pro rata distributions of shares to all stockholders) you receive on your shares or ADSs, including net amounts withheld in respect of ROC withholding taxes, will generally be treated as dividend income to you to the extent the distributions are made from our current and accumulated earnings and profits as calculated according to U.S. federal income tax principles. These amounts (including withheld taxes) will be includible in your gross income as ordinary income on the day you actually or constructively receive the distributions, which in the case of an ADS will be the date actually or constructively received by the depository. You will not be entitled to claim a dividends-received deduction allowed to corporations under the Code with respect to distributions you receive from us.

With respect to non-corporate U.S. holders, certain dividends received from a qualified foreign corporation may be subject to reduced rates of taxation, provided that the foreign corporation was not, in the year prior to the year in which the dividends are paid, and is not, in the year in which the dividends are paid, a passive foreign investment company (see “Passive Foreign Investment Company” below). A foreign corporation is treated as a qualified foreign corporation with respect to dividends paid by that corporation on shares (or ADSs backed by such shares) that are readily tradable on an established securities market in the United States. Under current U.S. Treasury Department guidance, our ADSs, which are listed on the NYSE, but not our shares, are treated as readily tradable on an established securities market in the United States. Thus, we do not believe that dividends that we pay on our shares that are not represented by ADSs currently meet the conditions required for these reduced tax rates. There can be no assurance that our ADSs will continue to be readily tradable on an established securities market in later years, or that our shares will be readily tradable on an established securities market in any given year. Non-corporate U.S. holders that do not meet a minimum holding period requirement during which they are not protected from the risk of loss, or that elect to treat the dividend income as “investment income” pursuant to Section 163(d)(4) of the Code, will not be eligible for the reduced rates of taxation regardless of the trading status of our shares or ADSs. In addition, the rate reduction will not apply to dividends if the recipient of a dividend is obligated to make related payments with respect to positions in substantially similar or related property. This disallowance applies even if the minimum holding period has been met. You should consult your own tax advisor regarding the application of these rules given your particular circumstances.

The amount of any dividend paid in NT dollars will equal the U.S. dollar value of the NT dollars you receive, calculated by reference to the exchange rate in effect on the date you actually or constructively receive the dividend, which in the case of an ADS will be the date actually or constructively received by the depository, regardless of whether the NT dollars are actually converted into U.S. dollars. If the NT dollars received as a dividend are converted into U.S. dollars on the date they are actually or constructively received, you generally will not be required to recognize foreign currency gain or loss in respect of the dividend income. If the NT dollars received as a dividend are not converted into U.S. dollars on the date of receipt, you will have a basis in the NT dollars equal to their U.S. dollar value on the date of receipt. Any gain or loss you realize if you subsequently sell or otherwise dispose of the NT dollars will be treated as ordinary income or loss from sources within the United States for foreign tax credit limitation purposes.

Subject to certain conditions and limitations under the Code, you may be entitled to a credit or deduction against your U.S. federal income taxes for the net amount of any ROC taxes that are withheld from dividend distributions made to you. In determining the amounts withheld in respect of ROC taxes, any reduction of the amount withheld on account of a ROC credit in respect of the 10% unappropriated earnings tax imposed on us is not considered a withholding tax and will not be treated as distributed to you or creditable by you against your U.S. federal income tax. The limitation on foreign taxes eligible for credit is calculated separately with respect to specific classes of income. For purposes of calculating the foreign tax credit, dividends we pay with respect to shares or ADSs will generally be considered passive category income from sources outside the United States. Further, a U.S.

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holder that has held shares or ADSs for less than a specified minimum period during which it is not protected from risk of loss, or is obligated to make payments related to the dividends, may not be allowed a foreign tax credit for foreign taxes imposed on dividends paid on shares or ADSs. The rules governing the foreign tax credit are complex. We therefore urge you to consult your tax advisor regarding the availability of the foreign tax credit under your particular circumstances.

To the extent that the amount of any distribution you receive exceeds our current and accumulated earnings and profits for a taxable year, as determined under U.S. federal income tax principles, the distribution will first be treated as a tax-free return of capital, causing a reduction in your adjusted basis in the shares or ADSs and thereby increasing the amount of gain, or decreasing the amount of loss, you will recognize on a subsequent disposition of the shares or ADSs. The balance in excess of adjusted basis, if any, will be taxable to you as capital gain recognized on a sale or exchange. However, we do not expect to keep earnings and profits in accordance with U.S. federal income tax principles. Therefore, you should expect that a distribution will generally be treated as a dividend.

It is possible that pro rata distributions of shares or ADSs to all stockholders may be made in a manner that is not subject to U.S. federal income tax. The basis of any new shares or ADSs so received will generally be determined by allocating your basis in the old shares or ADSs between the old shares or ADSs and the new shares or ADSs, based on their relative fair market values on the date of distribution.

For U.S. tax purposes, any such tax-free share distribution would not result in foreign source income to you. Consequently, you may not be able to use the foreign tax credit associated with any ROC withholding tax imposed on such distributions unless you can use the credit (subject to applicable limitations) against U.S. federal income tax due on other foreign source income in the appropriate category for foreign tax credit purposes.

Taxation of Capital Gains

When you sell or otherwise dispose of your shares or ADSs, you will generally recognize capital gain or loss in an amount equal to the difference between the U.S. dollar value of the amount realized for the shares or ADSs and your basis in the shares or ADSs, determined in U.S. dollars. Such gain or loss will generally be long-term capital gain or loss if you have held the shares or ADSs for more than one year. If you are an individual or other non-corporate holder, long-term capital gains will be eligible for reduced rates of taxation. Your ability to deduct capital losses is subject to limitations. For foreign tax credit limitation purposes, such gain or loss will generally be treated as U.S. source gain or loss. Consequently, you may not be able to use the foreign tax credit arising from any ROC tax imposed on the disposition of shares or ADSs unless such credit can be applied (subject to applicable limitations) against tax due on other income treated as derived from foreign sources.

Any ROC securities transaction taxes that you pay generally will not be creditable foreign taxes for U.S. federal income tax purposes, but you may be able to deduct such taxes, subject to certain limitations under the Code. You are urged to consult your tax advisors regarding the U.S. federal income tax consequences of these taxes.

Passive Foreign Investment Company

We believe that we were not a “passive foreign investment company,” or PFIC, for U.S. federal income tax purposes for our taxable year ending on December 31, 2018, and we do not expect to become a PFIC for our current taxable year or in the future, although there can be no assurance in this regard. If we were treated as a PFIC for any taxable year during which you held our shares or ADSs, you could be subject to additional U.S. federal income taxes on gain recognized with respect to the shares or ADSs and on certain distributions, plus an interest charge on certain taxes treated as having been deferred under the PFIC rules.

Non-corporate U.S. holders will not be eligible for reduced rates of taxation on any dividends received from us, if we are a PFIC in the taxable year in which such dividends are paid or in the preceding taxable year.

Information Reporting and Backup Withholding

In general, information reporting will apply to dividends in respect of our shares or ADSs and the proceeds from the sale, exchange or other disposition of our shares or ADSs that are paid to you within the United States (and in certain cases, outside the United States), unless you are an exempt recipient such as a corporation. A backup withholding tax may apply to such payments if you fail to provide a taxpayer identification number or certification of exempt status or fail to report in full dividend and interest income.

Backup withholding is not an additional tax and any amounts withheld under the backup withholding rules will be allowed as a refund or a credit against your U.S. federal income tax liability provided the required information is timely furnished to the Internal Revenue Service.

F. Dividends and Paying Agents

Not applicable.

G. Statement by Experts

Not applicable.

H. Documents on Display

We have filed this annual report on Form 20-F, including exhibits, with the SEC. As allowed by the SEC, in Item 19 of this annual report, we incorporate by reference certain information we have already filed with the SEC. This means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is considered to be part of this annual report.

You may read and copy this annual report, including the exhibits incorporated by reference in this annual report, at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549 and at the SEC's regional offices in New York, New York and Chicago, Illinois. You also can obtain copies of this annual report, including the exhibits incorporated by reference in this annual report, from the SEC's Public Reference Room and regional offices upon payment of a duplicating fee.

The SEC also maintains a website at www.sec.gov that contains reports, proxy statements and other information regarding registrants that file electronically with the SEC. Our annual report and some of the other information submitted by us to the SEC may be accessed through this web site.

I. Subsidiary Information

Not applicable.

ITEM 11. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk is the risk of loss related to adverse changes in market prices, including interest rates and foreign exchange rates, of financial instruments. In the normal course of business, we are routinely subject to a variety of risks, including market risk associated with interest rate movements, currency rate movements on non-NT dollar-denominated assets and liabilities and equity price movements on our portfolio of equity securities.

We regularly assess these financial instruments and their ability to address market risk and have established policies and business practices to protect against the adverse effects of these and other potential exposures.

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Interest Rate Risk

We do not expect interest rate risk to have a material impact on our financial condition and results of operations. Please refer to “Item 5. Operating and Financial Review and Prospects—B. Liquidity and Capital Resources” for a discussion of our loans.

For our non-fixed interest rate loans, the interest rates will change in accordance with the fixed rates of the banks we borrowed from. For the financial assets, the risk associated with fluctuating interest rates is principally confined to our cash deposits in banks, which is one of the many ways we manage our capital. Assuming an increase or decrease of 0.25% in the interest rates of our non-fixed interest rate financial assets and loans, our profit before tax for the year ended December 31, 2018 would have increased or decreased by NT\$18.7 million (US\$0.6 million). We have not used any derivative financial instruments to hedge interest rate risk. We have not been exposed nor do we anticipate being exposed to material risks due to changes in interest rates. As of December 31, 2018, our cash and cash equivalents amounted to NT\$27.6 billion (US\$0.9 billion). Interest income from our cash deposits in banks accounts for only a very small percentage of our total revenue. Therefore, we believe our exposure to interest rate risk is immaterial.

Foreign Currency Risk

We are exposed to foreign currency risk as a result of (i) our foreign currency and derivative trading activities; (ii) our telecommunications equipment being sourced from overseas suppliers; (iii) our international settlement payments associated with our services for international calls and roaming traffic; and (iv) investment denominated in foreign currencies.

We entered into forward exchange contracts to reduce our exposure to foreign currency risk due to fluctuations in exchange rates. Outstanding forward exchange contracts on December 31, 2018 were as follows:

	Currencies	Maturity	Contract
FX Instrument	Involved	Period	Amount
Forward exchange contracts-Buy	EUR\$/NT\$	2019.03-06	EUR\$5 million/NT\$193 million
Forward exchange contracts-Buy	US\$/NT\$	2019.01	US\$2 million/NT\$62 million
Forward exchange contracts-Buy	EUR\$/NT\$	2019.03	EUR\$5 million/NT\$172 million

Note 38 to our consolidated financial statements included elsewhere in this annual report provides a sensitivity analysis for foreign currency risk.

Equity Price Risk

We are exposed to equity price risk as a result of holding other company’s equity, and we manage our investment portfolio in accordance with our internal policies and procedures.

The table below presents the carrying amount and accumulated unrealized gain or loss for our financial assets at fair value through profit or loss, or FVTPL, and financial assets at fair value through other comprehensive income, or FVTOCI, as of December 31, 2018.

	Carrying	Unrealized	Unrealized
	Amount	Gain	Loss
	NT\$	NT\$	NT\$
		(in	
		millions)	
Financial assets at FVTPL			
Non-listed stocks	517	—	25
Financial assets at FVTOCI			
Equity investment	6,933	1,036	507

The value of our equity holdings fluctuates depending on the market conditions. Assuming an increase or decrease of 5% in the equity prices, our profit before tax and other comprehensive income before tax for the year ended December 31, 2018 would have increased or decreased by NT\$26 million (US\$0.8 million) and NT\$347 million (US\$11.3 million) as a result of the changes in fair value of financial assets at FVTPL and financial assets at FVTOCI, respectively. However, we do not expect the gains and losses in the values of the equities that we hold to have a material impact on our financial condition and results of operations.

ITEM 12. DESCRIPTION OF SECURITIES OTHER THAN EQUITY SECURITIES

A. Debt Securities

Not applicable

B. Warrants and Rights

Not applicable

C. Other Securities

Not applicable

D. American Depositary Shares

Depositary Fees

Under the terms of the deposit agreement for our ADSs, an ADS holder may have to pay the following service fees to the depositary:

Service	Fees
Issuance of ADSs	Up to US\$5.00 per 100 ADS issued
Cancellation of ADSs	Up to US\$5.00 per 100 ADS cancelled
Distribution of cash dividends or other cash distributions	Up to US\$2.00 per 100 ADS held
Distribution of ADSs pursuant to stock dividends, free stock distributions or exercises of rights	Up to US\$5.00 per 100 ADS held
Distribution of securities other than ADSs or rights to purchase additional ADSs	Up to US\$5.00 per 100 ADS held

Depository Charges

In addition, an ADS holder shall be responsible for the following charges:

- taxes (including applicable interest and penalties) and other governmental charges;
- such registration fees as may from time to time be in effect for the registration of common shares or other deposited securities on the share register and applicable to transfers of common shares or other deposited securities to or from the name of the custodian, the depository or any nominees upon the making of deposits and withdrawals, respectively;
- such cable, telex and facsimile transmission and delivery expenses as are expressly provided in the deposit agreement to be at the expense of ADS holders and beneficial owners of ADSs;
- the expenses and charges incurred by the depository in the conversion of foreign currency; and
- the fees and expenses incurred by the depository, the custodian or any nominee in connection with the servicing or delivery of deposited securities.

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

Depository fees payable in connection with distributions of cash or securities to ADS holders and the depository services fee are charged by the depository to the holders of record of ADSs as of the applicable ADS record date. The depository fees payable for cash distributions are generally deducted from the cash being distributed. In the case of distributions other than cash (i.e., stock dividends, rights offerings), the depository charges the applicable fee to the ADS record date holders concurrent with the distribution. In the case of ADSs registered in the name of the investor (whether certificated or un-certificated in direct registration), the depository sends invoices to the applicable record date ADS holders. In the case of ADSs held in brokerage and custodian accounts via the central clearing and settlement system, The Depository Trust Company, or DTC, the depository generally collects its fees through the systems provided by DTC (whose nominee is the registered holder of the ADSs held in DTC) from the brokers and custodians holding ADSs in their DTC accounts. The brokers and custodians who hold their clients' ADSs in DTC accounts in turn charge their clients' accounts the amount of the fees paid to the depository.

In the event of refusal to pay the depository fees and charges, the depository may, under the terms of the deposit agreement, refuse the requested service until payment is received or may set off the amount of the depository fees from any distribution to be made to the ADS holder.

The fees and charges ADS holders may be required to pay may vary overtime and may be changed by us and by the depository. ADS holders will receive prior notice of such changes.

Payments by Depository

In 2018, we received US\$0.5 million net payments (after deducting the 30% U.S. withholding tax) from JPMorgan Chase Bank, N.A., the Depository Bank for our ADR program. The payments were intended to cover certain of our expenses incurred in relation to the ADR program for the year, including:

- investor relations efforts;
- legal fees, NYSE listing fees, proxy process expenses, and SEC filing fees;
- Sarbanes-Oxley and accounting related expenses in connection with ongoing SEC compliance and listing requirements; and
- other ADR program-related expenses.

Part II

ITEM 13. DEFAULTS, DIVIDEND ARREARAGES AND DELINQUENCIES

None.

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

None.

ITEM 15. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

As of the end of the period covered by this annual report, an evaluation has been carried out under the supervision and with the participation of our management, including our chief executive officer and our chief financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures, as such term is defined under Rules 13a-14(c) and 15d-14(c) promulgated under the Securities Exchange Act of 1934, as amended. Based on that evaluation, our chief executive officer and chief financial officer have concluded that our disclosure controls and procedures are effective in ensuring that material information required to be disclosed in this annual report is recorded, processed, summarized and reported to them for assessment, and required disclosure is made within the time period specified in the rules and forms of the SEC.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) under the Securities Exchange Act of 1934, as amended, for our company. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board (IASB), or IFRSs, and 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 a company's assets, (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with IFRSs, and that a company's receipts and expenditures are being made only in accordance with authorizations of a company's management and directors, and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of a company's assets that could have a material effect on the consolidated financial statements.

Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurance with respect to consolidated financial statement preparation and presentation and 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.

As required by Section 404 of the Sarbanes-Oxley Act of 2002 and related rules as promulgated by the SEC, management assessed the effectiveness of our internal control over financial reporting as of December 31, 2018 using criteria established in Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2018 based on the criteria established in Internal Control-Integrated Framework (2013) issued by the

Committee of Sponsoring Organizations of the Treadway Commission.

Deloitte & Touche, an independent registered public accounting firm who has also audited our consolidated financial statements as of and for the year ended December 31, 2018, has issued an attestation report on the effectiveness of our internal control over financial reporting in accordance with the standards of the Public Company Accounting Oversight Board (United States).

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Attestation Report of the Registered Public Accounting Firm

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Chunghwa Telecom Co., Ltd.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Chunghwa Telecom Co., Ltd. and subsidiaries (the “Company”) as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2018, of the Company and our report dated April 29, 2019, expressed an unqualified opinion on those consolidated financial statements and included an explanatory paragraph regarding the Company’s change in methods of accounting for financial instruments and revenue from contracts with customers in 2018 due to the adoption of IFRS 9 and IFRS 15.

Basis for Opinion

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

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

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in

accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the consolidated financial statements.

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

/s/ DELOITTE & TOUCHE

Deloitte & Touche
Taipei, Taiwan
The Republic of China

April 29, 2019

Changes in Internal Control Over Financial Reporting

Beginning January 1, 2018, we adopted the new revenue standard and implemented significant new revenue accounting systems, processes and internal controls over revenue recognition to assist us in the application of the new revenue standard. Other than as discussed above, there were no changes in our internal control over financial reporting that occurred during the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 16A. AUDIT COMMITTEE FINANCIAL EXPERT

Lo-Yu Yen is our audit committee financial expert and independent director. See “Item 6. Directors, Senior Management and Employees —C. Board Practices.”

The SEC has indicated that the designation of Mr. Yen as the audit committee financial expert does not: (i) make Mr. Yen an “expert” for any purpose, including without limitation for purposes of Section 11 of the Securities Act of 1933, as amended, as a result of this designation; (ii) impose any duties, obligations or liability on Mr. Yen that are greater than those imposed on him as a member of the audit committee and the board of directors in the absence of such designation; or (iii) affect the duties, obligations or liability of any other member of the audit committee or the board of directors.

ITEM 16B. CODE OF ETHICS

We have adopted a Code of Ethics and Ethical Corporate Management Best Practice Principles that applies to our directors, managers and employees, including our chief executive officer and chief financial officer. We have posted a copy of our Code of Ethics and Ethical Corporate Management Best Practice Principles on our website at <https://www.cht.com.tw/en/home/cht/about-cht/corporate-governance/other-bylaws>.

ITEM 16C. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The following table sets forth the aggregate fees by categories specified below in connection with certain professional services rendered by Deloitte & Touche, our principal accountant for the years indicated. We did not pay any other fees to Deloitte & Touche during the periods indicated below.

Year Ended
December 31

	2017	2018	
	NT\$	NT\$	US\$
	(in millions)		
Audit fees ⁽¹⁾	38.2	39.4	1.3
Audit-related fees ⁽²⁾	—	—	—
Tax fees ⁽³⁾	—	—	—
All other fees ⁽⁴⁾	—	—	—

(1) “Audit fees” means the aggregate fees billed in each of the fiscal years listed for professional services rendered by our principal accountant for the audit of our annual consolidated financial statements or services that are normally provided by the auditors in connection with statutory and regulatory filings or engagements.

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- (2) “Audit-related fees” means the aggregate fees billed in each of the fiscal years listed for assurance and related services by our principal accountant that are reasonably related to the performance of the audit or review of our consolidated financial statements and are not reported under “Audit fees.” Services comprising the fees disclosed under the category of “Audit-related fees” involve principally the issuance of agreed-upon procedures letters.
- (3) “Tax fees” means the aggregate fees billed in each of the fiscal years listed for professional services rendered by our principal accountant for tax compliance, tax advice and tax planning. Services comprising the fees disclosed under the category of “Tax Fees” involve tax advice.
- (4) “All other fees” means the aggregate fees billed in each of the last two fiscal years for products and services provided by our principal accountant other than the services reported in items (1) to (3) above.

All audit and non-audit services provided by Deloitte & Touche were pre-approved by our audit committee according to the revised Rule 201(c) (7) of Regulation S-X, entitled “Audit Committee Administration of the Engagement,” that served to strengthen requirements regarding auditor independence.

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

None.

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

Not applicable.

ITEM 16F. CHANGE IN REGISTRANT’S CERTIFYING ACCOUNTANT

Not applicable.

ITEM 16G. CORPORATE GOVERNANCE

As a ROC company listed on the NYSE, we are subject to the U.S. corporate governance rules to the extent that these rules are applicable to foreign private issuers. The following summary details the significant differences between our corporate governance practices and corporate governance standards for non-foreign private issuers (e.g., U.S. companies) under the NYSE Listed Company Manual.

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

The Legal Framework. In general, corporate governance principles for Taiwanese companies are set forth in the ROC Company Act, the ROC Securities Exchange Act, regulations promulgated by the Securities and Futures Bureau of the FSC and, to the extent they are listed on the TWSE, listing rules of the TWSE. Corporate governance principles under provisions of ROC law may differ in significant ways to corporate governance standards for non-foreign private issuers listed on the NYSE. Committed to high standards of corporate governance, we have generally brought our corporate governance in line with U.S. regulations. However, we have not adopted certain recommended NYSE corporate governance standards where such standards are not in conformity with ROC laws or regulations or generally prevailing business practices in Taiwan. We believe the following to be the significant differences between our corporate governance practices and NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE.

Director Independence. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require companies to have a majority of independent directors on the board of directors. The ROC Securities Exchange Act requires the independent directors of a public company to comprise of no less than two persons and one-fifth of the total number of directors. We currently have five independent directors on our thirteen-member board of directors. We follow the standards regulated under the ROC Securities Exchange Act and by the FSC for

determining director independence, which are comparable to the standards imposed by the NYSE.

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In addition, under the ROC requirements, our board of directors is not required to make a formal determination of a director's independence. Nevertheless, we believe that our independent directors are free from any business or other relationships that would impair the exercise of their independent judgment. Furthermore, pursuant to the NYSE Listed Company Manual, non-executive directors must meet on a regular basis without the management directors present. All of our directors attend our board of directors' meetings; however, no separate meeting is held among non-executive directors.

Audit Committee. On April 1, 2003, the SEC adopted final rules relating to the audit committee requirements. Foreign private issuers listed on the NYSE were required to comply with the related NYSE corporate governance rules by July 31, 2005. Our audit committee was established in September 2004 in accordance with the rules set forth in the NYSE Listed Company Manual. According to the NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE, the board must review the status of any audit member that serves on more than three audit committees. There is no such requirement under the ROC law, which allows a person to serve as an independent director on up to four public companies in the ROC.

Section 303A.07 of the NYSE Listed Company Manual requires issuers to have at least three directors on the audit committee that meets the definition of independence set forth under Rule 10A-3 of the Exchange Act and Section 303A of the NYSE Listed Company Manual. There is no such requirement under the ROC law, which requires all independent directors of a public company to be members of the audit committee if the company has established such a committee.

On February 20, 2013, the FSC of the ROC announced that any (i) financial holding company, bank, bill finance company or insurance company, (ii) listed company whose paid-in capital reaches NT\$50 billion or (iii) integrated securities firm controlled by a financial holding company, should establish an audit committee to replace supervisors. As a result, our new audit committee started from the date of the annual general meeting on June 25, 2013. See "Item 6. Directors, Senior Management and Employees—C. Board Practices." As a result, we now simultaneously comply with the relevant rules of the NYSE Listed Company Manual and the relevant rules and regulations in the ROC.

Nominating/Corporate Governance Committee and Corporate Governance Principles. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require companies to have a nominating/corporate governance committee, composed entirely of independent directors. In addition to identifying individuals qualified to become board members, the nominating/corporate governance committee must develop and recommend to the board a set of corporate governance principles. The ROC Company Act does not require companies incorporated in the ROC to have a nominating/corporate governance committee. We do not currently have a nominating committee or a corporate governance committee.

Currently, our board of directors performs the duties of a corporate governance committee and regularly reviews our corporate governance principles and practices. The ROC Company Act requires that directors shall be elected by stockholders. Our Articles of Incorporation requires us, beginning in the fifth commencement, to establish at least three independent directors in the number of directors. The elections for directors shall proceed with the candidate nomination mechanism; the stockholders shall elect the directors from among the nominees listed in the roster of director candidates. Stockholders holding 1% or more of our outstanding shares are entitled to nominate candidates of directors in writing to us. The numbers of candidates nominated by stockholders shall not exceed the numbers of directors to be elected; neither the numbers of candidates nominated by the Board. Elections for independent and non-independent directors shall proceed concurrently, and the number of elected independent and non-independent directors shall be calculated separately.

Non-foreign private issuers listed on the NYSE are also required to adopt and disclose corporate governance guidelines. We currently comply with the ROC Non-Binding Corporate Governance Best Practice Principles for

TWSE/Taipei Exchange Listed Companies promulgated by the TWSE, or Best Practice Principles, and we explain differences between our practice and the principles, if any, in our ROC annual report.

Compensation Committee. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require companies to have a compensation committee, composed entirely of independent directors. The Article 14-6 of the ROC Securities and Exchange Act requires all listed companies to establish a compensation committee for directors, supervisors and managers' compensation, which includes salary, stock options and other rewards, as well as authorizes the Competent Authority (i.e., FSC) to enact a regulation on the authorities of the compensation committee and the qualifications of its members. See "Item 6. Directors, Senior Management and Employees—C. Board Practices" for description of our compliance.

Code of Business Conduct and Ethics. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require companies must adopt a code of business conduct and ethics for directors, officers and employees and promptly disclose any waivers of the code for directors or executive officers. We have adopted Code of Ethics which applies to our directors, managers and employees, and Ethical Corporate Management Best Practice Principles that applies to our directors, managers, employees and persons having substantial control over us. We have filed Code of Ethics and Ethical Corporate Management Best Practice Principles as an exhibit to our annual report filed with the U.S. SEC and a copy is available to any stockholder upon request.

Equity Compensation Plans. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require that equity compensation plans be approved by a company's stockholders. Under the ROC Company Act and the ROC Securities and Exchange Act, the distribution of compensation to employees should be decided by the board of directors and reported in stockholders' meeting. The approval of stockholders' meeting is required for any issuances of restricted stock to employees, and the board of director has authority to approve employee stock option plans and to grant options to employees pursuant to such plans, subject to the approval of the FSC, and to approve share buy-back programs and transfer of shares to employees under such programs. We intend to follow only the ROC requirements.

Means to Communicate with Non-Management Directors. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require companies to establish a means for stockholders, employees and other interested parties to communicate with non-management directors. The ROC law does not have comparable requirements. However, according to the Best Practice Principles, companies are required to establish channels of communication with employees and encourage employees to communicate directly with the management or directors so as to reflect employees' opinions about the management, financial conditions and material decisions of the company concerning employee welfare. We have complied with these provisions.

Internal Audit Function. The NYSE corporate governance rules applicable to non-foreign private issuers listed on the NYSE require companies to establish an internal audit function to provide management and the audit committee with assessments of the company's risk management processes and system of internal control. We have complied with the Best-Practice Principles by setting up an internal control/audit system in accordance with the ROC Regulations Governing Establishment of Internal Control Systems by Public Companies.

CEO Certification to the NYSE. The NYSE listing standards require the CEO of companies to certify compliance with NYSE corporate governance standards annually. ROC law does not contain such requirement. In this regard, we only follow the ROC corporate governance requirement which does not require CEO annual certification. However, our CEO and CFO are required to certify in the 20-F annual report that, to his or her knowledge the information contained therein fairly represents in all material respects the financial condition and results of operations of our company.

ITEM 16H. MINE SAFETY DISCLOSURE

Not applicable.

Part iII

ITEM 17. FINANCIAL STATEMENTS

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

ITEM 18. FINANCIAL STATEMENTS

The following is a list of the consolidated financial statements and report of independent registered public accounting firm included in this annual report beginning on page F-1.

INDEX TO THE CONSOLIDATED FINANCIAL STATEMENTS

	Page
<u>Report of Independent Registered Public Accounting Firm</u>	F-1
<u>Consolidated Balance Sheets as of December 31, 2017 and 2018</u>	F-2
<u>Consolidated Statements of Comprehensive Income for the years ended December 31, 2016, 2017 and 2018</u>	F-4
<u>Consolidated Statements of Changes in Equity for the years ended December 31, 2016, 2017 and 2018</u>	F-6
<u>Consolidated Statements of Cash Flows for the years ended December 31, 2016, 2017 and 2018</u>	F-7
<u>Notes to Consolidated Financial Statements</u>	F-10

ITEM 19. EXHIBITS

Exhibit

Number	Description of Exhibits
1.1*	<u>Articles of Incorporation of Chunghwa Telecom Co., Ltd. (English translation), as last amended by Annual General Meeting on June 15, 2018.</u>
2.1	<u>Form of Amended and Restated Deposit Agreement dated as of November 2007 among Chunghwa Telecom Co. Ltd., JPMorgan Chase Bank, N.A., as depositary, and all holders from time to time of ADRs issued thereunder, including the Form of American Depositary Receipt (incorporated by reference to Exhibit (a) to the Registrant's Registration Statement on Form F-6 (File No. 333-147321) filed with the Commission on November 13, 2007).</u>
8.1*	<u>List of Subsidiaries.</u>
11.1	<u>Code of Ethics as approved by the board of directors on August 13, 2013 (English translation) (incorporated by reference to Exhibit 11.1 to the Registrant's Annual Report on Form 20-F for the fiscal year ended December 31, 2013 (File No. 001-31731) filed with the Commission on April 28, 2014).</u>
11.2	<u>Ethical Corporate Management Best Practice Principles as approved by the board of directors on August 13, 2013 (English translation) (incorporated by reference to Exhibit 11.2 to the Registrant's Annual Report on Form 20-F for the fiscal year ended December 31, 2013 (File No. 001-31731) filed with the Commission on April 28, 2014).</u>
12.1*	<u>Certification of our Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.</u>
12.2*	<u>Certification of our Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.</u>
13.1*	<u>Certification of our Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.</u>
13.2*	<u>Certification of our Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.</u>
101.INS*	XBRL Instance Document.
101.SCH*	XBRL Taxonomy Extension Schema Document.
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document.
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document.

