HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED FINANCIAL STATEMENTS AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

ATTACHMENT: INDEPENDENT AUDITORS' REPORT

HANWHA CORPORATION

Contents

Deloitte Anjin LLC
9F., One IFC,
10, Gukjegeumyung-ro,
Youngdeungpo-gu, Seoul
07326, Korea

Tel: +82 (2) 6676 1000
Fax: +82 (2) 6674 2114
www.deloitteanjin.co.kr

INDEPENDENT AUDITORS' REPORT

English Translation of Independent Auditors' Report Originally Issued in Korean on March 20, 2019

To the Shareholder and the Board of Directors of

Hanwha Corporation., Ltd.:

Report on the Audited Consolidated Financial Statements

Our Opinion

We have audited the accompanying consolidated financial statements of Hanwha Corporation and its subsidiaries (the "Group") , which comprise the consolidated statements of financial position as of December 31, 2018 and 2017, and the consolidated statements of income, the consolidated statements of comprehensive income, consolidated statements of changes in shareholders' equity and consolidated statement of cash flows, for the years then ended, and a summary of significant accounting policies and other explanatory information.

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Group as of December 31, 2018 and December 31, 2017, and its financial performance and its cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("K-IFRSs").

Basis for Audit Opinion

We conducted our audits in accordance with the Korean Standards on Auditing ("KSAs"). Our responsibilities under those standards are further described in the Auditors; Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are independent of the Group in accordance with the ethical requirements, including those related to independence, that are relevant to our audits of the consolidated financial statements in the Republic of Korea as required by prevailing audit regulations. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current year. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a consolidated opinion on these matters.

Valuation of Premium Reserve

(1) Why it is determined to be a key matter

As explained in Note 2 (29) 1), the Group calculates premium reserves in accordance with the premium and liability reserve calculation manual under the Regulation on Supervision of Insurance Business for settling future insurance claims arisen from the existing contracts at the end of reporting period. Estimation of premium reserve requires assumptions such as interest rate and risk rate defined under Article 6-12 of the Regulation on Supervision of Insurance Business.

Premium reserve is calculated by level premium method, in which the premiums are guaranteed to remain the same throughout the contract. It reserves excess premium when level premium exceeds risk premium in the beginning of the contract to cover the premium shortage at the end of the contract when risk premium exceeds level premium.

Deloitte.

Premium reserve recognized in the consolidated statement of financial position is ₩89,225,510 million as at the end of reporting period.

The calculation of premium reserve might cause a misstatement due to involvement of various types of contract information and complex models, which could have a material impact on profit for the year and net assets of the Group.

(2) How our audit addressed the key audit matter

In order to obtain audit evidence for the purpose of group auditing related to the valuation of premium reserves of the consolidated subsidiaries, it was decided to use the component auditor of Hanwha Life Insurance Co., Ltd. We confirm that component auditor's independence, objectivity and competence. In addition, in order to evaluate the sufficiency and suitability of the audit evidence obtained, we reviewed the component auditor's audit report for confirming procedures performed by the component auditor.

We obtained an understanding and assessed the Group's policy to calculate premium reserve is in compliance with the Regulation on Supervision of Insurance Business and Detailed Regulation on Supervision of Insurance Business. We also reconciled the premium reserve amount on the final premium reserve closing data with the one on the financial closing data.

We tested completeness of insurance contracts subject to premium reserve by examining the contracts' details in insurance contract system agree to those in premium reserve calculation system.

We evaluated reliability and accuracy of underlying data of premium reserve calculation, and it includes obtaining detailed calculation sheet of premium reserve and examining, on a sample basis, input data required by the Group's policy are completely and appropriately included in the details of calculation.

We assessed reserve calculation logic and tested mathematical accuracy of premium reserve valuation through independent recalculation.

We verified accuracy of estimated interest rate and crediting rate of premium reserve, on a sample basis, by agreeing the support documents and disclosed information on inputs configured in the premium reserve calculation system.

Responsibilities of Management and the Directors for the Consolidated Financial Statements

Management is responsible for the preparation of the accompanying consolidated financial statements in accordance with K-IFRSs, and for such internal control as they determine is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management of the Group is responsible for assessing the Group's ability to continue as a going concern; disclosing, as applicable, matters related to going concern and using the going-concern basis of accounting, unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

The directors' responsibilities include overseeing the Group's financial reporting process.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with KSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with KSAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, design and perform audit procedures responsive to those risks and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of the management's use of the going-concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We are solely responsible for our audit opinion.

We communicate with the directors of the Group regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the directors of the Group with a statement that we have complied with relevant ethical requirements, including those related to independence, and to communicate with them all matters that may reasonably be thought to bear on our independence and, where applicable, related safeguards.

From the matters communicated with the directors, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current year and are therefore the key audit matters. We describe these matters in our auditors' report, unless law or regulation precludes public disclosure about the matter.

The engagement partner on the audit resulting in this independent auditors' report is, Park, Jaegwan.

March 20, 2019

Deloitte Anjin LLC

Notice to Readers

This report is effective as of March 20, 2019, the auditors' report date. Certain subsequent events or circumstances may have occurred between the auditors' report date and the time the auditors' report is read. Such events or circumstances could significantly affect the consolidated financial statements and may result in modifications to the auditors' report.

Hanwha Corporation and its Subsidiaries
(the "Group")

Consolidated Financial Statements
as of and for the Years Ended
December 31, 2018 and 2017

"The accompanying consolidated financial statements, including all footnote disclosures, were prepared by, and are the responsibility of, the Group."

OK, KYEONG SEAK

Chief Executive Officer
HANWHA CORPORATION

Headquarters Address: (Road Name and Address) 86, Cheonggyecheon-ro, Jung-gu, Seoul
(Phone Number) 02-729-1114

HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

AS OF DECEMBER 31, 2018 AND 2017

	2018	2017
	(In millions of Korean won)	
ASSETS		
Current assets:		
Cash and cash equivalents (Notes 7,8,9 and 60)	₩ 2,944,541	₩ 2,109,153
AFS financial assets (Notes 9,11,59 and 60)	-	291
FVTPL-financial assets (Notes 9,11,59 and 60)	15	-
FVTOCI-financial assets (Notes 9,11,59 and 60)	156	-
Trade and other receivables (Notes 9,10,55 and 60)	4,244,879	5,035,330
Other financial assets (Notes 7,9,12,13,55,59 and 60)	711,140	676,752
Other current assets (Note 15 and 25)	1,844,018	1,034,290
Current income tax assets	15,431	11,963
Inventories (Note 14)	3,879,808	2,690,791
Assets held for sale (included assets of disposal group) (Note 58)	80,534	61,122
	13,720,522	11,619,692
Non-current assets:		
AFS financial assets (Notes 9,11,59 and 60)	-	478,059
FVTPL-financial assets (Notes 9,11,59 and 60)	155,203	-
FVTOCI-financial assets (Notes 9,11,59 and 60)	23,669	-
Trade and other receivables (Notes 9 and 10)	93,866	84,751
Other financial assets (Notes 7,9,12,13,59 and 60)	211,341	193,861
Investments in associates (Note 5)	2,102,268	2,290,061
Investment property (Note 17)	814,188	962,153
Property, plant and equipment (Note 16)	11,480,140	10,176,341
Intangible assets (Note 18)	2,059,497	1,550,579
Other non-current assets (Note 15)	154,906	71,370
Deferred income tax assets (Note 53)	365,769	344,971
	17,460,847	16,152,146
Assets for financial business:		
Cash and cash equivalents (Notes 26,27 and 60)	2,114,197	785,401
Deposit (Notes 26,27 and 60)	-	1,001,668
FVTPL-financial assets (Notes 26,28 and 60)	20,164,936	-
FVTOCI-financial assets (Notes 26,28 and 60)	23,457,239	-
Financial assets measured at amortized cost (Notes 26,28 and 60)	60,480,040	-
Securities (Notes 26 and 28)	-	70,305,759
Investments in associates (Note 5)	153,432	167,805
Loans and non-trade receivables (Notes 26,29, 55 and 60)	-	26,823,704
Property, plant and equipment (Note 33)	1,681,989	1,699,399
Investment property (Note 33)	2,404,677	2,375,656
Intangible assets (Note 33)	317,169	388,069
Derivative financial assets (Notes 26,31,59 and 60)	493,277	1,646,078
Current income tax assets	13,728	128,275
Deferred income tax assets (Note 53)	251,653	40,409
Other financial assets (Notes 26,30,55 and 60)	2,056,028	1,846,494
Other assets (Note 32)	3,368,153	3,563,762
Separate account assets (Note 38)	21,410,690	21,650,661
	138,367,208	132,423,140
Total assets	₩ 169,548,577	₩ 160,194,978

(Continued)

HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION (CONTINUED)

AS OF DECEMBER 31, 2018 AND 2017

	2018	2017
	(In millions of Korean won)	
LIABILITIES		
Current liabilities:		
Trade and other payables (Notes 9,19,55 and 59)	₩ 3,005,321	₩ 3,385,071
Borrowings and debentures (Notes 9 and 20)	7,062,482	5,804,804
Other financial liabilities (Notes 9,13 and 21)	786,101	740,551
Other current liabilities (Note 22 and 25)	3,459,705	2,460,873
Provisions for other liabilities and charges (Note 24)	364,124	239,930
Current income tax liabilities	185,279	299,461
Liabilities classified as held-for-sale	6,989	-
	14,870,001	12,930,690
Non-current liabilities:		
Trade and other payables (Notes 9,19 and 55)	164,078	139,134
Borrowings and debentures (Notes 9,20 and 55)	5,799,913	5,139,400
Other financial liabilities (Notes 9,13,21 and 60)	326,550	348,546
Other non-current liabilities (Note 22)	1,278,849	1,264,979
Net defined benefit liabilities (Note 23)	1,554,394	1,371,094
Provisions for other liabilities and charges (Note 24)	279,589	200,587
Deferred income tax liabilities (Note 53)	1,239,858	1,174,032
	10,643,231	9,637,772
Liabilities for financial business:		
Withheld liabilities (Notes 26 and 37)	1,151,598	1,243,860
Insurance contract liabilities (Notes 34 and 35)	94,572,120	90,222,047
Policyholder's equity adjustments (Note 36)	172,509	701,449
Current income tax liabilities	294,262	22,148
Deferred income tax liabilities (Note 53)	213,749	646,220
Derivative financial liabilities (Notes 26,31,59 and 60)	565,918	166,066
Net defined benefit liabilities (Note 39)	173,403	153,389
Provisions for other liabilities and charges (Note 40)	58,802	49,878
Other financial liabilities (Notes 26,41,59 and 60)	7,684,399	6,463,536
Other liabilities (Note 42)	160,541	181,062
Separate account liabilities (Notes 35 and 38)	22,035,009	21,812,115
	127,082,310	121,661,770
Total liabilities	152,595,542	144,230,232
EQUITY		
Equity attributable to owners of the parent:		
Capital stock (Note 43)	489,550	489,550
Capital surplus (Note 43)	496,385	547,154
Capital adjustments (Note 44)	23,339	38,295
Accumulated other comprehensive income (Note 45)	(484,146)	101,197
Retained earnings (Note 46)	3,660,257	3,365,096
	4,185,385	4,541,292
Non-controlling interests	12,767,650	11,423,454
Total equity	16,953,035	15,964,746
Total liabilities and equity	₩ 169,548,577	₩ 160,194,978

(Concluded)

See notes to consolidated financial statements.

HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	2018	2017
	(In millions of Korean won)	
Revenue		
Revenue from non-financial business (Notes 25, 47 and 55)	₩ 23,517,759	₩ 22,758,266
Revenue from financial business (Notes 47 and 55)	25,348,457	27,646,170
Adjustment amount for profit or loss (Overlay Adjustment) (Note 47)	(126,063)	-
	48,740,153	50,404,436
Cost of sales		
Cost of sales from non-financial business (Notes 25,48,50 and 55)	20,205,466	19,373,919
Cost of sales from financial business (Notes 48, 50 and 55)	24,781,743	26,547,199
Adjustment amount for profit or loss (overlay adjustment) (Note 47)	(507,978)	-
	44,479,231	45,921,118
Gross profit	4,260,922	4,483,318
Selling and administrative expenses (Notes 49,50 and 55)	2,454,774	2,324,387
Operating profit	1,806,148	2,158,931
Other gains (Notes 51 and 55)	842,142	916,894
Other losses (Notes 51 and 55)	1,425,396	1,287,061
Finance income (Notes 9,26 and 52)	75,194	37,348
Finance costs (Notes 9,26 and 52)	419,079	413,436
Share in profit of associates (Note 5)	420,831	582,469
Profit before income tax expense	1,299,840	1,995,145
Income tax expense (Note 53)	500,500	684,208
Profit for the year	799,340	1,310,937
Profit attributable to:		
Equity holders of the parent company's profit for the year	468,400	405,379
Non-controlling interests' profit for the year	330,940	905,558
Other comprehensive income (loss)		
Items that may be reclassified subsequently to profit of loss :		
Change in value of AFS financial assets	-	(154,732)
Gain (loss) on valuation of FVTOCI—financial assets(debt instrument)	25,017	-
Change in value of held-to-maturity investments of financial assets	-	(76,264)
Share in other comprehensive income (loss) of associates	9,967	(27,383)
Gain on valuation of derivatives qualifying cash flow hedge	6,340	9,373
Translation of foreign currency financial statements	(10,921)	(65,062)
Other comprehensive income (loss) of separate accounts	35,293	(39,726)
Adjustment amount for profit or loss (overlay adjustment)	(228,927)	-
Items that will not be reclassified to profit of loss:		
Remeasurements of the net defined benefit liabilities	(210,196)	41,035
Gain (loss) on valuation of FVTOCI—financial assets (debt instrument)	(144,576)	-
Gain on valuation of financial liabilities designated as at FVTPL (credit risk change)	865	-
Other comprehensive loss for the year, net of tax	(373,427)	(312,759)
Total comprehensive income for the year	425,913	998,178

(Continued)

HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (CONTINUED)

FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

		2018		2017
		(In millions of Korean won)		
Attributable to:				
Equity holders of the parent company	₩	264,895	₩	310,414
Non-controlling interests		161,018		687,764
Total comprehensive income for the year	₩	425,913	₩	998,178
Earnings per share attributable to the equity holders of the parent company during the year (Note 54):				
Basic earnings per common share	₩	6,541	₩	5,619
Basic earnings per preferred share	₩	6,591	₩	5,669

(Concluded)

See notes to consolidated financial statements.

HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	2018	2017
	(In millions of Korean won)	
Cash flows from operating activities		
Cash generated from operations (Note 57)	₩ (148,872)	₩ 388,328
Interest and dividends received from financial business	3,448,972	5,286,217
Interest paid for financial business	(100,031)	(82,647)
Income tax paid	(450,868)	(453,411)
Net cash provided by operating activities	2,749,201	5,138,487
Cash flows from investing activities		
Acquisition of property, plant and equipment	(1,530,513)	(967,822)
Proceeds from disposal of property, plant and equipment	201,956	95,080
Acquisition of intangible assets	(262,690)	(157,835)
Proceeds from disposal of intangible assets	28,275	33,096
Acquisition of investments in associates	(166,909)	(269,602)
Proceeds from disposal of investments in associates	21,247	19,754
Acquisition of financial assets at FVTPL	(5,374,655)	-
Proceeds from disposal of financial assets at FVTPL	3,586,205	-
Acquisition of financial assets at FVTOCI	(6,369,566)	-
Proceeds from disposal of financial assets at FVTOCI	7,955,795	-
Acquisition of financial assets at amortized cost	(1,880,366)	-
Proceeds from disposal of financial assets at amortized cost	122,395	-
Change in AFS financial assets	-	1,234,519
Change in held-to-maturity investments of financial assets	-	(5,594,414)
Acquisition of investment property	(20,684)	(26,307)
Proceeds from disposal of investment property	37,187	487,987
Proceeds from disposal of assets classified as held for sale	111,431	80,139
Change in other financial assets	560,775	109,364
Interest received	77,908	40,734
Dividends received	499,869	217,277
Decrease in cash from changes in scope of consolidation	(224,594)	(947,205)
Others	(5,286)	(20,560)
Net cash used in investing activities	(2,632,220)	(5,665,795)
Cash flows from financing activities		
Increase in borrowings and debentures	5,829,985	6,134,727
Repayment of borrowings and debentures	(4,375,137)	(6,706,618)
Increase in paid-in capital	-	-
Change in other financial liabilities	(44,350)	(4,595)
Change in non-controlling interests	(88,771)	718,419
Issuance of hybrid capital instruments	1,249,456	-
Dividends paid to holders of hybrid capital instruments	(53,906)	-
Interest paid	(469,688)	(389,819)
Dividends paid	(56,276)	(57,040)
Net cash provided by (used in) financing activities	1,991,313	(304,926)
Net increase (decrease) in cash and cash equivalents	2,108,294	(832,234)
Cash and cash equivalents		
Cash and cash equivalents at beginning of year	2,894,554	3,768,959
Exchange gains (losses) on cash and cash equivalents	55,890	(42,171)
Cash and cash equivalents at end of year	₩ 5,058,738	₩ 2,894,554

See notes to consolidated financial statements.