* Filed herewith.

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this annual report on its behalf.

CHUNGHWA TELECOM CO., LTD.

By: /s/ CHI-MAU SHEIH

Name: Chi-Mau Sheih

Title: Chairman and Chief Executive Officer

Date: April 29, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Chunghwa Telecom Co., Ltd.

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Chunghwa Telecom Co., Ltd. and subsidiaries (the “Company”) as of December 31, 2017 and 2018, 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, 2018, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Our audits also comprehended the translation of New Taiwan dollar amounts into U.S. dollar amounts and, in our opinion, such translation has been made in conformity with the basis stated in Note 6 to the consolidated financial statements. Such U.S. dollar amounts are presented solely for the convenience of readers outside Taiwan.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company’s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated April 29, 2019, expressed an unqualified opinion on the Company’s internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 5 to the consolidated financial statements, the Company changed its method of accounting for financial instruments and revenue from contracts with customers in 2018 due to the adoption of IFRS 9 and IFRS 15.

Basis for Opinion

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

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

/s/ DELOITTE & TOUCHE

Deloitte & Touche

Taipei, Taiwan

Republic of China

April 29, 2019

We have served as the Company's auditor since 1998.

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CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

DECEMBER 31, 2017 and 2018

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

ASSETS	Notes	2017	2018	US\$ (Note 6)
		NT\$	NT\$	
CURRENT ASSETS				
Cash and cash equivalents	3, 7	\$28,825	\$27,645	\$903
Hedging financial assets	3, 5, 21	—	1	—
Contract assets	3, 5, 30	—	4,869	159
Trade notes and accounts receivable, net	3, 4, 5, 11, 30	31,941	30,076	983
Receivables from related parties	40	49	24	1
Inventories	3, 4, 5, 12, 41	8,840	15,121	494
Prepayments	5, 13, 40	2,188	1,873	61
Other current monetary assets	14, 28	5,308	9,504	310
Other current assets	5, 20, 32, 41	2,183	2,576	84
Total current assets		79,334	91,689	2,995
NONCURRENT ASSETS				
Financial assets at fair value through profit or loss	3, 4, 5, 8	—	517	17
Financial assets at fair value through other comprehensive income	3, 4, 5, 9	—	6,933	226
Available-for-sale financial assets	3, 5, 10	5,751	—	—
Investments accounted for using equity method	3, 16	2,326	2,732	89
Contract assets	3, 5, 30	—	2,344	77
Property, plant and equipment	3, 4, 17, 40, 41	288,708	288,914	9,439

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Investment properties	3, 4, 18	8,048	8,287	271
Intangible assets	3, 4, 19	54,883	50,944	1,664
Deferred income tax assets	3, 32	2,730	3,554	116
Incremental costs of obtaining a contract	3, 5, 30	—	1,335	44
Net defined benefit assets	3, 4, 28	13	1,164	38
Prepayments	13, 40	3,573	3,463	113
Other noncurrent assets	20, 41	5,536	5,180	169
Total noncurrent assets		371,568	375,367	12,263
TOTAL		\$450,902	\$467,056	\$15,258

(continued)

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		2017	2018	US\$
	Notes	NT\$	NT\$	(Note 6)
LIABILITIES AND EQUITY				
CURRENT LIABILITIES				
Short-term loans	22	\$70	\$100	\$3
Financial liabilities at fair value through profit				
or loss	3, 5, 8	1	1	—
Hedging derivative financial liabilities	3, 5, 21	1	—	—
Contract liabilities	3, 5, 27, 30	—	10,688	349
Trade notes and accounts payable	24	19,396	20,465	669
Payables to related parties	40	684	918	30
Current tax liabilities	3, 5, 32	8,674	6,221	203
Other payables	25	25,001	23,315	762
Provisions	3, 5, 26	189	128	4
Advance receipts	3, 5, 27	8,842	—	—
Other current liabilities	5	1,081	1,382	45
Total current liabilities		63,939	63,218	2,065
NONCURRENT LIABILITIES				
Contract liabilities	3, 5, 27, 30	—	2,595	85
Long-term loans	23, 41	1,600	1,600	52
Deferred income tax liabilities	3, 5, 32	1,430	1,992	65
Provisions	3, 26	78	79	3
Customers' deposits	40	4,671	4,716	154
Net defined benefit liabilities	3, 4, 28	2,704	3,534	115
Deferred revenue	3, 5	3,612	—	—
Other noncurrent liabilities	5	3,458	4,793	157
Total noncurrent liabilities		17,553	19,309	631
Total liabilities		81,492	82,527	2,696
EQUITY ATTRIBUTABLE TO STOCKHOLDERS				
OF THE PARENT				
Common stocks		77,574	77,574	2,534
Additional paid-in capital		148,091	149,762	4,893
Retained earnings				
Legal reserve		77,574	77,574	2,534
Special reserve		2,681	2,676	87
Unappropriated earnings		54,633	66,626	2,177
Total retained earnings		134,888	146,876	4,798
Other adjustments		383	460	15
Total equity attributable to stockholders				
of the parent	5, 15, 29	360,936	374,672	12,240
NONCONTROLLING INTERESTS	5, 15, 29	8,474	9,857	322
Total equity		369,410	384,529	12,562
TOTAL		\$450,902	\$467,056	\$15,258

(concluded)

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

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CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

YEARS ENDED DECEMBER 31, 2016, 2017 and 2018

(In Millions of New Taiwan or U.S. Dollars, Except Earnings Per Share That Are in New Taiwan or U.S. Dollars)

	Notes	2016 NT\$	2017 NT\$	2018 NT\$	US\$ (Note 6)
REVENUES	3, 5, 30, 40, 44	\$229,991	\$227,514	\$215,483	\$ 7,040
OPERATING COSTS	3, 5, 12, 28, 30, 31, 40, 44	147,552	146,837	139,545	4,559
GROSS PROFIT		82,439	80,677	75,938	2,481
OPERATING EXPENSES					
Marketing		25,516	25,357	23,170	757
General and administrative		4,537	4,626	4,589	150
Research and development		3,785	3,886	3,725	122
Expected credit loss		—	—	920	30
Total operating expenses	3, 5, 28, 31, 40, 44	33,838	33,869	32,404	1,059
OTHER INCOME AND EXPENSES	18, 19, 31, 44	(496)	(105)	110	4
INCOME FROM OPERATIONS		48,105	46,703	43,644	1,426
NON-OPERATING INCOME AND EXPENSES					
Interest income	44	189	205	197	7
Other income	9, 31, 40	1,072	836	700	23
Other gains and losses	31, 38, 40	(448)	(132)	(46)	(2)
Interest expenses	44	(20)	(22)	(18)	(1)
Share of the profits of associates and joint ventures accounted for using equity method	16, 44	515	419	509	17
Total non-operating income and expenses		1,308	1,306	1,342	44
INCOME BEFORE INCOME TAX		49,413	48,009	44,986	1,470
INCOME TAX EXPENSE	3, 5, 32	7,787	7,849	6,405	210
NET INCOME		41,626	40,160	38,581	1,260
TOTAL OTHER COMPREHENSIVE INCOME (LOSS)					
Items that will not be reclassified to profit or loss:					
Remeasurements of defined benefit pension	28	(2,043)	(2,024)	(1,215)	(40)

plans					
Unrealized gain or loss on investments in					
equity instruments at fair value through					
other comprehensive income	3,38	—	—	(346)	(11)
Gain or loss on hedging instruments subject to basis					
adjustment	3,21	—	—	2	—
Share of remeasurements of defined benefit					
pension plans of associates and joint					
ventures	16	(44)	1	2	—
Income tax benefit relating to items that will					
not be reclassified to profit or loss	32	347	344	450	15
		(1,740)	(1,679)	(1,107)	(36)

(Continued)

CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

YEARS ENDED DECEMBER 31, 2016, 2017 and 2018

(In Millions of New Taiwan or U.S. Dollars, Except Earnings Per Share That Are in New Taiwan or U.S. Dollars)

	Notes	2016 NT\$	2017 NT\$	2018 NT\$	US\$ (Note 6)
Items that may be reclassified subsequently					
to profit or loss:					
Exchange differences arising from the					
translation of the foreign operations		\$(170)	\$(229)	\$90	\$ 3
Unrealized gain or loss on available-for-					
sale financial assets	31	(144)	605	—	—
Cash flow hedges	21, 31	(1)	(1)	—	—
Share of exchange differences arising					
from the translation of the foreign					
operations of associates and joint					
ventures	16	(3)	(5)	3	—
Income tax benefit relating to					
items that may be reclassified					
subsequently	32	2	3	—	—
		(316)	373	93	3
Total other comprehensive loss,					
net of income tax		(2,056)	(1,306)	(1,014)	(33)
TOTAL COMPREHENSIVE INCOME		\$39,570	\$38,854	\$37,567	\$ 1,227
NET INCOME ATTRIBUTABLE TO					
Stockholders of the parent		\$40,485	\$38,988	\$37,557	\$ 1,227
Noncontrolling interests		1,141	1,172	1,024	33
		\$41,626	\$40,160	\$38,581	\$ 1,260
COMPREHENSIVE INCOME					
ATTRIBUTABLE TO					
Stockholders of the parent		\$38,486	\$37,705	\$36,552	\$ 1,194
Noncontrolling interests		1,084	1,149	1,015	33
		\$39,570	\$38,854	\$37,567	\$ 1,227

EARNINGS PER SHARE	5, 33				
Basic		\$5.22	\$5.03	\$4.84	\$ 0.16
Diluted		\$5.21	\$5.02	\$4.83	\$ 0.16
EARNINGS PER EQUIVALENT ADS					
Basic		\$52.19	\$50.26	\$48.41	\$ 1.58
Diluted		\$52.11	\$50.19	\$48.35	\$ 1.58

The accompanying notes are an integral part of the consolidated financial statements (Concluded)

CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

YEARS ENDED DECEMBER 31, 2016, 2017 and 2018

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

Equity Attributable to Stockholders of the Parent						Other Adjustments						Total Equity Attributable to Stockholders of the Parent	Noncontrolling Interests		
Retained Earnings						Unrealized									
Common Stocks	Additional Paid-in Capital	Legal Reserve	Special Reserve	Unappropriated Earnings	Total Retained Earnings	Exchange Differences of the	Gain or Loss on Translation of the	Arising from the	Gain or Loss on Available-for-sale Financial Assets	Assets at Fair Value Through Other Comprehensive Income	Cash on Hand	Hedging Instruments	Total Adjustments	Equity	Interests
NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
\$77,574	\$146,733	\$77,574	\$2,676	\$59,448	\$139,698	\$177	\$91	\$—	\$1	\$—	\$1	\$—	\$269	\$364,274	\$5,065
—	—	—	—	(42,551)	(42,551)	—	—	—	—	—	—	—	—	(42,551)	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(710)
—	58	—	—	—	—	—	—	—	—	—	—	—	—	58	25

Capital														
g														
ately														
al	—	389	—	—	—	—	—	—	—	—	—	—	389	786
a														
e for														
ded														
31,	—	—	—	—	40,485	40,485	—	—	—	—	—	—	40,485	1,141
ative														
year														
r 31,	—	—	—	—	(1,725)	(1,725)	(131)	(142)	—	(1)	—	(274)	(1,999)	(57)
ative														
ss)														
r														
31,	—	—	—	—	38,760	38,760	(131)	(142)	—	(1)	—	(274)	38,486	1,084
d														
s of														
s	—	—	—	—	—	—	—	—	—	—	—	—	—	17
e in														
ing	—	—	—	—	—	—	—	—	—	—	—	—	—	5
E,														
ER	77,574	147,180	77,574	2,676	55,657	135,907	46	(51)	—	—	—	(5)	360,656	6,272
ion														
or														
erve	—	—	—	5	(5)	—	—	—	—	—	—	—	—	—
ends														
ends	—	—	—	—	(38,336)	(38,336)	—	—	—	—	—	—	(38,336)	—
by														
s	—	—	—	—	—	—	—	—	—	—	—	—	—	(942)

	—	3	—	—	—	—	—	—	—	—	—	3	—
Capital													
Assets													
Liabilities													
Equity													
Capital	—	—	—	—	—	—	—	—	—	—	—	—	—
Reserves	—	77	—	—	—	—	—	—	—	—	—	77	29
Capital													
Assets													
Liabilities													
Equity													
Capital	—	802	—	—	—	—	—	—	—	—	—	802	1,750
Reserves	—	—	—	—	—	—	—	—	—	—	—	—	—
Capital													
Assets													
Liabilities													
Equity													
Capital	—	—	—	—	38,988	38,988	—	—	—	—	—	38,988	1,172
Reserves	—	—	—	—	—	—	—	—	—	—	—	—	—
Capital													
Assets													
Liabilities													
Equity													
Capital	—	—	—	—	(1,671)	(1,671)	(220)	609	—	(1)	—	388	(1,283)
Reserves	—	—	—	—	37,317	37,317	(220)	609	—	(1)	—	388	1,149

31,														
d														
s of	—	2	—	—	—	—	—	—	—	—	—	2	20	
e in	—	27	—	—	—	—	—	—	—	—	—	27	196	
ing														
E,														
ER	77,574	148,091	77,574	2,681	54,633	134,888	(174)	558	—	(1)	—	383	360,936	8,474
ve														
	—	—	—	—	12,393	12,393	—	(558)	883	1	(1)	325	12,718	(4)
E,														
7 1,														
D	77,574	148,091	77,574	2,681	67,026	147,281	(174)	—	883	—	(1)	708	373,654	8,470
ion														
erve	—	—	—	(5)	5	—	—	—	—	—	—	—	—	—
ends														
	—	—	—	—	(37,205)	(37,205)	—	—	—	—	—	—	(37,205)	—
ends														
by														
s	—	—	—	—	—	—	—	—	—	—	—	—	—	(958)
osal	—	2	—	—	—	—	—	—	—	—	—	—	2	—
in														
s	—	826	—	—	—	—	—	—	—	—	—	—	826	349
ital														
g														
ately														
al	—	777	—	—	—	—	—	—	—	—	—	—	777	700
a														
e for	—	—	—	—	37,557	37,557	—	—	—	—	—	—	37,557	1,024
ded														

ative (ss)														
d 31,	—	—	—	—	(757)	(757)	95	—	(345)	—	2	(248)	(1,005)	(9)
ative (ss)														
d 31,	—	—	—	—	36,800	36,800	95	—	(345)	—	2	(248)	36,552	1,015
s of	—	11	—	—	—	—	—	—	—	—	—	—	11	42
e in ling	—	55	—	—	—	—	—	—	—	—	—	—	55	239
E, ER	\$77,574	\$149,762	\$77,574	\$2,676	\$66,626	\$146,876	\$(79)	\$—	\$538	\$—	\$1	\$460	\$374,672	\$9,857
E, ER														
S OF														
(6)	\$2,534	\$4,893	\$2,534	\$87	\$2,177	\$4,798	\$(3)	\$—	\$18	\$—	\$—	\$15	\$12,240	\$322

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

CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

YEARS ENDED DECEMBER 31, 2016, 2017 and 2018

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

	2016	2017	2018	US\$
	NT\$	NT\$	NT\$	(Note 6)
CASH FLOWS FROM OPERATING ACTIVITIES				
Income before income tax	\$49,413	\$48,009	\$44,986	\$1,470
Adjustments to reconcile income before income tax to net cash provided by operating activities:				
Depreciation	29,106	28,164	27,482	898
Amortization	3,379	3,766	4,386	143
Amortization of incremental costs of obtaining contracts	—	—	1,941	63
Expected credit loss	—	—	920	30
Provision for doubtful accounts	941	643	—	—
Interest expenses	20	22	18	1
Interest income	(189)	(205)	(197)	(7)
Dividend income	(391)	(328)	(396)	(13)
Compensation cost of share-based payment transactions	17	22	17	1
Share of profits of associates and joint ventures accounted for using equity method	(515)	(419)	(509)	(17)
Loss (gain) on disposal of property, plant and equipment	48	107	(142)	(5)
Property, plant and equipment transferred to expenses	—	3	—	—
Loss on disposal of intangible assets	—	—	—	—
Gain on disposal of financial instruments	—	(3)	(6)	—
Loss on disposal of investments accounted for using equity method	2	—	—	—
Impairment loss on available-for-sale financial assets	577	—	—	—
Provision for inventory and obsolescence	192	52	365	12
Impairment loss on property, plant and equipment	596	—	—	—
Reversal of impairment loss on investment properties	(148)	(11)	(19)	(1)
Impairment loss on intangible assets	—	9	51	2
Valuation loss (gain) on financial assets and liabilities at fair value through profit or loss, net	1	(1)	21	1
Loss (gain) on foreign exchange, net	(80)	83	(17)	(1)
Changes in operating assets and liabilities:				
Decrease (increase) in:				

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Financial assets held for trading	—	—	—	—
Financial assets mandatorily measured at				
fair value through profit or loss	—	—	63	2
Contract assets	—	—	2,751	90
Trade notes and accounts receivable	(4,613)	(1,191)	1,354	44
Receivables from related parties	28	(36)	25	1
Inventories	1,166	(1,469)	(6,778)	(221)
Prepayments	62	458	418	14
Other current monetary assets	(242)	(81)	(173)	(6)
Other current assets	214	(61)	(261)	(9)
Incremental cost of obtaining a contract	—	—	(802)	(26)
Increase (decrease) in:				
Contract liabilities	—	—	2,653	87
Trade notes and accounts payable	2,497	587	1,065	35
Payables to related parties	151	(78)	234	8
Other payables	(76)	(691)	(1,089)	(36)
Provisions	(63)	82	27	1
Advance receipts	504	(728)	—	—
Other operating liabilities	7	(76)	422	14
Deferred revenue	(70)	66	—	—
Net defined benefit plans	(8,539)	49	(1,535)	(50)
Cash generated from operations	73,995	76,744	77,275	2,525
Interest paid	(20)	(22)	(18)	(1)
Income tax paid	(9,023)	(5,790)	(10,891)	(356)
Net cash provided by operating activities	64,952	70,932	66,366	2,168

(Continued)

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CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

YEARS ENDED DECEMBER 31, 2016, 2017 and 2018

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

	2016	2017	2018	US\$
	NT\$	NT\$	NT\$	(Note 6)
CASH FLOWS FROM INVESTING ACTIVITIES				
Acquisition of financial assets at fair value				
through other comprehensive income	\$—	\$—	\$(290)	\$(10)
Proceeds from return of financial assets at				
fair value through other comprehensive income	—	—	7	—
Acquisition of available-for-sale financial assets	(53)	(400)	—	—
Proceeds from disposal of available-for-sale				
financial assets	39	9	—	—
Proceeds from capital reduction of				
available-for-sale financial assets	37	12	—	—
Acquisition of time deposits and negotiable				
certificate of deposit with maturities of more				
than three months	(4,119)	(6,231)	(9,720)	(318)
Proceeds from disposal of time deposits and				
negotiable certificate of deposit with				
maturities of more than three months	2,834	5,650	5,655	185
Proceeds from disposal of held-to-maturity				
financial assets	1,875	2,140	—	—
Acquisition of investments accounted for using				
equity method	(30)	—	(205)	(7)
Proceeds from disposal of investments				
accounted for using equity method	182	—	3	—
Proceeds from capital reduction of investments	—	—	19	1

accounted for using equity method				
Acquisition of property, plant and equipment	(23,517)	(26,875)	(28,550)	(933)
Proceeds from disposal of property, plant and				
equipment	44	159	264	9
Acquisition of intangible assets	(282)	(11,305)	(498)	(16)
Acquisition of investment properties	—	—	(6)	—
Increase in other noncurrent assets	63	(788)	(80)	(3)
Interest received	198	233	187	6
Cash dividends received	1,066	675	600	20
Net cash used in investing activities	(21,663)	(36,721)	(32,614)	(1,066)

(Continued)

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CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

YEARS ENDED DECEMBER 31, 2016, 2017 and 2018

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

	2016	2017	2018	US\$ (Note 6)
	NT\$	NT\$	NT\$	
CASH FLOWS FROM FINANCING ACTIVITIES				
Proceeds from short-term loans	\$1,415	\$6,952	\$360	\$12
Repayment of short-term loans	(1,387)	(7,020)	(330)	(11)
Repayment of long-term loans	(150)	—	—	—
Increase (decrease) in customers' deposits	(294)	(111)	31	1
Increase (decrease) in other noncurrent liabilities	(104)	(37)	84	3
Cash dividends paid	(42,551)	(38,336)	(37,205)	(1,215)
Partial disposal of interests in subsidiaries without losing control	83	106	1,175	38
Cash dividends distributed to noncontrolling interests	(710)	(942)	(958)	(31)
Change in other noncontrolling interests	1,180	2,777	1,806	59
Unclaimed dividend	—	3	2	—
Net cash used in financing activities	(42,518)	(36,608)	(35,035)	(1,144)
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	58	122	103	3
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	829	(2,275)	(1,180)	(39)
CASH AND CASH EQUIVALENTS, BEGINNING OF THE YEAR	30,271	31,100	28,825	942
CASH AND CASH EQUIVALENTS, END OF THE YEAR	\$31,100	\$28,825	\$27,645	\$903

(Concluded)

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

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CHUNGHWA TELECOM CO., LTD. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In Millions of New Taiwan Dollars, Unless Stated Otherwise)

1. GENERAL

Chunghwa Telecom Co., Ltd. (“Chunghwa”) was incorporated on July 1, 1996 in the Republic of China (“ROC”) pursuant to the Article 30 of the Telecommunications Act. Chunghwa is a company limited by shares and, prior to August 2000, was wholly owned by the Ministry of Transportation and Communications (“MOTC”). Prior to July 1, 1996, the current operations of Chunghwa were carried out under the Directorate General of Telecommunications (“DGT”). The DGT was established by the MOTC in June 1943 to take primary responsibility in the development of telecommunications infrastructure and to formulate policies related to telecommunications. On July 1, 1996, the telecom operations of the DGT were spun-off as Chunghwa which continues to carry out the business and the DGT continues to be the industry regulator.

Effective August 12, 2005, the MOTC completed the process of privatizing Chunghwa by reducing the government ownership to below 50% in various stages. In July 2000, Chunghwa received approval from the Securities and Futures Commission (the “SFC”) for a domestic initial public offering and its common stocks were listed and traded on the Taiwan Stock Exchange (the “TWSE”) on October 27, 2000. Certain of Chunghwa’s common stocks were sold, in connection with the foregoing privatization plan, in domestic public offerings at various dates from August 2000 to July 2003. Certain of Chunghwa’s common stocks were also sold in an international offering of securities in the form of American Depository Shares (“ADS”) on July 17, 2003 and were listed and traded on the New York Stock Exchange (the “NYSE”). The MOTC sold common stocks of Chunghwa by auction in the ROC on August 9, 2005 and completed the second international offering on August 10, 2005. Upon completion of the share transfers associated with these offerings on August 12, 2005, the MOTC owned less than 50% of the outstanding shares of Chunghwa and completed the privatization plan.

Chunghwa together with its subsidiaries are hereinafter referred to collectively as “the Company”.

2. APPROVAL OF FINANCIAL STATEMENTS

The consolidated financial statements were authorized for issue by the management on April 22, 2019.

3. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The Company initially applied IFRS 9 “Financial Instruments” and IFRS 15 “Revenue from Contracts with Customers” on January 1, 2018, and elected not to reflect the figures on a retrospective basis in comparative periods. Different accounting policies for each accounting period as a result of the application of new accounting standards are listed by year separately.

Statement of Compliance

The accompanying consolidated financial statements have been prepared in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board (collectively, “IFRSs”).

Basis of Preparation

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

Current and Noncurrent Assets and Liabilities

Current assets include:

- a. Assets held primarily for the purpose of trading;
- b. Assets expected to be realized within twelve months after the reporting period; and
- c. Cash and cash equivalents unless the asset is restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period.

Current liabilities include:

- a. Liabilities held primarily for the purpose of trading;
- b. Liabilities due to be settled within twelve months after the reporting period; and
- c. Liabilities for which the Company does not have an unconditional right to defer settlement for at least twelve months after the reporting period.

Assets and liabilities that are not classified as current are classified as noncurrent.

Light Era Development Co., Ltd. (LED) engages mainly in development of property for rent and sale. The assets and liabilities of LED related to property development within its operating cycle, which is over one year, are classified as current items.

Basis of Consolidation

- a. Principles for preparing consolidated financial statements

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

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

All inter-company transactions, balances, income and expenses are eliminated in full upon consolidation.

Attribution of total comprehensive income to the noncontrolling interests

Total comprehensive income of subsidiaries is attributed to the stockholders of the parent and to the noncontrolling interests even if it results in the noncontrolling interests having a deficit balance.