HANWHA CORPORATION AND ITS SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Capital Stock	Capital Surplus	Capital Adjustments	Accumulated Other Comprehensive Income and Expense	Retained Earnings	Non-Controlling Interests	Total
				(In millions of Korean won)			
Balance at January 1, 2017	₩ 489,550	₩ 670,913	₩ 38,196	₩ 214,194	₩ 2,995,295	₩ 9,819,788	₩ 14,227,936
Profit for the year	-	-	-	-	405,379	905,558	1,310,937
Comprehensive income:							
Change in value of AFS financial assets	-	-	-	(46,460)	-	(108,272)	(154,732)
Change in value of held-to-maturity investments of financial assets	-	-	-	(32,965)	-	(43,299)	(76,264)
Share in other comprehensive income of associates	-	-	-	(14,356)	-	(13,027)	(27,383)
Gain (loss) on valuation of derivatives qualifying cash flow hedge	-	-	-	5,765	-	3,608	9,373
Translation of foreign currency financial statements	-	-	-	(7,274)	-	(57,788)	(65,062)
Remeasurements of the net defined benefit liabilities	-	-	-	-	18,032	23,003	41,035
Other comprehensive income of separate accounts	-	-	-	(17,707)	-	(22,019)	(39,726)
Transactions with equity holders of the parent company:							
Dividends	-	-	-	-	(57,040)	(93,953)	(150,993)
Capital transactions within the Group	-	(123,768)	-	-	-	1,007,039	883,271
Other changes in equity	-	9	99	-	3,430	2,816	6,354
Balance at December 31, 2017	₩ 489,550	₩ 547,154	₩ 38,295	₩ 101,197	₩ 3,365,096	₩ 11,423,454	₩ 15,964,746
Balance at January 1, 2018	₩ 489,550	₩ 547,154	₩ 38,295	₩ 101,197	₩ 3,365,096	₩ 11,423,454	₩ 15,964,746
Adjustment from changes in accounting policies	-	-	-	(414,726)	(120,648)	(464,566)	(999,940)
Profit for the year	-	-	-	-	468,400	330,940	799,340
Comprehensive income:							
Gain (loss) on valuation of FVTOCI—financial assets	-	-	-	(61,329)	-	(58,230)	(119,559)
Gain (loss) on valuation of FVTOCI—debt instruments	-	-	-	105	-	760	865
Share in other comprehensive income of associates	-	-	-	4,540	-	5,427	9,967
Gain (loss) on valuation of derivatives qualifying cash flow hedge	-	-	-	2,762	-	3,578	6,340
Translation of foreign currency financial statements	-	-	-	(13,276)	-	2,355	(10,921)
Remeasurements of the net defined benefit liabilities	-	-	-	-	(32,888)	(33,597)	(66,485)
Other comprehensive income of separate accounts	-	-	-	15,622	-	19,671	35,293
Adjustment amount for profit or loss (overlay adjustment)	-	-	-	(119,041)	-	(109,886)	(228,927)
Gain (loss) on disposal of FVTOCI—financial assets	-	-	-	-	14,780	26,275	41,055
Transactions with equity holders of the parent company:							
Dividends	-	-	-	-	(56,276)	(166,254)	(222,530)
Capital transactions within the Group	-	(50,769)	-	-	-	1,824,833	1,774,064
Other changes in equity	-	-	(14,956)	-	21,793	(37,110)	(30,273)
Balance at December 31, 2018	₩ 489,550	₩ 496,385	₩ 23,339	₩ (484,146)	₩ 3,660,257	₩ 12,767,650	₩ 16,953,035

(Concluded)

See notes to consolidated financial statements

HANWHA CORPORATION AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

1. GENERAL INFORMATION:

Hanwha Corporation (the "Company") as the parent company, in accordance with Korean International Financial Reporting Standard ("K- IFRS") 1110, Consolidated Financial Statements, was established on October 28, 1952, and is engaged in the manufacturing and selling of explosives and trading business. The Company has manufacturing facilities in the cities of Yeosu, Daejeon, Boeun, Gumi, Changwon and Asan and several business offices.

On June 25, 1976, the Company listed its stock on the Korea Exchange. Through numerous capital increases, the capital stock of the Company as of December 31, 2018, amounted to ₩489,550 million (equivalent to $437,841 thousand). As of December 31, 2018, the Company's major shareholders consist of the following:

	Common stock (Number of shares)	Preferred stock (Number of shares)	Total (Number of shares)	Percentage of ownership (%)
Kim Seung-Youn	16,977,949	1,470,000	18,447,949	18.84
Kim Dong-Kwan	3,330,000	860,654	4,190,654	4.28
H-Solution(formerly, Hanwha S&C Co., Ltd.)	1,650,000	426,450	2,076,450	2.12
Cheonan Bukil Institute and others	5,069,894	5,726	5,075,620	5.18
Treasury stock	5,880,000	-	5,880,000	6.01
Others	42,050,892	20,188,464	62,239,356	63.57
Total	74,958,735	22,951,294	97,910,029	100.00

(*1) In October 2016, the Company increased paid-in capital for preferred stock without voting rights (22,472,000 shares), which is included above.

2. SIGNIFICANT ACCOUNTING POLICIES:

(1) Basis of consolidated financial statements preparation

The Company and its subsidiaries (the "Group") have prepared the consolidated financial statements in accordance with K-IFRSs.

The principal accounting policies are set out below. Accounting policies used in preparing the consolidated financial statements for the current year are identical to those used for the previous year, except for the effects of introduction of standards or interpretations as explained below.

The accompanying consolidated financial statements have been prepared on the historical cost basis, except for certain non-current assets and financial instruments that are measured at revalued amounts or fair values, as explained in the accounting policies below. Historical cost is based on the fair values of the consideration given.

1) New and revised standards that have been applied from the year beginning on January 1, 2018, are as follows:

- K-IFRS 1109 (Enactment): 'Financial Instruments'

The Group has applied K-IFRS 1109 Financial Instruments and the related consequential amendments to other K-IFRSs that are effective for an annual period that begins on or after January 1, 2018. K-IFRS 1109 introduced new requirements for

1) the classification and measurement of financial assets and financial liabilities, 2) impairment of financial assets, and 3) general hedge accounting.

In addition, the Group applied the overlay approach in accordance with K-IFRS 1104 Insurance Contracts as it first applied K-IFRS 1109.

At the date of initial application, the Group elected not to restate prior periods, and hence, the Company did not restate comparative financial statements in accordance with K-IFRS 1109.

Details of these new requirements as well as their impact on the Group's consolidated financial statements are described below.

A. Classification and measurement of financial assets

All recognized financial assets that are within the scope of K-IFRS 1109 are required to be measured subsequently at amortized cost or fair value on the basis of the entity's business model for managing the financial assets and the contractual cash flow characteristics of the financial assets.

- Financial assets measured at amortized cost

Debt instruments that are held within a business model whose objective is to collect the contractual cash flows, and that have contractual cash flows that are solely payments of principal and interest on the principal amount outstanding, are measured subsequently at amortized cost.

- Financial assets measured at fair value through other comprehensive income ("FVTOCI")

Debt instruments that are held within a business model whose objective is both to collect the contractual cash flows and to sell the debt instruments, and that have contractual cash flows that are solely payments of principal and interest on the principal amount outstanding, are measured subsequently at FVTOCI.

- Financial assets measured at fair value through profit or loss ("FVTPL")

All other debt investments and equity investments are measured subsequently at FVTPL.

Notwithstanding the foregoing, the Group may make the following irrevocable election or designation at the time of initial recognition of a financial asset.

In a business combination that is not held for trading and does apply K-IFRS 1103, one may elect to present subsequent changes in the fair value of the investment in equity securities that are not contingent consideration recognized by the acquirer in other comprehensive income.

If the Group eliminates or significantly reduces accounting mismatch by designating debt security as at FVTPL, the Group can designate the debt security that meets the requirements of a financial asset at FVTOCI or a financial asset at amortized cost as at FVTPL

When a debt security measured at FVTOCI is removed, the cumulative gain or loss recognized in other comprehensive income is reclassified from equity to profit or loss as a reclassification adjustment. On the other hand, for equity security designated as at FVTOCI, cumulative gains or losses previously recognized in other comprehensive income are not subsequently reclassified to profit or loss but are transferred to retained earnings.

Management has reviewed and assessed the financial assets held by the Group based on the facts and circumstances that existed at the date of initial application, and as a result of the initial application of K-IFRS 1109, management has determined that the following effects will occur:

- Debt securities classified as available-for-sale ("AFS") financial assets in accordance with K-IFRS 1039 Financial Instruments: Recognition and Measurement are held under a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets, and the debt securities with contractual cash flows consisting solely payments of principal and interest on the principal amount outstanding are classified as financial assets at FVTOCI. Changes in the fair value of these debt securities are recognized as accumulated gain or loss until they are eliminated or reclassified.

- Investments in equity securities classified as AFS financial assets in accordance with K-IFRS 1039 and measured at fair value at the end of each reporting period (neither held for trading nor contingent consideration arising from business combinations) are designated as at FVTOCI. Changes in the fair value of these equity securities are recognized as accumulated gain or loss.

- In accordance with K-IFRS 1039, held-to-maturity financial assets and financial assets classified as loans and receivables are held under a business model whose objective is collecting contractual cash flows, and the financial assets consisting solely payments of principal and interest on the principal amount outstanding are measured at amortized cost under K-IFRS 1109.

Financial assets at FVTPL in accordance with K-IFRS 1039 are also measured at FVTPL under K-IFRS 1109.

B. Impairment: Financial assets

In accordance with K-IFRS 1109's expected credit loss("ECL") impairment model, unlike K-IFRS 1039, an impairment loss is recognized in respect of impairment of financial assets at the end of each reporting period to reflect changes in credit risk after the initial recognition of the financial asset losses and their changes, that is, it does not necessarily mean that a credit event should occur before one recognizes credit losses

The Company recognizes ECL about i) debt security measured at amortized cost or FVTOCI, ii) lease receivables, iii) contractual assets and iv) loan contracts and financial guarantee contracts that are subject to the impairment provisions of K-IFRS 1109 ECL as loss allowance

In particular, when the credit risk of a financial instrument is significantly increased after initial recognition, or when the credit is impaired when a financial asset is acquired, the loss allowance is measured as the ECL for the whole period. K-IFRS 1109 provides a simplified approach of measuring the loss allowance on trade receivables, contract assets and lease receivables under certain circumstances, which is the amount corresponding to the ECLs for the whole period. Among them, the Company applies the simplified approach for trade receivables and contract assets.

Management determines the credit risk at the date of first recognition of financial instruments in accordance with K-IFRS 1109. Also, management reviews and assesses the impairment of financial assets, contract assets and financial guarantee contracts using reasonable and supportive information that is available for use without undue cost or effort in comparison with the credit risk of the initial date of adoption (January 1, 2018).

The difference between provisions for doubtful accounts under K-IFRS 1039 and guarantees under K-IFRS 1037 Provisions, Contingent Liabilities and Contingent Assets as of January 1, 2018, and loss allowance under K-IFRS 1109 is not material.

In accordance with amendments to K-IFRS 1107 Financial Instruments: Disclosures, the disclosure requirements for the total exposure of credit risk on the Group's consolidated financial statements have increased.

C. Classification and measurement of financial liabilities

One of the major changes related to the classification and measurement of financial liabilities as a result of the adoption of K-IFRS 1109 is the change in the fair value of financial liabilities designated as at FVTPL. Except for when the effect of changes in the credit risk of the financial liabilities designated as at fair value through fair value measurement is recognized as other comprehensive income, it causes an accounting inconsistency in the profit or loss; changes in fair value are recognized in other comprehensive income. Changes in fair value due to credit risk of financial liabilities are not subsequently reclassified to profit or loss but are replaced with retained earnings when financial liabilities are eliminated. In accordance with K-IFRS 1039, all changes in fair value of financial liabilities designated as financial liabilities at FVTPL have been presented in profit or loss.

The adoption of K-IFRS 1109 has no significant impact on the classification and measurement of financial liabilities.

Note 60 (1) 1) describes the specific details of the change in classification according to the application of K-IFRS 1109.

D. Hedge accounting

The new general hedge accounting requirements retain three types of hedge accounting. However, greater flexibility has been introduced to the types of transactions eligible for hedge accounting, specifically broadening the types of instruments that qualify for hedging instruments and the types of risk components of non-financial items that are eligible for hedge accounting. In addition, the effectiveness test has been replaced with the principle of an 'economic relationship.' Retrospective assessment of hedge effectiveness is also no longer required. Enhanced disclosure requirements about the Group's risk management activities have also been introduced.

In accordance with K-IFRS 1109's transition provisions for hedge accounting, the Group has applied the K-IFRS 1109 hedge accounting requirements prospectively from the date of initial application on January 1, 2018. The Group's qualifying hedging relationships in place as at January 1, 2018, also qualify for hedge accounting in accordance with K-IFRS 1109 and were therefore regarded as continuing hedging relationships. No rebalancing of any of the hedging relationships was necessary on January 1, 2018. As the critical terms of the hedging instruments match those of their corresponding hedged items, all hedging relationships continue to be effective under K-IFRS 1109's effectiveness assessment requirements. The Group has also not designated any hedging relationships under K-IFRS 1109 that would not have met the qualifying hedge accounting criteria under K-IFRS 1039.

K-IFRS 1109 requires hedging gains and losses to be recognized as an adjustment to the initial carrying amount of non-financial hedged items (basis adjustment). In addition, transfers from the hedging reserve to the initial carrying amount of the hedged item are not reclassification adjustments under K-IFRS 1001 Presentation of Financial Statements, and hence, they do not affect other comprehensive income. Hedging gains and losses subject to basis adjustments are categorized as amounts that will not be subsequently reclassified to profit or loss in other comprehensive income. This is consistent with the Group's practice prior to the adoption of K-IFRS 1109.

Consistent with prior periods, when a forward contract is used in a cash flow hedge or fair value hedge relationship, the Group designates the change in fair value of the entire forward contract, including the forward element, as the hedging instrument.

The Company continues to designate fair value changes in futures contracts, including forward contracts, as a means of hedging instruments in fair value hedging relationship.

Apart from this, the application of the K-IFRS 1109 hedge accounting requirements has had no other impact on the results and financial position of the Group for the current year. Please refer to Note 59 for detailed disclosures regarding the Group's risk management activities.

Amendments to K-IFRS 1115 – Revenue from Contracts with Customers
The Company initially applied K-IFRS 1115 and adopted the cumulative effect of the initial application of K-IFRS 1115 on January 1, 2018. We chose to apply a modified retrospective method to recognize it on the first day. In addition, the standard is applied retroactively only to contracts that are not completed on the date of initial application, and all contractual changes made before the initial application date are not rewritten.

A. Identification of performance obligations in the contract

The Group is engaged in overseas export contract transaction under various trade conditions and carries out ancillary activities, such as transportation contracts, insurance contracts, and customs clearance to transport goods or other goods to the customer's promised location. In accordance with K-IFRS 1115, overseas export contracts are identified by separating performance obligations into supply of goods and transportation services. Transportation services are recognized as revenue over the period in which the services are provided by the Group when the customer receives and consumes the benefits, and any unfulfilled revenue is recognized as a contract liability.

B. Performance obligations over time

In accordance with K-IFRS 1115, the assets created by the Company's performance of the obligation have no alternative use to the Company itself and the Company must have an enforceable right to payment for performance completed to date to recognize revenue on a progress basis. Based on the internal legal team's opinion, these contracts apply the progress basis only to contracts with enforceable right to payment for performance completed to date, and those without the right to payment shall recognize revenue on delivery basis.

C. Variable consideration

Upon application of K-IFRS 1115, the Company estimates the amount of consideration depending on which method the entity expects to better predict the amount of consideration to which it will be entitled—the expected value or the most likely amount. Variable consideration is included in the transaction price only to the extent that it is probable or highly probable that a significant reversal in the cumulative amount of revenue recognized will not occur in the future periods.

D. Contract modifications

In the case of project-based contracts, a number of contracts are being changed in response to customer requests. As a result of these contract changes, if the range of contracts is expanded by adding promised goods or services and the price of the contract increases by an amount of consideration that reflects the entity’s stand-alone selling prices of the additional promised goods or services and any appropriate adjustments to that price to reflect the circumstances of the particular contract, it must be accounted for as a separate contract.

Amendments to K-IFRS 1102 — Share-Based Payment

The amendments include the following: 1) When measuring the fair value of share-based payment, the effects of vesting and non-vesting conditions on the measurement of cash-settled, share-based payment should be consistent with the measurement of equity-settled, share-based payment; 2) Share-based payment transaction in which the Group settles the share-based payment arrangement net by withholding a specified portion of the equity instruments per statutory tax withholding requirements would be classified as equity settled in its entirety, which otherwise would be classified as equity settled without the net settlement feature; and 3) When a cash-settled, share-based payment changes to an equity-settled, share-based payment because of modifications of the terms and conditions, the original liability recognized is derecognized and the equity-settled, share-based payment is recognized at the modification-date fair value. Any difference between the carrying amount of the liability at the modification date and the amount recognized in equity at the same date would be recognized in profit and loss immediately. The application of these amendments has no significant impact on the Group’s consolidated financial statements.