Changes in the Company's ownership interests in subsidiaries

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

b. The subsidiaries in the consolidated financial statements

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

Name of Investor	Name of Investee	Main Businesses and Products	Percentage of Ownership December 31		Note
			2017	2018	
Chunghwa Telecom Co., Ltd.	Senao International Co., Ltd. (“SENAO”)	Handset and peripherals retailer; sales of CHT mobile phone plans as an agent	29	28	a)
	Light Era Development Co., Ltd. (“LED”)	Planning and development of real estate and intelligent buildings, and property management	100	100	
	Donghwa Telecom Co., Ltd. (“DHT”)	International private leased circuit, IP VPN service, and IP transit services	100	100	
	Chunghwa Telecom Singapore Pte., Ltd. (“CHTS”)	International private leased circuit, IP VPN service, and IP transit services	100	100	
	Chunghwa System Integration Co., Ltd. (“CHSI”)	Providing system integration services and telecommunications equipment	100	100	
	Chunghwa Investment Co., Ltd. (“CHI”)	Investment	89	89	
	CHIEF Telecom Inc. (“CHIEF”)	Network integration, internet data center (“IDC”), communications integration and cloud application services	67	57	b)
	CHYP Multimedia Marketing & Communications Co., Ltd. (“CHYP”)	Digital information supply services and advertisement services	100	100	
	Prime Asia Investments Group Ltd. (B.V.I.) (“Prime Asia”)	Investment	100	100	
	Spring House Entertainment Tech. Inc. (“SHE”)	Software design services, internet contents production and play, and motion picture production and distribution	56	56	
	Chunghwa Telecom Global, Inc. (“CHTG”)	International private leased circuit, internet services, and transit services	100	100	
	Chunghwa Telecom Vietnam Co., Ltd. (“CHTV”)	Intelligent energy saving solutions, international circuit, and information and communication technology (“ICT”) services.	100	100	
	Smartfun Digital Co., Ltd. (“SFD”)	Providing diversified family education digital services	65	65	
	Chunghwa Telecom Japan Co., Ltd. (“CHTJ”)	International private leased circuit, IP VPN service, and IP transit services	100	100	
	Chunghwa Sochamp Technology Inc. (“CHST”)	Design, development and production of Automatic License Plate Recognition software and hardware	51	51	
			100	100	

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Honghwa International Co., Ltd. (“HHI”)	Telecommunications engineering, sales agent of mobile phone plan application and other business services			
Chunghwa Leading Photonics Tech Co., Ltd. (“CLPT”)	Production and sale of electronic components and finished products	75	75	
Chunghwa Telecom (Thailand) Co., Ltd. (“CHTT”)	International private leased circuit, IP VPN service, ICT and cloud VAS services	100	100	c)

(Continued)

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Name of Investor	Name of Investee	Main Businesses and Products	Percentage of Ownership		Note
			December 31 2017	December 31 2018	
	CHT Security Co., Ltd. (“CHTSC”)	Computing equipment installation, wholesale of computing and business machinery equipment and software, management consulting services, data processing services, digital information supply services and internet identify services	80	80	d)
	New Prospect Investments Holdings Ltd. (B.V.I.) (“New Prospect”)	Investment	—	—	e)
Senao International Co., Ltd.	Senao International (Samoa) Holding Ltd. (“SIS”)	International investment	100	100	
	Youth Co., Ltd. (“Youth”)	Sale of information and communication technologies products	89	93	f)
	Aval Technologies Co., Ltd. (“Aval”)	Sale of information and communication technologies products	100	100	
	SENYOUNG Insurance Agent Co., Ltd. (“SENYOUNG”)	Property and liability insurance agency	100	100	g)
Youth Co., Ltd.	ISPOT Co., Ltd. (“ISPOT”)	Sale of information and communication technologies products	100	100	
	Youyi Co., Ltd. (“Youyi”)	Maintenance of information and communication technologies products	100	100	
Light Era Development Co., Ltd.	Taoyuan Asia Silicon Valley Innovation Co., Ltd. (“TASVI”)	Development of real estate	—	60	h)
CHIEF Telecom Inc.	Unigate Telecom Inc. (“Unigate”)	Telecommunications and internet service	100	100	
	Chief International Corp. (“CIC”)	Telecommunications and internet service	100	100	
	Shanghai Chief Telecom Co., Ltd. (“SCT”)	Telecommunications and internet service	49	49	
Chunghwa System Integration Co., Ltd.	Concord Technology Co., Ltd. (“Concord”)	Investment	100	-	i)
Chunghwa Investment Co., Ltd.	Chunghwa Precision Test Tech. Co., Ltd. (“CHPT”)	Production and sale of semiconductor testing components and printed circuit board	38	34	j)
Concord Technology Co.,	Glory Network System Service (Shanghai) Co.,	Design, development and production of computer and internet software, installment, maintenance and	—	—	k)

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Ltd.	Ltd. (“GNSS (Shanghai)”) consulting services of information system integration, and sales of self-production products			
Chunghwa Precision Test Tech. Co., Ltd.	Chunghwa Precision Test Tech. USA Corporation (“CHPT (US)”) CHPT Japan Co., Ltd. (“CHPT (JP)”) Chunghwa Precision Test Tech. International, Ltd. (“CHPT (International)”)	Design and after-sale services of semiconductor testing components and printed circuit board Related services of electronic parts, machinery processed products and printed circuit board Wholesale and retail of electronic materials, and investment	100	100
Senao International (Samoa) Holding Ltd.	Senao International HK Limited (“SIHK”)	International investment	100	100

(Continued)

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Name of Investor	Name of Investee	Main Businesses and Products	Percentage of Ownership December 31		
			2017	2018	Note
Senao International HK Limited	Senao Trading (Fujian) Co., Ltd. (“STF”)	Sale of information and communication technologies products	100	100	l)
	Senao International Trading (Shanghai) Co., Ltd. (“SITS”)	Sale of information and communication technologies products	100	100	
	Senao International Trading (Shanghai) Co., Ltd. (“SEITS”)	Maintenance of information and communication technologies products	100	—	m)
	Senao International Trading (Jiangsu) Co., Ltd. (“SITJ”)	Sale of information and communication technologies products	100	100	n)
Prime Asia Investments Group Ltd. (B.V.I.)	Chunghwa Hsingta Co., Ltd. (“CHC”)	Investment	100	100	
Chunghwa Hsingta Co., Ltd. (“CHC”)	Chunghwa Telecom (China) Co., Ltd. (“CTC”)	Integrated information and communication solution services for enterprise clients, and intelligent energy network service	100	100	
	Jiangsu Zhenhua Information Technology Company, LLC. (“JZIT”)	Providing intelligent energy saving solution and intelligent buildings services	75	—	o)
Chunghwa Precision Test Tech. International, Ltd.	Shanghai Taihua Electronic Technology Limited (“STET”)	Design of printed circuit board and related consultation service	100	100	

(Concluded)

- a) SENAO transferred its treasury stock to employees in June 2018 and the Company’s ownership interest in SENAO decreased to 28.18% as of December 31, 2018. As Chunghwa controls five out of nine seats of the Board of Directors of SENAO through the support of large beneficial stockholders, the accounts of SENAO are included in the consolidated financial statements.
- b) Chunghwa and CHI disposed some shares of CHIEF in June 2017 before CHIEF traded its shares on the emerging stock market according to the local requirements. The Company’s equity ownership of CHIEF decreased to 70.43% as of December 31, 2017. CHIEF issued new shares in March and November 2018 as its employees exercised their options. In addition, Chunghwa and CHI disposed some shares of CHIEF in May 2018 before CHIEF traded its shares on the General Stock Market of the Taipei Exchange according to the local requirements. Furthermore, Chunghwa and CHI did not participate in the capital increase of CHIEF in June 2018. Therefore, the Company’s equity ownership interest in CHIEF decreased to 60.23% as of December 31, 2018.
- c) Chunghwa invested 100% equity shares of Chunghwa Telecom (Thailand) Co., Ltd. (“CHTT”) in March 2017.
- d) Chunghwa invested 80.27% equity shares of CHT Security Co., Ltd. (“CHTSC”) in December 2017.
- e)

New Prospect was approved to dissolve its business in April 2017. The liquidation of New Prospect was completed in May 2017.

- f) SENAO subscribed for all the shares in the capital increase of Youth in December 2018. Therefore, the Company's equity ownership interest in Youth increased from 89% to 93%.
- g) SENAO invested 100% equity shares of SENYOUNG Insurance Agent Co., Ltd. ("SENYOUNG") in November 2017.
- h) LED invested 60% equity shares of Taoyuan Asia Silicon Valley Innovation Co., Ltd. ("TASVI") in March 2018. TASVI was approved to end and dissolve its business in April 2019. The liquidation of TASVI is still in process.
- i) Concord was approved to end and dissolve its business in August 2017. The liquidation of Concord was completed in January 2018.

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- j) CHI did not participate in the capital increase of CHPT in September 2017, and disposed some shares of CHPT from April to August 2018. Therefore, its ownership interest in CHPT decreased to 34.25% as of December 31, 2018. However, considering absolute and relative size of ownership interest, and the dispersion of shares owned by the other stockholders, the management concluded that the Company has a sufficiently dominant voting interest to direct the relevant activities; hence, CHPT is deemed as a subsidiary of the Company.
- k) GNSS (Shanghai) completed its liquidation in August 2017 and Concord received the proceeds from the liquidation.
- l) STF was approved to end and dissolve its business in September 2018. The liquidation of STF is still in process.
- m) SEITS completed its liquidation in March 2018.
- n) SITJ was approved to end and dissolve its business in April 2018. The liquidation of SITJ was completed in March 2019.
- o) JZIT completed its liquidation in December 2018 and CHC received the proceeds from the liquidation.

The following diagram presents information regarding the relationship and ownership percentages between Chunghwa and its subsidiaries as of December 31, 2018:

Foreign Currencies

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

At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Exchange differences on monetary items arising from settlement or translation denominated in foreign currencies are recognized in profit or loss in the period in which they arise.

Non-monetary items carried at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined and related exchange differences are recognized in profit or loss. Conversely, when the fair value changes were recognized in other comprehensive income, related exchange difference shall be recognized in other comprehensive income.

Non-monetary items that are measured at historical cost in a foreign currency are not retranslated.

Chunghwa uses New Taiwan dollars (NT\$) as the functional currency. For the purposes of presenting consolidated financial statements, the assets and liabilities of the Company's foreign operations (including of the subsidiaries and associates in other countries or currencies used different with Chunghwa) are translated into New Taiwan dollars using exchange rates prevailing at the end of each reporting period. Income and expense items are translated at the average exchange rates for the period. Exchange differences arising, if any, are recognized in other comprehensive income and attributed to stockholders of the parent and noncontrolling interests as appropriate.

Cash Equivalents

Cash equivalents include commercial paper, time deposits and negotiable certificates of deposit with original maturities within three months from the date of acquisition, 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.

Inventories

Inventories are stated at the lower of cost or net realizable value item by item, except for those that may be appropriate to group items of similar or related inventories. Net realizable value is the estimated selling price of inventories less all estimated costs of completion and costs necessary to make the sale. The calculation of the cost of inventory is derived using the weighted-average method.

Buildings and Land Consigned to Construction Contractors

Inventories of LED are stated at the lower of cost or net realizable value item by item, except for those that may be appropriate to group as similar items or related inventories. Land acquired before construction is classified as land held for development, and then reclassified as land held under development after LED begins its construction project.

Upon the completion of the construction project, LED recognizes revenues in the amount of proceeds from customers for land and buildings and related costs when ownership is transferred to the customers. The unsold portion of the completed construction project is transferred to land and building held for sale.

Investments in Associates and Joint Ventures

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

Investments accounted for using the equity method include investments in associates and interests in joint ventures. Under the equity method, an investment in an associate or a joint venture is initially recognized at cost and adjusted thereafter to recognize the Company's share of profit or loss and other comprehensive income of the associate and joint venture as well as the distribution received.

When the Company reduces its ownership interest in an associate or a joint venture but the Company continues to use the equity method, the Company reclassifies to profit or loss the proportion of the gain or loss that had previously been recognized in other comprehensive income relating to that reduction in ownership interest if that gain or loss would be reclassified to profit or loss on the disposal of the related assets or liabilities.

Any excess of the cost of acquisition over the Company's share of the fair value of the identifiable net 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 shall not be amortized. Any excess of the Company's share of the net fair value of the identifiable assets and liabilities over the cost of acquisition is recognized immediately in profit or loss.

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

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

Property, Plant and Equipment

Property, plant and equipment are initially measured at cost and subsequently measured at cost less accumulated depreciation and accumulated impairment loss.

Property, plant and equipment in the course of construction are depreciated and classified to the appropriate categories of property, plant and equipment when completed and ready for their intended use.

Depreciation on property, plant and equipment is recognized using the straight-line method. Each significant part is depreciated separately. Freehold land is not depreciated. The estimated useful lives, residual values and depreciation method are reviewed at the end of each year, 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 net disposal proceeds and the carrying amount of the asset is recognized in profit or loss in the period in which the property is derecognized.

Investment Properties

Investment properties are properties held to earn rentals and/or for capital appreciation. Investment properties also include land held for a currently undetermined future use.

Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are measured at cost less accumulated depreciation and accumulated impairment loss. Depreciation is recognized using the straight-line method.

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

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

On derecognition of the investment properties, the difference between the net disposal proceeds and the carrying amount of the asset is recognized in profit or loss in the period in which the property is derecognized.

Goodwill

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

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

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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 attributable 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 to the other assets of the unit pro rata 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.

Intangible Assets Other Than Goodwill

Intangible assets with finite useful lives that are acquired separately are initially measured at cost and subsequently measured at cost less accumulated amortization and accumulated impairment loss. Amortization is recognized on a straight-line basis. The estimated useful life, residual value and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis. The residual value of an intangible asset with a finite useful life shall be assumed to be zero unless the Company expects to dispose of the intangible asset before the end of its economic life. Intangible assets with indefinite useful lives that are acquired separately are measured at cost less accumulated impairment loss.

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.

Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the carrying amount of the asset, are recognized in profit or loss in the period in which the asset is derecognized.

Impairment of Tangible Assets, Intangible Assets (Other Than Goodwill) and Incremental Costs of Obtaining Contracts

At the end of each reporting period, the Company 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 Company estimates the recoverable amount of the cash-generating unit to which the asset belongs.

Intangible assets not yet available for use are tested for impairment at least annually, and whenever there is an indication that the asset may be impaired.

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.

Impairment loss from the assets related to incremental cost of obtaining contracts is recognized to the extent that the carrying amount of the assets exceeds the remaining amount of consideration that the Company expects to receive in exchange for related goods or services less the costs which relate directly to providing those goods or services.

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 in profit or loss.

Financial Instruments

Financial assets and financial liabilities are recognized when the Company 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 of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to 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.

a. Financial assets

All regular way purchases or sales of financial assets are recognized and derecognized on a trade date basis. The regular way of transaction means the purchase or sale of financial assets delivered within the time frame established by regulation or convention in the marketplace.

1) Measurement category

Prior to 2018

a) Financial assets at fair value through profit or loss (FVTPL)

Financial assets are classified as at FVTPL when the financial asset is held for trading.

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 does not incorporate any dividend or interest earned on the financial asset.

b) Held-to-maturity financial assets

Held-to-maturity financial assets are non-derivative financial assets with fixed or determinable payments and fixed maturity date that the Company has positive intention and ability to hold to maturity other than those that are designated as at fair value through profit or loss or as available-for-sale and those that meet the definition of loans and receivables on initial recognition.

The Company invests in bank debentures and corporate bonds with specific credit ratings and the Company has positive intent and ability to hold to maturity, are classified as held-to-maturity investments.

Subsequent to initial recognition, held-to-maturity financial assets are measured at amortized cost using the effective interest method less any impairment loss.

c) Available-for-sale financial assets (AFS financial assets)

AFS financial assets are non-derivatives that are either designated as AFS or are not classified as loans and receivables, held-to-maturity financial assets or financial assets at fair value through profit or loss.

The Company invests in listed stocks, emerging market stocks, and non-listed stocks. Among these investments, those that have a quoted market price in an active market are classified as AFS and measured at fair value at the end of each reporting period; the others that do not have a quoted market price in an active market and whose fair value cannot be reliably measured are measured at cost less any identified impairment losses at the end of each reporting period. If, in a subsequent period, the fair value of the financial assets can be reliably measured, the financial assets are remeasured at fair value. The difference between the carrying amount and the fair value is recognized in other comprehensive income. Any impairment losses are recognized in profit or loss.

Changes in the carrying amount of AFS monetary financial assets relating to changes in foreign currency exchange rates, interest income calculated using the effective interest method and dividends on AFS equity investments are recognized in profit or loss. Other changes in the carrying amount of AFS financial assets are recognized in other comprehensive income and will be reclassified to profit or loss when the investment is disposed of or is determined to be impaired.

Dividends on AFS equity instruments are recognized in profit or loss when the Company's right to receive the dividends is established.

d) Loans and receivables

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Loans and receivables (including cash and cash equivalents, trade notes and accounts receivable, receivables from related parties, other financial assets and refundable deposits) are measured at amortized cost using the effective interest method, less any impairment loss, except for short-term receivables as the effect of discounting is immaterial.

2018

a) Financial assets at fair value through profit or loss (FVTPL)

Financial asset is classified as at FVTPL when the financial asset is mandatorily classified as at FVTPL. Financial assets mandatorily classified as at FVTPL include investments in equity instruments which are not designated as at fair value through other comprehensive income (FVOCI).

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 does not incorporate any dividend earned on the financial asset. Fair value is determined in the manner described in Note 39.

b) 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 are measured at amortized cost, which equals to gross carrying amount determined by the effective interest method less any impairment loss, except for short-term receivables as the effect of discounting is immaterial. Exchange differences are recognized in profit or loss.

Interest income is calculated by applying the effective interest rate to the gross carrying amount of financial assets.

c) Investments in equity instruments at FVOCI

On initial recognition, the Company may make an irrevocable election to designate investments in equity instruments as at FVOCI. Designation at FVOCI 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 FVOCI 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, it will be transferred to retained earnings.

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

2) Impairment of financial assets and contract assets

Prior to 2018

Financial assets, other than those at FVTPL, are assessed to determine whether there is objective evidence that an impairment loss has occurred at the end of each reporting period. 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 asset, the estimated future cash flows of the investment have been affected.

For financial assets carried at amortized cost, such as held-to-maturity financial assets, and trade notes and accounts receivable, assets that are individually assessed and not impaired are, in addition, assessed for impairment on a collective basis.

For financial assets carried at amortized cost, the amount of the impairment loss recognized is mainly based on the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate. However, since the discounted effect of short-term receivables is immaterial, the impairment loss is recognized on the difference between carrying amount and estimated future cash flow.

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

For AFS 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.

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When an AFS 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 AFS equity securities, impairment losses previously recognized in profit or loss are not reversed through profit or loss. Any increase in fair value subsequent to an impairment loss is recognized in other comprehensive income.

For financial assets that are carried at cost, the amount of the impairment loss is mainly measured as the difference between the asset's carrying amount and the present value of the estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment loss is not reversed in subsequent periods.

The carrying amount of the financial asset is reduced by the impairment loss directly for all financial assets with the exception of trade notes and accounts receivable and other receivables, where the carrying amount is reduced through the use of an allowance account. When trade notes and accounts receivable and other receivables are considered uncollectible, it is 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 notes and accounts receivable and other receivables that are written off against the allowance account.

2018

The Company recognizes a loss allowance for expected credit losses on financial assets at amortized cost (including accounts receivable) and contract assets.

The Company recognizes lifetime Expected Credit Loss (ECL) for accounts receivable and contract assets. For all other financial instruments, the Company 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 Company 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 ECL that is expected to result from default events on a financial instrument that are possible within 12 months after the reporting date.

The Company recognizes an impairment loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account.

3)Derecognition of financial assets

The Company 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.

Prior to 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 that had been recognized in other comprehensive income is recognized in profit or loss.

2018

On derecognition of a financial asset measured 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 investments in equity instruments at FVOCI in its entirety, the cumulative gain or loss is directly transferred to retained earnings, and it is not reclassified to profit or loss.

b. Financial liabilities

1) Subsequent measurement

Except for financial liabilities at FVTPL, all the financial liabilities are subsequently measured at amortized cost using the effective interest method.

2) Derecognition of financial liabilities

The Company derecognizes financial liabilities when, and only when, the Company's obligations are discharged, cancelled or expired. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable, including any non-cash assets transferred or liabilities assumed, is recognized in profit or loss.

c. Derivative financial instruments

The Company enters into derivative financial instruments to manage its exposure to foreign exchange rate risks, including forward exchange contracts.

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

Hedge Accounting

The Company designates some derivatives instruments as cash flow hedges. Hedges of foreign exchange risk on firm commitments are accounted for as 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 is 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 forecast 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 are included in the initial cost of the non-financial asset or non-financial liability.

Before 2018, hedge accounting was discontinued prospectively when the Company revoked the designated hedging relationship, or when the hedging instrument expired or was sold, terminated, or exercised, or when the hedging instrument no longer met the criteria for hedge accounting. Starting from 2018, the Company 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.

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Provisions

Provisions are measured at the best estimate of the expenditure required to settle the Company's obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. The provisions for warranties claims and trade-in right are made by management according to the sales agreements which represent the management's best estimate of the future outflow of economic benefits. The provisions of warranties claims are recognized as operating cost and prior to 2018, the provisions of trade-in right are recognized as the reduction of revenue in the period in which the goods are sold.

Revenue Recognition

Prior to 2018

Revenue from the sale of goods is recognized when all the following conditions are satisfied:

- a. The Company has transferred to the buyer the significant risks and rewards of ownership of the goods;
- b. The Company 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 the Company; and
- e. The costs incurred or to be incurred in respect of the transaction can be measured reliably.

Revenue is measured at the fair value of the consideration received or receivable and represents amounts for goods sold in the normal course of business, net of sales discounts and volume rebates. For trade notes and accounts receivable due within one year from the balance sheet date, as the nominal value of the consideration to be received approximates its fair value and transactions are frequent, fair value of the consideration is not determined by discounting all future receipts using an imputed rate of interest.

Usage revenues from fixed-line services (including local, domestic long distance and international long distance telephone services), cellular services, internet and data services, and interconnection and call transfer fees from other telecommunications companies and carriers are billed in arrears and are recognized based upon seconds or minutes of traffic processed when the services are provided in accordance with contract terms.

Other revenues are recognized as follows: (a) one-time subscriber connection fees (on fixed-line services) are deferred and recognized over the average expected customer service periods, (b) monthly fees (on fixed-line services, mobile, internet and data services) are accrued every month, and (c) prepaid services (fixed-line, mobile, internet and data services) are recognized as income based upon actual usage by customers.

Where the Company enters into transactions which involve both the provision of telecommunications service bundled with products such as handsets, total consideration received from products and telecommunications service in these arrangements are allocated and measured using units of accounting within the arrangement based on their relative fair values limited to the amount paid by the customer for the products.

Services revenue is recognized when service provided. Revenue from a contract to provide services is recognized by reference to the stage of completion of the contract.

Dividend income from investments is recognized when the stockholder's right to receive payment has been established under the premises when it is probable that the economic benefit related to the transactions will flow to the Company and that the revenue can be reasonably measured.

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

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When another party is involved in providing goods or services to a customer, the Company is acting as a principal when it has exposure to the significant risks and rewards associated with the sale of goods or the rendering of services; otherwise, the Company is acting as an agent. When the Company is acting as a principal, gross inflow of economic benefits arising from transactions is recognized as revenue. When the Company is acting as an agent, revenue is recognized in the amount of commission.

2018

The Company identifies the performance obligations in the contract with the customers, allocates transaction price to each performance obligation and recognizes revenue when performance obligations are satisfied.

Sales of products are recognized as revenue when the Company delivers products and the customer accepts and controls the product. Except for the consumer electronic products such as mobile devices sold in channel stores which are usually in cash sale, the Company recognizes revenues and corresponding trade notes and accounts receivable for sale of other electronic devices.

Usage revenues from fixed-line services (including local, domestic long distance and international long distance telephone services), cellular services, internet and data services, and interconnection and call transfer fees from other telecommunications companies and carriers are billed in arrears and are recognized based upon seconds or minutes of traffic processed when the services are provided in accordance with contract terms. The usage revenues and corresponding trade notes and accounts receivable are recognized monthly.

Other revenues are recognized as follows: (a) one-time subscriber connection fees (on fixed-line services) are first recognized as contract liabilities and revenues are recognized subsequently over the average expected customer service periods, (b) monthly fees (on fixed-line services, mobile, internet and data services) and related receivables are accrued monthly, and (c) prepaid services (fixed-line, mobile, internet and data services) are recognized as contract liabilities upon collection considerations from customers and are recognized as revenues subsequently based upon actual usage by customers.

Where the Company enters into transactions which involve both the provision of telecommunications service bundled with products such as handsets, total consideration received from products and telecommunications service in these arrangements are allocated based on their relative stand-alone selling price. The amount of sales revenue recognized for products is not limited to the amount paid by the customer for the products. When the amount of sales revenue recognized for products exceeded the amount paid by the customer for the products, the difference is recognized as contract assets. Contract assets are reclassified to accounts receivable when the amounts become collectible from customers subsequently. When the amount of sales revenue recognized for products was less than the amount paid by the customer for the products, the difference is recognized as contract liabilities and revenues are recognized subsequently when the telecommunications service are provided.

For project business contracts, if a substantial part of the Company's promise to customers is to manage and coordinate the various tasks and assume the risks of those tasks to ensure the individual goods or services are incorporated into the combined output, they are treated as a single performance obligation since the Company provides a significant integration service. The Company recognizes revenues and corresponding accounts receivable when the project business contract is completed and accepted by customers.

For service contracts such as maintenance and warranties, customers simultaneously receive and consume the benefits provided by the Company; thus revenues and corresponding accounts receivable of service contracts are recognized over the related service period.

When another party is involved in providing goods or services to a customer, the Company is acting as a principal if it controls the specified good or service before that good or service is transferred to a customer; otherwise, the Company is acting as an agent. When the Company is acting as a principal, gross inflow of economic benefits arising from transactions is recognized as revenue. When the Company is acting as an agent, revenue is recognized in the amount of commission.

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Incremental costs of obtaining contracts

Commissions and equipment subsidy related to telecommunications service as a result of obtaining contracts are recognized as an asset under the incremental costs of obtaining contracts to the extent the costs are expected to be recovered, and are amortized over the contract period. However, the Company elects not to capitalize the incremental costs of obtaining contracts if the amortization period of the assets that the Company otherwise would have recognized is expected to be one year or less.

Leasing

a. The Company as lessor

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

b. The Company as lessee

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

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.

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

Employee Benefits

a. 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 service.

b. Retirement benefits

Payments to defined contribution retirement benefit plans are recognized as an expense when employees have rendered service entitling them to the contributions.

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

Net defined benefit liability (asset) represents the actual deficit (surplus) in the Company'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.

c. Other long-term employee benefits

Other long-term employee benefits are accounted for in the same way as the accounting required for defined benefit plan except that remeasurement is recognized in profit or loss.

Share-based Payment Arrangements - Employee Stock Options

The fair value determined at the grant date of the employee share options is expensed on a straight-line basis over the vesting period, based on the Company's estimate of employee stock options that are expected to ultimately vest, with a corresponding increase in additional paid-in capital - employee stock options. If the equity instruments granted vest immediately at the grant date, expenses are recognized in full in profit or loss.

At the end of each reporting period, the Company revises 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 additional paid-in capital - employee stock options.

Income Tax

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

a. Current tax

The current tax is based on taxable profit for the year. Taxable profit differs from profit as reported in the consolidated statement of comprehensive income because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. The Company's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

Income tax on unappropriated earnings is accrued during the period the earnings arise and adjusted to the extent that distributions are approved by the stockholders in the following year.

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

b. 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 the 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 difference arising from 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 carry forward and unused tax credits from purchases of machinery, equipment and technology, and research and development expenditures 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, and interests in joint ventures, except where the Company is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments 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 the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered. A previously unrecognized deferred tax asset is also reviewed at the end of each reporting period 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 assets and liabilities are measured at the tax rates that are expected to apply in the period in which the liability is settled or the asset realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax assets and liabilities reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

c. Current and deferred tax

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

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.

4. CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION, UNCERTAINTY AND ASSUMPTION

In the application of the Company's accounting policies, the management is required to make judgments, estimates and assumptions which are based on historical experience and other factors that are not readily apparent from other sources. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed by the management 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.

The following are the key assumptions concerning the future, and other key sources of estimation and uncertainty at the end of the reporting period. Actual results may differ from these estimates.

a. Revenue recognition

The Company's project agreements are mainly to provide one or more equipment or services to customers. In order to fulfill the agreements, another party may be involved in some agreements. The Company considers the following factors to determine whether the Company is a principal of the transaction: whether the Company is the primary obligation provider of the agreements, its exposures to inventory risks and the discretion in establishing prices, etc. The determination of whether the Company is a principal or an agent will affect the amount of revenue recognized by the Company. Only when the Company is acting as a principal, gross inflows of economic benefits arising from transactions is recognized as revenue.

b. Impairment of trade notes and accounts receivable

Prior to 2018

When there is objective evidence showed indications of impairment, the Company considers the estimation of future cash flows. The amount of impairment will be measured at the difference between the carrying amount and the present value of estimated future cash flows discounted by the original effective interest rates of the financial assets. However, as the impact from discounting short-term receivables is not material, the impairment of short-term

receivables is measured at the difference between the carrying amount and the estimated undiscounted future cash flows. Where the actual future cash flows are lower than expected, a material impairment loss may arise.

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The provision for impairment of trade notes and accounts receivable is based on assumptions about risk of default and expected loss rates. The Company uses judgment in making these assumptions and in selecting the inputs to the impairment calculation, based on the Company's past experience, current market conditions as well as forward looking information at the end of each reporting period. For details of the key assumptions and inputs used, see Note 11. Where the actual future cash flows are less than expected, a material impairment loss may arise.

c. Fair value measurements and valuation processes

For the assets and liabilities measured at fair value without quoted prices in active markets, the Company's management determines the appropriate valuation techniques for the fair value measurements and whether to engage third party qualified appraisers based on the related regulations and professional judgments.

Information about the valuation techniques and inputs used in determining the fair value of various assets and liabilities was disclosed in Note 39. If the actual changes of inputs in the future differ from expectation, the fair value may vary accordingly. The Company updates inputs periodically to monitor the appropriateness of the fair value measurement.

d. Provision for inventory valuation and obsolescence

Inventories are stated at the lower of cost or net realizable value. Estimates of net realizable value are based on the most reliable evidence available at the time the estimates are made at the end of reporting period. These estimates take into consideration fluctuations of price or cost directly relating to events occurring after the end of the period to the extent that such events confirm conditions existing at the end of the period. Inventory write-downs are determined on an item by item basis, except for those similar items which could be categorized into the same groups. The Company uses the inventory holding period and turnover as the evaluation basis for inventory obsolescence losses.

e. Impairment of tangible and intangible assets

In the process of evaluating the potential impairment of tangible and intangible assets, the Company is required to consider internal and external indicators of impairment and make subjective judgments in determining the independent cash flows, useful lives, expected future revenue and expenses related to the specific asset groups within the context of the telecommunication industry. Any changes in these estimates based on changed economic conditions or business strategies could result in significant impairment charges in future periods.

f. Useful lives of property, plant and equipment

As discussed in Note 3, "Summary of Significant Accounting Policies - Property, Plant and Equipment", the Company reviews estimated useful lives of property, plant and equipment at the end of each year.

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g. Recognition and measurement of defined benefit plans

Net defined benefit liabilities and the resulting pension expense under defined benefit pension plans are calculated using the Projected Unit Credit Method. Actuarial assumptions comprise the discount rate, employee turnover rate, average future salary increase and etc. Changes in economic circumstances and market conditions will affect these assumptions and may have a material impact on the amount of the expense and the liability.

h. Control over subsidiaries

As discussed in Note 3, some entities are subsidiaries of the Company although the Company only owns less than 50% ownership interests in these entities. After considering the Company's absolute size of holding in the entity and the relative size of and the dispersion of shares owned by the other stockholders, and the contractual arrangements between the Company and other investors, potential voting interests and the written agreement between stockholders, the management concluded that the Company has a sufficiently dominant voting interest to direct the relevant activities of the entity and to have control over the governance of the entity and therefore the Company has control over these entities.

5. APPLICATION OF NEW AND AMENDED INTERNATIONAL FINANCIAL REPORTING STANDARDS

Amendments to IFRSs and the New Interpretation That Are Mandatorily Effective for the Current Year

The Company has applied the amendments to IAS 28 included in the Annual Improvements to IFRSs 2014-2016 Cycle, Amendments to IFRS 2: Classification and Measurement of Share-based Payment Transactions, IFRS 9: Financial Instruments and its related amendments, IFRS 15: Revenue from Contracts with Customers and its related amendments, Amendments to IAS 40: Transfers of Investment Property, and IFRIC 22: Foreign Currency Transactions and Advance Consideration for the first time in 2018. Except for the following, the application of these new standards and amendments has had no impact on the disclosures or amounts recognized in the Company's consolidated financial statements.

a. IFRS 9 "Financial Instruments" and related amendments

IFRS 9 supersedes IAS 39 "Financial Instruments: Recognition and Measurement", with consequential amendments to IFRS 7 "Financial Instruments: Disclosures" and other standards. IFRS 9 sets out the requirements for classification, measurement and impairment of financial assets and hedge accounting. Refer to Note 3 for information relating to the relevant accounting policies.