Amendments to K-IFRS 1040 — Transfers of Investment Property

The amendments clarify that a transfer to, or from, investment property necessitates an assessment of whether a property meets, or has ceased to meet, the definition of investment property, supported by observable evidence that a change in use has occurred. The amendments further clarify that situations other than the ones listed in K-IFRS 1040 may evidence a change in use and that a change in use is possible for properties under construction (i.e., a change in use is not limited to completed properties). The application of these amendments has no material impact on the Group's consolidated financial statements.

Amendments to K-IFRS 2122 — Foreign Currency Transactions and Advance Consideration

The interpretation addresses how to determine the 'date of transaction,' for the purpose of determining the exchange rate to use on initial recognition of an asset, expense or income, when consideration for that item has been paid or received in advance in a foreign currency, which resulted in the recognition of a non-monetary asset or non-monetary liability (e.g., a non-refundable deposit or deferred revenue).

The interpretation specifies that the date of transaction is the date on which the entity initially recognizes the non-monetary asset or non-monetary liability arising from the payment or receipt of advance consideration. If there are multiple payments or receipts in advance, the interpretation requires an entity to determine the date of transaction for each payment or receipt of advance consideration.

Because the Group already accounts for transactions involving the payment or receipt of advance consideration in a foreign currency in a way that is consistent with the amendments, the amendments have no impact on the Group's consolidated financial statements.

Annual Improvements to K-IFRSs 2014 – 2016 – Cycle

The annual improvements include amendments to K-IFRS 1101 First-Time Adoption and K-IFRS 1028 Investment in Associates and Joint Ventures. The amendments to K-IFRS 1028 clarify that the option for a venture capital organization and other similar entities to measure investments in associates and joint ventures at FVTPL is available separately for each associate or joint venture and that election should be made at initial recognition of the associate or joint venture. In respect of the option for an entity that is not an investment entity ("IE") to retain the fair value measurement applied by its associates and joint ventures that are IEs when applying the equity method, the amendments make a similar clarification that this choice is available for each IE associate or IE joint venture.

The amendments have no impact on the Group's consolidated financial statements as the Company is neither a first-time adopter of K-IFRSs nor a venture capital organization. Furthermore, the Group does not have any associate or joint venture that is an IE.

3) The Group has not applied the following new standards and amendments that have been issued but are not yet adopted.

Amendments to K-IFRS 1116 – Lease

K-IFRS 1116 introduces a comprehensive model for the identification of lease arrangements and accounting treatments for both lessors and lessees. K-IFRS 1116 will supersede the current lease guidance, including K-IFRS 1017 Leases and the related interpretations when it becomes effective. The Group will apply this standard on January 1, 2019.

K-IFRS 1116 distinguishes leases and service contracts on the basis of whether an identified asset is controlled by a customer. Distinctions of operating leases and finance leases are removed for lessee accounting and are replaced by a model where a right-of-use asset and corresponding liability have to be recognized for all leases by lessees except for short-term leases and leases of low-value assets.

The right-of-use asset is initially measured at cost and subsequently measured at cost (subject to certain exceptions), less accumulated depreciation and impairment losses, adjusted for any remeasurement of the lease liability. The lease liability is initially measured at the present value of the lease payments that are not paid at that date. Subsequently, the lease liability is adjusted for interest and lease payments as well as the impact of lease modifications, amongst others. Furthermore, the classification of cash flows will also be affected as operating lease payments under K-IFRS 1017 are presented as operating cash flows; whereas under the K-IFRS 1116 model, the lease payments will be split into a principal portion and an interest portion, which will be presented as financing and operating cash flows, respectively.

In contrast to lessee accounting, K-IFRS 1116 substantially carries forward the lessor accounting requirements in K-IFRS 1017 and continues to require a lessor to classify a lease either as an operating lease or a finance lease. Furthermore, extensive disclosures are required by K-IFRS 1116.

The Company intends to account for each lease element and related non-leases as one lease element by applying the simplified approach for contracts that include a whole (or part of) lease contract or lease. As a result of the analysis of the effects on financial statements, it is believed that there will be no significant impact on the financial statements. However, the financial impact assessment is subject to change depending on the additional information available in the future.

(2) Basis of consolidation

The consolidated financial statements incorporate the financial statements of the Company and entities (including structured entities) controlled by the Company (and its subsidiaries). Control is achieved when the Company 1) has the power over the investee; 2) is exposed, or has rights, to variable returns from its involvement with the investee; and 3) has the ability to use its power to affect its returns. The Company reassesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control listed above.

When the Group has less than a majority of the voting rights of an investee, it has power over the investee when the voting rights are sufficient to give it the practical ability to direct the activities of the investee unilaterally. The Group considers all relevant facts and circumstances in assessing whether or not the Group's voting rights in an investee are sufficient to give it power, including:

- the size of the Group's holding of voting rights relative to the size and dispersion of holdings of other vote holders;
- potential voting rights held by the Group, other vote holders or other parties;
- rights arising from other contractual arrangements; and
- any additional facts and circumstances that indicate that the Group has, or does not have, the current ability to direct the relevant activities at the time that decisions need to be made, including voting patterns at previous shareholders' meetings.

Income and expenses of subsidiaries acquired or disposed of during the year are included in the consolidated statements of comprehensive income from the date the Group gains control to the date when the Group ceases to control the subsidiary. Profit or loss and each component of other comprehensive income are attributed to the owners of the Group and to the non-controlling interests. Total comprehensive income of subsidiaries is attributed to the owners of the Group and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

When necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies in line with the Group’s accounting policies.

All intragroup transactions and related assets, liabilities, income and expenses are eliminated in full on consolidation.

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

When the Group loses control of a subsidiary, a gain or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest and (ii) the previous carrying amount of the assets (including goodwill) and liabilities of the subsidiary and any non-controlling interests. When assets of the subsidiary are carried at revalued amounts or fair values and the related cumulative gain or loss has been recognized in other comprehensive income and accumulated in equity, the amounts previously recognized in other comprehensive income and accumulated in equity are accounted for as if the Group had directly disposed of the relevant assets (i.e., reclassified to profit or loss or transferred directly to retained earnings). The fair value of any investment retained in the former subsidiary at the date when control is lost is recognized as the fair value on initial recognition for subsequent accounting under K-IFRS 1109 or, when applicable, the cost on initial recognition of an investment in an associate or a joint venture.

(3) Business combination

Acquisitions of businesses are accounted for using the acquisition method. The consideration transferred in a business combination is measured at fair value, which is calculated as the sum of the fair values of the assets transferred by the Group, the liabilities incurred by the Group to the former owners of the acquiree and the equity interests issued by the Group in exchange for control of the acquiree. Acquisition-related costs are generally recognized in profit or loss as incurred.

- Deferred tax assets or liabilities and liabilities or assets related to employee benefit arrangements are recognized and measured in accordance with K-IFRS 1012 and K-IFRS 1019, respectively;
- Liabilities or equity instruments related to share-based payment arrangements of the acquiree or share-based payment arrangements of the Group entered into to replace share-based payment arrangements of the acquiree are measured in accordance with K-IFRS 1102 at the acquisition date.
- Assets (or disposal groups) that are classified as held for sale in accordance with K-IFRS 1105 are measured in accordance with that standard.

Goodwill is measured as the excess of the sum of: a) the consideration transferred, b) the amount of any non-controlling interests in the acquiree and c) the fair value of the acquirer's previously held equity interest in the acquiree (if any) over the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed. If, after reassessment, the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed exceeds the sum of: a) the consideration transferred, b) the amount of any non-controlling interests in the acquiree and c) the fair value of the acquirer's previously held interest in the acquiree (if any), the excess is recognized immediately in profit or loss as a negative goodwill.

Non-controlling interests that are present ownership interests and entitle their holders to a proportionate share of the entity's net assets in the event of liquidation may be initially measured either at fair value or at the non-controlling interests' proportionate share of the recognized amounts of the acquiree's identifiable net assets. The choice of measurement basis is made on a transaction-by-transaction basis. Other types of non-controlling interests are measured at fair value or, when applicable, on the basis specified in another K-IFRS.

When the consideration transferred by the Group in a business combination includes assets or liabilities resulting from a contingent consideration arrangement, the contingent consideration is measured at its acquisition-date fair value and included as part of the consideration transferred in a business combination. Changes in the fair value of the contingent consideration that qualify as measurement-period adjustments are adjusted retrospectively, with corresponding adjustments against goodwill. Measurement-period adjustments are adjustments that arise from additional information obtained during the 'measurement period' (which cannot exceed one year from the acquisition date) about facts and circumstances that existed at the acquisition date.

The subsequent accounting for changes in the fair value of the contingent consideration that do not qualify as measurement-period adjustments depends on how the contingent consideration is classified. Contingent consideration that is classified as equity is not remeasured at subsequent reporting dates and its subsequent settlement is accounted for within equity. Contingent consideration that is classified as an asset or a liability is remeasured at subsequent reporting dates in accordance with K-IFRS 1109 or K-IFRS 1037 as appropriate, with the corresponding gain or loss being recognized in profit or loss.

When a business combination is achieved in stages, the Group's previously held equity interest in the acquiree is remeasured to fair value at the acquisition date and the resulting gain or loss, if any, is recognized in profit or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are reclassified to profit or loss where such treatment would be appropriate if those interests were disposed of.

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

(4) Investments in associates and joint ventures

An associate is an entity over which the Group has significant influence. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

A joint venture is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

The results and assets and liabilities of associates or joint ventures are incorporated in these consolidated financial statements using the equity method of accounting, except when the investment is classified as held for sale, in which case it is accounted for in accordance with K-IFRS 1105. Under the equity method, an investment in an associate or a joint venture is initially recognized in the consolidated statements of financial position at cost and adjusted thereafter to recognize the Group's share of the profit or loss and other comprehensive income of the associate or joint venture. When the Group's share of losses of an associate or a joint venture exceeds the Group's interest in that associate or joint venture (which includes any long-term interests that, in substance, form part of the Group's net investment in the associate or joint venture), the Group discontinues recognizing its share of further losses. Additional losses are recognized only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate or joint venture.

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

In case the Group continues to apply the equity method, even though its ownership interest in an associate or a joint venture decreases, and if the gain or loss previously recognized in other comprehensive income is reclassified to profit or loss as a result of the disposal of the related asset or liability, the proportion of the gain or loss related to the reduction of ownership interest is reclassified to profit or loss. In addition, K-IFRS 1105 applies when an investment in an associate or a joint venture meets the criteria for classification as held for sale.

The requirements of K-IFRS 1028 are applied to determine whether it is necessary to recognize any impairment loss with respect to the Group's investment in an associate or a joint venture. When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment in accordance with K-IFRS 1036 as a single asset by comparing its recoverable amount (higher of value in use or fair value, less costs of disposal) with its carrying amount. Any impairment loss recognized is not allocated to any asset, including goodwill that forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized in accordance with K-IFRS 1036 to the extent that the recoverable amount of the investment subsequently increases.

The Group discontinues the use of the equity method from the date when the investment ceases to be an associate or a joint venture. When the Group retains an interest in the former associate or a joint venture and the retained interest is a financial asset, the Group measures the retained interest at fair value at that date and the fair value is regarded as its fair value on initial recognition in accordance with K-IFRS 1109. The difference between the carrying amount of the associate or a joint venture at the date the equity method was discontinued and the fair value of any retained interest and any proceeds from disposing of a part interest in the associate or a joint venture is included in the determination of the gain or loss on disposal of the associate or joint venture. In addition, the Group accounts for all amounts previously recognized in other comprehensive income in relation to that associate on the same basis as would be required if that associate had directly disposed of the related assets or liabilities. Therefore, if a gain or loss previously recognized in other comprehensive income by that associate or joint venture would be reclassified to profit or loss on the disposal of the related assets or liabilities, the Group reclassifies the gain or loss from equity to profit or loss (as a reclassification adjustment) when the associate or joint venture is disposed of.

When the Group reduces its ownership interest in an associate or a joint venture but continues to use the equity method, it 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. In addition, the Group applies K-IFRS 1105 to a portion of investment in an associate or a joint venture that meets the criteria to be classified as held for sale.

The Group continues to use the equity method when an investment in an associate becomes an investment in a joint venture or an investment in a joint venture becomes an investment in an associate. There is no remeasurement to fair value upon such changes in ownership interests.

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

(5) Interest in joint operation

A joint operation is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the assets, and obligations for the liabilities, relating to the arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

When a group entity undertakes its activities under joint operations, the Group, as a joint operator, recognizes in relation to its interest in a joint operation:

- its assets, including its share of any assets held jointly;
- its liabilities, including its share of any liabilities incurred jointly;
- its revenue from the sale of its share of the output arising from the joint operation;
- its share of the revenue from the sale of the output by the joint operation; and
- its expenses, including its share of any expenses incurred jointly.

The Group accounts for the assets, liabilities, revenues and expenses relating to its interest in a joint operation in accordance with the K-IFRSs applicable to the particular assets, liabilities, revenues and expenses.

When a group entity transacts with a joint operation in which a group entity is a joint operator (such as a sale or contribution of assets), the Group is considered to be conducting the transaction with other parties to the joint operation, and gains and losses resulting from the transactions are recognized in the Group's consolidated financial statements only to the extent of other parties' interests in the joint operation.

When a group entity transacts with a joint operation in which a group entity is a joint operator (such as a purchase of assets), the Group does not recognize its share of the gains and losses until it resells those assets to a third party.

(6) Goodwill

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

For the purpose of impairment testing, goodwill is allocated to each of the Group's cash-generating units ("CGUs") (or group of CGUs) that is expected to benefit from the synergies of the combination.

A CGU 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. If the recoverable amount of the CGU 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 other assets of the unit on a pro rata basis based on the carrying amount of each asset in the unit. Any impairment loss for goodwill is recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.
On disposal of the relevant CGU, the attributable amount of goodwill is included in the determination of the profit or loss on disposal.

(7) Non-current assets held for sale

Non-current assets and disposal groups are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuous use. This condition is regarded as met only when the sale is highly probable and the non-current asset (or the disposal group) is available for immediate sale in its present condition. Management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification.

When the Group is committed to a sale plan involving loss of control of a subsidiary, all of the assets and liabilities of that subsidiary are classified as held for sale when the criteria described above are met, regardless of whether the Group will retain a non-controlling interest in its former subsidiary after the sale.

When the Group is committed to a sale plan involving disposal of an investment, or a portion of an investment, in an associate or a joint venture, the investment or the portion of the investment that will be disposed of is classified as held for sale when the criteria described above are met, and the Group discontinues the use of the equity method in relation to the portion that is classified as held for sale. Any retained portion of an investment in an associate or a joint venture that has not been classified as held for sale continues to be accounted for using the equity method. The Group discontinues the use of the equity method at the time of disposal when the disposal results in the Group losing significant influence over the associate or joint venture.
Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous carrying amount or fair value, less costs to sell.

(8) Revenue recognition

The Group has applied K-IFRS 1115 since January 1, 2018. In accordance with K-IFRS 1115, the Company has chosen to apply the cumulative effect of initial application of the K-IFRS retrospectively to recognize it on January 1, 2018, at the date of initial application. In addition, this was applied retrospectively only to contracts that were not completed at the date of initial application, and a practical expedient was used not to restate contracts retrospectively for all contract changes made before the date of initial application.

According to K-IFRS 1115, all types of contracts are recognized by applying a five-step revenue recognition model (① Contract Identification → ② Performance Obligations Identification → ③ Transaction Price Calculation → ④ Transaction Price Allocations to Performance Obligations → ⑤ Revenue Recognition When Satisfied with Performance Obligations).

1) Identify performance obligations

1. Point in time

The Group recognizes revenue when the goods or services are transferred to the customer. In addition, the Group exports a variety of finished goods or merchandises by Incoterms Group C condition (CIF and others). Since the seller provides logistics service after passing the control to the customer, the Group identifies the relative logistics service (including insurance) as separate performance obligation.

2. Overtime

Under K-IFRS 1115, if performance obligations satisfy one or more of the three condition of paragraph 35, performance obligations would be identified as over-time, otherwise as point in time. The time of revenue recognition can be changed if the Group's performance obligations satisfy the three condition of paragraph 35.

2) Allocate transaction price

The Group allocates the transaction price to the separate performance obligations in one contract based on the relative stand-alone selling price of each separate performance obligation. For estimating stand-alone selling price of each performance obligation, the Group uses the method of 'Market price adjustment approach' and others.

3) Variable transaction price

The price the customer promises due to the return right granted by the Group in accordance with the contract of sale of the goods with the customer may change. In accordance with K-IFRS 1115, the variable cost is estimated using a method that expects to be able to better anticipate the consideration to be entitled to the right to receive the expected or probable price of the right to receive the right. It recognizes revenue by including the variable price in the transaction price only to the extent that it is highly unlikely that it will carry out a significant portion of the cumulative revenue amount that has already been recognized. Amounts that the Group does not expect to have the right to receive or receive are recognized as a refund liability, and the related inventories are recognized as refundable assets.

(9) Leases

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

1) The Group as lessor
Amounts due from lessees under finance leases are recognized as receivables at the amount of the Group's net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on the Group's net investment outstanding in respect of the leases.

Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized on a straight-line basis over the lease term.

2) The Group as lessee

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

Lease payments are apportioned between finance expenses and reduction of the lease obligation so as to achieve a constant rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with the Group's general policy on borrowing costs (see Note 2 (11)). Contingent rentals are recognized as expenses in the periods in which they are incurred.

Operating lease payments are recognized as an expense on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognized as an expense in the period in which they are incurred.

In the event that lease incentives are received to enter into operating leases, such incentives are recognized as a liability. The aggregate benefit of incentives is recognized as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

(10) Foreign currencies

The individual financial statements of each group entity are presented in the currency of the primary economic environment in which the entity operates (its functional currency). For the purpose of the consolidated financial statements, the results and financial position of each group entity are expressed in Korean won, which is the functional currency of the entity and the presentation currency for the consolidated financial statements.

In preparing the financial statements of the individual entities, 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. 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. Non-monetary items that are measured in terms of historical cost in a foreign currency are not retranslated.

Exchange differences are recognized in profit or loss in the period in which they arise, except for:

- exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings;
- exchange differences on transactions entered into in order to hedge certain foreign currency risks (see Note 2 (24) below for hedge accounting policies); and
- exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur (therefore, forming part of the net investment in the foreign operation), which are recognized initially in other comprehensive income and reclassified from equity to profit or loss on disposal or partial disposal of the net investment.

For the purpose of presenting consolidated financial statements, the assets and liabilities of the Group's foreign operations are expressed in Korean won using exchange rates prevailing at the end of the reporting period. Income and expense items are translated at the average exchange rates for the period, unless exchange rates fluctuated significantly during that period, in which case the exchange rates at the dates of the transactions are used. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in equity (attributed to non-controlling interests as appropriate). On the disposal of a foreign operation (i.e., a disposal of the Group's entire interest in a foreign operation or a disposal involving loss of control over a subsidiary that includes a foreign operation, or partial disposal of an interest in a joint arrangement or an associate that includes a foreign operation whose retained interest becomes a financial asset), all of the accumulated exchange differences in respect of that operation attributable to the owners of the Group are reclassified to profit or loss. Any exchange differences that had previously been attributed to non-controlling interests are derecognized, but they are not reclassified to profit or loss.

In case of a partial disposal (i.e., no loss of control) of a subsidiary that includes a foreign operation, the proportionate share of accumulated exchange differences is reattributed to non-controlling interests in equity and is not recognized in profit or loss. For all other partial disposals (i.e., partial disposals of associates or joint arrangements that do not result in the Group losing significant influence or joint control), the proportionate share of the accumulated exchange differences is reclassified to profit or loss.

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate. Exchange differences arising are recognized in other comprehensive income.

(11) Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, which are assets that necessarily take a substantial period to get ready for their intended use or sale, are added to the cost of those assets until the assets are substantially ready for their intended use or sale.
Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.
All other borrowing costs are recognized in profit or loss in the period in which they are incurred.

(12) Government grants

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

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

Government grants related to assets are presented in the consolidated statements of financial position by deducting the grant from the carrying amount of the asset. The related grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

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

(13) Retirement benefit costs and termination benefits

Contributions to defined contribution retirement benefit plans are recognized as an expense when employees have rendered service entitling them to the contributions.

For defined benefit retirement benefit plans, the cost of providing benefits is determined using the projected unit credit method, with actuarial valuations being carried out at the end of each reporting period. Remeasurement, comprising the actuarial gains and losses, the effect of the changes to the asset ceiling (if applicable) and the return on plan assets (excluding interest), is reflected immediately in the consolidated statements of financial position with a charge or credit recognized in other comprehensive income in the period in which it occurs. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss. Past service cost is recognized in profit or loss in the period of a plan amendment. Net interest is calculated by applying the discount rate at the beginning of the period to the net defined benefit liability or asset. Defined benefit costs are composed of service cost (including current service cost, past service cost as well as gains and losses on curtailments and settlements), net interest expense (income) and remeasurement.

The Group presents the service cost and net interest expense (income) components in profit or loss and the remeasurement component in other comprehensive income. Curtailment gains and losses are accounted for as past service costs.

The retirement benefit obligation recognized in the consolidated statements of financial position represents the actual deficit or surplus in the Group’s defined benefit plans. Any surplus resulting from this calculation is limited to the present value of any economic benefits available in the form of refunds from the plans or reductions in future contributions to the plans.

A liability for a termination benefit is recognized at the earlier of when the entity can no longer withdraw the offer of the termination benefit or when the entity recognizes any related restructuring costs.

Discretionary contributions made by employees or third parties reduce service cost upon payment of these contributions to the plan. When the formal terms of the plan specify that there will be contributions from employees or third parties, the accounting depends on whether the contributions are linked to service as follows:

If the contributions are not linked to services (e.g., contributions are required to reduce a deficit arising from losses on plan assets or from actuarial losses), they are reflected in the remeasurement of the net defined benefit liability (asset).

If contributions are linked to services, they reduce service costs. For the amount of contribution that is dependent on the number of years of service, the Group reduces service cost by attributing the contributions to periods of service using the attribution method required by K-IFRS 1019 paragraph 70 for the gross benefits. On the other hand, for the number of years of service and for independent contributions, the Group recognizes these contributions as a reduction in the service cost over the period in which the related service is provided.

(14) Share-based payment arrangements

1) Share-based payment transactions of the Company

Equity-settled, share-based payments to employees and others providing similar services are measured at the fair value of the equity instruments at the grant date.

The fair value determined at the grant date of the equity-settled, share-based payments is expensed on a straight-line basis over the vesting period based on the Group's estimate of equity instruments that will eventually vest. At the end of each reporting period, the Group revises its estimate of the number of equity instruments expected to vest. The impact of the revision of the original estimates, if any, is recognized in profit or loss such that the cumulative expense reflects the revised estimate, with a corresponding adjustment in other component of equity.

Equity-settled, share-based payment transactions with parties other than employees are measured at the fair value of the goods or services received, except where that fair value cannot be estimated reliably, in which case they are measured at the fair value of the equity instruments granted and measured at the date the entity obtains the goods or the counterparty renders the service.

For cash-settled, share-based payments, a liability is recognized for the goods or services acquired and measured initially at its fair value. At the end of each reporting period until the liability is settled and at the date of settlement, the fair value of the liability is remeasured, with any changes in fair value recognized in profit or loss for the year.

2) Share-based payment transactions of the acquiree in a business combination

When the share-based payment awards held by the employees of an acquiree (acquiree awards) are replaced by the Group's share-based payment awards (replacement awards), both the acquiree awards and the replacement awards are measured in accordance with K-IFRS 1102 at the acquisition date. The portion of the replacement awards that is included in measuring the consideration transferred in a business combination equals the market-based measure of the acquiree awards multiplied by the ratio of the portion of the vesting period completed to the greater of the total vesting period or the original vesting period of the acquiree award. The excess of the market-based measure of the replacement awards over the market-based measure of the acquiree awards included in measuring the consideration transferred is recognized as remuneration cost for post-combination service.

However, when the acquiree awards expire as a consequence of a business combination and the Group replaces those awards when it does not have an obligation to do so, the replacement awards are measured at their market-based measure in accordance with K-IFRS 1102. All of the market-based measure of the replacement awards is recognized as remuneration cost for post-combination service.

At the acquisition date, when the outstanding equity-settled, share-based payment transactions held by the employees of an acquiree are not exchanged by the Group for its share-based payment transactions, the acquiree's share-based payment transactions are measured at their market-based measure at the acquisition date. If the share-based payments have vested by the acquisition date, they are included as part of the non-controlling interests in the acquiree. However, if the share-based payment transactions have not vested by the acquisition date, the market-based measure of the unvested share-based payment transactions is allocated to the non-controlling interests in the acquiree based on the ratio of the portion of the vesting period completed to the greater of the total vesting period or the original vesting period of the share-based payment transaction. The balance is recognized as remuneration cost for post-combination service.

(15) Taxation

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

1) Current tax

The tax currently payable is based on taxable profit for the year. Taxable profit differs from profit 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 Group's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

2) Deferred tax

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences to the extent it is probable that taxable profits will be available against which those deductible temporary differences can be utilized. Such deferred tax assets and liabilities are not recognized if the temporary difference arises from goodwill or from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the taxable profit nor the accounting profit.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries and associates and interests in joint ventures, except where the Group 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 the benefits of the temporary differences can be utilized 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 assets 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 is realized based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

Deferred tax assets and liabilities are offset if, and only if, the Group has a legally enforceable right to set off current tax assets against current tax liabilities and the deferred tax assets and liabilities relate to income taxes levied by the same taxation authority on either the same taxable entity or different taxable entities, which intend either to settle current tax liabilities and assets on a net basis or to realize the assets and settle the liabilities simultaneously in each future period in which significant amounts of deferred tax liabilities or assets are expected to be settled or recovered.

3) Current and deferred taxes for the year

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

(16) Property, plant and equipment

Property, plant and equipment are stated at cost, less subsequent accumulated depreciation and accumulated impairment losses. The cost of an item of property, plant and equipment is directly attributable to its purchase or construction, which includes any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. It also includes the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

Subsequent costs are recognized in carrying amount of an asset or as a separate asset if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. Routine maintenance and repairs are expensed as incurred.

The Group does not depreciate land. Depreciation expense is computed using the straight-line method based on the estimated useful lives of the assets as follows:

	Estimated useful lives (Years)		Estimated useful lives (Years)
Buildings	5–65	Vehicles	1–12
Structures	5–55	Tools and equipment	1–20
Machinery	2–20	Others	1–30

If each part of an item of property, plant and equipment has a cost that is significant in relation to the total cost of the item, it is depreciated separately.

The Group reviews the depreciation method, the estimated useful lives and the residual values of property, plant and equipment at the end of each annual reporting period. If expectations differ from previous estimates, the changes are accounted for as a change in an accounting estimate.

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the asset. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in profit or loss in the period in which the property is derecognized.

(17) Investment properties

Investment properties are properties held to earn rentals and/or for capital appreciation (including property under construction for such purposes). Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are reported at cost, less accumulated depreciation and accumulated impairment losses.

Subsequent costs are recognized in the carrying amount of an asset or as a separate asset if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. Routine maintenance and repairs are expensed as incurred.

While land is not depreciated, all other investment property is depreciated based on the respective assets' estimated useful lives ranging from 5–60 years using the straight-line method.

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimate accounted for on a prospective basis.

An investment property is derecognized upon disposal or when the investment property is permanently withdrawn from use and no future economic benefits are expected from the disposal. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in profit or loss in the period in which the property is derecognized.

(18) Intangible assets

1) Intangible assets acquired separately

Intangible assets with finite useful lives that are acquired separately are carried at cost, less accumulated amortization and accumulated impairment losses, and amortization is recognized on a straight-line basis over their estimated useful lives. The estimated useful life and the 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. Intangible assets with indefinite useful lives that are acquired separately are carried at cost, less accumulated impairment losses.

2) Internally generated intangible assets - research and development expenditure

Expenditure on research activities is recognized as an expense in the period in which it is incurred.

Expenditure arising from development (or from the development phase of an internal project) is recognized as an intangible asset if, only if, the development project is designed to produce new or substantially improved products and the Group can demonstrate the technical and economic feasibility and measure reliably the resources attributable to the intangible asset during its development.

The amount initially recognized for internally generated intangible assets is the sum of the expenditure incurred from the date when the intangible asset first meets the recognition criteria. Where no internally generated intangible asset can be recognized, development expenditure is recognized in profit or loss in the period in which it is incurred.

Subsequent to initial recognition, internally generated intangible assets are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

3) Intangible assets acquired in a business combination

Intangible assets that are acquired in a business combination are recognized separately from goodwill and are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

4) Derecognition of intangible assets

An intangible asset is derecognized on disposal or when no future economic benefits are expected from its use. 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 when the asset is derecognized.

(19) Impairment of tangible and intangible assets other than goodwill

At the end of each reporting period, the Group reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). When it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the CGU to which the asset belongs. Where a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual CGUs; otherwise, they are allocated to the smallest group of CGUs for which a reasonable and consistent allocation basis can be identified.

Intangible assets with indefinite useful lives and intangible assets not yet available for use are tested for impairment at least annually and whenever there is an indication that an asset may be impaired.

Recoverable amount is the higher of net fair value or value in use. If the recoverable amount of an asset (or a CGU) is estimated to be less than its carrying amount, the carrying amount of the asset (or the CGU) is reduced to its recoverable amount and the reduced amount is recognized in profit or loss.

Where an impairment loss subsequently reverses, the carrying amount of the asset (or the CGU) is increased to the revised estimate of its recoverable amount so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset (or the CGU) in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

(20) Inventories

Inventories are stated at the lower of cost or net realizable value. Cost of inventories, except for those in transit, is measured using the weighted-average method, on a first-in, first-out basis, and consists of the purchase price, cost of conversion and other costs incurred in bringing the inventories to their present location and condition. Net realizable value represents the estimated selling price for inventories, less all estimated costs of completion and costs necessary to make the sale.

When inventories are sold, the carrying amount of those inventories is recognized as an expense (cost of sales) in the period in which the related revenue is recognized. The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, is recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(21) Provisions

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

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material). The discount rate used is a pretax rate that reflects current market assessments of the time value of money and the risks specific to the liability. Where discounting is used, the increase in the provision due to the passage is recognized in profit or loss as borrowing cost.

When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party, a receivable is recognized as an asset if it is virtually certain that reimbursement will be received and the amount of the receivable can be measured reliably.

At the end of each reporting period, the remaining provision balance is reviewed and assessed to determine if the current best estimate is being recognized. If the existence of an obligation to transfer economic benefit is no longer probable, the related provision is reversed during the period.

1) Onerous contracts

Present obligations arising under onerous contracts are recognized and measured as provisions. An onerous contract is considered to exist where the Group has a contract under which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received from the contract.

2) Restructurings

A restructuring provision is recognized when the Group has developed a detailed formal plan for the restructuring and has raised a valid expectation in those affected that it will carry out the restructuring by starting to implement the plan or announcing its main features to those affected by it. The measurement of a restructuring provision includes only the direct expenditures arising from the restructuring, which are those amounts that are both necessarily entailed by the restructuring and not associated with the ongoing activities of the entity.

3) Warranties

Provisions for the expected cost of warranty obligations under local sale of goods legislation are recognized at the date of sale of the relevant products, at the directors' best estimate of the expenditure required to settle the Group's obligation.

4) Contingent liabilities acquired in a business combination

Contingent liabilities acquired in a business combination are initially measured at fair value at the acquisition date. At the end of subsequent reporting periods, such contingent liabilities are measured at the higher of the amount that would be recognized in accordance with K-IFRS 1037 or the amount initially recognized less cumulative amortization recognized in accordance with K-IFRS 1018.

(22) Financial assets

All regular way purchases or sales of financial assets are recognized and derecognized on a trade-date basis. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

All recognized financial assets are measured subsequently in their entirety at either amortized cost or fair value depending on the classification of the financial assets.

1) Classification of financial assets

Debt instruments that meet the following conditions are measured subsequently at amortized cost:

- The financial asset is held within a business model whose objective is to hold financial assets in order to collect contractual cash flows.
- 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.

Debt instruments that meet the following conditions are measured subsequently at FVTOCI:

- The financial asset is held within a business model whose objective is achieved by both collecting contractual cash flows and selling the financial assets.
- 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.

By default, all other financial assets are measured subsequently at FVTPL. Despite the foregoing, the Group may make the following irrevocable election **or** designation at initial recognition of a financial asset:

- The Group may irrevocably elect to present subsequent changes in fair value of an equity investment in other comprehensive income if certain criteria are met (see (1-3) below).
- The Group may irrevocably designate a debt investment that meets the amortized cost or FVTOCI criteria as measured at FVTPL if doing so eliminates or significantly reduces an accounting mismatch (see (1-4) below).

1-1) Amortized cost and effective interest method

The effective interest method is a method of calculating the amortized cost of a debt instrument and allocating interest income over the relevant period. For financial assets other than purchased or originated credit-impaired financial assets (i.e., assets that are credit impaired on initial recognition), the effective interest rate is the rate that exactly discounts estimated future cash receipts (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts), excluding ECLs, through the expected life of the debt instrument, or, where appropriate, a shorter period, to the gross carrying amount of the debt instrument on initial recognition. For purchased or originated credit-impaired financial assets, a credit-adjusted effective interest rate is calculated by discounting the estimated future cash flows, including ECLs, to the amortized cost of the debt instrument on initial recognition.