The requirements for classification, measurement and impairment of financial assets have been applied retrospectively on January 1, 2018, and the requirements for hedge accounting have been applied prospectively. IFRS 9 is not applicable to items that have already been derecognized on or before December 31, 2017.

Classification, measurement and impairment of financial assets and liabilities

On the basis of the facts and circumstances that existed on January 1, 2018, the Company performed an assessment of the classifications of financial assets and liabilities and elected not to restate the comparative figures.

The following table shows the original measurement categories and carrying amounts under IAS 39 and the new measurement categories and carrying amounts under IFRS 9 for each class of the Company's financial assets and financial liabilities as of January 1, 2018.

	Measurement Category		Carrying Amount		
	IAS 39	IFRS 9	IAS 39 NT\$	IFRS 9 NT\$	Note
(In Millions)					
Financial Assets					
Cash and cash equivalents	Loans and receivables	Amortized cost	\$28,825	\$28,825	1)
Equity securities	Available-for-sale	FVTPL	596	596	2)
	Available-for-sale	FVOCI- equity	5,155	6,997	2)
		investments			
Trade notes and accounts receivable, receivables from related parties, other current monetary assets and refundable deposits	Loans and receivables	Amortized cost	40,158	40,158	1)
Financial Liabilities					
Short-term loans, trade notes and accounts payable, payables to related parties, partial other payables, customers' deposit and loan-term loans	Amortized cost	Amortized cost	39,725	39,725	
Derivatives	Held-for-trading	FVTPL	1	1	
	Hedging derivative	Hedging financial	1	1	3)
	financial liabilities	liabilities			

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	IAS 39		IFRS 9		Retained Earnings	Other adjustment	Noncontrolling Interests	
	Carrying Amount		Carrying Amount		Effect on January 1, 2018	Effect on January 1, 2018	Effect on January 1, 2018	Note
	Reclassifications	Remeasurements						
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	
	(In Millions)							
Financial assets measured at								
FVTPL	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	
Add: reclassification from								
available for sale (IAS 39) -								
mandatory reclassification	—	596	—	596	6	(6)	—	2)
	—	596	—	596	6	(6)	—	
Financial liabilities measured at								
FVTPL	(1)	—	—	(1)	—	—	—	
Financial assets measured at								
FVOCI- equity investments	—	—	—	—	—	—	—	
Add: reclassification from								
available for sale (IAS 39) -								
designated at January 1, 2018	—	5,155	1,842	6,997	1,516	327	(1)	2)
	—	5,155	1,842	6,997	1,516	327	(1)	
Financial assets measured at								
Amortized cost	—	—	—	—	—	—	—	
Add: reclassification from loans								
and receivables (IAS 39)	—	68,983	—	68,983	—	—	—	1)
	—	68,983	—	68,983	—	—	—	

Financial liabilities measured at amortized cost	—	—	—	—	—	—	—
Add: reclassification from							
amortized cost (IAS 39)	—	(39,725)	—	(39,725)	—	—	—
	—	(39,725)	—	(39,725)	—	—	—
Hedging financial liabilities	—	—	—	—	—	—	—
Add: reclassification from							
Hedging derivative instrument							
(IAS 39)	—	(1)	—	(1)	—	—	— 3)
	—	(1)	—	(1)	—	—	—
Total	\$ (1)	\$35,008	\$ 1,842	\$36,849	\$ 1,522	\$ 321	\$ (1)

1) Cash and cash equivalents, trade notes and accounts receivable, receivables from related parties, other current monetary assets and refundable deposit that were classified as loans and receivables under IAS 39 are now classified as financial assets measured at amortized cost with assessment of expected credit loss.

2) The Company elected to reclassify equity securities originally classified as available-for-sale under IAS 39 to FVTPL and designated at FVOCI in accordance with IFRS 9. As a result, the related other equity - unrealized gain or loss on available-for-sale financial assets of \$6 million and \$556 million were reclassified to retained earnings and to other equity - unrealized gain or loss on financial assets at FVOCI, respectively.

Equity investments in non-listed stocks previously carried at cost under IAS 39 are designated as FVOCI and remeasured at fair values. As a result, financial assets at FVOCI and other equity - unrealized gain or loss on financial assets at FVOCI were increased by \$1,842 million and \$1,843 million, respectively, and noncontrolling interests was decreased by \$1 million. Some investments that previously classified as available-for-sale and measured at cost under IAS 39 were classified mandatorily as FVTPL under IFRS 9 as the contractual cash flows are not solely payments of principal and interest on the principal outstanding and such investments are not equity instruments.

The Company recognized impairment loss on certain investments in equity securities previously classified as available-for-sale and measured at cost and the loss was accumulated in retained earnings under IAS 39. Since those investments were designated as financial assets measured at FVOCI under IFRS 9 and no impairment assessment is required, an adjustment was made that resulted in a decrease of \$1,516 million in other equity - unrealized gain or loss on financial assets at FVOCI and an increase of the \$1,516 million in retained earnings on January 1, 2018.

3) Upon the application of IFRS 9, all derivative and non-derivative financial assets and financial liabilities which were designated as hedging instruments are presented as hedging financial assets and hedging financial liabilities for starting from January 1, 2018.

As the Company expects there is no tax obligation upon the disposal of the available-for-sale financial assets, the deferred income tax liabilities was decreased by \$1 million, unrealized gain or loss on available-for-sale financial assets was increased by \$4 million and noncontrolling interests was decreased by of \$3 million, respectively.

b. IFRS 15 “Revenue from Contracts with Customers” and related amendments

IFRS 15 establishes principles for recognizing revenue that apply to all contracts with customers, and supersedes IAS 18 “Revenue”, IAS 11 “Construction Contracts” and a number of revenue-related interpretations. Please refer to Note 3 for related accounting policies.

When applying IFRS 15 and related amendments, the Company allocates the transaction price to each performance obligation identified in the contract on a relative stand-alone selling price basis.

Where the Company enters into transactions which involve both the provision of telecommunications service bundled with products such as handsets, total consideration received from products and telecommunications service in these arrangements is allocated based on each performance obligation’s relative stand-alone selling price. The amount of sales revenue recognized for products is no longer limited to the amount paid by the customer for the products. This does not change the total revenue recognized, but changes the timing of revenue recognition. The Company may recognize more revenue at the beginning of the contract period (i.e., at the time of sale of products), and revenue recognized for telecommunications service in the subsequent contract periods will decrease.

Incremental cost of obtaining contracts is recognized as an asset to the extent the Company expects to recover those costs. Such asset is amortized on a basis that is consistent with the transfer to the customer of the goods or services to which the asset relates. Before the application of IFRS 15, the relevant expenditures were recognized as expenses.

IFRS 15 and its related amendments require that when another party is involved in providing goods or services to a customer, the Company is a principal if it controls the specified good or service before that good or service is transferred to a customer. Before the application of IFRS 15, the Company determined whether it is a principal or an agent based on its exposure to the significant risks and rewards associated with the sale of goods or the rendering of services.

Under IFRS 15, the net effect of revenue recognizes, consideration received and receivable is recognized as a contract asset or a contract liability. Before the application of IFRS 15, receivable was recognized or advance receipts and deferred revenue was reduced when revenue was recognized for the contract under IAS 18.

Under IFRS 15, the Company recognized a trade-in liability (other current liabilities) and a right to recover a product (other current assets) when recognizing revenue for the sale with a trade-in right. Before the application of IFRS 15, trade-in right provisions and inventories were recognized when recognizing revenue.

The Company elected to retrospectively apply IFRS 15 to contracts that were not completed on January 1, 2018 and recognized the cumulative effect of the change in the retained earnings on January 1, 2018.

Impact on items of assets, liabilities and equity

	Carrying		Carrying
	Amount	Adjustments	Amount
	Before	Arising	After
	Retrospective	from	Retrospective
	Adjustment	Initial	Adjustments
	as	Application	as
	of	of	of
	January	January	January
	1,	1,	1,
	2018	IFRS 15	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Contract assets - current	\$—	\$ 6,065	\$ 6,065
Trade notes and accounts receivable, net	\$31,941	(118)	\$ 31,823
Inventories	\$8,840	(132)	\$ 8,708
Prepayments - current	\$2,188	(7)	\$ 2,181
Other current assets	\$2,183	132	\$ 2,315
Contract assets - noncurrent	\$—	3,917	\$ 3,917
Incremental costs of obtaining contracts	\$—	2,474	\$ 2,474
Total effect on assets		\$ 12,331	
Contract liabilities - current	\$—	\$ 8,004	\$ 8,004
Current tax liabilities	\$8,674	2,227	\$ 10,901
Provisions - current	\$189	(88)	\$ 101
Advance receipts	\$8,842	(8,842)	\$ —
Other current liabilities	\$1,081	72	\$ 1,153
Contract liabilities - noncurrent	\$—	2,626	\$ 2,626
Deferred revenue	\$3,612	(3,612)	\$ —
Other noncurrent liabilities	\$3,458	1,072	\$ 4,530
Total effect on liabilities		\$ 1,459	
Total effect on equity (unappropriated earnings)	\$54,633	\$ 10,872	\$ 65,505

The following table shows the increase (decrease) in assets, liabilities and equity resulting from the application of IFRS 15 on the balance sheet date.

	December 31 2018 NT\$ (In Millions)
Contract assets - current	\$ 4,869
Trade notes and accounts receivable, net	(109)
Inventories	(80)
Prepayments - current	(12)
Other current assets	80
Contract assets - noncurrent	2,344
Incremental costs of obtaining contracts	1,335
Assets	\$ 8,427
Contract liabilities - current	\$ 10,688
Current tax liabilities	1,419
Provisions - current	(52)
Advance receipts	(11,277)
Other current liabilities	340
Contract liabilities - noncurrent	2,595
Deferred revenue	(3,748)
Other noncurrent liabilities	1,172
Liabilities	\$ 1,137
Equity (unappropriated earnings)	\$ 7,290

Impact on items of statement of comprehensive income for current year

The following table shows the increase (decrease) in net income resulting from the application of IFRS 15.

	Year Ended
	December 31 2018 NT\$ (In Millions)
Revenues	\$ (3,228)

Operating costs	2,455
Operating expenses	(1,293)
Income from operations	(4,390)
Income tax expense	(808)
Net income	\$ (3,582)
Decrease in net income attributable to:	
Stockholders of the parent	\$ (3,582)
Noncontrolling interests	—
	\$ (3,582)
Impact on earnings per share(NT\$):	
Basic earnings per share	\$ (0.46)
Diluted earnings per share	\$ (0.46)

New and Amended IFRSs in Issue But Not Yet Effective

The Company has not applied the following new and amended IFRSs that have been issued but are not yet effective.

		Effective Date
		Issued
New or Amended Standards and Interpretations		by IASB (Note 1)
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 IFRS 3	Definition of a Business	January 1, 2020 (Note 2)
Amendments to IFRS 10 and IAS 28	Sale or Contribution of Assets between an Investor and its Associate or Joint Venture	To be determined by IASB
Amendments to IAS 19	Plan Amendment, Curtailment or Settlement	January 1, 2019 (Note 3)
Amendments to IAS 28	Long-term Interests in Associates and Joint Ventures	January 1, 2019
Amendments to IAS 1 and IAS 8	Definition of Materiality	January 1, 2020 (Note 4)
IFRIC 23	Uncertainty Over Income Tax Treatments	January 1, 2019

Note 1: The aforementioned new or amended standards or interpretations are effective after fiscal year beginning on or after the effective dates, unless specified otherwise.

Note 2: The Company shall apply these amendments to business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2020 and to asset acquisitions that occur on or after the beginning of that period.

Note 3: The Company shall apply the amendments to pension plan amendments, curtailments or settlements occurring on or after January 1, 2019.

Note 4: The Company shall apply these amendments prospectively in annual periods beginning on or after January 1, 2020.

Except for the following items, the Company believes the adoption of the aforementioned new and amended IFRSs will not have material impact on the Company's consolidated financial statements.

a. IFRS 16 "Leases"

IFRS 16 sets out the accounting standards for identifying leases and accounting treatments for lessors and lessees. It will supersede IAS 17, IFRIC 4 - Determining Whether an Arrangement Contains a Lease and a number of related interpretations.

Upon the initial application of IFRS 16, the Company anticipates reassessing whether a contract is, or contains, a lease in accordance with the definition of a lease under IFRS 16. Some contracts currently identified as containing a lease under IAS 17 and IFRIC 4 do not meet the definition of a lease under IFRS 16 and will be accounted for in accordance with other accounting standards because the Company does not have the right to direct the use of the identified assets. Contracts that are reassessed as leases or containing a lease will be accounted for in accordance with the transitional provisions under IFRS 16.

Upon the initial application of IFRS 16, if the Company is a lessee, it shall recognize right-of-use assets and lease liabilities for all leases on the consolidated balance sheets except for those whose payments under low-value will be recognized as expenses on a straight-line basis. On the consolidated statements of comprehensive income, the Company will present the depreciation expense charged on the right-of-use asset separately from the interest expense accrued on lease liability using the effective interest method. On the consolidated statements of cash flows, cash payments for the principal portion of lease liability will be classified within financing activities; cash payments for interest portion will be classified within operating activities. Before the application of IFRS 16, payments under operating lease contracts are recognized as expenses on a straight-line basis. Prepaid lease payments for use rights of leased assets are recognized as prepaid rents. Cash flows for operating leases are classified within operating activities on the statements of cash flows.

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The Company will not make any adjustments for leases in which the Company is a lessor and will account for those leases with the application of IFRS 16 starting from January 1, 2019.

The Company anticipates applying IFRS 16 retrospectively with the cumulative effect of the initial application of IFRS 16 recognized in retained earnings on January 1, 2019. Comparative financial information will not be restated.

Lease liabilities will be recognized on January 1, 2019 for leases currently classified as operating leases under IAS 17 and measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate on January 1, 2019. Right-of-use assets will be measured at the present value discounted using the aforementioned incremental borrowing rate as if IFRS 16 had been applied since the commencement date of leases. The Company will apply IAS 36 for assessing impairment of right-of-use assets.

Anticipated impacts on assets, liabilities and equity

	Adjustments		
	Carrying Amount as of December 31, 2018 NT\$ (In Millions)	Arising from Initial Application of IFRS 16 NT\$	Adjusted Carrying Amount as of January 1, 2019 NT\$
Prepayments - current	\$ 1,873	\$ (245)	\$ 1,628
Property, plant and equipment	\$ 288,914	(1,309)	\$ 287,605
Right-of-use assets	\$—	12,163	\$ 12,163
Deferred income tax assets	\$ 3,554	26	\$ 3,580
Prepayments - noncurrent	\$ 3,463	(414)	\$ 3,049
Total effect on assets		\$ 10,221	
Contract liabilities - current	\$ 10,688	\$ 214	\$ 10,902
Lease liabilities - current	\$—	3,394	\$ 3,394
Other payables	\$ 23,315	(48)	\$ 23,267
Other current liabilities	\$ 1,382	(214)	\$ 1,168
Contract liabilities - noncurrent	\$ 2,595	3,483	\$ 6,078
Deferred income tax liabilities	\$ 1,992	—	\$ 1,992
Lease liabilities - noncurrent	\$—	6,946	\$ 6,946
Other noncurrent liabilities	\$ 4,793	(3,483)	\$ 1,310
Total effect on liabilities		\$ 10,292	
Unappropriated earnings	\$ 66,626	\$ (51)	\$ 66,575
Noncontrolling interests	\$ 9,857	\$ (20)	\$ 9,837
Total effect on equity		\$ (71)	

Except for the abovementioned impact, as of the date the consolidated financial statements were authorized for issue, the Company is continuously assessing the possible impact that the application of other standards and interpretations will have on the Company's financial position and operating result, and will disclose the relevant impact when the assessment is completed.

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6. U.S. DOLLAR AMOUNTS

The Company maintains its accounts and expresses its consolidated financial statements in New Taiwan dollars. For readers' convenience only, U.S. dollar amounts presented in the accompanying consolidated financial statements have been translated from New Taiwan dollars as set forth in the statistical release of the Federal Reserve Board of the United States as of December 31, 2018, which was NT\$30.61 to US\$1.00. The convenience translations should not be construed as representations that the New Taiwan dollar amounts have been, could have been, or could in the future be, converted into U.S. dollars at this or any other rate of exchange.

7. CASH AND CASH EQUIVALENTS

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Cash		
Cash on hand	\$383	\$463
Bank deposits	7,877	10,575
	8,260	11,038
Cash equivalents (investments with maturities of less than three months)		
Commercial paper	\$10,179	\$6,144
Negotiable certificate of deposit	7,950	7,600
Time deposits	2,436	2,863
	20,565	16,607
	\$28,825	\$27,645

The annual yield rates of bank deposits, commercial paper, negotiable certificates of deposit and time deposits as of balance sheet dates were as follows:

	December 31	
	2017	2018
Bank deposits	0.00%-0.70%	0.00%-0.50%
Commercial paper	0.32%-0.40%	0.47%-0.57%
Negotiable certificate of deposit	0.40%-0.50%	0.55%-0.60%
Time deposits	0.52%-4.40%	0.09%-4.40%

8. FINANCIAL INSTRUMENTS AT FAIR VALUE THROUGH PROFIT OR LOSS

	December 31 2017 NT\$	2018 NT\$
	(In Millions)	
Financial assets-noncurrent		
Mandatorily measured at FVTPL		
Non-derivatives		
Non-listed stocks - domestic	\$—	\$293
Non-listed stocks - foreign	—	224
Forward exchange contracts	\$—	\$517
Financial liabilities-current		
Held for trading		
Derivatives (not designated for hedge)		
Forward exchange contracts	\$1	\$1

Some available-for-sale financial assets under IAS 39 were mandatorily reclassified as FVTPL when applying IFRS 9.

Outstanding forward exchange contracts not designated for hedge as of balance sheet dates were as follows:

		Contract	
	Currency	Maturity Period	Amount (In Millions)
December 31, 2017			
Forward exchange contracts - buy	EUR/NT\$	2018.03-06	EUR2/NT\$69
Forward exchange contracts - buy	US\$/NT\$	2018.01	US\$4/NT\$125
December 31, 2018			
Forward exchange contracts - buy	EUR/NT\$	2019.03-06	EUR5/NT\$193
Forward exchange contracts - buy	US\$/NT\$	2019.01	US\$2/NT\$62

The Company entered into the above forward exchange contracts to manage its exposure to foreign currency risk due to fluctuations in exchange rates. However, the aforementioned derivatives did not meet the criteria for hedge accounting.

9. FINANCIAL ASSETS AT FAIR VALUE THROUGH OTHER COMPREHENSIVE INCOME - NONCURRENT - 2018

	December
	31
	2018
	NT\$
	(In
	Millions)
Domestic investments	
Listed stocks	\$ 2,900
Non-listed stocks	3,901
Foreign investments	
Non-listed stocks	132
	\$ 6,933

The Company holds the above foreign and domestic stocks for medium to long-term strategic purposes and expects to profit from long-term investment. Accordingly, the management elected to designate these investments in equity instruments at FVOCI as they believe that recognizing short-term fair value fluctuations of these investments in profit or loss is not consistent with the Company's strategy of holding these investments for long-term purposes. These investments in equity instruments were classified as available-for-sale financial assets under IAS 39. Refer to Note s 5 and 10 for information relating to their reclassification and comparative information for 2017.

The Company recognized dividend income of \$396 million for the year ended December 31, 2018 from those investments still held on December 31, 2018.

10. AVAILABLE-FOR-SALE FINANCIAL ASSETS - NONCURRENT – 2017

	December 31 2017 NT\$ (In Millions)
Equity securities	
Domestic listed stocks	\$ 3,125
Domestic non-listed stocks	2,332
Foreign non-listed stocks	294
	\$ 5,751

Chunghwa evaluated and concluded its listed available-for-sale financial assets were impaired and recorded an impairment loss of \$577 million for the year ended December 31, 2016. The Company evaluated and concluded that there was no indication that its listed available-for-sale financial assets were impaired; therefore, no impairment loss was recognized for the year ended December 31, 2017.

The fair values of the above non-listed stocks investments cannot be reliably measured due to the range of reasonable fair value estimates was so significant, the above non-listed stocks investments owned by the Company were carried at costs less any impairment losses at the balance sheet dates.

The Company invested \$300 million to invest Taiwan Capital Buffalo Fund Co., Ltd. in December 2017 and owns 12.9% equity shares of Taiwan Capital Buffalo Fund Co., Ltd.. Taiwan Capital Buffalo Fund Co., Ltd. engaged mainly in investment business.

The Company disposed non-listed available-for-sale financial assets with carrying amounts of \$9 million and \$5 million for the years ended 2016 and 2017, respectively, and recognized the gains (losses) from the disposal of \$1 million and \$3 million for the years ended December 31, 2016 and 2017, respectively.

The Company evaluated and concluded that there was no indication that non-listed available-for-sale financial assets were impaired; therefore, no impairment loss was recognized for the years ended December 31, 2016 and 2017.

11. TRADE NOTES AND ACCOUNTS RECEIVABLE, NET

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Trade notes and accounts receivable	\$34,058	\$32,678
Less: Loss allowance	(2,117)	(2,602)
	\$31,941	\$30,076

Prior to 2018

The average credit terms range from 30 to 90 days. In determining the recoverability of trade notes and accounts receivable, the Company considers significant change in the credit quality of the trade notes and accounts receivable from the date credit was initially granted up to the end of the reporting period. In general, with few exceptional cases, it is unlikely for the notes and accounts receivable due longer than 180 days to be collected, therefore the Company recognized 100% allowance of notes and accounts receivable overdue longer than 180 days. For the notes and accounts receivable less than 180 days, the allowance for doubtful accounts was estimated based on the Company's historical recovery experience.

The Company serves a large consumer base; therefore, the concentration of credit risk is limited.

The aging analysis for trade notes and accounts receivable as of balance sheet dates was as follows:

	December 31 2017 NT\$ (In Millions)
Non-overdue	\$ 30,032
Less than 30 days	1,280
31-60 days	485
61-90 days	278
91-120 days	253
121-180 days	122
More than 181 days	1,608
	\$ 34,058

The above aging analysis was based on days overdue.

At the balance sheet dates, the receivables that were past due but not impaired were considered recoverable by the management of the Company. The aging of these receivables as of balance sheet dates was as follows:

	December 31 2017 NT\$ (In Millions)
Less than 30 days	\$ 328
31-60 days	36

61-90 days	7
91-120 days	70
121-180 days	1
More than 181 days	7
	\$ 449

The above aging analysis was based on days overdue.

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Movements of the allowance for doubtful accounts were as follows:

	Individually	Collectively	
	Assessed	Assessed	
	for	for	
	Impairment	Impairment	Total
	NT\$	NT\$	NT\$
	(In Millions)		
Balance on January 1, 2016	\$364	\$ 970	\$1,334
Add: Provision for doubtful accounts	715	228	943
Deduct: Amounts written off	(274)	(230)	(504)
Balance on December 31, 2016	805	968	1,773
Add: Provision for doubtful accounts	535	43	578
Deduct: Amounts written off	(15)	(219)	(234)
Balance on December 31, 2017	\$1,325	\$ 792	\$2,117

2018

The average credit terms range from 30 to 90 days.

The Company serves a large consumer base for telecommunications business; therefore, the concentration of credit risk is limited. When having transactions with customers, the Company considers the record of arrears in the past. In addition, the Company may also collect some telecommunication charges in advance to reduce the payment arrears in subsequent periods.

The Company adopted a policy of dealing with counterparties with certain credit ratings for project business and to obtain collateral where necessary to mitigate the risk of loss arising from default. Credit rating information is provided by independent rating agencies where available and, if such credit rating information is not available, the Company uses other publicly available financial information and its own historical transaction experience to rate its major customers. The Company continues to monitor the credit exposure and credit ratings of its counterparties and spread the credit risk amongst qualified counterparties.

In order to mitigate credit risk, the management of the Company has delegated a team responsible for determining credit limits, credit approvals and other monitoring procedures to ensure the recoverability of receivables. In addition, the Company reviews the recoverable amount of receivables at balance sheet dates to ensure that adequate allowance is provided for possible irrecoverable amounts. In this regard, the management believes the Company's credit risk could be reasonably reduced.

The Company applies the simplified approach to providing for expected credit losses prescribed by IFRS 9, which permits the use of lifetime expected loss provision for receivables. The expected credit losses on receivables are estimated using a provision matrix by reference to past default experience of the customers and an analysis of the customers' current financial positions, as well as the forward-looking indicators such as macroeconomic business indicator.

When there are evidences indicating that the counterparty is in evasion, bankruptcy, deregistration of its company or the accounts receivable are over two years past due and the recoverable amount cannot be reasonable estimated, the Company writes off the trade notes and accounts receivable. For accounts receivable that have been written off, the Company continues to engage in enforcement activity to attempt to recover the receivables due. Where recoveries are made, these are recognized in profit or loss.

Except for receivables arising from telecommunications business and project business, the Company's remaining accounts receivable are limited. Therefore, only Chunghwa's provision matrix arising from telecommunications business and project business is disclosed below.

December 31, 2018

	Not Past Due	Past Due	Pass Due	Pass Due	Pass Due	Pass Due	Pass Due	Total
	Less than 30 Days	31 to 60 Days	61 to 90 Days	91 to 120 Days	121 to 180 Days	181 to 360 Days	over 360 Days	
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
Telecommunications business								
Expected credit loss rate								
(Note a)	0%-3%	3%-30%	7%-69%	19%-82%	21%-90%	61%-95%	100%	
Gross carrying amount	\$23,307	\$ 455	\$ 95	\$49	\$ 37	\$ 36	\$418	\$24,397
Loss allowance								
(Lifetime ECL)	(80)	(27)	(24)	(29)	(28)	(25)	(418)	(631)
Amortized cost	\$23,227	\$ 428	\$ 71	\$20	\$ 9	\$ 11	\$—	\$23,766
Project business								
Expected credit loss rate								
(Note b)	0%-5%	5%	10%	30%	50%	80%	100%	
Gross carrying amount	\$4,067	\$ 88	\$ 92	\$8	\$ 12	\$ 7	\$1,725	\$5,999
Loss allowance (Lifetime ECL)								
(Lifetime ECL)	(153)	(8)	(10)	(3)	(8)	(6)	(1,725)	(1,913)
Amortized cost	\$3,914	\$ 80	\$ 82	\$5	\$ 4	\$ 1	\$—	\$4,086

Note Please refer to Note 44 for the information of disaggregation of telecommunications service revenue. The expected credit loss rate applicable to different business revenue varies so as to reflect the risk level indicating by factors like historical experience.

Note The project business has different loss types according to the customer types. The expected credit loss rate listed above is for general customers. When customer is the government or its affiliates, it is expected that no credit loss will occur. For those who had bounced or exchanged checks as well as those accounts receivable were overdue more than six months that are classified as high risk customers, the expected credit loss of high risk customers is at least 50%, and the rate is increased when the overdue days increases.

Movements of the allowance for doubtful accounts were as follows:

	Year Ended December 31 2018 NT\$ (In Millions)
Balance at January 1, 2018	\$ 2,117
Add: Provision of credit loss	805
Less: Amounts written off	(320)
Balance at December 31, 2018	\$ 2,602

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12. INVENTORIES

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Merchandise	\$5,133	\$6,068
Project in process	1,390	6,756
Work in process	152	109
Raw materials	89	112
	6,764	13,045
Land held under development	1,999	1,999
Construction in progress	77	77
	\$8,840	\$15,121

The operating costs related to inventories were \$54,183 million, \$56,342 million and \$48,649 million for the years ended December 31, 2016, 2017 and 2018, respectively.

For the years ended December 31, 2016, 2017 and 2018, the provisions for inventory and obsolescence recognized as operating costs included the amounts of \$192 million, \$52 million and \$365 million, respectively.

As of December 31, 2017 and 2018, inventories of \$2,076 million and \$2,076 million, respectively, were expected to be recovered for a time period longer than twelve months. The aforementioned amount of inventories is related to property development owned by LED.

Land held under development and construction in progress on December 31, 2017 and 2018 was developed by LED for Qingshan Sec., Dayuan Dist., Taoyuan City project.

13. PREPAYMENTS

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Prepaid rents	\$2,687	\$2,415
Others	3,074	2,921
	\$5,761	\$5,336
Current		
Prepaid rents	\$812	\$600
Others	1,376	1,273
	\$2,188	\$1,873
Noncurrent		
Prepaid rents	\$1,875	\$1,815
Others	1,698	1,648
	\$3,573	\$3,463

14. OTHER CURRENT MONETARY ASSETS

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Time deposits and negotiable certificates of deposit		
with maturities of more than three months	\$4,054	\$8,157
Others	1,254	1,347
	\$5,308	\$9,504

The annual yield rates of time deposits and negotiable certificates of deposit with maturities of more than three months at the balance sheet dates were as follows:

	December 31	
	2017	2018
Time deposits and negotiable certificates of deposit	0.06%-4.15%	0.03%-3.05%
with maturities of more than three months		

15. SUBSIDIARIES

a. Information on significant noncontrolling interest subsidiary

The table below shows details of less than wholly owned subsidiaries of the Company that have material noncontrolling interests:

Subsidiaries	Place of Incorporation and Principal Place of Business	Proportion of Ownership	
		Interests and Voting Rights	
		Held by Noncontrolling Interests	
		December 31	
		2017	2018
SENAO	Taiwan	71%	72%
CHPT	Taiwan	62%	66%

Profit Allocated to Accumulated

	Noncontrolling Interests			Noncontrolling Interests	
	Year Ended December 31			December 31	
	2016	2017	2018	2017	2018
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)				
SENAO	\$690	\$592	\$326	\$4,092	\$4,108
CHPT	\$341	\$431	\$477	3,513	4,022
Individually immaterial subsidiaries with noncontrolling interests				869	1,727
				\$8,474	\$9,857

Summarized financial information in respect of SENA O and its subsidiaries that has material noncontrolling interests is set out below. The summarized financial information below represents amounts before intercompany eliminations.

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Current assets	\$7,584	\$7,041
Noncurrent assets	\$2,531	\$2,527
Current liabilities	\$4,278	\$3,757
Noncurrent liabilities	\$160	\$164
Equity attributable to the parent	\$1,585	\$1,539
Equity attributable to noncontrolling interests	\$4,092	\$4,108

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Revenue and income	\$34,453	\$36,038	\$31,540
Costs and expenses	33,476	35,200	31,081
Profit for the year	\$977	\$838	\$459
Profit attributable to the parent	\$287	\$246	\$133
Profit attributable to noncontrolling interests	690	592	326
Profit for the year	\$977	\$838	\$459
Other comprehensive income (loss) attributable			
to the parent	\$(21)	\$3	\$(2)
Other comprehensive loss attributable to			
noncontrolling interests	(53)	(17)	(10)
Other comprehensive loss for the year	\$(74)	\$(14)	\$(12)
Total comprehensive income attributable to the			
parent	\$266	\$249	\$131
Total comprehensive income attributable to			
noncontrolling interests	637	575	316
Total comprehensive income for the year	\$903	\$824	\$447
Dividends paid to noncontrolling interests	\$526	\$703	\$587

Net cash flow from operating activities	\$531	\$ 1,081	\$696
Net cash flow from investing activities	130	(57)	(13)
Net cash flow from financing activities	(677)	(897)	(491)
Effect of exchange rate changes on cash and cash			
equivalents	(7)	(2)	1
Net cash inflow (outflow)	\$(23)	\$ 125	\$193

Summarized financial information in respect of CHPT and its subsidiaries that has material noncontrolling interests is set out below.

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The summarized financial information below represents amounts before intercompany eliminations.

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Current assets	\$4,496	\$4,417
Noncurrent assets	\$2,167	\$2,779
Current liabilities	\$965	\$1,076
Noncurrent liabilities	\$1	\$1
Equity attributable to CHI	\$2,184	\$2,097
Equity attributable to noncontrolling interests	\$3,513	\$4,022

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Revenue and income	\$2,607	\$ 3,127	\$3,299
Costs and expenses	2,020	2,402	2,549
Profit for the year	\$587	\$ 725	\$750
Profit attributable to CHI	\$246	\$ 294	\$273
Profit attributable to noncontrolling interests	341	431	477
Profit for the year	\$587	\$ 725	\$750
Other comprehensive loss attributable to CHI	\$—	\$ (1)	\$—
Other comprehensive loss attributable to noncontrolling interests	—	(2)	—
Other comprehensive loss for the year	\$—	\$ (3)	\$—
Total comprehensive income attributable to CHI	\$246	\$ 293	\$273
Total comprehensive income attributable to noncontrolling interests	341	429	477
Total comprehensive income for the year	\$587	\$ 722	\$750
Dividends paid to noncontrolling interests	\$109	\$ 146	\$210
Net cash flow from operating activities	\$671	\$ 1,052	\$862
Net cash flow from investing activities	(904)	(639)	(733)

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Net cash flow from financing activities	841	2,306	(328)
Effect of exchange rate changes on cash and cash			
equivalents	(2)	(4)	1
Net cash inflow (outflow)	\$606	\$ 2,715	\$(198)

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b. Equity transactions with noncontrolling interests

CHI disposed of some shares of CHPT in March 2016, and did not participate in the capital increase of CHPT in March 2016 and September 2017. Additionally, CHI disposed some shares of CHPT from April to August 2018. Therefore, the Company's ownership interest in CHPT decreased to 34.25% as of December 31, 2018. See Note 34(e) for details.

Chunghwa and CHI disposed some shares of CHIEF in June 2017 and May 2018 before CHIEF traded its shares on the emerging stock market and the General Stock Market of the Taipei Exchange according to the local requirements. In addition, Chunghwa and CHI did not participate in the capital increase of CHIEF in June 2018. Furthermore, CHIEF issued new shares in March and November 2018 as its employees exercised their options. Therefore, the Company's equity ownership interest in CHIEF decreased to 60.23% as of December 31, 2018. See Note 34(c)(d) for details.

SENAO transferred its treasury stock to employees in June and November 2017, and June 2018. The Company's ownership interest in SENAO decreased to 28.93% and 28.18% as of December 31, 2017 and 2018, respectively. See Note 34(b) for details.

SENAO subscribed for all the shares in the capital increase of Youth in December 2018. Therefore, the Company's equity ownership interest in Youth increased from 89% to 93%.

The above transactions were accounted for as equity transactions since the Company did not cease to have control over these subsidiaries.

The detailed information of the equity transactions for the years ended December 31, 2016, 2017 and 2018 was as follows:

	Year Ended December 31				
	2016		2017		2018
	CHI Did Not Participate in the Capital Increase of CHPT	CHI Did Not Participate in the Capital Increase of CHPT	CHI Did Not Participate in the Capital Increase of CHPT	SENAO Transferred its Treasury Stock	Chunghwa and CHI Disposed Some Shares of CHIEF
	NT\$	NT\$	NT\$	NT\$	
	(In Millions)				
Cash consideration received					
from (paid to)					
Noncontrolling interests	\$83	\$ 1,175	\$2,552	\$ 164	\$ 106
The proportionate share of	(25)	(786)	(1,750)	(137)	(29)
the carrying amount of					

the net assets of the					
subsidiary transferred (to)					
from noncontrolling					
interests					
Differences arising from					
equity transactions	\$58	\$ 389	\$802	\$ 27	\$ 77
Line items for equity					
transaction adjustments					
Additional paid-in capital -					
difference between					
consideration received or					
paid and the carrying					
amount of the subsidiaries'					
net assets upon actual					
disposal or acquisition	\$58	\$ —	\$—	\$ —	\$ 77
Additional paid-in capital -					
arising from changes in					
equities of subsidiaries	\$—	\$ 389	\$802	\$ 27	\$ —
Unappropriated earnings	\$—	\$ —	\$—	\$ —	\$ —

	Year Ended December 31					
	2018					
	SENAO					
	not					
	Proportionately participating in the Capital Increase of You NT\$ (In Millions)			Chunghwa and CHI Did Not Participate in the Increase of CHIEF NT\$		
	SENAO	CHI	CHPT	CHIEF	Chunghwa and CHI	Share-Based Payment of CHIEF
	Disposed Some Shares of CHPT	Disposed Some Shares of CHPT	Disposed Some Shares of CHPT	Disposed Some Shares of CHPT	Disposed Some Shares of CHIEF	Disposed Some Shares of CHIEF
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
Cash consideration received						
from noncontrolling interests	\$—	\$ 327	\$ 1,042	\$ 1,477	\$ 133	\$ 35
The proportionate share of						
the carrying amount of						
the net assets of the						
subsidiary transferred to						
noncontrolling interests	—	(272)	(330)	(700)	(19)	(24)
Differences arising from						
equity transactions	\$—	\$ 55	\$ 712	\$ 777	\$ 114	\$ 11
Line items for equity						
transaction adjustments						
Additional paid-in capital -						
difference between						
consideration received or						
paid and the carrying						
amount of the subsidiaries'						
net assets upon actual						
disposal or acquisition	\$—	\$ —	\$ 712	\$ —	\$ 114	\$ —
Additional paid-in capital -	\$—	\$ 55	\$ —	\$ 777	\$ —	\$ 11

arising from changes in
equities of subsidiaries

16. INVESTMENTS ACCOUNTED FOR USING EQUITY METHOD

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Investments in associates	\$2,326	\$2,732
Investments in joint ventures	—	—
	\$2,326	\$2,732

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a. Investments in associates

Investments in associates were as follows:

	Carrying Amount December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Listed		
Senao Networks, Inc. (“SNI”)	\$704	\$768
Non-listed		
ST-2 Satellite Ventures Pte. Ltd. (“STS”)	472	496
International Integrated System, Inc. (“IISI”)	292	306
Viettel-CHT Co., Ltd. (“Viettel-CHT”)	256	286
Taiwan International Standard Electronics Co., Ltd. (“TISE”)	132	213
Chunghwa PChome Fund I Co., Ltd. (“CPFI”)	—	199
KKBOX Taiwan Co., Ltd. (“KKBOXTW”, previously known as Skysoft Co., Ltd.)	140	147
KingwayTek Technology Co., Ltd. (“KWT”)	90	97
So-net Entertainment Taiwan Limited (“So-net”)	104	120
Taiwan International Ports Logistics Corporation (“TIPL”)	50	50
Click Force Co., Ltd. (“CF”)	38	38
UUPON Inc. (“UUPON”, previously known as Dian Zuan Integrating Marketing Co., Ltd.)	12	4
Alliance Digital Tech Co., Ltd. (“ADT”)	13	3
Cornerstone Ventures Co., Ltd. (“CVC”)	—	5
HopeTech Technologies Limited (“HopeTech”)	23	—
MeWorks LIMITED (HK) (“MeWorks”)	—	—
	\$2,326	\$2,732

The percentages of ownership and voting rights in associates held by the Company as of balance sheet dates were as follows:

	% of Ownership and Voting Rights December 31	
	2017	2018
Senao Networks, Inc. (“SNI”)	34	34
ST-2 Satellite Ventures Pte., Ltd. (“STS”)	38	38
International Integrated System, Inc. (“IISI”)	32	32
Viettel-CHT Co., Ltd. (“Viettel-CHT”)	30	30

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Taiwan International Standard Electronics Co., Ltd. (“TISE”)	40	40
Chunghwa PChome Fund I Co., Ltd. (“CPFI”)	-	50
KKBOX Taiwan Co., Ltd. (“KKBOXTW”)	30	30
KingwayTek Technology Co., Ltd. (“KWT”)	26	26
So-net Entertainment Taiwan Limited (“So-net”)	30	30
Taiwan International Ports Logistics Corporation (“TIPL”)	27	27
Click Force Co., Ltd. (“CF”)	49	49
UUPON Inc. (“UUPON”)	22	22
Alliance Digital Tech Co., Ltd. (“ADT”)	14	14
Cornerstone Ventures Co., Ltd. (“CVC”)	-	49
HopeTech Technologies Limited (“HopeTech”)	45	-
MeWorks LIMITED (HK) (“MeWorks”)	20	20

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None of the above associates is considered individually material to the Company. Summarized financial information of associates that are not individually material was as follows:

	Year Ended December		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
The Company's share of profits	\$557	\$ 420	\$509
The Company's share of other comprehensive			
income (loss)	(47)	(4)	5
The Company's share of total comprehensive			
income	\$510	\$ 416	\$514

The Level 1 fair values based on the closing market prices of SNI as of the balance sheet dates were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
SNI	\$2,130	\$1,447

Chunghwa participated in the capital increase of ADT by investing \$30 million in December 2016. The Company owns 14% equity shares of ADT. As the Company remains the seat in the Board of Directors of ADT, and considers the relative size of ownership interest and the dispersion of shares owned by the other stockholders, the Company remains significant influence over ADT. In June 2018, the stockholders of ADT approved to dissolve. ADT engages mainly in the development of mobile payments and information processing service.

The Company did not participate in the capital increase of UUPON in April 2017 and the ownership interest of UUPON decreased to 22%. UUPON engages mainly in information technology service and general advertisement service.

HopeTech returned the proceeds of \$19 million as a result of capital reduction in January 2018. The Company received \$3 million by disposing all shares of HopeTech in June 2018 and recognized disposal loss of \$0.1 million. HopeTech engages mainly in sale of information and communication technologies products.

The Company invested 50% equity shares of Chunghwa PChome Fund I Co., Ltd. (“CPFI”) in October 2018. The Company has only two out of five seats of the Board of Directors of CPFI, and has no control but significant influence over CPFI. Therefore, the Company recognized CPFI as investment in associate. CPFI engages mainly in investment business.

The Company invested 49% equity shares of Cornerstone Ventures Co., Ltd. (“CVC”) in October 2018. The Company has only two out of five seats of the Board of Directors of CVC, and has no control but significant influence over CVC. Therefore, the Company recognized CVC as investment in associate. CVC engages mainly in investment business.

The Company’s share of profit and other comprehensive loss of associates was recognized based on the audited financial statements.

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b. Investments in joint ventures

In March 2016, the stockholders of HDD approved that HDD should start its dissolution from March 31, 2016. Chunghwa received the proceeds from the liquidation in September 2016 and recognized the disposal loss of \$0.4 million. HDD completed its liquidation in March 2017.

In December 2016, the stockholders of CBO approved that CBO should start its dissolution from December 31, 2016. CBO completed its liquidation in December 2017.

None of the above joint ventures is considered individually material to the Company. Summarized financial information of joint ventures that were not material to the Company was as follows:

	Year Ended December		
	31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
The Company's share of loss	\$ (42)	\$ (1)	\$ —
The Company's share of other comprehensive			
income	—	—	—
The Company's share of total comprehensive loss	\$ (42)	\$ (1)	\$ —

The Company's share of loss of joint ventures was recorded based on the audited financial statements.

17. PROPERTY, PLANT AND EQUIPMENT

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Carrying amount		
Land	\$ 104,079	\$ 103,972
Land improvements	302	263
Buildings	45,895	44,784
Computer equipment	2,374	2,115
Telecommunications equipment	114,900	116,322
Transportation equipment	321	231
Miscellaneous equipment	2,310	2,582
Construction in progress and equipment to be accepted	18,527	18,645
	\$ 288,708	\$ 288,914

	Land	Improvements	Buildings	Computer Equipment	Telecommuni- cations Equipment	Transportation Equipment	Miscellaneous Equipment	Construction in Progress and Equipment to be Accepted	Total
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)								
Cost									
Balance on									
January 1, 2016	\$102,747	\$1,575	\$67,790	\$14,996	\$705,372	\$3,815	\$8,737	\$20,402	\$925,434
Additions	791	—	36	42	171	1	255	23,295	24,591
Disposal	(2)	(6)	(35)	(1,546)	(11,542)	(54)	(625)	—	(13,810)
Effect of foreign exchange differences	—	—	—	(3)	(35)	—	(4)	—	(42)
Others	336	12	(53)	806	21,726	104	580	(23,556)	(45)
Balance on									
December 31, 2016	\$103,872	\$1,581	\$67,738	\$14,295	\$715,692	\$3,866	\$8,943	\$20,141	\$936,128
Accumulated depreciation and impairment									
Balance on									
January 1, 2016	\$—	\$(1,203)	\$(24,421)	\$(11,715)	\$(582,205)	\$(2,750)	\$(6,741)	\$—	\$(629,035)
Depreciation expenses	—	(51)	(1,269)	(1,332)	(25,280)	(529)	(626)	—	(29,087)
Disposal	—	6	34	1,529	11,512	54	583	—	13,718
Impairment losses	—	—	—	—	(596)	—	—	—	(596)
	—	—	—	1	7	—	4	—	12

Effect of foreign exchange differences									
Others	—	—	65	(65)	65	(12)	(23)	—	30
Balance on December 31, 2016	\$—	\$(1,248)	\$(25,591)	\$(11,582)	\$(596,497)	\$(3,237)	\$(6,803)	\$—	\$(644,958)
Cost									
Balance on January 1, 2017	\$103,872	\$1,581	\$67,738	\$14,295	\$715,692	\$3,866	\$8,943	\$20,141	\$936,128
Additions	—	—	30	78	193	1	193	25,574	26,069
Disposal	(158)	(5)	(108)	(974)	(13,739)	(62)	(402)	—	(15,448)
Effect of foreign exchange differences									
Others	365	19	5,034	764	20,080	29	784	(27,188)	(113)
Balance on December 31, 2017	\$104,079	\$1,595	\$72,694	\$14,162	\$722,054	\$3,834	\$9,515	\$18,527	\$946,460

(Continued)

	Land	Improvements	Buildings	Equipment	Telecommuni- Equipment	Transportation Equipment	Miscellaneous Equipment	Construction in Progress and Equipment to be Accepted	Total
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
(In Millions)									
Accumulated depreciation and impairment Balance on January 1, 2017	\$—	\$(1,248)	\$(25,591)	\$(11,582)	\$(596,497)	\$(3,237)	\$(6,803)	\$—	\$(644,958)
Depreciation expenses	—	(50)	(1,402)	(1,192)	(24,492)	(330)	(677)	—	(28,143)
Disposal	—	4	47	967	13,712	63	389	—	15,182
Effect of foreign exchange differences	—	—	—	—	45	—	2	—	47
Others	—	1	147	19	78	(9)	(116)	—	120
Balance on December 31, 2017	\$—	\$(1,293)	\$(26,799)	\$(11,788)	\$(607,154)	\$(3,513)	\$(7,205)	\$—	\$(657,752)
Cost Balance on January 1, 2018	\$104,079	\$1,595	\$72,694	\$14,162	\$722,054	\$3,834	\$9,515	\$18,527	\$946,460
Additions	—	—	21	52	159	—	334	27,413	27,979
Disposal	(71)	—	—	(643)	(31,984)	(29)	(623)	—	(33,350)
Effect of foreign	—	—	—	—	60	—	—	—	60

exchange									
differences									
Others	(36)	6	196	687	25,459	77	648	(27,295)	(258)
Balance on									
December									
31, 2018	\$103,972	\$1,601	\$72,911	\$14,258	\$715,748	\$3,882	\$9,874	\$18,645	\$940,891
Accumulated									
depreciation									
and									
impairment									
Balance on									
January 1,									
2018	\$—	\$(1,293)	\$(26,799)	\$(11,788)	\$(607,154)	\$(3,513)	\$(7,205)	\$—	\$(657,752)
Depreciation									
expenses	—	(45)	(1,356)	(983)	(24,236)	(162)	(679)	—	(27,461)
Disposal	—	—	—	632	31,952	29	615	—	33,228
Effect of									
foreign									
exchange									
differences	—	—	—	—	(20)	—	—	—	(20)
Others	—	—	28	(4)	32	(5)	(23)	—	28
Balance on									
December									
31, 2018	\$—	\$(1,338)	\$(28,127)	\$(12,143)	\$(599,426)	\$(3,651)	\$(7,292)	\$—	\$(651,977)

(Concluded)

The Company determined that some telecommunications equipment was impaired in 2016 due to the expiration of 2G license in June 2017 which will lead to the termination of the related service. The Company evaluated and concluded the recoverable amount determined on the basis of value in use of aforementioned telecommunications equipment was lower than the carrying value, and recognized impairment losses of \$596 million for the year ended December 31 2016. In addition, the Company evaluated and concluded the recoverable amount of partial computer and miscellaneous equipment was nil and recognized impairment losses of \$0.4 million for the year ended December 31, 2016. The impairment loss was included in other income and expenses in the statements of comprehensive income. There was no indication that property, plant and equipment was impaired so the Company did not recognize any impairment loss for the years ended December 31, 2017 and 2018.

Depreciation expense is computed using the straight-line method over the following estimated service lives:

Land improvements	8-30 years
Buildings	
Main buildings	35-60 years
Other building facilities	3-20 years
Computer equipment	2-8 years
Telecommunications equipment	
Telecommunication circuits	2-30 years
Telecommunication machinery and	
antennas equipment	2-30 years
Transportation equipment	3-10 years
Miscellaneous equipment	
Leasehold improvements	1-6 years
Mechanical and air conditioner equipment	3-16 years
Others	1-10 years

18. INVESTMENT PROPERTIES

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Carrying amount		
Investment properties	\$8,048	\$8,287

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	Investment Properties NT\$ (In Millions)
Cost	
Balance on January 1, 2016	\$ 9,058
Additions	—
Reclassification	137
Balance on December 31, 2016	\$ 9,195
Accumulated depreciation and impairment	
Balance on January 1, 2016	\$ (1,156)
Depreciation expense	(19)
Reclassification	(53)
Reversal of impairment loss	148
Balance on December 31, 2016	\$ (1,080)
Cost	
Balance on January 1, 2017	\$ 9,195
Reclassification	(60)
Balance on December 31, 2017	\$ 9,135
Accumulated depreciation and impairment	
Balance on January 1, 2017	\$ (1,080)
Depreciation expense	(21)
Reclassification	3
Reversal of impairment loss	11
Balance on December 31, 2017	\$ (1,087)
Cost	
Balance on January 1, 2018	\$ 9,135
Additions	\$ 6
Reclassification	251
Balance on December 31, 2018	\$ 9,392
Accumulated depreciation and impairment	
Balance on January 1, 2018	\$ (1,087)
Depreciation expense	(21)
Reclassification	(16)
Reversal of impairment loss	19
Balance on December 31, 2018	\$ (1,105)

Depreciation expense is computed using the straight-line method over the following estimated service lives:

Land improvements	8-30 years
-------------------	------------

Buildings

Main buildings 35-60 years

Other building facilities 4-10 years

After the evaluation of land and buildings, the Company concluded the recoverable amount which represented the fair value less costs to sell of some land and buildings was higher than the carrying amount in 2016, 2017 and 2018. Therefore, the Company recognized reversals of impairment loss of \$148 million, \$11 million and \$19 million for the years ended December 31, 2016, 2017 and 2018, respectively, and the amounts were recognized only to the extent of impairment losses that had been recognized in prior years. The reversal of impairment loss was included in other income and expenses in the statements of comprehensive income.

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The fair values of the Company's investment properties as of December 31, 2017 and 2018 were determined by Level 3 fair value measurements inputs based on the appraisal reports conducted by independent appraisers. Those appraisal reports are based on the comparison approach, income approach or cost approach. Key assumptions and the fair values were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Fair value	\$17,728	\$ 18,515
Overall capital interest rate	1.46%-2.20%	2.02%-4.04%
Profit margin ratio	12%-20%	12%-20%
Discount rate	1.04%	—
Capitalization rate	0.47%-1.69%	0.79%-1.75%

All of the Company's investment properties are held under freehold interest.

19. INTANGIBLE ASSETS

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Carrying amount		
3G and 4G concession	\$53,469	\$49,512
Computer software	880	959
Goodwill	209	209
Others	325	264
	\$54,883	\$50,944

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	3G and 4G Concession NT\$	Computer Software NT\$	Goodwill NT\$	Others NT\$	Total NT\$
(In Millions)					
Cost					
Balance on January 1, 2016	\$59,209	\$ 3,249	\$ 236	\$ 409	\$63,103
Additions-acquired separately	—	277	—	5	282
Disposal	—	(121)	—	—	(121)
Effect of foreign exchange difference	—	—	—	—	—
Others	—	3	—	—	3
Balance on December 31, 2016	\$59,209	\$ 3,408	\$ 236	\$ 414	\$63,267
Accumulated amortization and impairment					
Balance on January 1, 2016	\$(10,608)	\$(1,983)	\$(18)	\$(47)	\$(12,656)
Amortization expenses	(2,805)	(551)	—	(23)	(3,379)
Disposal	—	121	—	—	121
Impairment losses	—	—	—	—	—
Effect of foreign exchange difference	—	—	—	—	—
Balance on December 31, 2016	\$(13,413)	\$(2,413)	\$(18)	\$(70)	\$(15,914)
Cost					
Balance on January 1, 2017	\$59,209	\$ 3,408	\$ 236	\$ 414	\$63,267
Additions-acquired separately	10,935	366	—	4	11,305
Disposal	—	(462)	—	—	(462)
Effect of foreign exchange difference	—	—	—	—	—
Balance on December 31, 2017	\$70,144	\$ 3,312	\$ 236	\$ 418	\$74,110
Accumulated amortization and impairment					
Balance on January 1, 2017	\$(13,413)	\$(2,413)	\$(18)	\$(70)	\$(15,914)
Amortization expenses	(3,262)	(481)	—	(23)	(3,766)
Disposal	—	462	—	—	462
Impairment losses	—	—	(9)	—	(9)
Effect of foreign exchange difference	—	—	—	—	—
Balance on December 31, 2017	\$(16,675)	\$(2,432)	\$(27)	\$(93)	\$(19,227)
Cost					
Balance on January 1, 2018	\$70,144	\$ 3,312	\$ 236	\$ 418	\$74,110
Additions-acquired separately	—	485	—	13	498
Disposal	—	(371)	—	(58)	(429)
Effect of foreign exchange difference	—	—	—	—	—
Balance on December 31, 2018	\$70,144	\$ 3,426	\$ 236	\$ 373	\$74,179
Accumulated amortization and impairment					
Balance on January 1, 2018	\$(16,675)	\$(2,432)	\$(27)	\$(93)	\$(19,227)
Amortization expenses	(3,957)	(406)	—	(23)	(4,386)
Disposal	—	371	—	58	429
Impairment losses	—	—	—	(51)	(51)
Effect of foreign exchange difference	—	—	—	—	—
Balance on December 31, 2018	\$(20,632)	\$(2,467)	\$(27)	\$(109)	\$(23,235)

For long-term business development, Chunghwa submitted an application to NCC for 4G mobile broadband license in 1.8 and 2.1 GHz frequency bands and obtained certain spectrums. Chunghwa paid the 4G concession fee amounting to \$10,935 million in November 2017.

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The concessions are granted and issued by the NCC. The concession fees are amortized using the straight-line method from the date operations commence through the date the license expires. The carrying amount of 3G concession fee was fully amortized in December 2018, and 4G concession fees will be fully amortized by December 2030 and December 2033.

The computer software is amortized using the straight-line method over the estimated useful lives of 1 to 10 years. Other intangible assets are amortized using the straight-line method over the estimated useful lives of 3 to 20 years. Goodwill is not amortized.

SENAO evaluated the goodwill that arose in the acquisition of Youth and its subsidiaries at the end of each year. SENAO determined the smallest identifiable group of assets that generates cash inflows as single cash generating units by business type, and evaluated the recoverable amount of those cash generating units by their value in use. The management of SENAO estimated the cash flow projections based on the financial budgets for the following five years. Discount rates were 14.6%, 14.8% and 13.7% as of December 31 2016, 2017 and 2018, respectively and were used to calculate the recoverable amount of related cash generating units by discounting aforementioned cash flows.

SENAO concluded that there was no impairment loss recognized for the years ended December 31, 2016 and 2018. Furthermore, SENAO concluded the recoverable amount of the goodwill was lower than the carrying value and recognized impairment loss of \$9 million for the year ended December 31, 2017.

SENAO evaluated and determined that the recoverable amount of certain licensed contract was nil and recognized the impairment loss of \$51 million for the year ended December 31, 2018. The recoverable amount was based on the value in use.

The aforementioned impairment loss was included in other income and expenses in the statements of comprehensive income.

20. OTHER ASSETS

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Spare parts	\$2,059	\$2,422
Refundable deposits	1,860	1,992
Other financial assets	1,000	1,000
Others	2,800	2,342
	\$7,719	\$7,756
Current		
Spare parts	\$2,059	\$2,422
Others	124	154
	\$2,183	\$2,576
Noncurrent		
Refundable deposits	\$1,860	\$1,992
Other financial assets	1,000	1,000
Others	2,676	2,188
	\$5,536	\$5,180

Other financial assets - noncurrent was Piping Fund. As part of the government's effort to upgrade the existing telecommunications infrastructure, Chunghwa and other public utility companies were required by the ROC government to contribute to a Piping Fund administered by the Taipei City Government. This fund was used to finance various telecommunications infrastructure projects. Net assets of this fund will be returned proportionately after the project is completed.

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21. HEDGING DERIVATIVE FINANCIAL INSTRUMENTS

Chunghwa's hedge strategy is to enter forward exchange contracts - buy to avoid its foreign currency exposure to certain foreign currency denominated equipment payments in the following six months. In addition, Chunghwa's management considers the market condition to determine the hedge ratio, and enters into forward exchange contracts with the banks to avoid the foreign currency risk.

Chunghwa signed equipment purchase contracts with suppliers, and entered into forward exchange contracts to avoid foreign currency risk exposure to Euro-denominated purchase commitments. Those forward exchange contracts were designated as cash flow hedges. When forecast purchases actually take place, basis adjustments are made to the initial carrying amounts of hedged items.

For the hedges of highly probable forecast sales and purchases, as the critical terms (i.e. the notional amount, life and underlying) of the forward foreign exchange contracts and their corresponding hedged items are the same, the Company performs a qualitative assessment of effectiveness and it is expected that the value of the forward contracts and the value of the corresponding hedged items will systematically change in opposite direction in response to movements in the underlying exchange rates.

The main source of hedge ineffectiveness in these hedging relationships is the effect of credit risks of the Company and the counterparty on the fair value of the forward exchange contracts. Such credit risks do not impact the fair value of the hedged item attributable to changes in foreign exchange rates. No other sources of ineffectiveness emerged from these hedging relationships.

Prior to 2018

The hedging instrument was showed as follows:

	December 31 2017 NT\$ (In Millions)
Hedging derivative financial assets	
Cash flow hedge - forward exchange contracts	\$
Hedging derivative financial liabilities	
Cash flow hedge - forward exchange contracts	\$ 1

For the years ended December 31, 2016 and 2017, losses arising from changes in fair value of the hedged items recognized in other comprehensive income were \$1 million and \$1 million, respectively. Upon the completion of the purchase transaction, the amount deferred and recognized in equity initially will be reclassified into equipment as its carrying value.