The amortized cost of a financial asset is the amount at which the financial asset is measured at initial recognition, minus the principal repayments, plus the cumulative amortization using the effective interest method of any difference between that initial amount and the maturity amount, adjusted for any loss allowance. The gross carrying amount of a financial asset is the amortized cost of the financial asset before adjusting for any loss allowance.

Interest income is recognized using the effective interest method for debt instruments measured subsequently at amortized cost and at FVTOCI. For financial assets other than purchased or originated credit-impaired financial assets, interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset, except for financial assets that have subsequently become credit impaired (see below). For financial assets that have subsequently become credit impaired, interest income is recognized by applying the effective interest rate to the amortized cost of the financial asset. If, in subsequent reporting periods, the credit risk on the credit impaired-financial instrument improves so that the financial asset is no longer credit impaired, interest income is recognized by applying the effective interest rate to the gross carrying amount of the financial asset.

For purchased or originated credit-impaired financial assets, the Group recognizes interest income by applying the credit-adjusted effective interest rate to the amortized cost of the financial asset from initial recognition. The calculation does not revert to the gross basis even if the credit risk of the financial asset subsequently improves so that the financial asset is no longer credit impaired.

Interest income is recognized in profit or loss and is included in the "finance income - interest income" line item. (see Note 52)

1-2) Debt instruments classified as at FVTOCI

The corporate bonds are initially measured at fair value plus transaction costs. Subsequently, changes in the carrying amount of these corporate bonds as a result of foreign exchange gains and losses, impairment gains or losses and interest income calculated using the effective interest method are recognized in profit or loss. The amounts that are recognized in profit or loss are the same as the amounts that would have been recognized in profit or loss if these corporate bonds had been measured at amortized cost. All other changes in the carrying amount of these corporate bonds are recognized in other comprehensive income and accumulated under the heading of investments revaluation reserve. When these corporate bonds are derecognized, the cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss.

1-3) Equity instruments designated as at FVTOCI

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

A financial asset is held for trading if:

- it has been acquired principally for the purpose of selling in the near term;
- on initial recognition, it is part of a portfolio of identified financial instruments that the Group manages together and has evidence of a recent actual pattern of short-term profit taking; or
- it is a derivative (except for a derivative that is a financial guarantee contract or a designated and effective hedging instrument).

Investments in equity instruments at FVTOCI are initially measured at fair value plus transaction costs. Subsequently, they are measured at fair value, with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in the investments revaluation reserve. The cumulative gain or loss is not reclassified to profit or loss on disposal of the equity investments, instead it is transferred to retained earnings.

Dividends on these investments in equity instruments are recognized in profit or loss in accordance with K-IFRS 1109, unless the dividends clearly represent a recovery of part of the cost of the investment. Dividends are included in the ‘finance income’ line item (see Note 52) in profit or loss.

1-4) Financial assets at FVTPL

Financial assets that do not meet the criteria for being measured at amortized cost or FVTOCI are measured at FVTPL. Specifically:

- Investments in equity instruments are classified as at FVTPL, unless the Group designates an equity investment that is neither held for trading nor a contingent consideration arising from a business combination as at FVTOCI on initial recognition (see (1-3) above).
- Debt instruments that do not meet the amortized cost criteria or the FVTOCI criteria (see (1-1) and (1-2) above) are classified as at FVTPL. In addition, debt instruments that meet either the amortized cost criteria or the FVTOCI criteria may be designated as at FVTPL upon initial recognition if such designation eliminates or significantly reduces a measurement or recognition inconsistency (so called ‘accounting mismatch’) that would arise from measuring assets or liabilities or recognizing the gains and losses on them on different bases. The Group has not designated any debt instruments as at FVTPL.

Financial assets at FVTPL are measured at fair value at the end of each reporting period, with any fair value gains or losses recognized in profit or loss to the extent they are not part of a designated hedging relationship.
The net gain or loss recognized in profit or loss includes dividends earned on the financial asset in the ‘Other non-operating income and expenses.’ Meanwhile, interests on financial assets at FVTPL are recognized in ‘Financial income.’ The fair value is determined as described in Note 59.

2) Foreign exchange gains and losses

The carrying amount of financial assets that are denominated in a foreign currency is determined in that foreign currency and translated at the spot rate at the end of each reporting period. Specifically:

- For financial assets measured at amortized cost that are not part of a designated hedging relationship, exchange differences are recognized in profit or loss in the 'other gains and losses' line item.
- For debt instruments measured at FVTOCI that are not part of a designated hedging relationship, exchange differences on the amortized cost of the debt instrument are recognized in profit or loss in the 'other gains and losses.' Other exchange differences are recognized in other comprehensive income in the investments revaluation reserve:
- For financial assets measured at FVTPL that are not part of a designated hedging relationship, exchange differences are recognized in profit or loss in the 'other gains and losses' line item.
- For equity instruments measured at FVTOCI, exchange differences are recognized in other comprehensive income in the investments revaluation reserve.

3) Impairment of financial assets

The Group recognizes a loss allowance for ECLs on investments in debt instruments that are measured at amortized cost or at FVTOCI, lease receivables, trade receivables and contract assets, as well as on financial guarantee contracts. The amount of ECLs is updated at each reporting date to reflect changes in credit risk since initial recognition of the respective financial instrument.

The Group always recognizes lifetime ECL for trade receivables, contract assets and lease receivables. The ECLs on these financial assets are estimated using a provision matrix based on the Group's historical credit loss experience, adjusted for factors that are specific to the debtors, general economic conditions and an assessment of both the current as well as the forecast direction of conditions at the reporting date, including time value of money where appropriate.

For all other financial instruments, the Group recognizes lifetime ECL when there has been a significant increase in credit risk since initial recognition. However, if the credit risk on the financial instrument has not increased significantly since initial recognition, the Group measures the loss allowance for that financial instrument at an amount equal to 12-month ECL.

Lifetime ECL represents the ECLs that will result from all possible default events over the expected life of a financial instrument. In contrast, 12-month ECL represents the portion of lifetime ECL that is expected to result from default events on a financial instrument that are possible within 12 months after the reporting date.

4) Derecognition of financial assets

The Group derecognizes a financial asset only when the contractual rights to the cash flows from the asset expire or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If the Group neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, the Group recognizes its retained interest in the asset and an associated liability for amounts it may have to pay. If the Group retains substantially all the risks and rewards of ownership of a transferred financial asset, the Group continues to recognize the financial asset and also recognizes a collateralized borrowing for the proceeds received.

On derecognition of a financial asset measured at amortized cost, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. In addition, on derecognition of an investment in a debt instrument classified as at FVTOCI, the cumulative gain or loss previously accumulated in the investments revaluation reserve is reclassified to profit or loss. In contrast, on derecognition of an investment in equity instrument which the Group has elected on initial recognition to measure at FVTOCI, the cumulative gain or loss previously accumulated in the investments revaluation reserve is not reclassified to profit or loss but is transferred to retained earnings.

(23) Financial liabilities and equity instruments

1) Classification as debt or equity

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

2) Equity instruments

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

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

3) Compound instruments

The component parts of compound instruments (convertible bonds) issued by the Group are classified separately as financial liabilities and equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and equity instrument. Conversion option that will be settled by the exchange of a fixed amount of cash or another financial asset for a fixed number of the Company's own equity instruments is an equity instrument.

At the date of issue, the fair value of the liability component is estimated using the prevailing market interest rate for a similar non-convertible instrument. This amount is recorded as a liability on an amortized cost basis using the effective interest method until extinguished upon conversion or at the instrument's maturity date.
The conversion option classified as equity is determined by deducting the amount of the liability component from the fair value of the compound instrument as a whole. This is recognized and included in equity, net of income tax effects, and is not subsequently remeasured. In addition, the conversion option classified as equity will remain in equity until the conversion option is exercised, in which case the balance recognized in equity will be transferred to share premium. No gain or loss is recognized in profit or loss upon conversion or expiration of the conversion option.

Transaction costs that relate to the issue of the convertible notes are allocated to liability and equity components in proportion to the allocation of the gross proceeds. Transaction costs relating to equity component are recognized directly in equity. Transaction costs relating to the liability component are included in the carrying amount of the liability component and are amortized over the lives of the convertible notes using the effective interest method.

4) Financial liability

All financial liabilities are measured subsequently at amortized cost using the effective interest method or at FVTPL. However, financial liabilities that arise when a transfer of a financial asset does not qualify for derecognition or when the continuing involvement approach applies, and financial guarantee contracts are issued by the Group, are measured in accordance with the specific accounting policies set out below.

5) Financial liabilities at FVTPL

Financial liabilities are classified as at FVTPL when a financial liability is a contingent consideration that may be paid by an acquirer as part of a business combination to which K-IFRS 1103 applies or held for trading, or it is designated as at FVTPL.

A financial liability is classified as held for trading if:

- it has been acquired principally for the purpose of repurchasing in the near term;
- on initial recognition, it is part of a portfolio of identified financial instruments that the Group manages together and has a recent actual pattern of short-term profit taking; or
- it is a derivative that is not designated and effective as a hedging instrument.

A financial liability other than a financial liability held for trading or a contingent consideration that may be paid by an acquirer as part of a business combination may be designated as at FVTPL upon initial recognition if:

- such designation eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise;
- the financial liability forms part of a group of financial assets or financial liabilities or both, which is managed and its performance is evaluated on a fair value basis, in accordance with the Group's documented risk management or investment strategy, and information about the grouping is provided internally on that basis; or
- it forms part of a contract containing one or more embedded derivatives, and K-IFRS 1109 permits the entire combined contract (asset or liability) to be designated as at FVTPL.

Financial liabilities at FVTPL are measured at fair value, with any gains or losses arising on changes in fair value recognized in profit or loss to the extent that they are not part of a designated hedging relationship (see Hedge accounting policy). The net gain or loss recognized in profit or loss incorporates any interest paid on the financial liability and is included in the 'other gains and losses' line item in consolidated statements of comprehensive income.

However, for financial liabilities that are designated as at FVTPL, the amount of change in the fair value of the financial liability that is attributable to changes in the credit risk of that liability is recognized in other comprehensive income, unless the recognition of the effects of changes in the liability's credit risk in other comprehensive income would create or enlarge an accounting mismatch in profit or loss. The remaining amount of change in the fair value of liability is recognized in profit or loss. Changes in fair value attributable to a financial liability's credit risk that are recognized in other comprehensive income are not subsequently reclassified to profit or loss; instead, they are transferred to retained earnings upon derecognition of the financial liability.

Gains or losses on financial guarantee contracts issued by the Group that are designated by the Group as at FVTPL are recognized in profit or loss.

6) Financial liabilities measured subsequently at amortized cost

Financial liabilities that are not (i) contingent consideration of an acquirer in a business combination, (ii) held for trading or (iii) designated as at FVTPL are measured subsequently at amortized cost using the effective interest method.
The effective interest method is a method of calculating the amortized cost of a financial liability and allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments, including all fees and points paid or received (that form an integral part of the effective interest rate) transaction costs and other premiums or discounts through the expected life of the financial liability, or (where appropriate) a shorter period, to the net carrying amount on initial recognition.

7) Financial guarantee contracts

A financial guarantee contract is a contract that requires the issuer to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payments when due in accordance with the terms of debt instruments.
Financial guarantee contract liabilities are initially measured at their fair values and, if not designated as at FVTPL, are subsequently measured at the higher of:

- the amount of loss allowance, as determined in accordance with K-IFRS 1109 (see "Financial assets" above) or
- the amount initially recognized, less cumulative amortization recognized in accordance with K-IFRS 1115.

8) Foreign exchange gains and losses

For financial liabilities that are denominated in a foreign currency and are measured at amortized cost at the end of each reporting period, the foreign exchange gains and losses are determined based on the amortized cost of the instruments. These foreign exchange gains and losses are recognized in the ‘other gains and losses’ line item in consolidated statements of comprehensive income for financial liabilities that are not part of a designated hedging relationship. For those which are designated as a hedging instrument for a hedge of foreign currency risk, foreign exchange gains and losses are recognized in other comprehensive income and accumulated in a separate component of equity.
The fair value of financial liabilities denominated in a foreign currency is determined in that foreign currency and translated at the spot rate at the end of the reporting period. For financial liabilities that are measured as at FVTPL, the foreign exchange component forms part of the fair value gains or losses and is recognized in profit or loss for financial liabilities that are not part of a designated hedging relationship.

9) Derecognition of financial liabilities

The Group derecognizes financial liabilities when, and only when, the Group’s obligations are discharged, cancelled or have expired. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.
When the Group exchanges with the existing lender one debt instrument for another one with substantially different terms, such exchange is accounted for as an extinguishment of the original financial liability and the recognition of a new financial liability. Similarly, the Group accounts for substantial modification of terms of an existing liability or part of it as an extinguishment of the original financial liability and the recognition of a new liability.

(24) Derivative financial instruments

The Group enters into a variety of derivative financial instruments to manage its exposure to interest rate and foreign exchange rate risk, including foreign exchange forward contracts, interest rate swaps and cross-currency swaps.

Derivatives are initially recognized at fair value at the date the derivative contract is 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 such case, the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

A derivative with a positive fair value is recognized as a financial asset, and a derivative with a negative fair value is recognized as a financial liability. A derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the instrument is more than 12 months and it is not expected to be realized or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

The Group recognizes changes in the fair value of derivatives that are designated as hedging instruments and changes in the fair value of the hedged item in profit or loss.

1) Embedded derivatives

Derivatives embedded in non-derivative host contracts are treated as separate derivatives when they meet the definition of a derivative, their risks and economic characteristics are not closely related to those of the host contracts and the contracts are not measured at FVTPL.

An embedded derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the hybrid instrument to which the embedded derivative relates is more than 12 months and it is not expected to be realized or settled within 12 months. Other embedded derivatives are presented as current assets or current liabilities.

2) Hedge accounting

The Group designates certain hedging instruments, which include derivatives, embedded derivatives and non-derivatives in respect of foreign currency risk, as either fair value hedges, cash flow hedges or hedges of net investments in foreign operations. Hedges of foreign exchange risk on firm commitments are accounted for as cash flow hedges.
At the inception of the hedge relationship, the entity documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Group documents whether the hedging instrument is highly effective in offsetting changes in fair values or cash flows of the hedged item.

3) Cash flow hedge

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 and is included in the 'other gains and losses' line item.
Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to profit or loss in the periods when the hedged item is recognized in profit or loss, in the same line of the consolidated statements of comprehensive income as the recognized hedged item. However, when the forecast transaction that is hedged results in the recognition of a non-financial asset or a non-financial liability, the gains and losses previously accumulated in equity are transferred from equity and included in the initial measurement of the cost of the non-financial asset or non-financial liability.

Hedge accounting is discontinued when the Group revokes the hedging relationship; when the hedging instrument expires or is sold, terminated or exercised; or when it no longer qualifies for hedge accounting. Any gain or loss accumulated in equity at that time remains in equity and is recognized when the forecast transaction is ultimately recognized in profit or loss. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in profit or loss.

(25) Fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, regardless of whether that price is directly observable or estimated using another valuation technique. In estimating the fair value of an asset or a liability, the Group takes into account the characteristics of the asset or liability if market participants would take those characteristics into account when pricing the asset or liability at the measurement date. Fair value for measurement and/or disclosure purposes in these consolidated financial statements is determined on such a basis, except for share-based payment transactions that are within the scope of K-IFRS 1102; leasing transactions that are within the scope of K-IFRS 1017; *Leases*, and measurements that have some similarities to fair value, but are not fair value, such as net realizable value in K-IFRS 1002 *Inventories* or value in use in K-IFRS 1036.
In addition, for financial reporting purposes, fair value measurements are categorized into Levels 1, 2 and 3, based on the degree to which the inputs to the fair value measurements are observable and the significance of the inputs to the fair value measurement in its entirety, which are described as follows:

- Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the Group can access at the measurement date.
- Level 2 inputs are inputs, other than quoted prices included within Level 1, that are observable for the asset or liability, either directly or indirectly.
- Level 3 inputs are unobservable inputs for the asset or liability.

(26) Accounting related to the Greenhouse Gas Emission Rights Cap and Trade Scheme

The Group classifies the emission rights as intangible assets. Emission rights allowances the government allocated free of charge are measured at nil, and emission rights allowances purchased are measured at cost, which the Group paid to purchase the allowances. If emission rights the government allocated free of charge are sufficient to settle the emission rights allowances allotted for vintage year, the emission liabilities are measured at nil. However, for the emission liabilities that exceed the allowances allocated free of charge, the shortfall is measured at best estimate at the end of the reporting period.