As of December 31, 2016 and 2017, Chunghwa expected part of the equipment purchase transactions would not occur and reclassified the related gains of \$1 million and \$2 million, respectively, from equity to profit or loss which arising from the forward exchange contracts of the aforementioned transactions for the years ended December 31, 2016 and 2017.

The outstanding forward exchange contracts at the balance sheet dates were as follows:

			Contract
		Maturity	Amount
	Currency	Period	(Millions)
December 31, 2017			
Forward exchange contracts - buy	EUR/NT\$	2018.03-06	EUR4/NT\$142

	Hedge Ineffectiveness		NT\$	NT\$	NT\$
			(In Millions)		
Cash flow hedge					
Forecast equipment purchases	\$	(2)	\$	1	\$ —

For the year ended December 31, 2018

Hedge Transaction	Comprehensive Income			Reclassification from Equity to Profit or Loss and the Adjusted Line Item	
	Hedging Gain or Loss Recognized in OCI	Amount of Hedge Ineffectiveness Recognized in Profit or Loss	Line Item in which Hedge Ineffectiveness is Included	Amount Reclassified to P/L and the Adjusted Line Item	Due to Hedged Future Cash Flows No Longer Expected to Occur
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)				
Cash flow hedge					
Forecast equipment purchases	\$ 2	\$ —	—	\$ (4)	\$ —
				Construction in progress and equipment to be accepted	Other gains and losses

22. SHORT-TERM LOANS

December 31
2017 2018
NT\$ NT\$
(In Millions)

Unsecured loans \$70 \$100

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The annual interest rates of loans were as follows:

	December 31	
	2017	2018
Unsecured loans	2.15%-2.19%	1.35%-2.35%

23. LONG-TERM LOANS

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Secured loans (Note 41)	\$1,600	\$1,600

The annual interest rates of loans were as follows:

	December 31	
	2017	2018
Secured loans	0.91%	0.92%

LED obtained a secured loan from Chang Hwa Bank in September 2010. Interest is paid monthly. \$300 million and \$1,350 million were originally due in December 2014 and September 2015, respectively. In October 2014, the bank borrowing mentioned above was extended to September 2018 for one time repayment. LED made an early repayment of \$ 50 million in April 2015. LED entered into a contract with Chang Hwa Bank to renew the contract upon the maturity of the aforementioned contract in December 2017 and the due date of the renew contract is extended to September 2021.

24. TRADE NOTES AND ACCOUNTS PAYABLE

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Trade notes and accounts payable	\$19,396	\$20,465

Trade notes and accounts payable were attributable to operating activities and the trading conditions were agreed separately.

25. OTHER PAYABLES

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Accrued salary and compensation	\$9,748	\$9,041
Accrued compensation to employees and		
remuneration to directors and supervisors	1,949	1,739
Payables to contractors	2,058	1,710
Payables to equipment suppliers	1,690	1,459
Amounts collected for others	1,203	1,226
Accrued franchise fees	1,248	1,151
Accrued maintenance costs	1,081	1,050
Others	6,024	5,939
	\$25,001	\$23,315

26. PROVISIONS

	December	
	31	
	2017	2018
	NT\$	NT\$
	(In	
	Millions)	
Warranties	\$132	\$132
Employee benefits	43	51
Trade-in right	87	—
Others	5	24
	\$267	\$207
Current	\$189	\$128
Noncurrent	78	79
	\$267	\$207

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	Warranties	Employee Benefits	Trade-in Rights	Others	Total
	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)				
Balance on January 1, 2016	\$213	\$ 30	\$ —	\$ 5	\$248
Additional provisions recognized	81	9	31	—	121
Used / forfeited during the year	(183)	(1)	—	—	(184)
Balance on December 31, 2016	\$111	\$ 38	\$ 31	\$ 5	\$185
Balance on January 1, 2017	\$111	\$ 38	\$ 31	\$ 5	\$185
Additional provisions recognized	79	7	69	—	155
Used / forfeited during the year	(58)	(2)	(13)	—	(73)
Balance on December 31, 2017	\$132	\$ 43	\$ 87	\$ 5	\$267
Balance on January 1, 2018	\$132	\$ 43	\$ 87	\$ 5	\$267
Effect of retrospective application of IFRS 15	—	—	(87)	—	(87)
Balance on January 1, 2018 as adjusted	132	43	—	5	180
Additional provisions recognized	164	9	—	19	192
Used / forfeited during the year	(164)	(1)	—	—	(165)
Balance on December 31, 2018	\$132	\$ 51	\$ —	\$ 24	\$207

- a. The provision for warranties claims represents the present value of the management's best estimate of the future outflow of economic benefits that will be required under the Company's obligation for warranties in sales agreements. The estimate has been made based on the historical warranty experience.
- b. The provision for employee benefits represents vested long-term service compensation accrued.
- c. The provision for trade-in right in 2016 and 2017 was based on the management's judgments to estimate the trade-in right of products exercised by customers in the future. The provision was recognized as a reduction of revenue in the period in which the goods are sold.

27. ADVANCE RECEIPTS – 2017

Advance receipts are mainly from advance telecommunication charges. For the obligations to transfer goods or services to customers for which the Company has received consideration from, they were retrospectively reclassified as contract liabilities starting from 2018.

28. RETIREMENT BENEFIT PLANS

a. Defined contribution plans

The pension plan under the Labor Pension Act of ROC (the "LPA") is considered as a defined contribution plan. Based on the LPA, Chunghwa and its domestic subsidiaries make monthly contributions to employees' individual pension accounts at 6% of monthly salaries and wages. Its foreign subsidiaries would make monthly contributions based on the local pension requirements.

b. Defined benefit plans

Chunghwa completed its privatization plans on August 12, 2005. Chunghwa is required to pay all accrued pension obligations including service clearance payment, lump sum payment under civil service plan, additional separation payments, etc. upon the completion of the privatization in accordance with the Statute Governing Privatization of Stated-owned Enterprises. After paying all pension obligations for privatization, the plan assets of Chunghwa should be transferred to the Fund for Privatization of Government-owned Enterprises (the "Privatization Fund") under the Executive Yuan. On August 7, 2006, Chunghwa transferred the remaining balance of fund to the Privatization Fund. However, according to the instructions of MOTC, Chunghwa was requested to administer the distributions to employees for pension obligations including service clearance payment, lump sum payment under civil service plan, additional separation payments, etc. upon the completion of the privatization and recognized in other current monetary assets.

Chunghwa and its subsidiaries SENA0, CHIEF, CHSI, and SHE with the pension mechanism under the Labor Standards Law are considered as defined benefit plans. These pension plans provide benefits based on an employee's length of service and average six-month salary prior to retirement. Chunghwa and its subsidiaries contribute an amount no more than 15% of salaries paid each month to their respective pension funds (the Funds), which are administered by the Labor Pension Fund Supervisory Committee (the Committee) and deposited in the names of the Committees in the Bank of Taiwan. The plan assets are held in a commingled fund which is operated and managed by the government's designated authorities; as such, the Company does not have any right to intervene in the investments of the funds. According to the Article 56 of the Labor Standards Law in the ROC revised in February 2015, entities are required to contribute the difference in one appropriation to the Funds before the end of next March when the balance of the Funds is insufficient to pay employees who will meet the retirement eligibility criteria within next year.

The amounts included in the consolidated balance sheets arising from the Company's obligation in respect of its defined benefit plans were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Present value of funded defined benefit obligation	\$37,663	\$41,397
Fair value of plan assets	(34,972)	(39,027)
Funded status - deficit	\$2,691	\$2,370
Net defined benefit liabilities	\$2,704	\$3,534
Net defined benefit assets	(13)	(1,164)
	\$2,691	\$2,370

Movements in the defined benefit obligation and the fair value of plan assets were as follows:

	Present Value of Funded Defined Benefit Obligation NT\$	Fair Value of Plan Assets NT\$ (In Millions)	Net Defined Benefit Liabilities (Assets) NT\$
Balance on January 1, 2016	\$ 30,882	\$ 23,794	\$ 7,088
Current service cost	2,866	—	2,866
Interest expense/interest income	600	573	27
Amounts recognized in profit or loss	3,466	573	2,893
Remeasurement on the net defined benefit liability			
Return on plan assets (excluding amounts included in net interest)	—	(352)	352
Actuarial losses recognized from changes in demographic assumptions	(124)	—	(124)
Actuarial gains recognized from changes in financial assumptions	1,715	—	1,715
Actuarial losses recognized from experience adjustments	100	—	100
Amounts recognized in other comprehensive income	1,691	(352)	2,043
Contributions from employer	—	11,235	(11,235)
Benefits paid	(1,296)	(1,296)	—
Benefits paid directly by the Company	(171)	—	(171)
Balance on December 31, 2016	34,572	33,954	618
Current service cost	2,918	—	2,918
Interest expense/interest income	506	519	(13)
Amounts recognized in profit or loss	3,424	519	2,905
Remeasurement on the net defined benefit liability			
Return on plan assets (excluding amounts included in net interest)	—	(193)	193
Actuarial losses recognized from changes in demographic assumptions	15	—	15
Actuarial losses recognized from experience adjustments	1,816	—	1,816
Amounts recognized in other comprehensive income	1,831	(193)	2,024
Contributions from employer	—	2,635	(2,635)

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Benefits paid	(1,943)	(1,943)	—
Benefits paid directly by the Company	(221)	—	(221)
Balance on December 31, 2017	37,663	34,972	2,691
Current service cost	3,024	—	3,024
Interest expense/interest income	550	544	6
Amounts recognized in profit or loss	3,574	544	3,030
Remeasurement on the net defined benefit liability			
Return on plan assets (excluding amounts included in net interest)	—	875	(875)
Actuarial losses recognized from changes in			
demographic assumptions	4	—	4
Actuarial gains recognized from changes in			
financial assumptions	1,273	—	1,273
Actuarial losses recognized from experience adjustments	813	—	813
Amounts recognized in other comprehensive income	2,090	875	1,215
Contributions from employer	—	4,374	(4,374)
Benefits paid	(1,738)	(1,738)	—
Benefits paid directly by the Company	(192)	—	(192)
Balance on December 31, 2018	\$ 41,397	\$ 39,027	\$ 2,370

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Relevant pension costs recognized in profit and loss for defined benefit plans were as follows:

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Operating costs	\$1,732	\$1,734	\$1,796
Marketing expenses	838	847	886
General and administrative expenses	155	156	164
Research and development expenses	97	97	107
	\$2,822	\$2,834	\$2,953

The Company is exposed to following risks for the defined benefits plans under the Labor Standards Law:

a. Investment risk

Under the Labor Standards Law, the rate of return on assets shall not be lower than the average interest rate on a two-year time deposit published by the local banks and the government is responsible for any shortfall in the event that the rate of return is less than the required rate of return. The plan assets are held in a commingled fund mainly invested in foreign and domestic equity and debt securities and bank deposits which is operated and managed by the government's designated authorities; as such, the Company does not have any right to intervene in the investments of the funds.

b. Interest rate risk

The decline in government bond interest rate will increase the present value of the obligation on the defined benefit plan, while the return on plan assets will increase. The net effect on the present value of the obligation on defined benefit plan is partially offset by the return on plan assets.

c. Salary risk

The calculation of the present value of defined benefit obligation is referred to the plan participants' future salary. Hence, the increase in plan participants' salary will increase the present value of the defined benefit obligation.

The most recent actuarial valuation of plan assets and the present value of the defined benefit obligation were carried out by the independent actuary.

The principal assumptions used for the purpose of the actuarial valuations were as follows:

	Measurement Date December 31	
	2017	2018
Discount rates	1.50%	1.00%
Expected rates of salary increase	1.20%-2.00%	1.20%-2.00%

If reasonably possible changes of the respective significant actuarial assumptions occur at the end of reporting periods, while holding all other assumptions constant, the present value of the defined benefit obligation would increase (decrease) as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Discount rates		
0.5% increase	\$(1,232)	\$(1,258)
0.5% decrease	\$1,310	\$1,338
Expected rates of salary increase		
0.5% increase	\$1,398	\$1,430
0.5% decrease	\$(1,326)	\$(1,356)

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

Furthermore, in presenting the above sensitivity analysis, the present value of the defined benefit obligation has been calculated using the projected unit credit method at the end of the reporting period, which is the same as that applied in calculating the defined benefit obligation liability recognized in the consolidated balance sheets.

There is no change in the methods and assumptions used in preparing the sensitivity analysis from the previous period.

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
The expected contributions to the plan for the next year	\$4,393	\$2,237
The average duration of the defined benefit obligation	6.8-12.5 years	6.5-12.1 years

The Company's maturity analysis of the undiscounted benefit payments as of December 31, 2018 was as follows:

Year	Amount NT\$ (In Millions)
2019	\$2,736
2020	6,089

2021	10,454
2022	12,566
2023 and thereafter	46,894
	\$ 78,739

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29. EQUITY

a. Share capital

1) Common stocks

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Number of authorized shares	12,000	12,000
Authorized shares	\$120,000	\$120,000
Number of issued and paid shares	7,757	7,757
Issued and outstanding shares	\$77,574	\$77,574

The issued common stocks of a par value at \$10 per share entitled the right to vote and receive dividends.

2) Global depositary receipts

The MOTC and some stockholders sold some common stocks of Chunghwa in an international offering of securities in the form of American Depositary Shares (“ADS”) (one ADS represents 10 common stocks) in July 2003, August 2005, and September 2006. The ADSs were traded on the New York Stock Exchange since July 17, 2003. As of December 31, 2018, the outstanding ADSs were 234 million common stocks, which equaled 23 million units and represented 3.02% of Chunghwa’s total outstanding common stocks.

The ADS holders generally have the same rights and obligations as other common stockholders, subject to the provision of relevant laws. The exercise of such rights and obligations shall comply with the related regulations and deposit agreement, which stipulate, among other things, that ADS holders are entitled to, through deposit agents:

- a) Exercise their voting rights,
- b) Sell their ADSs, and
- c) Receive dividends declared and subscribe to the issuance of new shares.

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b. Additional paid-in capital

The adjustments of additional paid-in capital for the years ended December 31, 2016, 2017 and 2018 were as follows:

	Movements of						
	Additional	Difference		between			
	Paid-in	Consideration		Received			
	Capital	and		and			
	for	Movements	Received	Carrying			
	Associates	Additional	and	Amount			
	and	Paid-in	of the				
	Joint	Capital	Accounted	Arising from	Subsidiaries'	Stockholders'	
	Ventures	Capital	for	Changes in	Net	Contribution	
			Using	Equities of	Assets	Donated	Due to
	Share	Equity	Method	Subsidiaries	Disposal	Capital	Privatization
	Premium	Method	Subsidiaries	Disposal	Capital	Privatization	Total
	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$	NT\$
	(In Millions)						
Balance on January 1, 2016	\$ 126,045	\$ —	\$ —	\$ 27	\$ 13	\$ 20,648	\$ 146,733
Partial disposal of interests in subsidiaries	—	—	—	58	—	—	58
Change in additional paid-in capital for not participating in the capital increase of a subsidiary	—	—	389	—	—	—	389
Share-based payment transactions of subsidiaries	—	—	—	—	—	—	—
Balance on December 31, 2016	\$ 126,045	\$ —	\$ 389	\$ 85	\$ 13	\$ 20,648	\$ 147,180
Balance on January 1, 2017	\$ 126,045	\$ —	\$ 389	\$ 85	\$ 13	\$ 20,648	\$ 147,180
Unclaimed dividend	—	—	—	—	3	—	3
Change in additional paid-in capital from investments in associates and joint ventures accounted for using equity method	—	—	—	—	—	—	—
Partial disposal of interests in subsidiaries	—	—	1	76	—	—	77
	—	—	802	—	—	—	802

Change in additional paid-in capital for not participating in the capital increase of a subsidiary							
Other changes in additional paid-in capital in subsidiaries	—	—	—	—	—	—	—
Share-based payment transactions of subsidiaries	—	—	2	—	—	—	2
Treasury stock transfer of subsidiaries	—	—	27	—	—	—	27
Balance on December 31, 2017	\$ 126,045	\$ —	\$ 1,221	\$ 161	\$ 16	\$ 20,648	\$ 148,091
Balance on January 1, 2018	\$ 126,045	\$ —	\$ 1,221	\$ 161	\$ 16	\$ 20,648	\$ 148,091
Unclaimed dividend	—	—	—	—	2	—	2
Partial disposal of interests in subsidiaries	—	—	—	826	—	—	826
Change in additional paid-in capital for not proportionately participating in the capital increase of a subsidiary	—	—	777	—	—	—	777
Share-based payment transactions of subsidiaries	—	—	11	—	—	—	11
Treasury stock transfer of subsidiaries	—	—	55	—	—	—	55
Balance on December 31, 2018	\$ 126,045	\$ —	\$ 2,064	\$ 987	\$ 18	\$ 20,648	\$ 149,762

Additional paid-in capital from share premium, donated capital and the difference between consideration received and the carrying amount of the subsidiaries' net assets upon disposal may be utilized to offset deficits. Furthermore, when Chunghwa has no deficit, it may be distributed in cash or capitalized, which however is limited to a certain percentage of Chunghwa's paid-in capital except the additional paid-in capital arising from unclaimed dividend can only be utilized to offset deficits.

The additional paid-in capital from movements of paid-in capital arising from changes in equities of subsidiaries may only be utilized to offset deficits.

Among additional paid-in capital from movements of investments in associates and joint ventures accounted for using equity method, the portion arising from the difference between consideration received and the carrying amount of the subsidiaries' net assets upon disposal may be utilized to offset deficits; furthermore, when the Company has no deficit, it may be distributed in cash or capitalized. However, other additional paid-in capital recognized in proportion of share ownership may only be utilized to offset deficits.

c. Retained earnings and dividends policy

In accordance with the Chunghwa's Articles of Incorporation, Chunghwa must pay all outstanding taxes, offset deficits in prior years and set aside a legal reserve equal to 10% of its net income before distributing a dividend or making any other distribution to stockholders, except when the accumulated amount of such legal reserve equals to Chunghwa's total issued capital, and depending on its business needs or requirements, may also set aside or reverse special reserves. No less than 50% of the remaining earnings comprising remaining balance of net income, if any, plus cumulative undistributed earnings shall be distributed as stockholders' dividends, of which cash dividends to be distributed shall not be less than 50% of the total amount of dividends to be distributed. If cash dividend to be distributed is less than \$0.10 per share, such cash dividend shall be distributed in the form of common stocks.

Special reserve was appropriated in accordance with the relevant laws and regulations or as requested by local authority. Pursuant to existing regulations, Chunghwa is required to set aside additional special reserve equivalent to debit balances under stockholder's equity. For subsequent decrease in the deduction amount to stockholder's equity, the decreased amount could be reversed from the special reserve to retained earnings.

The appropriation for legal reserve shall be made until the accumulated reserve equals the aggregate par value of the outstanding capital stock of Chunghwa. This reserve can only be used to offset a deficit, or, when the legal reserve has exceeded 25% of Chunghwa's paid-in capital, the excess may be transferred to capital or distributed in cash.

The appropriations of the 2016 and 2017 earnings of Chunghwa approved by the stockholders in their meetings on June 23, 2017 and June 15, 2018 were as follows:

	Appropriation of Earnings		Dividends Per Share	
	For Fiscal Year	For Fiscal Year	For Fiscal Year	For Fiscal Year
	2016	2017	2016	2017
	NT\$	NT\$	NT\$	NT\$
	(In Millions)			
Special reserve	\$5	\$(5)		
Cash dividends	38,336	37,205	\$4.9419	\$4.796

The appropriations of earnings for 2018 had been proposed by Chunghwa's Board of Directors on March 19, 2019. The appropriations and dividends per share were as follows:

	For Fiscal Year
	2018
	Appropriation
	Dividends
	of
	Earnings Per Share
	NT\$ NT\$

(In
Millions)

Cash dividends \$34,746 \$ 4.479

The appropriations of earnings for 2018 are subject to the resolution of the stockholders' meeting planned to be held on June 21, 2019.

d. Other equity items

1) Exchange differences arising from the translation of the foreign operations

The exchange differences arising from the translation of the foreign operations from their functional currency to New Taiwan dollars were recognized as exchange differences arising from the translation of the foreign operations in other comprehensive income.

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

	Unrealized Gain or Loss on AFS Financial Assets NT\$ (In Millions)
Balance as of January 1, 2016	\$ 91
Unrealized gain or loss on available-for-sale financial assets	(721)
Income tax relating to unrealized gain and loss on available-for-sale financial assets	2
Amount reclassified from equity to profit or loss on disposal of available-for-sale financial assets	—
Amount reclassified from equity to profit or loss on impairment of available-for-sale financial assets	577
Balance as of December 31, 2016	\$ (51)
Balance as of January 1, 2017	\$ (51)
Unrealized gain or loss on available-for-sale financial assets	607
Income tax relating to unrealized gain and loss on available-for-sale financial assets	2
Amount reclassified from equity to profit or loss on disposal of available-for-sale financial assets	—
Balance as of December 31, 2017 under IAS 39	558
Effect of retrospective application of IFRS 9	(558)
Balance as of January 1, 2018 under IFRS 9	\$ —

Unrealized gain or loss on available-for-sale financial assets were accumulated gains and losses on the available-for-sale financial assets measured at fair value, which were recognized in other comprehensive income and were included in the calculation of the related disposal gain and loss or impairment loss of such financial assets upon reclassified to profits or losses.

3) Unrealized gain or loss on financial assets at FVOCI

	Year Ended
	December 31 2018
	NT\$ (In Millions)
Balance as of January 1, 2018 under IAS 39	\$ —
Effect of retrospective application of IFRS 9	883
Balance as of January 1, 2018 under IFRS 9	883
Unrealized gain or loss for the year	
Equity instruments	(345)
Balance as of December 31, 2018	\$ 538

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e. Noncontrolling interests

	Year Ended December		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Beginning balance	\$5,065	\$6,272	\$8,474
Effect of retrospective application	—	—	(4)
Beginning balance as adjusted	5,065	6,272	8,470
Attributable to noncontrolling interests			
Net income for the year	1,141	1,172	1,024
Exchange differences arising from the translation of the net investment in foreign operations	(41)	(12)	(3)
Unrealized gain or loss on financial assets at FVOCI	—	—	(1)
Unrealized loss on available-for-sale financial assets	—	(2)	—
Income tax relating to unrealized gain and loss on available-for-sale financial assets	—	1	—
Remeasurements of defined benefit pension plans	(18)	(8)	(9)
Income tax relating to remeasurements of defined benefit pension plans	3	—	3
Share of other comprehensive income or loss of associates accounted for using equity method	(1)	(2)	1
Cash dividends distributed by subsidiaries	(710)	(942)	(958)
Partial disposal of interests in subsidiaries	25	29	349
Change in additional paid-in capital for not proportionately participating in the capital increase of subsidiaries	786	1,750	700
Other changes in additional paid-in capital of subsidiaries	—	—	—
Share-based payment transactions of subsidiaries	17	20	42
Net increase in noncontrolling interests	5	196	239
Ending balance	\$6,272	\$8,474	\$9,857

30. REVENUE

Prior to 2018

The main source of revenue of the Company includes various telecommunications services in different streams. The information of disaggregation of revenue please refer to Note 44.

2018

Year
EndedDecember
31
2018
NT\$

	(In Millions)
Revenue from contracts with customers	\$214,461
Other revenues	
Rental income	640
Other	382
	1,022
Total	\$215,483

The information of performance obligations in customer contracts, please refer to Note 3 Summary of Significant Accounting Policies for details.

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a. Disaggregation of revenue
For the year ended December 31, 2018

	Domestic		International			Total NT\$
	Fixed Communi- cations	Mobile Communi- cations	Internet	Fixed Communi- cations	Others	
	Business NT\$	Business NT\$	Business NT\$	Business NT\$	Others NT\$	
	(In Millions)					
Main Products and Service Revenues						
Mobile services revenue	\$—	\$ 63,906	\$—	\$ —	\$—	\$ 63,906
Sales of products	1,731	35,702	4	251	3,601	41,289
Local telephone and domestic long distance telephone						
services revenue	29,996	—	—	—	—	29,996
Broadband access and domestic leased line services						
revenue	22,453	—	—	—	—	22,453
Data Communications internet services revenue	—	—	21,137	—	—	21,137
International network and leased telephone services						
revenue	—	—	—	8,724	—	8,724
Others	11,923	1,269	8,509	4,449	806	26,956
	\$ 66,103	\$ 100,877	\$ 29,650	\$ 13,424	\$ 4,407	\$ 214,461

b. Contract balances

	December 31 2018 NT\$ (In Millions)
Trade notes and accounts receivable (Note 11)	\$ 30,076
Contract assets	

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Products and service bundling	\$ 7,123
Other	109
Less : Loss allowance	(19)
	\$ 7,213
Current	\$ 4,869
Noncurrent	2,344
	\$ 7,213
Contract liabilities	
Telecommunications business	\$ 8,193
Project business	4,508
Products and service bundling	106
Other	476
	\$ 13,283
Current	\$ 10,688
Noncurrent	2,595
	\$ 13,283

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The changes in the contract asset and the contract liability balances primarily result from the timing difference between the satisfaction of performance obligations and the payments collected from customers. Significant changes of contract assets and liabilities recognized resulting from product and service bundling were as follows:

	Year Ended
	December 31 2018 NT\$ (In Millions)
Contract assets	
Net increase of customer contracts	\$ 4,126
Reclassified to trade receivables	(7,532)
	\$ (3,406)
Contract liabilities	
Net increase of customer contracts	\$ 16
Recognized as revenues	(194)
	\$ (178)

The Company applies the simplified approach to providing for expected credit losses prescribed by IFRS 9, which permits the use of lifetime expected loss provision for receivables. Contract assets will be reclassified to trade receivables when the corresponding invoice is billed to the client. Contract assets have substantially the same risk characteristics as the trade receivables of the same types of contracts. Therefore, the Company concluded that the expected loss rates for trade receivables can be applied to the contract assets.

Revenue recognized for the period that was included in the contract liability at the beginning of the period was as follows:

	Year Ended
	December 31 2018 NT\$ (In Millions)
Telecommunications business	\$ 7,157
Project business	627
Others	324
	\$ 8,108

c. Incremental costs of obtaining contracts

	December 31 2018 NT\$ (In Millions)
Noncurrent	
Incremental costs of obtaining contracts	\$ 1,335

The Company considered the past experience and the default clauses in the telecommunications service contract and believes the commissions and equipment subsidy paid for obtaining contracts are expected to be recoverable; therefore, incremental costs of obtaining contracts are recognized as an asset. Amortization expense of incremental costs of obtaining contracts for the year ended December 31, 2018 was \$1,941 million.

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d. Remaining Performance Obligations

As of December 31, 2018, the aggregate amount of transaction price allocated to performance obligations for non-cancellable telecommunications service contracts that are unsatisfied is \$38,909 million. The Company expects to recognize revenue when service is provided over contract terms in the next 36 months, \$24,388 million, \$11,581 million and \$2,940 million for 2019, 2020 and 2021, respectively. The variable consideration collected from customers on nonrecurring basis resulting from exceeded usage from monthly fee and revenue recognized for contracts that the Company has a right to consideration from customers in the amount corresponding directly with the value to the customers of the Company's performance completed to date have been excluded from the disclosure of remaining performance obligations.

As of December 31, 2018, the aggregate amount of transaction price allocated to performance obligations for non-cancellable project business contracts that are unsatisfied is \$20,990 million. The Company recognizes revenues when the project business contract is completed and accepted by customers. The Company expects to recognize such revenue of \$3,656 million, \$12,893 million and \$4,441 million in 2019, 2020 and 2021, respectively. Project business contracts whose expected duration are less than a year have been excluded from the aforementioned disclosure.

31. NET INCOME AND OTHER COMPREHENSIVE INCOME (LOSS)

a. Other income and expenses

	Year Ended		
	December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Gain or loss on disposal of property, plant and equipment	\$(48)	\$(107)	\$142
Reversal of impairment loss on investment properties	148	11	19
Loss on disposal of intangible assets	—	—	—
Impairment loss on intangible assets	—	(9)	(51)
Impairment loss on property, plant and equipment	(596)	—	—
	\$ (496)	\$ (105)	\$ 110

b. Other income

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Dividend income	\$391	\$ 328	\$396
Rental income	41	61	70
Income from Piping Fund	202	—	2
Others	438	447	232
	\$1,072	\$ 836	\$700

c. Other gains and losses

	Year Ended		
	December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Net foreign currency exchange gains or losses	\$181	\$(88)	\$37
Gain on disposal of financial instruments	—	3	6
Gain or loss on disposal of investments accounted for using equity method	(2)	—	—
Valuation gain or loss on financial assets and liabilities at fair value through profit or loss, net	(1)	1	(21)
Impairment loss on available-for-sale financial assets	(577)	—	—
Others	(49)	(48)	(68)
	\$(448)	\$(132)	\$(46)

d. Impairment loss (reversal of impairment loss) on financial instruments

	Year Ended		
	December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Contract assets	\$—	\$—	\$19
Trade notes and accounts receivable	\$943	\$578	\$805
Available-for-sale financial assets	\$577	\$—	\$—
Other receivables	\$(2)	\$65	\$96
Inventories	\$192	\$52	\$365
Property, plant and equipment	\$596	\$—	\$—
Investment properties	\$(148)	\$(11)	\$(19)
Intangible assets	\$—	\$9	\$51

e. Depreciation and amortization expenses

	Year Ended December 31		
	2016 NT\$	2017 NT\$	2018 NT\$
	(In Millions)		
Property, plant and equipment	\$29,087	\$28,143	\$27,461
Investment properties	19	21	21
Intangible assets	3,379	3,766	4,386
Incremental costs of obtaining contracts	—	—	1,941
Total depreciation and amortization expenses	\$32,485	\$31,930	\$33,809
Depreciation expenses summarized by functions			
Operating costs	\$27,214	\$26,402	\$25,996
Operating expenses	1,892	1,762	1,486
	\$29,106	\$28,164	\$27,482
Amortization expenses summarized by functions			
Operating costs	\$3,042	\$3,473	\$6,085
Marketing expenses	173	154	113
General and administrative expenses	126	104	93
Research and development expenses	38	35	36
	\$3,379	\$3,766	\$6,327

f. Employee benefit expenses

	Year Ended December 31		
	2016 NT\$	2017 NT\$	2018 NT\$
	(In Millions)		
Post-employment benefit			
Defined contribution plans	\$544	\$594	\$640
Defined benefit plans	2,822	2,834	2,953
	3,366	3,428	3,593
Share-based payment			
Equity-settled share-based payment	17	22	17
Other employee benefit			
Salaries	25,985	25,760	26,204
Insurance	2,652	2,748	2,740
Others	15,730	15,449	14,470
	44,367	43,957	43,414
Total employee benefit expenses	\$47,750	\$47,407	\$47,024
Summary by functions			
Operating costs	\$25,190	\$24,725	\$24,367
Operating expenses	22,560	22,682	22,657
	\$47,750	\$47,407	\$47,024

Chunghwa distributes employees' compensation at the rates from 1.7% to 4.3% and remuneration to directors not higher than 0.17%, respectively, of pre-tax income. As of December 31, 2018, the payables of the employees' compensation and the remuneration to directors were \$1,404 million and \$38 million, respectively. Such amounts have been approved by the Chunghwa's Board of Directors on March 19, 2019 and will be reported to the stockholders in their meeting planned to be held on June 21, 2019.

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If there is a change in the proposed amounts after the annual financial statements are authorized for issue, the differences are recorded as a change in accounting estimate.

The compensation to the employees and remuneration to the directors of 2016 and 2017 approved by the Board of Directors on March 7, 2017 and March 13, 2018, respectively, were as follows.

	2016	2017
	Cash	Cash
	NT\$	NT\$
	(In Millions)	
Compensation distributed to the		
employees	\$1,702	\$1,596
Remuneration paid to the directors	42	41

There was no difference between the initial accrual amounts and the amounts proposed in the Board of Directors in 2017 and 2018 of the aforementioned compensation to employees and the remuneration to directors.

g. Reclassification adjustments of other comprehensive income or loss

	Year Ended	
	December 31	
	2016	2017
	NT\$	NT\$
	(In Millions)	
Unrealized gain or loss on available-for-sale financial assets		
Arising during the year	\$(721)	\$605
Reclassification adjustments		
Upon disposal	—	—
Upon impairment	577	—
	\$(144)	\$605
Cash flow hedges		
Gain arising during the year	\$15	\$3
Reclassification adjustments included in profit		
or loss	(1)	(2)
Adjusted against the carrying amount of		
hedged items	(15)	(2)
	\$(1)	\$(1)

32. INCOME TAX

a. Income tax recognized in profit or loss

The major components of income tax expense were as follows:

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Current tax			
Current tax expenses recognized for the year	\$6,736	\$7,996	\$8,271
Income tax on unappropriated earnings	(346)	(60)	(2,070)
Income tax adjustments on prior years	(22)	(2)	7
Others	15	10	8
	6,383	7,944	6,216
Deferred tax			
Deferred tax expense recognized for the year	1,404	(101)	208
Income tax adjustments on prior years	—	6	19
Change in tax rate	—	—	(38)
	1,404	(95)	189
Income tax expense recognized in profit or loss	\$7,787	\$7,849	\$6,405

Reconciliation of accounting profit and income tax expense was as follows:

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Income before income tax	\$49,413	\$48,009	\$44,986
Income tax expense calculated at the statutory rate			
(17% in 2016 and 2017, and 20% in 2018)	\$8,400	\$8,162	\$8,997
Nondeductible income and expenses in determining			
taxable income	5	34	227
Unrecognized deductible temporary differences	(9)	(1)	1
Unrecognized loss carryforwards	12	10	21
Tax-exempt income	(25)	(87)	(580)
Additional income tax under Alternative Minimum Tax Act	—	—	46
Income tax on unappropriated earnings	(346)	(60)	(2,070)
Investment credits	(234)	(212)	(204)
Change in tax rate	—	—	(38)
Effect of different tax rates of group entities operating in			
other jurisdictions	(8)	(2)	(15)

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Income tax adjustments on prior years	(22)	4	26
Others	14	1	(6)
Income tax expense recognized in profit or loss	\$7,787	\$7,849	\$6,405

In 2016 and 2017, the applicable tax rate used above is the corporate tax rate of 17% payable by the entities subject to the Income Tax Act of the Republic of China.

Income Tax Act in the ROC was amended in February 2018 and the corporate income tax rate is adjusted from 17% to 20%. Such amendment is effective from 2018. In addition, the rate of the corporate surtax applicable to 2018 unappropriated earnings is reduced from 10% to 5%. The applicable tax rate used by subsidiaries in China is 25%, and tax rates used by other entities in the Company operating in other jurisdictions are based on the tax laws in those jurisdictions.

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b. Income tax benefit recognized in other comprehensive income

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Deferred tax			
Remeasurement on defined benefit plan	\$(347)	\$(344)	\$(243)
Change in tax rate	—	—	(207)
Unrealized gain or loss on available-for-sale financial assets	(2)	(3)	—
Total income tax benefit recognized in other comprehensive income	\$(349)	\$(347)	\$(450)

c. Current tax assets and liabilities

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Current tax assets		
Tax refund receivable (included in other current assets - other)	\$2	\$—
Current tax liabilities		
Income tax payable	\$8,674	\$6,221

d. Deferred income tax assets and liabilities

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

For the year ended December 31, 2016

	January 1,	Recognized in Profit or Loss	Recognized in	
			Other Comprehensive Income	December 31,
	2016	2016	2016	2016
	NT\$	NT\$	NT\$	NT\$
	(In Millions)			
Deferred Income Tax Assets				

Temporary differences				
Defined benefit obligation	\$1,206	\$ (179)	\$ 347	\$ 1,374
Allowance for doubtful receivables over quota	169	61	—	230
Share of profits of associates and joint ventures				
accounted for using equity method	325	5	—	330
Deferred revenue	136	(19)	—	117
Impairment loss on property, plant and equipment	44	78	—	122
Valuation loss on inventory	33	(13)	—	20
Estimated warranty liabilities	18	1	—	19
Accrued award credits liabilities	22	(2)	—	20
Property, plant and equipment	2	—	—	2
Unrealized foreign exchange loss, net	18	(18)	—	—
Others	40	(6)	—	34
	2,013	(92)	347	2,268
Loss carryforwards	48	6	—	54
	\$2,061	\$ (86)	\$ 347	\$ 2,322

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	Recognized in			
	January 1, 2016	Recognized in Profit or Loss NT\$	Other Comprehensive Income NT\$	December 31, 2016 NT\$
(In Millions)				
Deferred Income Tax Liabilities				
Temporary differences				
Defined benefit obligation	\$(1)	\$(1,268)	\$ —	\$(1,269)
Land value incremental tax	(95)	—	—	(95)
Intangible assets	(43)	3	—	(40)
Deferred revenue for award credits	(2)	(44)	—	(46)
Unrealized foreign exchange gain, net	(1)	(9)	—	(10)
Valuation gain or loss on financial instruments, net	(5)	—	2	(3)
Others	(1)	—	—	(1)
	\$(148)	\$(1,318)	\$ 2	\$(1,464)

For the year ended December 31, 2017

	Recognized in			
	January 1, 2017	Recognized in Profit or Loss NT\$	Other Comprehensive Income NT\$	December 31, 2017 NT\$
(In Millions)				
Deferred Income Tax Assets				
Temporary differences				
Defined benefit obligation	\$1,374	\$ 5	\$ 344	\$ 1,723
Allowance for doubtful receivables over quota	230	59	—	289
Share of profits of associates and joint ventures				
accounted for using equity method	330	1	—	331
Deferred revenue	117	(11)	—	106
Impairment loss on property, plant and equipment	122	(10)	—	112
Valuation loss on inventory	20	3	—	23
Estimated warranty liabilities	19	3	—	22

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Accrued award credits liabilities	20	(5)	—	15
Trade-in right	—	15	—	15
Property, plant and equipment	2	—	—	2
Unrealized foreign exchange loss, net	—	17	—	17
Others	34	(5)	—	29
	2,268	72	344	2,684
Loss carryforwards	54	(8)	—	46
	\$2,322	\$ 64	\$ 344	\$ 2,730

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	January 1, 2017 NT\$ (In Millions)	Recognized in Profit or Loss NT\$	Recognized in	
			Other Comprehensive Income NT\$	December 31, 2017 NT\$
Deferred Income Tax Liabilities				
Temporary differences				
Defined benefit obligation	\$ (1,269)	\$ 4	\$ —	\$ (1,265)
Land value incremental tax	(95)	—	—	(95)
Intangible assets	(40)	1	—	(39)
Deferred revenue for award credits	(46)	17	—	(29)
Unrealized foreign exchange gain or loss, net	(10)	10	—	—
Valuation gain or loss on financial instruments, net	(3)	(1)	3	(1)
Others	(1)	—	—	(1)
	\$ (1,464)	\$ 31	\$ 3	\$ (1,430)

For the year ended December 31, 2018

	January 1, 2018 NT\$ (In Millions)	Effect of Retrospective Application of IFRS 9 (Note 5) NT\$	Recognized in Profit or Loss NT\$	Recognized	
				in Other Comprehensive Income NT\$	December 31, 2018 NT\$
Deferred Income Tax Assets					
Temporary differences					
Defined benefit obligation	\$ 1,723	\$ —	\$ 134	\$ 450	\$ 2,307
Allowance for doubtful receivables over quota	289	—	146	—	435
Share of profits of associates and joint ventures					
accounted for using equity method	331	—	58	—	389
Deferred revenue	106	—	5	—	111
Impairment loss on property, plant and	112	—	(19)	—	93

equipment					
Valuation loss on inventory	23	—	65	—	88
Estimated warranty liabilities	22	—	4	—	26
Accrued award credits liabilities	15	—	(1)	—	14
Trade-in right	15	—	(5)	—	10
Property, plant and equipment	2	—	—	—	2
Unrealized foreign exchange loss, net	17	—	(16)	—	1
Others	29	—	8	—	37
	2,684	—	379	450	3,513
Loss carryforwards	46	—	(5)	—	41
	\$2,730	\$	—	\$ 374	\$ 450
					\$ 3,554

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	January 1, 2018 NT\$ (In Millions)	Effect of Retrospective Application of IFRS 9 (Note 5) NT\$	Recognized in Profit or Loss NT\$	Recognized in Other Comprehensive Income NT\$	December 31, 2018 NT\$
Deferred Income Tax Liabilities					
Temporary differences					
Defined benefit obligation	\$(1,265)	\$ —	\$ (567)	\$ —	\$ (1,832)
Land value incremental tax	(95)	—	—	—	(95)
Intangible assets	(39)	—	7	—	(32)
Deferred revenue forward credits	(29)	—	(2)	—	(31)
Unrealized foreign exchange gain, net	—	—	(1)	—	(1)
Valuation gain or loss on financial instruments,					
net	(1)	1	—	—	—
Others	(1)	—	—	—	(1)
	\$(1,430)	\$ 1	\$ (563)	\$ —	\$ (1,992)

e. Items for which no deferred income tax assets have been recognized

	December 31	
	2017 NT\$	2018 NT\$
	(In Millions)	
Loss carryforwards		
Expire in 2019	\$ 138	\$ 136
Expire in 2020	42	41
Expire in 2021	9	12
Expire in 2022	11	10
Expire in 2023	—	9
Expire in 2024	—	2
Expire in 2025	13	15
Expire in 2026	—	8
Expire in 2027	2	3
Expire in 2028	—	1

	\$215	\$237
Deductible temporary differences	\$2	\$1

f. Information about unused loss carryforwards

As of December 31, 2018, unused loss carryforwards was as follows:

Remaining Creditable Amount NT\$ (In Millions)	Expiry Year
\$ 136	2019
41	2020
22	2021
11	2022
9	2023
2	2024
33	2025
12	2026
3	2027
8	2028
\$ 277	

g. Income tax examinations

Income tax returns of Chunghwa have been examined by the tax authorities through 2015. Income tax returns of Aval, CHSI, CHPT, HHI, SHE, and CHST have been examined by the tax authorities through 2016. Income tax returns of SENAO, CHIEF, CHI, LED, Unigate, CLPT, SFD, CHYP, CHTSC, ISPOT, Youth, Youyi and SENYOUNG have been examined by the tax authorities through 2017.

33. EARNINGS PER SHARE

Net income and weighted average number of common stocks used in the calculation of earnings per share were as follows:

Net Income

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Net income used to compute the basic earnings			
per share			
Net income attributable to the parent	\$40,485	\$38,988	\$37,557
Assumed conversion of all dilutive potential			

common stocks			
Employee stock options, employee compensation			
of subsidiaries	(1)	—	(6)
Net income used to compute the diluted earnings			
per share	\$40,484	\$38,988	\$37,551

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Weighted Average Number of Common Stocks

(Millions Shares)

	Year Ended December 31		
	2016	2017	2018
Weighted average number of common stocks used			
to compute the basic earnings per share	7,757	7,757	7,757
Assumed conversion of all dilutive potential common stocks			
Employee compensation	12	11	9
Weighted average number of common stocks used			
to compute the diluted earnings per share	7,769	7,768	7,766

Because Chunghwa may settle the employee compensation in shares or cash, Chunghwa shall presume that it will be settled in shares and takes those shares into consideration when calculating the weighted average number of outstanding shares used in the calculation of diluted EPS if the shares have a dilutive effect. The dilutive effect of the shares needs to be considered until the approval of the number of shares to be distributed to employees as compensation in the following year.

34. SHARE-BASED PAYMENT ARRANGEMENT

a. SENAO share-based compensation plan (“SENAO Plan”) described as follows:

Effective Date	Grant Date	Stock Options	
		Units (In Thousands)	Exercise Price NT\$
2012.05.28	2013.05.07	10,000	\$66.20 (Original price\$93.00)

Each option is eligible to subscribe for one common share when exercisable. Under the terms of the SENAO Plan, the options are granted at an exercise price equal to the closing price of the SENAO’s common stocks listed on the TWSE on the higher of closing price or par value. The SENAO Plan have exercise price adjustment formula upon the changes in common stocks equity (including cash capital increase, new share issue through capitalization of earnings and additional paid-in capital, merger, spin off and new share issue for Global Depository Shares, and so on) or distribution of cash dividends. The options of SENAO Plan are valid for six years and the graded vesting schedule for which 50% of option granted will vest two years after the grant date and another two tranches of 25%, each will vest three and four years after the grant date respectively.

The compensation costs of stock options granted on May 7, 2013, were \$13 million and \$4 million for the years ended December 31, 2016 and 2017, respectively. No compensation cost was recognized for the year ended December 31, 2018.

SENAO modified the plan terms of the outstanding stock options in July 2016, the exercise price changed from \$81.40 to \$76.10 per share. The modification did not cause any incremental fair value granted.

SENAO modified the plan terms of the outstanding stock options in July 2017, the exercise price changed from \$76.10 to \$70.70 per share. The modification did not cause any incremental fair value granted.

SENAO modified the plan terms of the outstanding stock options in July 2018, the exercise price changed from \$70.70 to \$66.20 per share. The modification did not cause any incremental fair value granted.

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Information about SENAO's outstanding stock options for the years ended December 31, 2016, 2017 and 2018 was as follows:

	Year Ended December 31, 2016 Granted on May 7, 2013	
	Weighted-	
	average	
	Number of	
	Exercise	
	Options	Price
	(In Thousands)	NT\$
Employee stock options		
Options outstanding at beginning of the year	7,787	\$ 81.40
Options exercised	—	—
Options forfeited	(1,200)	—
Options outstanding at end of the year	6,587	76.10
Options exercisable at end of the year	4,947	76.10
	Year Ended December 31, 2017 Granted on May 7, 2013	
	Weighted-	
	average	
	Number of	
	Exercise	
	Options	Price
	(In Thousands)	NT\$
Employee stock options		
Options outstanding at beginning of the year	6,587	\$ 76.10
Options exercised	—	—
Options forfeited	(661)	—
Options outstanding at end of the year	5,926	70.70
Options exercisable at end of the year	5,926	70.70
	Year Ended December 31, 2018 Granted on May 7, 2013	
	Weighted-	
	average	
	Number of	
	Exercise	
	Options	Price
		NT\$

	(In Thousands)	
Employee stock options		
Options outstanding at beginning of the year	5,926	\$ 70.70
Options exercised	—	—
Options forfeited	(608)	—
Options outstanding at end of the year	5,318	66.20
Options exercisable at end of the year	5,318	66.20

As of December 31, 2017 information about employee stock options outstanding was as follows:

Options Outstanding			Options Exercisable		
Weighted-			Weighted-		
average			average		
Range of Exercise Price	Number of Options (In Thousands)	Remaining Contractual Life (Years)	Weighted-average Exercise Price (In NT\$)	Number of Options (In Thousands)	Weighted-average Exercise Price (In NT\$)
\$70.70	5,926	1.35	\$ 70.70	5,926	\$ 70.70

As of December 31, 2018 information about employee stock options outstanding was as follows:

Options Outstanding			Options Exercisable		
Range of Exercise Price	Number of Options (In Thousands)	Weighted-average Remaining Contractual Life (Years)	Weighted-average Exercise Price (NT\$)	Weighted-average	
				Number of Options	Exercise Price (NT\$)
\$66.20	5,318	0.35	\$ 66.20	5,318	\$ 66.20

SENAO used the fair value method to evaluate the options using the Black-Scholes model and the related assumptions and the fair value of the options were as follows:

Stock Options		
Granted on		
May 7, 2013		
Grant-date share price (NT\$)	\$	93.00
Exercise price (NT\$)	\$	93.00
Dividends yield		—
Risk-free interest rate		0.91 %
Expected life		4.375 years
Expected volatility		36.22 %
Weighted average fair value of grants (NT\$)	\$	28.72

Expected volatility was based on the historical share price volatility of SENAO over the period equal to the expected life of SENAO Plan.

b. SENAO transferred the treasury stock

The Board of Directors of SENAO resolved to transfer treasury stock to specific employees in May and November 2017. The aforementioned treasury stock transferred to employees were measured at the fair value of the grant date. SENAO totally transferred 3,342 thousand shares of treasury stock and the compensation cost of \$9 million was recognized for the year ended December 31, 2017.

The Board of Directors of SENAO resolved to transfer treasury stock 6,658 thousand shares to specific employees in April 2018. The aforementioned treasury stock transferred to employees were measured at the fair value on the grant date. The compensation cost of \$15.6 million was recognized for the year ended December 31, 2018.

SENAO used the fair value method to evaluate share-based payment transaction using the Black-Scholes model and the related assumptions and the fair value of the option were as follows:

	Stock Options	Stock Options	Stock Options
	Granted on	Granted on	Granted on
	May 23, 2017	November 17, 2017	May 7, 2018
Grant-date share price (NT\$)	\$ 53.60	\$ 51.00	\$ 51.60
Exercise price (NT\$)	\$ 49.28	\$ 49.28	\$ 49.28
Dividends yield	—	—	—
Risk-free interest rate	0.59 %	0.59 %	0.59 %
Expected life	9 days	14 days	18 days
Expected volatility	12.35 %	9.94 %	8.78 %
Weighted average fair value of grants (NT\$)	\$ 4.33	\$ 1.75	\$ 2.34

Expected volatility was based on the historical share price volatility of SENAO over three months before the grant date.

c. CHIEF share-based compensation plan (“CHIEF Plan”) described as follows:

Stock Options			
Effective Date	Grant Date	Units	Exercise Price NT\$
2015.11.17	2015.10.22	2,000	\$34.40 (Original price\$43.00)
2017.12.18	2017.12.19	950	\$140.60 (Original price\$147.00)
	2018.10.31	50	\$147.00

Each option is eligible to subscribe for one thousand common stocks when exercisable. The options are granted to specific employees that meet the vesting conditions. The CHIEF Plan has exercise price adjustment formula upon the changes in common stocks or distribution of cash dividends. The options of CHIEF Plan are valid for five years and the graded vesting schedule will vest two years after the grant date.

The compensation costs for stock options granted on October 22, 2015 were \$4 million, \$3 million and \$1 million for the years ended December 31, 2016, 2017 and 2018, respectively.

The compensation costs for stock options granted on December 19, 2017 were \$0.1 million and \$0.6 million for the years ended December 31, 2017 and 2018, respectively.

The compensation cost for stock options granted on October 31, 2018 was \$0.1 million for the year ended December 31, 2018.

CHIEF modified the plan terms of stock options granted on October 22, 2015 in July 2016, the exercise price changed from \$43.00 to \$34.40 per share. The modification did not cause any incremental fair value granted.

CHIEF modified the plan terms of stock options granted on December 19, 2017 in June and August 2018 and the exercise price changed from \$147.00 to \$144.10 and \$144.10 to \$140.60 per share, respectively. The modification did not cause any incremental fair value granted.

Information about CHIEF’s outstanding stock options for the years ended December 31, 2016, 2017 and 2018 was as follows:

Year Ended December
31, 2016
Granted on October 22,
2015

	Number of Options	Weighted Average Exercise Price (NT\$)
Employee stock options		
Options outstanding at beginning of the year	2,000.00	\$ 43.00
Options granted	—	—
Options forfeited	(52.00)	—
Options outstanding at end of the year	1,948.00	34.40
Options exercisable at end of the year	—	—

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	Year Ended December 31, 2017			
	Granted on October 22, 2015		Granted on December 19, 2017	
	Weighted		Weighted	
	Average	Number	Average	Number
	of	Exercise	of	Exercise
	Options	Price (NT\$)	Options	Price (NT\$)
Employee stock options				
Options outstanding at beginning of the year	1,948.00	\$ 34.40	—	\$ —
Options granted	—	—	950.00	147.00
Options forfeited	(12.00)	—	—	—
Options outstanding at end of the year	1,936.00	34.40	950.00	147.00
Options exercisable at end of the year	968.00	34.40	—	—

	Year Ended December 31, 2018					
	Granted on		Granted on		Granted on	
	October 22, 2015		December 19, 2017		October 31, 2018	
	Weighted		Weighted		Weighted	
	Average	Number	Average	Number	Average	
	of	Exercise	of	Exercise	of	
	Options	Price (NT\$)	Options	Price (NT\$)	Options	Price (NT\$)
Employee stock options						
Options outstanding at beginning of the year	1,936.00	\$ 34.40	950.00	\$ 147.00	—	\$ —
Options granted	—	—	—	—	50.00	147.00
Options exercised	(1,027.25)	34.40	—	—	—	—
Options forfeited	(26.00)	—	(25.00)	—	—	—
Options outstanding at end of the year	882.75	34.40	925.00	140.60	50.00	147.00
Options exercisable at end of the year	416.50	34.40	—	—	—	—

As of December 31, 2017, information about employee stock options outstanding was as follows:

Granted on October 22, 2015			Options Exercisable		
Range	Number	Weighted	Weighted	Number	Weighted
of	of	Average	Average	of	Average

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Exercise Price	Options	Remaining Contractual Life (Years)	Exercise Price	Options	Exercise Price
NT\$			NT\$		NT\$
\$34.40	1,936.00	2.81	\$ 34.40	968.00	\$ 34.40

Granted on December 19, 2017

Options Outstanding Weighted Options Exercisable

Range of Exercise Price	Number of Options	Average Remaining Contractual Life (Years)	Weighted Average Exercise Price	Number of Options	Weighted Average Exercise Price
NT\$			NT\$		NT\$
\$147.00	950.00	4.96	\$ 147.00	—	\$ —

As of December 31, 2018, information about employee stock options outstanding was as follows:

Granted on October 22, 2015

Options Outstanding Weighted Options Exercisable

Range of Exercise Price	Number of Options	Average Remaining Contractual Life (Years)	Weighted Average Exercise Price	Number of Options	Weighted Average Exercise Price
NT\$			NT\$		NT\$
\$34.40	882.75	1.81	\$ 34.40	416.50	\$ 34.40

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Granted on December 19, 2017				Options Exercisable	
Options Outstanding			Weighted		
Range of Exercise Price NT\$	Number of Options	Average Remaining Contractual Life (Years)	Weighted Average Exercise Price NT\$	Number of Options	Weighted Average Exercise Price NT\$
\$140.60	925.00	3.96	\$ 140.60	—	\$ —

Granted on October 31, 2018				Options Exercisable	
Options Outstanding			Weighted		
Range of Exercise Price NT\$	Number of Options	Average Remaining Contractual Life (Years)	Weighted Average Exercise Price NT\$	Number of Options	Weighted Average Exercise Price NT\$
\$147.00	50.00	4.83	\$ 147.00	—	\$ —

CHIEF used the fair value method to evaluate the options using the Black-Scholes model and binomial option pricing model and the related assumptions and the fair value of the options were as follows:

	Stock Options Granted on October 22, 2015	Stock Options Granted on December 19, 2017	Stock Options Granted on October 31, 2018
Grant-date share price (NT\$)	\$ 39.55	\$ 95.92	\$ 166.00
Exercise price (NT\$)	\$ 43.00	\$ 147.00	\$ 147.00
Dividends yield	—	—	—
Risk-free interest rate	0.86 %	0.62 %	0.72 %
Expected life	5 years	5 years	5 years
Expected volatility	21.02 %	17.35 %	16.60 %

Weighted average fair value of grants (NT\$)	\$ 4,863	\$ 2,318	\$33,540
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Expected volatility was based on the average annualized historical share price volatility of CHIEF's comparable companies before the grant date.

d. New shares reserved for subscription by employees under cash injection of CHIEF

In March 2018, the Board of Directors of CHIEF approved the cash injection to issue 7,842 thousand shares and simultaneously reserved 1,176 thousand shares for subscription by employees according to the Company Act of the ROC. Furthermore, when the employees subscribed some shares or discarded their rights to subscribe shares, the Board of Directors of CHIEF authorized the chairman of the Board of Directors to contact specific people or group to subscribe.

The aforementioned options granted to employees are accounted for and measured at fair value of the grant date. No compensation cost was recognized for the year ended December 31, 2018.

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CHIEF used the fair value method to evaluate the options granted to employees on May 22, 2018 using the Black-Scholes model and the related assumptions and the fair value of the options were as follows:

	Stock Options
	Granted on
	May 22, 2018
Grant-date share price (NT\$)	\$156.41
Exercise price (NT\$)	\$170.00
Dividends yield	—
Risk-free interest rate	0.34 %
Expected life	7 days
Expected volatility	14.33 %
Weighted average fair value of grants (NT\$)	\$—

Expected volatility was based on the average annualized historical share price volatility of CHIEF's comparable companies before the grant date.

e. New shares reserved for subscription by employees under cash injection of CHPT

1) Capital Increase in March 2016

On December 8, 2015, the Board of Directors of CHPT approved the cash injection to issue 2,787 thousand shares and simultaneously reserved 418 thousand shares for subscription by employees according to the Company Act of the ROC. Furthermore, when the employees subscribed some shares or discarded their rights to subscribe shares, the Board of Directors of CHPT authorized the chairman of the Board of Directors to contact specific people or group to subscribe.

The aforementioned options granted to employees are accounted for and measured at fair value. The compensation cost was \$0.016 million for the year ended December 31, 2016.

CHPT used the fair value method to evaluate the options granted to employees on March 10, 2016 using the Black-Scholes model and the related assumptions and the fair value of the options were as follows:

Stock
Options

Granted
on

	March
	10,
	2016
Grant-date share price (NT\$)	\$ 302.46
Exercise price (NT\$)	\$ 360.00
Dividends yield	—
Risk-free interest rate	0.37 %
Expected life	12 days
Expected volatility	37.43 %
Weighted average fair value of grants (NT\$)	\$ 0.04

Expected volatility was based on the average annualized historical share price volatility of CHPT's comparable companies before the grant date.

2) Capital Increase in September 2017

On February 8, 2017, the Board of Directors of CHPT approved the cash injection to issue 2,000 thousand shares and simultaneously reserved 300 thousand shares for subscription by employees according to the Company Act of the ROC. Furthermore, when the employees subscribed some shares or discarded their rights to subscribe shares, the Board of Directors of CHPT authorized the chairman of the Board of Directors to contact specific people or group to subscribe.

The aforementioned options granted to employees are accounted for and measured at fair value. The compensation cost was \$6 million for the year ended December 31, 2017.

CHPT used the fair value method to evaluate the options granted to employees on September 18, 2017 using the Black-Scholes model and the related assumptions and the fair value of the options were as follows:

	Stock Options
	Granted on
	September 18,
	2017
Grant-date share price (NT\$)	\$ 1,295.00
Exercise price (NT\$)	\$ 1,267.33
Dividends yield	—
Risk-free interest rate	0.35 %
Expected life	4 days
Expected volatility	28.30 %
Weighted average fair value of grants (NT\$)	\$ 31.60

Expected volatility was based on the historical share price volatility of CHPT over the period equal to the expected life.