(27) Deferred acquisition costs

Acquisition costs arising from annuity contracts and long-duration contracts sold after April 1, 2004, excluding any excess amount over estimated acquisition costs (contracts sold after April 1, 2010, excluding the amount exceeding the standard deviation deduction amount), are deferred and amortized evenly over the premium payment period.
When the period of premium payment is longer than seven years, the amortization period of deferred acquisition costs is seven years. When the contract is cancelled, any unamortized portion as at the cancellation date (or the date it becomes invalid in case the contract becomes ineffective before cancellation date) is fully amortized in the fiscal year in which such cancellation occurs.
However, contracts sold after April 1, 2013, has been deferred by limit of a larger amount of paid insurance premium and standard deviation deduction amount (actual medical insurance and saving life insurance 70~100%, application by contract year, product, channel by the year ended 2017) and are unable to exceed 100% of the standard deviation deduction amount.

(28) Classification of Insurance Contracts and Investment Contracts

A Contract under which on party (the “insurer”) accepts significant insurance risk from another party (the “policyholder”) by agreeing to compensate the policyholder if a specified uncertain future event (the “insured event”) adversely affects the policyholder is classified as insurance contract. A contract that does not expose the insurer to significant insurance risk, but exposes the financial risk, is classified as investment contract. If the contracts are classified as insurance, the contracts remain insurance contracts until all rights and obligations are extinguished or expire. After classifying the contracts by assessing its quantitative significance, insurance contracts and investment contracts in accordance with K-IFRS 1104, and investment contracts without discretionary participation feature are accounted for as financial instruments in accordance with K- IFRS 1039.

(29) Insurance Contract Liabilities

The Group estimated reserves for future expense, such as premium, reserve for outstanding claims, and reserve for policyholder’s’ dividend and others, for insurance contract. The principal contents are as follows:

1) Premium reserve

Premium reserves represent the difference between the present value of estimated insurance benefits and the present value of net premiums to be collected after the end of reporting period for long-term and annuity insurance contracts in effect as at the end of reporting period.

2) Reserve for outstanding claims

As at the end of reporting period, for the contract that an insured event has occurred but the amount of claims payable is not yet determined, the Group records the reserve for the estimated amounts to be paid additional expenses arising from litigation, arbitration and claim investigation, expected to be incurred in the process of resolving an insured event are included in the reserves and the expected compensation income is deducted from the reserves.

3) Reserve for unearned premium

Reserve for unearned premium refers to the premiums due, but whose recognition is deferred

4) Reserve for minimum guaranteed benefit

Reserve for minimum guarantee benefit refers to amounts that guarantee a certain level of insurance. It is calculated by considering the future loss in accordance with Detailed Regulation on Supervision of Insurance Business.

5) Reserve for policyholders' dividends

In compliance with the Supervisory .Regulation, the Group reserves represent amounts payable to policyholders due to mortality gains, interest gains and expense gains.

6) Reserve for policyholders' profit dividend

Pursuant to relevant laws and contracts, the Group may provide an excess participating policyholder dividend reserve in accordance with the operating results of related insurance products. The reserve may be used to pay participating policyholder dividends or additional dividends.

7) Reserve for losses on dividend insurance

Reserve for losses on dividend insurance can be provided within 30 percent of excess participating policyholders' dividend reserve. It covers the loss of the participating insurance within five years, and after covering the loss, the remaining reserve would be available for dividends to participating policy-holders.

(30) Liability Adequacy Test

The Group assesses at the end of each reporting period whether its recognized insurance liabilities are adequate, using current estimates of future cash flows, and of related cash flows such as claims handling costs, as well as cash flows resulting from embedded options and guarantees.
If that assessment shows that the carrying amount of its insurance liabilities is inadequate in light of the estimated future cash flows, the entire deficiency shall be recognized in profit or loss.
The Group changed its method for assessing the adequacy of insurance contract liabilities such as determination of discount rate and the adjustment to the current estimates to conform to the new requirements of Detailed Regulations on Supervision of Insurance Business. The Group believes that the new method will provide more reliable and relevant information about the current estimates of future cash flows.
The changes in method have no effect on the consolidated statements of financial position as at December 31, 2017, and 2016, and the consolidated statements of comprehensive income for the years then ended. However, the amounts of surplus as at December 31, 2017, and 2016, were decreased by 3,873,742 million won and 3,252,353 million, respectively, in the notes to the consolidated financial statements. The notes to the consolidated financial statements as at December 31, 2017 and 2016, have been restated for the changes in accounting policies and are disclosed in Note 34.

(31) Claim Handling Cost

Claim handling costs are charged to income as incurred based on the estimated liability for compensation owed to contract holder or third parties damaged by the contract holders. Claims handling costs are expenses dealing with accident, and they are accompanying expenses of insurance payments. The Group accumulates expected payments of loss adjustment in the insurance contract liabilities.

(32) Compensation Receivables

Compensation receivables are calculated by multiplying the average recovery ratio for the last three years from the prior year's reporting period date to the amount of net claims for the three years according to the Regulation on Supervision Insurance Business, based on the estimated amount collectible through sales of collateralized assets or exercise of subrogation rights or any other rights which have been acquired in the course of settling the claims already paid as at settlement of accounts.

(33) Reinsurance Contracts

In accordance with K-IFRS 1104, the Group does not offset reinsurance assets against the related insurance liabilities and income or expense from reinsurance contracts against the expense or income form the related insurance contracts. The Group considers whether its reinsurance assets are impaired at the end of each reporting period. If a contractor's reinsurance asset is impaired, the contractor shall reduce its carrying amount accordingly and recognize that impairment loss in profit or loss.

(34) Policyholders' Equity Adjustment

Changes in the fair value of AFS financial assets, share of other comprehensive income of subsidiaries and associates, and others are allocated to policy holders' equity and shareholders' equity in accordance with Regulation on Insurance Supervisory. The amount of policyholder's equity is recorded as policyholders' equity adjustment.

(35) Separate Account Assets and Liabilities

Separate accounts represent assets and liabilities that are maintained by an insurance entity and are established primarily for the purpose of funding fixed and variable annuity contracts, variable life insurance contracts, variable universal insurance contracts, group annuity contracts, and similar activities.

The Insurance Business Law governs the structure of separate account, and the Regulation on Insurance Supervision has developed certain regulations with respect to separate accounts. The regulation on Insurance Supervision indicates that a separate account is legally segregated from the insurer's general account, and the assets in the separate accounts are generally restricted from being charged with liabilities arising out of any other business of the insurer.

Separate accounts are currently used to support group severance and variable insurance policies. In sponsoring a group severance insurance plan, the Group generally assumes the risk of investment gains or losses and guarantees the contract holder a specified interest rate. A variable insurance contract is contractual arrangement that combines some features of an investment company, such as when the contract holder assumes the risk of investment gains or losses, with certain traditional insurance features, such as when the insurance company assumes the risk of mortality and administrative expenses. The fair value of the contract holder's account varies with the investment experience of the specific portfolio of securities, the securities held in the separate accounts.

(36) Overlay Approach

The Group uses the overlay approach in accordance with K-IFRS 1104, and the Group may apply the overlay approach only if the following conditions are met:

(1) An item is measured at FVTPL on the basis of K-IFRS 1109, but the entire item is not measured at FVTPL if K-IFRS 1039 is applied.
(2) It is not held in relation to activities unrelated to insurance contracts within the scope of K-IFRS 1104.

In this case, the Group reclassifies the differences between (A) and (B) to profit or loss and other comprehensive income

(A) the amount reported in profit or loss in relation to a designated financial asset when K-IFRS 1109 is applied.

(B) the amount if an insurer had applied IAS 1039, it would have reported in profit or loss in relation to a designated financial asset.

The Group may apply the overlay adjustment approach on initial recognition of an asset, or when financial assets that have previously failed to meet the requirements but meet the conditions that the asset does not have in relation to activities unrelated to the insurance contract.

The Group continues to apply the overlay approach until the financial asset is derecognized, but withdraws to apply if the financial asset no longer qualifies for the overlay approach. In this case, the balance of accumulated other comprehensive income related to the financial asset is reclassified to profit or loss.

The Group may discontinue to apply the overlay approach in the beginning of each financial year for all designated financial assets, and because it is no longer an insurer, does not apply the overlay approach subsequently.

(37) Approval of Issuance of the Financial Statements

The issuance of the December 31, 2018, financial statements of the Group was approved by the Board of Directors on February 26, 2019, which is subject to change with approval at the annual shareholders' meeting

3. SIGNIFICANT ESTIMATES AND ASSUMPTIONS:

In the application of the Group accounting policies, which are described in Note 2, management is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the 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 uncertainty at the end of the reporting period, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year.

(1) Important decision applied in accounting policies

1) Capitalization of borrowing costs

As noted in Note 2, the Company capitalizes borrowing costs related to the acquisition, construction or production of the qualifying assets as part of the cost of such assets

2) Evaluation of business model

The classification and measurement of financial assets is based on contractual cash flow characteristics and business model (see Note 2 'Financial Assets' section). The business model is determined to reflect how groups of financial assets are managed together to meet specific business objectives. These assessments include judgements that reflect all relevant evidence. The relevant evidences include how the performance of an asset is assessed and measured, risks that could affect the performance of an asset, and the way those risks are managed, and compensation of the asset manager. When a financial asset measured at amortized cost or FVTOCI was derecognized before maturity, the Company observed to determine whether if it is consistent with the objective of the business model for financial asset management. Observations are part of our ongoing assessment of whether the business model for the remaining financial assets is appropriate and if not appropriate, there has been a change in the business model and a consequent change in the classification of financial assets. No such changes were required during the indicated period.

3) Significant increase in credit risk

As described in Note 2, the loss allowance is measured for assets that have significant increase in ECLs for the whole period or have been impaired since initial recognition. IFRS 9 does not define what constitutes a significant increase in credit risk. When assessing whether the credit risk of an asset has increased significantly, the Company considers forward-looking information that is quantitatively and quantitatively reasonable and supported.

(2) Key sources of estimation uncertainty

1) Impairment of goodwill

The Group tests annually whether goodwill has suffered any impairment. The recoverable amounts of CGUs have been determined based on value-in-use calculations and the fair value less costs to distribute.

2) Income tax

The income is subject to income taxes based on tax laws and interpretations of tax authorities in numerous jurisdictions. There are many transactions and calculations for which the ultimate tax determination is uncertain.

3) Fair value of financial instruments

The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques. The Group uses its judgment to select a variety of methods and make assumptions that are mainly based on market conditions existing at the end of each reporting period.

4) Net defined benefit liabilities

The present value of net defined benefit liability depends on a number of factors that are determined on an actuarial basis using a number of assumptions including the discount rate

(5) Uncertainty on the Estimation of the Total Construction Revenue and Total Construction Cost.

Although Total contract revenue is measured based on the contract amount initially agreed, measurement of contract revenue is subject to various uncertainties related to the outcome of future events. This is because as the contract is executed, it may decrease depending on the change of construction, compensation, incentives or delayed completion due to the Group's reasons.

The amount of construction revenues is affected by the progress measured based on the cumulative incurred contract costs. Total contract costs are based on future estimates of material costs, labor costs, overhead costs, etc., There are uncertainties that may change

(6) Provision

The Group has recorded provision for product warranties and construction warranties at the end of each reporting period. These provisions are based on estimates based on historical experience and forecasts of future events. However, there may be a significant difference between past events and forecasts, and there are uncertainties that may cause significant differences between the estimates based on future events and actual events.

(7) Impairment of non-financial assets

The Group assesses the existence of impairment on all non-financial assets at the end of each reporting period. For intangible assets with indefinite useful lives, impairment tests are carried out annually or in the event of impairment. For other non-financial assets, the Group carries out impairment tests when there are indications that the carrying amount will not be recoverable. To determine the use value, management must estimate future cash flows from the asset or CGU and choose an appropriate discount rate.

4. SUBSIDIARIES:

(1) Details of subsidiaries as of December 31, 2018 and 2017, are as follows:

	2018	2017
	Percentage of ownership(%)	
Subsidiaries		
Gyeonggi Yongin Techno Valley Co., Ltd.	80	80
Gimhae Techno Valley Co., Ltd.	80	80
Agricultural Corporation Company Green Tomorrow	90	90
Data Analytics Lab Co., Ltd.	100	-
Lake Park-H Co., Ltd	100	100
Seosan Techno Valley Co., Ltd.	65	65
Asan Techno Valley Co., Ltd.	100	100
Yangju Ecotec Co., Ltd.	100	100
Yeosu Sea World Corporation	100	100
H Valley Co., Ltd. (Formerly, Gyeonggi Hwasung Bio Valley Co., Ltd.)	100	100
Eco E&O	100	100
NHL Development Co., Ltd.	100	100
WATER SOLAR CO., LTD	100	-
Ilsan Seaworld,Co., Ltd	99.11	99.11
YoungAm TechnoSolar Co., Ltd	100	-
YoungAm HaeOReumSolar Co., Ltd	100	-
Hi-pass Solar Co., Ltd	100	-
Hanbando Solar Co., Ltd.	100	-
HaeSaRang Solar Co., Ltd	100	-
KAES Co., Ltd.	100	100
Hanwha 63 City Co., Ltd.	100	100
Hanwha Galleria Co., Ltd.	100	100
Hanwha Galleria Timeworld Co., Ltd.	69.45	69.45
Hanwha Engineering and Construction Corp.	100	100
Hanwha Finance Asset Co., Ltd.	100	100
Hanwha City Development Co., Ltd	100	100
Hanwha Defense Systems Corp.	100	100
Hanwha Life Asset Co., Ltd.	100	100
Hanwha B&B Co., Ltd.	100	100
Hanwha Life Insurance Co., Ltd.(*1)	44.99	44.99
Hanwha General Insurance Co., Ltd.	51.36	51.36
Hanwha Life Insurance Investigation & Adjusting	100	100
Hanwha Systems Co., Ltd.(*10)	52.91	100
Hanwha Estate Co., Ltd.	100	100
Hanwha Aerospace Co., Ltd.(Formerly, Hanwha Techwin Co., Ltd.) (*3)(*6)(*9)	33.03	32.68
Hanwha Station Development Co., Ltd.	67.25	67.25
Hanwha Eagles Professional Baseball Club Co., Ltd.	90	90
Hanwha Investment Corp.	97.82	97.82
Hanwha Asset Management Co., Ltd.	100	100
Hanwha Savings Bank Co., Ltd.	100	100
Hanwha Precision Machinery Co., Ltd.	100	100
Hanwha Land Systems Co., Ltd.	100	100
Hanwha Q CELLS & Advanced Materials Co., Ltd.(*11)	100	100
Hanwha Compound Corporation Co., Ltd.	100	100
Hanwha Chemical Co., Ltd.(*2)	36.26	35.89
Hanwha Chemical Overseas Holdings, Co., Ltd.	100	100
Hanwha Q Cell Co., Ltd.	100	100
Hanwha TechM Co., Ltd.	100	100
Hanwha Techwin Co., Ltd.(*2)	100	-
Hanwha Investment & Securities Co., Ltd.(*2)	32.23	32.23

	2018	2017
	Percentage of ownership(%)	
Hanwha Power System Co., Ltd.	100	100
Hanwha Hotel & Resort Inc.	99.32	99.32
Hanwha Techwin Tianjin Opto-Electronic Co., Ltd.	95	95
Hanwha Investment Management Limited	100	100
Hanwha Chemical Trading (Shanghai) Co., Ltd.	100	100
Hanwha International Trading (Shanghai) Co., Ltd.	100	100
Foodist Food Culture(Shanghai) Co., Ltd.	100	100
Hanwha TechM (Suzhou) Co., Ltd.	100	100
Hanwha Commercial Equipment Co., Ltd.	100	100
Aceka Turizm ve insaat A.s.	100	100
Acropark Golf Corp.	100	100
AKD En. ur. San. ve Tic. A.s.	100	100
AKY 4 En. ur. San. ve Tic. A.s.	100	100
AKY 5 En. ur. San. ve Tic. A.s.	100	100
Alkin Enerji uretim Ltd. sti.	100	100
Altaylar Altyapi ve Malzeme Hizmetleri A.s.	100	100
Aslan Gunes Enerjisi A.s.	100	100
Avenir el Divisadero SpA	100	100
Bilgidar iletisim Egitim ve Danismanlik Hizmetleri Tic.Ltd.sti.	100	100
Blue Albatross FZE	100	100
Bolca Enerji uretim A.s.	100	100
BSN 5 En. ur. San. ve Tic. A.s.	100	100
Buselik Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Dimetoka Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Eagle Petroleum Monterey, LLC	100	100
Eagle Petroleum, LLC	100	100
Eflak Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Elcin Enerji uretim Ltd. sti.	100	100
EMBR PTY LTD	100	100
Fior Gunes Enerjisi Anonim sirketi	100	100
Fnt Gida Turizm Ic Ve Dis Ticaret Sanayi Ltd. sti.	100	100
Fotovoltaica De Los Andes SpA	100	100
Fotovoltaica Del Desierto SPA	100	100
Fotovoltaica Sol del Norte SpA	100	100
Garnet Solar Power Generation 1, LLC	100	-
Greenland Altyapi ve Malzeme Hizmetleri A.s.	100	100
Hanwha Advanced Materials America LLC	100	100
Hanwha Advanced Materials Beijing Co., Ltd.	100	100
Hanwha Advanced Materials Chongqing Co.,Ltd.	100	100
Hanwha Advanced Materials Europe, s.r.o.	100	100
Hanwha Advanced Materials Germany GmbH	100	100
Hanwha Advanced Materials Holdings USA Inc.	100	100
Hanwha Advanced Materials Holdings USA LLC	100	100
Hanwha Advanced Materials Mexico S. De R.L. De C.V.	100	100
Hanwha Advanced Materials Shanghai Co., Ltd.	100	100
HANWHA AERO ENGINES.,LTD	100	100
Hanwha Agritech Ltd.	100	100
Hanwha America Development Inc.	100	100
Hanwha America Development LLC.	100	100
Hanwha Asset Management (USA) Ltd.	100	100
HANWHA ASSET MANAGEMENT PTE. LTD.	100	100
Hanwha AZDEL, Inc.	100	100
Hanwha Canada Development Inc.	100	100
Hanwha Chemical (Ningbo) Co., Ltd.	100	100
Hanwha Chemical (Thailand) Co.,Ltd.	99.99	99.99
HANWHA CHEMICAL INDIA PRIVATE LIMITED	99.99	99.99
Hanwha Chemical Malaysia Sdn. Bhd.	100	100

	2018	2017
	Percentage of ownership(%)	
Hanwha Consulting Services Myanmar Company Limited	99.99	99.99
Hanwha Europe GmbH	100	100
Hanwha Holdings(USA), Inc.	100	100
Hanwha Hong Kong Co., Ltd.	100	100
Hanwha International (S) Pte Ltd.	100	100
Hanwha International Corp.	100	100
HANWHA INTERNATIONAL INDIA PVT., LT	99.99	99.99
Hanwha International LLC.	100	100
Hanwha International Peru S.A.C.	100	100
Hanwha Life Insurance Company Limited. (Vietnam)	100	100
Hanwha Machinery Americas, Inc.	100	100
Hanwha Machinery Corporation	100	100
Hanwha Mining Services Australia Pty., Ltd	100	100
Hanwha Mining Services Chile SpA	100	100
Hanwha Parcel O LLC	100	100
Hanwha Power System Americas, Inc.	100	-
Hanwha Power Systems (Shanghai) Co.,LTD	100	-
Hanwha Power Systems Service Middle East LLC(*2)	49	-
Hanwha Property USA LLC	100	100
Hanwha PVPLUS LLC	100	100
Hanwha Q CELLS America Inc.	100	100
Hanwha Q CELLS America Project Holdings	100	100
Hanwha Q CELLS Americas Holdings. Corp.	100	-
Hanwha Q CELLS Australia Holdings Pty Ltd	100	-
Hanwha Q CELLS Australia Pty Ltd.	100	100
Hanwha Q CELLS Canada, Inc	100	-
Hanwha Q CELLS Canada, Corp.	100	100
Hanwha Q CELLS Chile SpA	100	100
Hanwha Q CELLS Co., Ltd.(*8)	93.91	93.97
Hanwha Q CELLS(Qidong) Co., Ltd.	100	100
Hanwha Q CELLS France SAS	100	100
Hanwha Q CELLS Gmbh	100	100
Hanwha Q CELLS Hong Kong Limited	100	100
Hanwha Q CELLS Investment Co., Ltd.	100	100
Hanwha Q CELLS Japan Co., Ltd.	100	100
Hanwha Q CELLS Japan Power Solutions Co.,Ltd.	100	100
Hanwha Q CELLS Malaysia Sdn. Bhd.	100	100
Hanwha Q CELLS Peru S.A.C	99.99	99.99
Hanwha Q CELLS PR Solar Holdings LLC	100	-
HANWHA Q CELLS SOLAR POWER SDN. BHD.	100	100
Hanwha Q CELLS Solar Technology Australia Pty Ltd.	100	-
Hanwha Q CELLS Technology Co., Ltd	100	100
Hanwha Q CELLS Til Til Uno SPA	100	100
Hanwha Q CELLS Turkey	100	100
Hanwha Q CELLS USA, INC.	100	-
Hanwha Q CELLS(Nantong) Co., Ltd.	100	100
Hanwha Resources (Canada) Ltd.	100	100
Hanwha Resources (USA) Corporation	100	100
Hanwha Riverside LLC.	100	100
Hanwha Saudi Contracting Co., Ltd.	100	100
Hanwha Singapore Pte. Ltd.	100	100
Hanwha Solar Electric Power Engineering Co., Ltd.	100	100
Hanwha Solar Engineering R&D center Co., Ltd.	100	100
Hanwha Solar Holdings Co.,Ltd	100	100
Hanwha Solar Power Kitsuki G.K.(*2)	1	1
Hanwha SolarOne (Laiyang) Co., Ltd	100	100
Hanwha SolarOne (Rugao) Co., Ltd	100	100

	2018	2017
	Percentage of ownership(%)	
Hanwha SolarOne GmbH	100	100
Hanwha SolarOne Investment Holding Ltd.	100	100
Hanwha SolarOne Power Generation (Wuxi) Co., Ltd.	100	100
Hanwha Solarone(beipiao)Co.,Ltd	100	-
Hanwha Systems Japan Co., Ltd.	100	-
Hanwha Q CELLS Technology (Shanghai) Co., Ltd.	100	100
Hanwha Techm Hungary Zrt.	97.21	97.21
Hanwha TechM USA LLC	100	100
Samsung Opto-Electronics America, Inc.	100	100
Hanwha Techwin Automation Americas, Inc.	100	100
HANWHA TECHWIN AUTOMATION VIETNAM CO,.LTD	100	100
Hanwha Techwin Do Brasil Equipamentos De Seguranca Ltda.	100	100
Hanwha Techwin Europe Limited	100	100
Hanwha Techwin Middle East FZE	100	100
Hanwha Techwin Security Vietnam	100	100
Hanwha Village Market, LLC	100	100
Hanwha West Properties LLC	100	100
Hazar Altyapi ve Malzeme Hizmetleri A.s.	100	100
Hersek Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Hiprom Enerji Yatirimlari A.s.	100	100
HMS AUSTRALIA OPERATIONS PTY LTD	100	100
HMS AUSTRALIA PROPERTY HOLDINGS PTY LTD	100	100
HQC Rock River Solar Holdings LLC	100	-
HQC Rock River Solar Power Generation Station LLC	100	-
HSEA PR Isla III, LLC	100	-
Huoqiu Hanrui New Energy Power Generation co. Ltd	100	100
HW SOLAR POWER 3 G.K.	100	100
HW SOLAR POWER 6 G.K.	100	100
HW SOLAR POWER 8 G.K.(*2)	0.66	0.66
isfahan Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Kanije Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Kartal Altyapi ve Malzeme Hizmetleri A.s.	100	100
Kartal Enerji uretim Ltd. sti.	100	100
Kent Altyapi ve Malzeme Hizmetleri A.s.	100	100
KMPT Solarpark Verwaltung GmbH	100	100
Kuantum Enerji uretim A.s.	100	100
Laheeb Al-Ezdihar	100	100
LDE Corporation PTY LTD	100	100
LDE HOLDINGS PTY LTD	100	100
LENEX Co.,Ltd.	100	100
Lisola Elektrik uretim ins.ve Tic.Ltd.sti.	100	100
LLP Zharyk Zol Company 2007	100	100
Lodz Solar Sp. z o.o.	100	100
Marel Bilisim Muhendislik Enerji Insaat Iletisim Turizm Gida San. Ve Dis Tic. Ltd. sti.	100	100
Maxxsol 01 srl	100	100
Mazovia Solar 1 Sp. Z o.o.	100	100
Mazovia Solar 2 Sp. Z o.o.	100	100
Mazovia Solar 3 Sp. Z o.o.	100	100
Meva Muhendislik Bilisim Enerji Insaat Iletisim Turizm San. Ve Dis Tic. Ltd. sti.	100	100
Moravia Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Mutlak Enerji uretim Ltd. sti.	100	100
Nantong Hanwha Import & Export Co., Ltd.	100	100
Nuans Enerji uretim A.s.	100	100
Onan Enerji uretim A.s.	100	100
PT. Bara Bumi International	100	100

	2018	2017
	Percentage of ownership(%)	
PT. Hanwha Life Insurance Indonesia	99.61	99.61
PT. Hanwha Mining Services Indonesia	100	100
PV Vallenar Uno SpA	100	100
RTE 4 En. ur. San. ve Tic. A.s.	100	100
S&P World Networks DMCC	100	100
Segah Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Sema Enerji uretim Ltd. sti.	100	100
Serimer Optik Medikal Kirtasiye Temizlik Insaat Ithalat Ihracat Sanayi Tic. Ltd. sti.	100	100
SFH Solarpark GmbH	100	100
Sipahi Enerji uretim A.s.	100	100
QSUN Poland Sp. z o.o.	100	-
QSUN 1	100	-
QSUN 2	100	-
QSUN 3	100	-
QSUN 4	100	-
QSUN 5	100	-
QSUN 6	100	-
QSUN 7	100	-
QSUN 8	100	-
QSUN 9	100	-
QSUN 10	100	-
QSUN 11	100	-
QSUN 12	100	-
QSUN 13	100	-
QSUN 14	100	-
QSUN 15	100	-
QSUN 16	100	-
QSUN 17	100	-
QSUN 18	100	-
QSUN 19	100	-
TAWASUL AL-EZDIHAR Co., Ltd	100	100
Techwin Engineering Center	100	100
Tecsol Srl	100	100
Tesla 1 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 10 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 11 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 12 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 13 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 2 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 6 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 7 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 8 Gunes En. ur. San. Ve Tic. A.s.	100	100
Tesla 9 Gunes En. ur. San. Ve Tic. A.s.	100	100
Toprakkale Altyapi ve Malzeme Hizmetleri A.s.	100	100
Tugce Enerji uretim A.s.	100	100
Turaneli Enerji Sanayi ve Ticaret Ltd. sti.	100	100
Ulu Gunes Enerjisi Anonim sirketi	100	100
Universal Bearings LLC.	100	100
Uno Enerji A.s.	100	100
Varlik Enerji uretim A.s.	100	100
Varna Enerji Sanayi ve Ticaret Ltd. sti.	100	100
World corporation	100	100
WSE Bradley Road Ltd	100	100
Hanwha Q CELLS USA Corp.	100	-
HSESM American Union LLC	100	-
HSESM PlanadaES LLC	100	-

	2018	2017
	Percentage of ownership(%)	
HSESM LeGrandUHS LLC	100	-
HQ MEX, LLC	100	-
HQ MEXICO HOLDINGS S DE RL DE CV	100	-
HQ MEXICO Solar I S DE RL DE CV	100	-
HQ MEXICO Solar II S DE RL DE CV	100	-
Kalaeloa Renewable Energy Park, LLC	100	-
HSEA HVES, LLC	100	-
Solar Monkey 1, LLC	100	-
Solar Monkey 2, LLC	100	-
HQC Maywood, LLC	100	-
Hanwha Q CELLS EPC USA, LLC	100	-
Hanwha Q CELLS Servicios Comerciales, S DE RL DE CV	100	-
Recon Co., Ltd.(*5)	-	-
Ilsan Seaworld 1st Co., Ltd.(*5)	-	-
KB Hotels&Resorts 1st LLC(*5)	-	-
Beneficiary certificates		
Small Giants New Renewable Energy Innovation Fund	100	100
2018 Hanwha IoT NeW Technology Venture Fund	73.33	-
ChungNam-Hanwha Small & Medium Company Growth Fund	66.67	66.67
Hanwha Global Business Fund	100	100
2018 Hanwha New Industry Global Plus-up Fund	60	-
ARIRANG KRX300	53.98	-
Hanwha Arirang NASDAQ Technology Sector ETF	58.82	-
TIGER Preferred Stock ETF	52.04	-
Kyobo AXA Bong-dam Song-san Highway Private Investment Trust	85.21	85.21
Laura 1st Co., Ltd.(*5)	-	-
Loyal MJ 1st Co., Ltd(*5)	-	-
Loyal MJ 2nd Co., Ltd(*5)	-	-
Masterpiece 1st Co, Ltd(*5)	-	-
Mirae Asset UK Gas Infra Private special asset Investment Trust No.1	83.78	83.78
Mirae Asset Global Renewable Energy Private Special Asset Investment Trust No.2	100	100
Mirae Asset Maps Global New Recycling Energy Private special asset Investment Trust No.1	100	100
Blackrock Global Total Solution Investment Trust No.1	100	-
Samsung VLCC Private Investment Trust No.1	68.39	75
Shining Clear Co., Ltd.(*5)	-	-
Smart Side Co., Ltd.(*5)	-	-
Simone Global Venture Private Investment Special No.1	100	100
Shinhan BNPP Global Solar Energy Private Equity Special Asset Investment Trust	100	100
Shinhan BNPP Seoul-Munsan Expressway Private Special Asset Investment Trust	93.33	93.33
Asia Pacific 45 Vessel Investment Co., Ltd.(*5)	-	-
HSF 7th Co., Ltd.(*5)	-	-
HSF 8th Co., Ltd. (*5)	-	-
YJ Deoksookoong Co., Ltd.(*5)	-	-
Yookyeong Kosdaq Venture Investment Trust No.1	99.8	-
Aegis KORIF Private real estate Trust 17-1	100	100
Aegis KORIF Private real estate Trust 17-2	100	100
Aegis KORIF Private real estate Trust 17-3	100	100
Aegis KORIF Private real estate Trust 17-4	100	100
Invest Blue 1st Co., Ltd.(*5)	-	-
Invest Sejong 1st Co., Ltd.(*5)	-	-
Invest Songdo 4th(*5)	-	-
Invest Songdo 3rd(*5)	-	-

	2018	2017
	Percentage of ownership(%)	
InvestCity 1st Co., Ltd.(*5)	-	-
InvestCity 3rd Co., Ltd.(*5)	-	-
Invest ST The First Co., Ltd.(*5)	-	-
Invest PS 2nd Co., Ltd.(*5)	-	-
Antares Co., Ltd.(*5)	-	-
Crystal Moonlight Co., Ltd.(*5)	-	-
Pine Tree sol Three Private equity investment Trust No.3	99.08	100
Pine Tree sol Three Private equity investment Trust No.5	97.09	97.09
Pine Tree sol Three Private equity investment Trust No.6-2	98.04	98
Poong Cheon 2nd(*5)	-	-
Phoenix Gate Tower 1st(*5)	-	-
Phoenix Kyomoon 1st Co., Ltd.(*5)	-	-
Phoenix SN 2nd Co., Ltd.(*5)	-	-
Phoenix Yeondong 3rd Co., Ltd.(*5)	-	-
Phoenix Yulbuk 1st Co., Ltd.(*5)	-	-
Phoenix Tangjung 1st Co., Ltd.(*5)	-	-
Hana Daol HW Landchip Private real estate feeder investment Trust No.1	98	98
Hanwha ASIA OPPORTUNITY Private Investment Trust No.1	100	100
Hanwha GLOBAL CORPORATE PE STRATEGY Private Investment Trust No.2	100	-
Hanwha GLOBAL CORPORATE PE STRATEGY Private Investment Trust No.1	100	100
Hanwha GLOBAL CREDIT STRATEGY Private Investment Trust No.1	100	-
Hanwha GLOBAL INFRASTRUCTURE STRATEGY No.2	100	-
Hanwha GLOBAL INFRASTRUCTURE STRATEGY No.1	100	100
Hanwha GLOBAL REAL ESTATE STRATEGY Private Investment Trust No.1	100	100
Hanwha GLOBAL REAL ESTATE STRATEGY Private Investment Trust No.2	100	-
Hanwha Prudential U.S. Real Estate Debt	100	100
Hanwha Lifestyle Private Investment Trust No.1	100	-
Hanwha Vietnam OPPORTUNITY Private Investment Trust No.1	100	-
Hanwha Solar Development Private Investment Trust No.2(*4)	50	-
Hanwha AI Global Choice Private Investment Trust No.1	100	100
Hanwha AI Global Choice Private Investment Trust No.2	100	100
Hanwha CONSUMER CREDIT Private Investment Trust No.1	100	100
Hanwha DEBT STRATEGY Real Estate Trust No.6	100	100
Hanwha LIFEPLUSTDF2020 equity investment Trust C-F	99.22	-
Hanwha LIFEPLUSTDF2025 equity investment Trust C-F	99.47	-
Hanwha LIFEPLUSTDF2030 equity investment Trust C-F	99.22	-
Hanwha LIFEPLUSTDF2035 equity investment Trust C-F	99.52	-
Hanwha LIFEPLUSTDF2040 equity investment Trust C-F	99.74	-
Hanwha LIFEPLUSTDF2045 equity investment Trust C-F	99.63	-
Hanwha LTI Private equity investment Trust No.2[Infra]	90.57	90.57
Hanwha LTI Infra Private equity investment Trust No.1	100	100
Hanwha Gwangju Ringroad special asset investment trust(Infra)(*4)	50	-
Hanwha Global Real Asset Investment Trust C-F	99.57	-
Hanwha Multi-Asset Cruize 5.0 C-i1	51.66	-
Hanwha Global Security Investment Trust for corporation only(Bond)C	95.22	-
Hanwha Vietnam Regend Security Investment trust(Stock) C-F	100	100
Hanwha Asian Regend Security Investment trust(Stock) C-F	100	100
Hanwha Asian Regend 4th Industrial Revolution Investment trust(Stock) C-F	88.8	100
HSF 17th Co., Ltd.(*5)	-	-
HSF 18th Co., Ltd.(*5)	-	-

	2018	2017
	Percentage of ownership(%)	
Hanwha Korea Regend 4th Industrial Revolution Investment trust(Stock) C-F	57,93	-
Hanwha Korea Regend Security Investment trust(Stock) C-F C-F(*4)	49.87	-
Hanwha Photovoltaics Private Investment Trust No.1(Power Generation Facility)(*4)	50	-
Hanwha Tricircle Infra Special Asset No.1	100	100
Hanwha Tricircle Infra Special Asset No.3	95	95
Hanwha Environment Love Private Investment Trust No.1(*4)	50	-
Hanwha Environment Love Private Investment Trust No.2(*4)	40.3	-

(*1) Considering the feasibility of a potential voting rights is remote, the Company is considered to have control since it is able to exercise the majority of voting rights in its decision-making process as the percentage of voting rights exceeds 50%.