35. NON-CASH TRANSACTIONS

For the years ended December 31, 2016, 2017 and 2018, the Company entered into the following non-cash investing activities:

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Increase in property, plant and equipment	\$ 24,591	\$ 26,069	\$ 27,979
Other payables	(1,074)	806	571
	\$ 23,517	\$ 26,875	\$ 28,550

36. OPERATING LEASE ARRANGEMENTS

a. The Company as lessee

Except for the ST-2 satellite referred in Note 40 to the consolidated financial statements, the Company entered into several lease agreements for base stations located all over in Taiwan. The future aggregate minimum lease payments

under non-cancellable operating leases are as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Within one year	\$2,918	\$3,439
Longer than one year but within five years	5,796	6,375
Longer than five years	779	744
	\$9,493	\$10,558

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b. The Company as lessor

The Company leases out some land and buildings. The future aggregate minimum lease collection under non-cancellable operating leases are as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Within one year	\$353	\$344
Longer than one year but within five years	659	580
Longer than five years	243	206
	\$1,255	\$1,130

37. CAPITAL MANAGEMENT

The Company manages its capital to ensure that entities in the Company will be able to continue as going concerns while maximizing the return to stakeholders through the optimization of the debt and equity balance.

The capital structure of the Company consists of debt of the Company and the equity attributable to the parent.

Some consolidated entities are required to maintain minimum paid-in capital amount as prescribed by the applicable laws.

The management reviews the capital structure of the Company as needed. As part of this review, the management considers the cost of capital and the risks associated with each class of capital.

According to the management's suggestion, the Company maintains a balanced capital structure through paying cash dividends, increasing its share capital, purchasing outstanding shares, and proceeds from new debt or repayment of debt.

38. FINANCIAL INSTRUMENTS

Categories of Financial Instruments

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Financial assets		
Measured at FVTPL		
Mandatorily measured at FVTPL	\$—	\$517
Hedging financial assets	—	1
Loans and receivables (Note a)	68,983	—
Available-for-sale financial assets	5,751	—
Financial assets at amortized cost (Note a)	—	70,241
Financial assets at FVOCI	—	6,933

Financial liabilities		
Measured at FVTPL		
Held for trading	1	1
Hedging derivative financial liabilities	1	—
Measured at amortized cost (Note b)	39,725	40,334

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Note The balances included cash and cash equivalents, trade notes and accounts receivable, receivables from related parties, other current monetary assets and refundable deposits (classified as other noncurrent assets) which were loans and receivables. Please refer to Notes 7, 11, 14, 20 and 40. Such amounts are reclassified as financial assets at amortized cost upon the application of IFRS 9 starting from 2018.

Note The balances included short-term loans, trade notes and accounts payable, payables to related parties, partial other payables, customers' deposits and long-term loans which were financial liabilities carried at amortized cost. Please refer to Notes 22, 23, 24, 25 and 40.

Financial Risk Management Objectives

The main financial instruments of the Company include equity investments, trade notes and accounts receivable, trade notes and accounts payable as well as loans. The Company's Finance Department provides services to its business units, co-ordinates access to domestic and international capital markets, monitors and manages the financial risks relating to the operations of the Company through internal risk reports which analyze exposures by degree and magnitude of risks. These risks include market risk (including foreign currency risk, interest rate risk and other price risk), credit risk, and liquidity risk.

The Company seeks to minimize the effects of these risks by using derivative financial instruments to hedge risk exposures. The use of financial derivatives is governed by the Company's policies approved by the Board of Directors. Those derivatives are used to hedge the risks of exchange rate fluctuation arising from operating or investment activities. Compliance with policies and risk exposure limits is reviewed by the Company's Finance Department on a continuous basis. The Company does not enter into or trade financial instruments, including derivative financial instruments, for speculative purposes.

Chunghwa reports the significant risk exposures and related action plans timely and actively to the audit committee and if needed to the Board of Directors.

a. Market risk

The Company is exposed to market risks of changes in foreign currency exchange rates and interest rates. The Company uses forward exchange contracts to hedge the exchange rate risk arising from assets and liabilities denominated in foreign currencies.

There were no changes to the Company's exposure to market risks or the manner in which these risks are managed and measured.

1) Foreign currency risk

The carrying amounts of the Company's foreign currency denominated monetary assets and monetary liabilities at the balance sheet dates were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Assets		
USD	\$5,584	\$5,903
EUR	28	34
SGD	63	124
JPY	36	17
RMB	3	2
Liabilities		
USD	4,964	6,999
EUR	1,323	1,217
SGD	96	51
JPY	12	14
RMB	—	—

The carrying amounts of the Company's derivatives with exchange rate risk exposures at the balance sheet dates were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Assets		
USD	\$ —	\$ —
EUR	—	1
Liabilities		
USD	—	—
EUR	1	1

Foreign currency sensitivity analysis

The Company is mainly exposed to the fluctuations of the currencies, USD, EUR, SGD, JPY and RMB, listed above.

The following table details the Company's sensitivity to a 5% increase and decrease in the functional currency against the relevant foreign currencies. 5% is the sensitivity rate used when reporting foreign currency risk internally to key management personnel and represents management's assessment of the reasonably possible changes in foreign exchange rates. The sensitivity analysis includes only outstanding foreign currency denominated monetary items and forward exchange contracts. A positive number below indicates an increase in pre-tax profit or equity where the functional currency weakens 5% against the relevant currency.

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Profit or loss			
Monetary assets and liabilities (a)			
USD	\$54	\$31	\$(55)
EUR	(48)	(65)	(59)
SGD	5	(2)	4
JPY	—	1	—
RMB	1	—	—
Derivatives (b)			
USD	3	6	3
EUR	8	3	10
Equity			
Derivatives (c)			
EUR	5	7	9

a) This is mainly attributable to the exposure to foreign currency denominated receivables and payables of the Company outstanding at the balance sheet dates.

b) This is mainly attributable to the forward exchange contracts.

c) This is mainly attributable to the changes in the fair value of derivatives that are designated as cash flow hedges.

For a 5% strengthening of the functional currency against the relevant currencies, it would have the equal but opposite effect on the pre-tax profit or equity for the amounts shown above.

2) Interest rate risk

The carrying amounts of the Company's exposures to interest rates on financial assets and financial liabilities at the balance sheet dates were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Fair value interest rate risk		

Financial assets	\$25,911	\$25,822
Cash flow interest rate risk		
Financial assets	6,715	9,161
Financial liabilities	1,670	1,700

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Interest rate sensitivity analysis

The sensitivity analyses below have been determined based on the exposure to interest rates for non-derivative instruments at the end of the reporting period. A 25 basis point increase or decrease is used when reporting interest rate risk internally to key management personnel and represents management's assessment of the reasonably possible change in interest rates.

If interest rates had been 25 basis points higher/lower and all other variables were held constant, the Company's pre-tax income would increase/decrease by \$12 million, \$13 million and \$19 million for the years ended December 31, 2016, 2017 and 2018, respectively. This is mainly attributable to the Company's exposure to floating interest rates on its financial assets and short-term and long-term loan.

3)Other price risk

The Company is exposed to equity price risks arising from holding other company's equity. Equity investments are held for strategic rather than trading purposes. The management managed the risk through holding various risk portfolios. Further, the Company assigned finance and investment departments to monitor the price risk.

Equity price sensitivity analysis

The sensitivity analyses below have been determined based on the exposure to equity price risks at the end of the reporting period.

If equity prices had been 5% higher/lower, pre-tax profit and pre-tax other comprehensive income for the year ended December 31, 2018 would have increased/decreased by \$26 million, and \$347 million as a result of the changes in fair value of financial assets at FVTPL and financial assets at FVTOCI, respectively. If equity prices had been 5% higher/lower, other comprehensive income would have increased/decreased by \$126 million and \$156 million as a result of the changes in fair value of available-for-sale assets for the years ended December 31, 2016 and 2017, respectively.

b. Credit risk

Credit risk refers to the risk that a counterparty would default on its contractual obligations resulting in financial loss to the Company. The maximum credit exposure of the aforementioned financial instruments is equal to their carrying amounts recognized in consolidated balance sheet as of the balance sheet date.

The Company has large trade receivables outstanding with its customers. A substantial majority of the Company's outstanding trade receivables are not covered by collateral or credit insurance. The Company has implemented ongoing measures including enhancing credit assessments and strengthening overall risk management to reduce its credit risk. While the Company has procedures to monitor and limit exposure to credit risk on trade receivables, there can be no assurance such procedures will effectively limit its credit risk and avoid losses. This risk is heightened during periods when economic conditions worsen.

As the Company serves a large number of unrelated consumers, the concentration of credit risk was limited.

c. Liquidity risk

The Company manages and maintains sufficient cash and cash equivalent position to support the operations and reduce the impact on fluctuation of cash flow.

1) Liquidity and interest risk tables

The following tables detailed the Company's remaining contractual maturity for its non-derivative financial liabilities with agreed repayment periods. The tables had been drawn up based on the undiscounted cash flows of financial liabilities based on the earliest date on which the Company is required to pay.

	Weighted Average Effective Interest Rate (%)						Total
	Less than 1 Month NT\$	1-3 Months NT\$	3 Months to 1 Year NT\$	1-5 Years NT\$	More than 5 Year NT\$	Total NT\$	
	(In Millions)						
December 31, 2017							
Non-derivative financial liabilities							
Non-interest bearing	—	\$41,884	\$ —	\$ 3,197	\$4,671	\$ —	\$49,752
Floating interest rate instruments	0.97	50	—	20	1,600	—	1,670
		\$41,934	\$ —	\$ 3,217	\$6,271	\$ —	\$51,422
December 31, 2018							
Non-derivative financial liabilities							
Non-interest bearing	—	\$41,808	\$ —	\$ 2,890	\$4,717	\$ —	\$49,415
Floating interest rate instruments	0.98	—	—	100	1,600	—	1,700
		\$41,808	\$ —	\$ 2,990	\$6,317	\$ —	\$51,115

The following table detailed the Company's liquidity analysis for its derivative financial instruments. The table had been drawn up based on the undiscounted gross inflows and outflows on those derivatives that require gross settlement.

	Less than 1 Month NT\$	1-3 Months NT\$	3 Months to 1 Year NT\$	1-5 Years NT\$	Total NT\$
	(In Millions)				
December 31, 2017					
Gross settled					
Forward exchange contracts					
Inflows	\$125	\$ 173	\$ 36	\$ —	\$334
Outflows	126	174	36	—	336
	\$(1)	\$(1)	\$ —	\$ —	\$(2)

December 31, 2018					
Gross settled					
Forward exchange contracts					
Inflows	\$62	\$ 238	\$ 126	\$ —	\$426
Outflows	62	238	126	—	426
	\$—	\$ —	\$ —	\$ —	\$—

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2) Financing facilities

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Unsecured bank loan facility		
Amount used	\$90	\$133
Amount unused	45,749	46,328
	\$45,839	\$46,461
Secured bank loan facility		
Amount used	\$1,600	\$1,600
Amount unused	1,910	1,340
	\$3,510	\$2,940

39. FAIR VALUE INFORMATION

The fair value measurement guidance establishes a framework for measuring fair value and expands disclosure about fair value measurements. The standard describes a fair value hierarchy based on three levels of inputs that may be used to measure fair value. These levels are:

Level 1 fair value measurements: These measurements are those derived from quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2 fair value measurements: These measurements are those derived from inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).

Level 3 fair value measurements: These measurements are those derived from valuation techniques that include inputs for the asset or liability that are not based on observable market data (unobservable inputs).

a. Financial instruments that are not measured at fair value but for which fair value is disclosed

The Company considers that the carrying amounts of financial assets and liabilities not measured at fair value approximate their fair values or the fair values cannot be reliably estimated, no financial instruments need to be disclosed on balance sheet date.

b. Financial instruments that are measured at fair value on a recurring basis

December 31, 2017

	Level	Level	Level	Total
	1	2	3	
Available-for-sale financial assets				
Listed securities				
Equity investments	\$3,125	\$ —	\$ —	\$3,125

Financial liabilities at FVTPL

Derivative	\$—	\$ 1	\$ —	\$1
Hedging derivative financial liabilities	\$—	\$ 1	\$ —	\$1

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December 31, 2018

	Level 1	Level 2	Level 3	Total
Financial assets at FVTPL				
Non-listed stocks	\$—	\$ —	\$517	\$517
Hedging financial assets	\$—	\$ 1	\$—	\$1
Financial assets at FVOCI				
Equity investment	\$2,900	\$ —	\$4,033	\$6,933
Financial liabilities at FVTPL				
Derivatives	\$—	\$ 1	\$—	\$1

There were no transfers between Levels 1 and 2 for the years ended December 31, 2017 and 2018.

The reconciliations for financial assets measured at Level 3 are listed below:

Financial Assets	Measured at Fair Value through Profit or Loss NT\$	Measured at Fair Value through Other Comprehensive Income NT\$ (In Millions)	Total NT\$
Balance at January 1, 2018 (IAS 39)	\$ —	\$ —	\$—
The effect on retrospective adjustment of applying IFRS 9	543	3,925	4,468
Balance at January 1, 2018 (IFRS 9)	543	3,925	4,468
Acquisition	—	290	290
Recognized in profit or loss under “Other gains and losses”	(26)	—	(26)
Recognized in other comprehensive income under “Unrealized gain or loss on investments in equity instruments at fair value through other comprehensive income”	—	(175)	(175)
Proceeds from return of investees	—	(7)	(7)
Balance at December 31, 2018	\$ 517	\$ 4,033	\$4,550
Unrealized loss in 2018	\$ (26)		

The fair values of financial assets and financial liabilities of Level 2 are determined as follows:

- 1) The fair values of financial assets and financial liabilities with standard terms and conditions and traded in active markets are determined with reference to quoted market prices.
- 2) For derivatives, fair values are estimated using discounted cash flow model. Future cash flows are estimated based on observable inputs including foreign exchange rates at the end of the reporting periods, and forward and spot exchange rates stated in the contracts, discounted at a rate that reflects the credit risk of various counterparties.

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The fair values of non-listed domestic and foreign equity investments were Level 3 financial assets, and determined using the market approach by reference the Price-to-Book ratios (P/B ratios) of peer companies that traded in active market or using assets approach. The significant unobservable inputs used were listed in the table below. A decrease in discount for the lack of marketability or noncontrolling interests discount would result in increases in the fair values.

	December 31 2018
Discount for lack of marketability	12.73%-20.00%
Noncontrolling interests discount	24.41%-25.00%

If the inputs to the valuation model were changed to reflect reasonably possible alternative assumptions while all the other variables were held constant, the fair values of equity investments would increase as below table. When related discounts increase, the fair value of equity investments would be the negative amount of the same amount.

	December 31 2018 NT\$ (In Millions)
Discount for lack of marketability	
5% decrease	\$ 268
Noncontrolling interests discount	
5% decrease	\$ 37

40. RELATED PARTIES TRANSACTIONS

The ROC Government, one of Chunghwa's customers has significant equity interest in Chunghwa. Chunghwa provides fixed-line services, wireless services, internet and data and other services to the various departments and institutions of the ROC Government in the normal course of business and at arm's-length prices. The transactions with the ROC government bodies have not been provided because the transactions are not individually or collectively significant. However, the related revenues and operating costs have been appropriately recorded.

a. The Company engages in business transactions with the following related parties:

Company	Relationship
Taiwan International Standard Electronics Co., Ltd.	Associate
So-net Entertainment Taiwan Limited	Associate
KKBOX Taiwan Co., Ltd.	Associate
KingwayTek Technology Co., Ltd.	Associate
UUPON Inc.	Associate
Taiwan International Ports Logistics Corporation	Associate
Huada Digital Corporation	Joint venture
Chunghwa Benefit One Co., Ltd.	Joint venture
International Integrated System, Inc.	Associate
Senao Networks, Inc.	Associate
EnGenius Tech. Co., Ltd.	Subsidiary of the Company's associate, Senao Networks, Inc.
HopeTech Technologies Limited	Associate
ST-2 Satellite Ventures Pte., Ltd.	Associate
Viettel-CHT Co., Ltd.	Associate
Click Force Co., Ltd.	Associate
Alliance Digital Tech Co., Ltd.	Associate
MeWorks LIMITED HK	Associate
Chunghwa PChome Fund I Co., Ltd. ("CPFI")	Associate
Cornerstone Ventures Co., Ltd. ("CVC")	Associate
Other related parties	
Chunghwa Telecom Foundation	A nonprofit organization of which the funds donated by Chunghwa exceeds one third of its total funds
Senao Technical and Cultural Foundation	A nonprofit organization of which the funds donated by SENAO exceeds one third of its total funds
Sochamp Technology Co., Ltd.	Investor of significant influence over CHST
E-Life Mall Co., Ltd.	One of the directors of E-Life Mall and a director of SENAO are members of an immediate family
Engenius Technologies Co., Ltd.	Chairman of Engenius Technologies Co., Ltd. is a member of SENAO's management
United Daily News Co., Ltd.	Investor of significant influence over SFD
Shenzhen Century Communication Co., Ltd.	Investor of significant influence over SCT
Taoyuan Aerotropolis Co., Ltd.	Investor of significant influence over TASUI

b. Balances and transactions between Chunghwa and its subsidiaries, which are related parties of Chunghwa, have been eliminated on consolidation and are not disclosed in this note. Terms of the foregoing transactions with related parties were not significantly different from transactions with non-related parties. When no similar transactions with non-related parties can be referenced, terms were determined in accordance with mutual agreements. Details of transactions between the Company and other related parties are disclosed below:

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1) Operating transactions

	Revenues		
	Year Ended		
	December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Associates	\$292	\$344	\$344
Joint ventures	7	1	—
Others	49	65	94
	\$348	\$410	\$438

	Operating Costs and Expenses		
	Year Ended December		
	31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Associates	\$1,405	\$1,197	\$1,304
Joint ventures	17	2	—
Others	74	71	75
	\$1,496	\$1,270	\$1,379

2) Non-operating transactions

	Non-operating Income and Expenses		
	Year Ended December		
	31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Associates	\$37	\$ 32	\$ 31
Others	—	—	—
	\$37	\$ 32	\$ 31

3) Receivables

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Associates	\$43	\$ 11
Others	6	13
	\$49	\$ 24

4) Payables

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Associates	\$680	\$914
Others	4	4
	\$684	\$918

5) Customers' deposits

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Associates	\$ 6	\$ 6

6) Acquisition of property, plant and equipment

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Associates	\$ 313	\$ 390	\$ 312
Joint ventures	7	—	—
	\$ 320	\$ 390	\$ 312

7) Prepayments

Chunghwa entered into a contract with ST-2 Satellite Ventures Pte., Ltd. on March 12, 2010 to lease capacity on the ST-2 satellite. This lease is for 15 years which should start from the official operation of ST-2 satellite and the total contract value is approximately \$6,000 million (SG\$261 million), including a prepayment of \$3,068 million, and the rest of amount should be paid annually when ST-2 satellite starts its official operation. ST-2 satellite was launched in May 2011, and began its official operation in August 2011. The total rental expense for the year ended December 31, 2016 was \$394 million, which consisted of an offsetting credit of the prepayment of \$204 million and an additional accrual of \$190 million. The total rental expense for the year ended December 31, 2017 was \$392 million, which consisted of an offsetting credit of the prepayment of \$204 million and an additional accrual of \$188 million. The total rental expense for the year ended December 31, 2018 was \$394 million, which consisted of an offsetting credit of the prepayment of \$204 million and an additional accrual of \$190 million. The prepaid rents (classified as prepayments) as of December 31, 2017 and 2018, were as follows:

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Prepaid rents - current	\$ 204	\$ 205
Prepaid rents - noncurrent	1,551	1,346
	\$ 1,755	\$ 1,551

c. Compensation of key management personnel

The compensation of directors and other key management personnel for the years ended December 31, 2016, 2017 and 2018 were as follows:

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Short-term employee benefits	\$251	\$ 254	\$282
Post-employment benefits	8	9	10
Share-based payment	2	2	9
	\$261	\$ 265	\$301

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The compensation of directors and other key management personnel was mainly determined by the compensation committee having regard to the performance of individual and market trends.

41. PLEDGED ASSETS

The following assets are pledged as collaterals for bank loans and custom duties of the imported materials.

	December 31	
	2017	2018
	NT\$	NT\$
	(In Millions)	
Property, plant and equipment	\$2,550	\$2,520
Land held under development (included in inventories)	1,999	1,999
Restricted assets (included in other assets - others)	3	3
	\$4,552	\$4,522

42. SIGNIFICANT CONTINGENT LIABILITIES AND UNRECOGNIZED COMMITMENTS

The Company's significant contingent liabilities and recognized commitments, excluding those disclosed in other notes, were as follows:

- a. Acquisitions of land and buildings of \$174 million as of December 31, 2018.
- b. Acquisitions of telecommunications equipment of \$15,760 million as of December 31, 2018.
- c. Unused letters of credit amounting to \$50 million as of December 31, 2018.
- d. A commitment to contribute \$2,000 million to a Piping Fund administered by the Taipei City Government, of which \$1,000 million was contributed by Chunghwa on August 15, 1996 (classified as other monetary assets - noncurrent). If the fund is not sufficient, Chunghwa will contribute the remaining \$1,000 million upon notification from the Taipei City Government.
- e. CHPT signed the contract for its headquarters construction amounted to \$1,614 million in July 2017. The payment of \$567 million has been made as of March 31, 2019.

43. SIGNIFICANT SUBSEQUENT EVENTS

The participation of establishing Next Commercial Bank Co., Ltd. ("NCB") was approved by Chunghwa's Board of Directors in January 2019. The Company expects to invest \$4,500 million at most in NCB's common stock and the Company's equity ownership interest in NCB will be no more than 45%. The establishment of NCB is subject to the approval of FSC. As of March 31, 2019, Chunghwa prepaid \$838 million for the application of establishment of NCB.

44. SEGMENT INFORMATION

The Company has the following reportable segments that provide different products or services. The reportable segments are managed separately because each segment represents a strategic business unit that serves different markets. Segment information is provided to CEO who allocates resources and assesses segment performance. The Company's measure of segment performance is mainly based on revenues and income before income tax. The Company's reportable segments are as follows:

- a. Domestic fixed communications business - the provision of local telephone services, domestic long distance telephone services, broadband access, and related services;

b. Mobile communications business - the provision of mobile services, sales of mobile handsets and data cards, and related services;

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- c. Internet business - the provision of HiNet services and related services;
 - d. International fixed communications business - the provision of international long distance telephone services and related services;
 - e. Others - the provision of non-telecom services and the corporate related items not allocated to reportable segments.
- Some operating segments have been aggregated into a single operating segment taking into account the following factors: (a) similar economic characteristics such as long-term gross profit margins; (b) the nature of the telecommunications products and services are similar; (c) the nature of production processes of the telecommunications products and services are similar; (d) the type or class of customer for the telecommunications products and services are similar; and (e) the methods used to provide the services to the customers are similar.

There was no material differences between the accounting policies of the operating segments and the accounting policies described in Note 3.

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a. Segment revenues and operating results

Analysis by reportable segment of revenues and operating results of continuing operations was as follows:

	Domestic			International		Total
	Fixed	Mobile		Fixed		
	Communi-	Communi-	Internet	Communi-	Others	
	cations	cations		cations	NT\$	NT\$
	Business	Business	Business	Business		
	NT\$	NT\$	NT\$	NT\$		
	(In Millions)					
Year ended December 31, 2016						
Revenues						
From external customers	\$72,784	\$110,801	\$28,100	\$14,434	\$3,872	\$229,991
Intersegment revenues	22,669	2,530	4,734	2,680	4,122	36,735
Segment revenues	\$95,453	\$113,331	\$32,834	\$17,114	\$7,994	266,726
Intersegment elimination						(36,735)
Consolidated revenues						\$229,991
Segment income before income tax	\$25,658	\$13,926	\$10,729	\$1,098	\$(1,998)	\$49,413
Year ended December 31, 2017						
Revenues						
From external customers	\$71,137	\$109,376	\$28,917	\$13,552	\$4,532	\$227,514
Intersegment revenues	22,515	2,031	4,209	2,375	4,600	35,730
Segment revenues	\$93,652	\$111,407	\$33,126	\$15,927	\$9,132	263,244
Intersegment elimination						(35,730)
Consolidated revenues						\$227,514
Segment income before income tax	\$24,888	\$12,433	\$11,118	\$1,029	\$(1,459)	\$48,009
Year ended December 31, 2018						
Revenues						
From external customers	\$66,753	\$100,937	\$29,813	\$13,435	\$4,545	\$215,483
Intersegment revenues	17,125	1,702	4,038	2,234	5,008	30,107
Segment revenues	\$83,878	\$102,639	\$33,851	\$15,669	\$9,553	245,590
Intersegment elimination						(30,107)
Consolidated revenues						\$215,483
Segment income before income tax	\$18,243	\$15,328	\$11,944	\$1,024	\$(1,553)	\$44,986

b. Other segment information

Other information reviewed by the chief operating decision maker or regularly provided to the chief operating decision maker was as follows:

For the year ended December 31, 2016

	Domestic			International		
	Fixed	Mobile		Fixed		
	Communi-	Communi-	Internet	Communi-		
	cations	cations		cations	Others	Total
	Business	Business	Business	Business	NT\$	NT\$
	NT\$	NT\$	NT\$	NT\$		
	(In Millions)					
Share of the profit of associates and joint ventures accounted for using equity method	\$—	\$—	\$—	\$—	\$515	\$515
Interest income	\$15	\$11	\$7	\$6	\$150	\$189
Interest expenses	\$—	\$2	\$—	\$—	\$18	\$20
Operating costs and expenses	\$64,230	\$79,593	\$13,160	\$14,313	\$10,094	\$181,390
Depreciation and amortization	\$16,414	\$10,620	\$3,626	\$1,451	\$374	\$32,485
Capital expenditure	\$9,846	\$8,981	\$2,718	\$1,136	\$836	\$23,517
Impairment loss on property, plant and equipment	\$—	\$596	\$—	\$—	\$—	\$596
Reversal of impairment loss on investment properties	\$148	\$—	\$—	\$—	\$—	\$148

For the year ended December 31, 2017

	Domestic			International		
	Fixed	Mobile		Fixed		
	Communi-	Communi-	Internet	Communi-		
	cations	cations		cations	Others	Total
	Business	Business	Business	Business	NT\$	NT\$
	NT\$	NT\$	NT\$	NT\$		

(In Millions)

Share of the profit of associates and joint						
ventures accounted for using equity method	\$—	\$—	\$—	\$—	\$419	\$419
Interest income	\$21	\$15	\$9	\$15	\$145	\$205
Interest expenses	\$—	\$6	\$—	\$—	\$16	\$22
Operating costs and expenses	\$62,795	\$80,275	\$13,288	\$13,385	\$10,963	\$180,706
Depreciation and amortization	\$15,614	\$11,001	\$3,385	\$1,477	\$453	\$31,930
Capital expenditure	\$11,647	\$9,742	\$2,779	\$1,580	\$1,127	\$26,875
Reversal of impairment loss on investment						
properties	\$11	\$—	\$—	\$—	\$—	\$11

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For the year ended December 31, 2018

	Domestic		International			Total NT\$
	Fixed Communi- cations	Mobile Communi- cations	Internet	Fixed Communi- cations	Others	
	Business NT\$	Business NT\$	Business NT\$	Business NT\$	NT\$	
(In Millions)						
Share of the profit of associates and joint ventures accounted for using equity method	\$—	\$—	\$—	\$—	\$509	\$509
Interest income	\$18	\$12	\$19	\$28	\$120	\$197
Interest expenses	\$—	\$—	\$—	\$—	\$18	\$18
Operating costs and expenses	\$59,430	\$73,901	\$13,766	\$13,279	\$11,573	\$171,949
Depreciation and amortization	\$15,027	\$13,788	\$3,121	\$1,425	\$448	\$33,809
Capital expenditure	\$12,693	\$10,664	\$2,729	\$1,348	\$1,116	\$28,550
Reversal of impairment loss on investment properties	\$19	\$—	\$—	\$—	\$—	\$19

c. Main products and service revenues

The following is an analysis of the Company's revenue from its major products and services.

	Year Ended December 31		
	2016 NT\$	2017 NT\$	2018 NT\$
(In Millions)			
Mobile services revenue	\$78,788	\$75,823	\$63,906
Sales of product	35,377	37,649	41,289
Local telephone and domestic long distance telephone services revenue	34,531	32,247	29,996
Broadband access and domestic leased line services revenue	23,315	22,950	22,453
Data communications internet services revenue	20,906	21,143	21,137
International network and leased telephone services revenue	10,634	9,328	8,724
Others	26,440	28,374	27,978
	\$229,991	\$227,514	\$215,483

d. Geographic information

The users of the Company's services are mainly from Taiwan, ROC. The revenues it derived outside Taiwan are mainly revenues from international long distance telephone and leased line services. The geographic information for revenues was as follows:

	Year Ended December 31		
	2016	2017	2018
	NT\$	NT\$	NT\$
	(In Millions)		
Taiwan, ROC	\$218,933	\$217,568	\$205,696
Overseas	11,058	9,946	9,787
	\$229,991	\$227,514	\$215,483

The Company has long-lived assets in U.S., Singapore, Hong Kong, China, Vietnam, Japan, and Thailand and except for \$4,445 million and \$4,324 million as of December 31, 2017 and 2018, respectively, in the aforementioned areas, the other long-lived assets are located in Taiwan, ROC.

e. Major customers

For the years ended December 31, 2016, 2017 and 2018, the Company did not have any single customer whose revenue exceeded 10% of the total revenues.

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