(*2) Although the percentage of ownership is less than 50%, the Company is considered to have control since it is able to exercise the majority of voting rights in its decision-making process as the percentage of voting rights exceeds 50%.

(*3) Although the percentage of ownership is less than 50%, the Company is considered to have control over these companies, as the remaining shareholders who hold less than 1% are widely dispersed, and the Company is able to exercise its majority voting rights in the decision-making process.

(*4) Although the percentage of ownership does not exceed 50%, it is included in the subsidiary in accordance with K-IFRS 1110, taking into account the percentage of ownership and the relationship with the agents.

(*5) Although the Company does not have ownership interest, these are included in the scope of consolidation, considering contractual arrangements, exposures to variable returns and others.

(*6) The percentage of ownership has been changed due to acquisition and retirement of treasury stock for the year ended December 31, 2018.

(*7) The percentage of ownership has been changed due to retirement of treasury stock for the year ended December 31, 2018.

(*8) The percentage of ownership has been changed due to uneven capital increase and acquisition of treasury stock for the year ended December 31, 2018.

(*9) Hanwha Techwin Co., Ltd. did spin off in April 1, 2018, and changed its name to Hanwha Aerospace Co., Ltd.; the new spun-off company is Hanwha Techwin Co., Ltd.

(*10) The percentage of ownership has been changed related to acquisition of Hanwha S&C Co., Ltd

(*11)Hanwha Advanced Materials merged Hanwha Q CELLS Korea and changed its name to Hanwha Q CELLS & Advanced Materials Co., Ltd. for the year ended December 31, 2018.

(2) Consus Incheon Sewer Private Equity Investment Trust 1 and other seven beneficiary certificates were excluded from the consolidated subsidiaries because the Group has failed to make practical decision on related activities of investees even though the Group has a majority of the ownership ratio for the year ended December 31, 2018

(3) Subsidiaries newly included in the consolidation for the year ended December 31, 2018, are as follows:

Included	Reason
Hanwha Systems Japan Co., Ltd.	Newly acquired
Hanwha Power System Americas, Inc.	Newly established
Hanwha Power Systems (Shanghai) Co.,LTD	Newly established
Hanwha Power Systems Service Middle East LLC	Newly established
Hanwha Solarone(beipiao)Co.,Ltd	Newly established
Hanwha Techwin Co., Ltd.	Newly established
Data Analytics Lab Co., Ltd.	Newly established
QSUN Poland Sp. z o.o.	Newly acquired
QSUN 1	Newly acquired
QSUN 2	Newly acquired
QSUN 3	Newly acquired
QSUN 4	Newly acquired
QSUN 5	Newly acquired

Included	Reason
QSUN 6	Newly acquired
QSUN 7	Newly acquired
QSUN 8	Newly acquired
QSUN 9	Newly acquired
QSUN 10	Newly acquired
QSUN 11	Newly acquired
QSUN 12	Newly acquired
QSUN 13	Newly acquired
QSUN 14	Newly acquired
QSUN 15	Newly acquired
QSUN 16	Newly acquired
QSUN 17	Newly acquired
QSUN 18	Newly acquired
QSUN 19	Newly acquired
Garnet Solar Power Generation 1, LLC	Newly acquired
HQC Rock River Solar Holdings LLC	Newly acquired
HQC Rock River Solar Power Generation Station LLC	Newly acquired
Hanwha Q CELLS PR Solar Holdings LLC	Newly acquired
HSEA PR Isla III, LLC	Newly acquired
Hanwha Q CELLS Solar Technology Australia Pty Ltd.	Newly acquired
Hanwha Q CELLS Australia Holdings Pty Ltd	Newly acquired
Hanwha Q CELLS Americas Holdings. Corp.	Newly acquired
Hanwha Q CELLS USA, INC.	Newly acquired
Hanwha Q CELLS Canada, Inc	Newly acquired
Hanwha Q CELLS USA Corp.	Newly acquired
HSESM American Union LLC	Newly acquired
HSESM PlanadaES LLC	Newly acquired
HSESM LeGrandUHS LLC	Newly acquired
HQ MEX, LLC	Newly acquired
HQ MEXICO HOLDINGS S DE RL DE CV	Newly acquired
HQ MEXICO Solar I S DE RL DE CV	Newly acquired
HQ MEXICO Solar II S DE RL DE CV	Newly acquired
Kalaeloa Renewable Energy Park, LLC	Newly acquired
HSEA HVES, LLC	Newly acquired
Solar Monkey 1, LLC	Newly acquired
Solar Monkey 2, LLC	Newly acquired
HQC Maywood, LLC	Newly acquired
Hanwha Q CELLS EPC USA, LLC	Newly acquired
Hanwha Q CELLS Servicios Comerciales, S DE RL DE CV	Newly acquired
Hi-pass Solar Co., Ltd	Newly acquired
HaeSaRang Solar Co., Ltd	Newly acquired
Hanbando Solar Co., Ltd.	Newly acquired
YoungAm TechnoSolar Co., Ltd	Newly acquired
YoungAm HaeOReumSolar Co., Ltd	Newly acquired
WATER SOLAR CO., LTD	Newly acquired
KB Hotels&Resorts 1st LLC	Newly acquired

(4) Subsidiaries excluded from the consolidation for the year ended December 31, 2018 are as follows:

Excluded	Reason
HSSC Stainless Inc.	Liquidated
Amru and Hanwha International	Sold
Eagle Petroleum Corsicana, LLC	Liquidated
Hanwha Hawaii LLC	Sold
Hale Ka Lae, LLC	Sold
Hanwha Q CELLS Til Til Dos SpA	Liquidated
Hanwha Mining Services Singapore Pte. Ltd.	Liquidated
Birinci Enerji Uretim A.s.	Sold
Yapici Enerji uretim A.s.	Sold
Yilmazer Enerji uretim A.s.	Sold
Yenicag 1 Enerji Elektrik Gunes Enerjisi uretimi ProjePazarlama Dagitim Sanayi Ticaret Ltd. sti.	Sold
Papatya Enerji Elektrik Gunes Enerjisi uretimi Proje Pazarlama Dagitim Sanayi Ticaret Ltd. sti.	Sold
Kayrabey Enerji Elektrik Gunes Enerjisi uretimi Proje Pazarlama Dagitim Sanayi Ticaret Ltd. sti.	Sold
Maki Enerji Elektrik Gunes Enerjisi uretimi Proje Pazarlama Dagitim Sanayi Ticaret Ltd. sti.	Sold
BDI Enerji Elektrik Gunes Enerjisi uretimi Proje Pazarlama Dagitim Sanayi Ticaret Ltd. sti.	Sold
Solarpark FFT Infrastruktur GmbH & Co. KG	Liquidated
Hanwha Development Services LLC.	Liquidated

(5) Summary of financial information of subsidiaries as of December 31, 2018 is as follows:

	Current assets	Non-current assets	Assets for financial business	Current liabilities	Non-current liabilities	Liabilities for financial business	Total equity
	(In millions of Korean won)						
Gyeonggi Yongin Techno Valley Co., Ltd.	232,683	88	-	235,582	15,010	-	(17,821)
Lake Park-H Co., Ltd.	305,630	67,569	-	203,849	198,109	-	(28,760)
Hanwha Galleria Co., Ltd.	430,386	1,437,274	-	516,499	366,320	-	984,842
Hanwha Galleria Timeworld Co., Ltd.	123,364	310,704	-	171,319	57,489	-	205,260
Hanwha Engineering and Construction Corp.	2,198,780	2,470,180	-	2,941,028	1,220,847	-	507,086
Hanwha City Development Co., Ltd	25,780	184,662	-	3,701	3,764	-	202,976
Hanwha Savings Bank Co., Ltd.	-	-	956,473	-	-	853,220	103,253
Hanwha Defense Systems Corp.	498,347	293,650	-	369,832	13,047	-	409,118
Hanwha Life Insurance Co., Ltd.(*1)	-	-	113,603,579	-	-	104,525,769	9,077,810
Hanwha General Insurance Co., Ltd.(*2)	-	-	16,878,515	-	-	15,352,223	1,526,291
Hanwha Systems Co., Ltd.	1,067,566	832,314	-	870,914	207,991	-	820,974
Hanwha Station Development Co., Ltd.	13,493	387,661	-	66,467	206,045	-	128,642
Hanwha Asset Management Co., Ltd.	-	-	216,641	-	-	21,989	194,652
Hanwha Precision Machinery Co., Ltd.	190,169	52,019	-	67,596	91,843	-	82,749
Hanwha Land Systems Co., Ltd.	368,688	973,718	-	498,207	271,666	-	572,533
Hanwha Q CELLS & Advanced Materials Co., Ltd.	1,129,876	1,989,891	-	1,004,229	1,081,470	-	1,034,069
Hanwha Compound Corporation Co., Ltd.	53,402	30,510	-	27,803	5,206	-	50,902

	Current assets	Non-current assets	Assets for financial business	Current liabilities	Non-current liabilities	Liabilities for financial business	Total equity
	(In millions of Korean won)						
Hanwha Chemical Overseas Holdings, Co., Ltd.	11,384	95,900	-	1,580	-	-	105,703
Hanwha Chemical Co., Ltd.(*2)	1,105,063	6,715,158	-	1,418,847	1,307,684	-	5,093,690
Hanwha Aerospace Co., Ltd.(Formerly, Hanwha Techwin Co., Ltd.)	1,255,489	2,208,312	-	1,061,250	742,964	-	1,659,587
Hanwha Investment & Securities Co., Ltd.(*3)(*9)	-	-	7,360,553	-	-	6,412,970	947,582
Hanwha Techwin Co., Ltd.	201,386	188,695	-	158,196	52,652	-	179,234
Hanwha Power System Co., Ltd.	152,634	68,452	-	71,043	26,255	-	123,789
Hanwha Hotel & Resort Inc.	156,110	2,322,295	-	846,337	956,856	-	675,212
Hanwha Advanced Materials Europe, s.r.o.	53,061	80,054	-	70,480	13,308	-	49,327
Hanwha Advanced Materials Germany GmbH	42,977	32,514	-	40,977	14,291	-	20,223
Hanwha America Development Inc.	38,086	71,716	-	-	3,607	-	106,194
Hanwha Chemical (Ningbo) Co., Ltd.	103,723	220,883	-	109,068	-	-	215,538
Hanwha Europe GmbH(*4)	62,129	19,615	-	56,669	6,086	-	18,989
Hanwha Holdings(USA), Inc.(*5)	347,941	320,882	-	356,368	40,696	-	271,758
Hanwha Hong Kong Co., Ltd.	70,981	32,568	-	83,290	31	-	20,228
Hanwha Q CELLS Co., Ltd.(*6)	1,008,806	1,343,870	-	1,199,413	436,146	-	717,118
Hanwha Q CELLS Gmbh	386,281	123,378	-	299,224	17,398	-	193,038
Hanwha Q CELLS Investment Co., Ltd.	92,202	382,044	-	13,879	100,629	-	359,738
Hanwha Q CELLS Japan Co., Ltd.	200,356	85,361	-	161,361	19,608	-	104,747
Hanwha Q CELLS Malaysia Sdn. Bhd.	301,380	314,301	-	181,507	269,123	-	165,051
Hanwha Q CELLS Turkey(*7)	85,644	57,475	-	115,834	43,450	-	(16,166)
Hanwha Solar Holdings Co.,Ltd	59,693	855,264	-	-	-	-	914,957
PT. Hanwha Life Insurance Indonesia	-	-	154,576	-	-	18,369	136,207
S&P World Networks DMCC	79,042	6,547	-	54,921	182	-	30,486
HANWHA AERO ENGINES.,LTD	27,213	78,495	-	8,463	67,073	-	30,173
Hanwha Q CELLS Americas Holdings. Corp.(*8)	143,552	151,448	-	151,601	70,103	-	73,296
Hanwha Life Insurance Company Limited. (Vietnam)	-	-	383,032	-	-	211,986	171,045
Samsung Opto-Electronics America, Inc.	101,077	6,162	-	71,941	-	-	35,299

	Current assets	Non-current assets	Assets for financial business	Current liabilities	Non-current liabilities	Liabilities for financial business	Total equity
	(In millions of US dollars)						
Gyeonggi Yongin Techno Valley Co., Ltd.	$ 208	$ 0	$ -	$ 211	$ 13	$ -	$ (16)
Lake Park-H Co., Ltd.	273	60	-	182	177	-	(26)
Hanwha Galleria Co., Ltd.	385	1,285	-	462	328	-	881
Hanwha Galleria Timeworld Co., Ltd.	110	278	-	153	51	-	184
Hanwha Engineering and Construction Corp.	1,967	2,209	-	2,630	1,092	-	454
Hanwha City Development Co., Ltd	23	165	-	3	3	-	182
Hanwha Savings Bank Co., Ltd.	-	-	855	-	-	763	92
Hanwha Defense Systems Corp.	446	263	-	331	12	-	366
Hanwha Life Insurance Co., Ltd.(*1)	-	-	101,604	-	-	93,485	8,119
Hanwha General Insurance Co., Ltd.(*2)	-	-	15,096	-	-	13,731	1,365
Hanwha Systems Co., Ltd.	955	744	-	779	186	-	734
Hanwha Station Development Co., Ltd.	12	347	-	59	184	-	115
Hanwha Asset Management Co., Ltd.	-	-	194	-	-	20	174
Hanwha Precision Machinery Co., Ltd.	170	47	-	60	82	-	74
Hanwha Land Systems Co., Ltd.	330	871	-	446	243	-	512
Hanwha Q CELLS & Advanced Materials Co., Ltd.	1,011	1,780	-	898	967	-	925
Hanwha Compound Corporation Co., Ltd.	48	27	-	25	5	-	46
Hanwha Chemical Overseas Holdings, Co., Ltd.	10	86	-	1	-	-	95
Hanwha Chemical Co., Ltd.(*2)	988	6,006	-	1,269	1,170	-	4,556
Hanwha Aerospace Co., Ltd.(Formerly, Hanwha Techwin Co., Ltd.)	1,123	1,975	-	949	664	-	1,484
Hanwha Investment & Securities Co., Ltd.(*3)(*9)	-	-	6,583	-	-	5,736	847
Hanwha Techwin Co., Ltd.	180	169	-	141	47	-	160
Hanwha Power System Co., Ltd.	137	61	-	64	23	-	111
Hanwha Hotel & Resort Inc.	140	2,077	-	757	856	-	604
Hanwha Advanced Materials Europe, s.r.o.	47	72	-	63	12	-	44
Hanwha Advanced Materials Germany GmbH	38	29	-	37	13	-	18
Hanwha America Development Inc.	34	64	-	-	3	-	95
Hanwha Chemical (Ningbo) Co., Ltd.	93	198	-	98	-	-	193
Hanwha Europe GmbH(*4)	56	18	-	51	5	-	17
Hanwha Holdings(USA), Inc.(*5)	311	287	-	319	36	-	243
Hanwha Hong Kong Co., Ltd.	63	29	-	74	0	-	18
Hanwha Q CELLS Co., Ltd.(*6)	902	1,202	-	1,073	390	-	641

	Current assets	Non-current assets	Assets for financial business	Current liabilities	Non-current liabilities	Liabilities for financial business	Total equity
	(In millions of US dollars)						
Hanwha Q CELLS Gmbh	345	110	-	268	16	-	173
Hanwha Q CELLS Investment Co., Ltd.	82	342	-	12	90	-	322
Hanwha Q CELLS Japan Co., Ltd.	179	76	-	144	18	-	94
Hanwha Q CELLS Malaysia Sdn. Bhd.	270	281	-	162	241	-	148
Hanwha Q CELLS Turkey(*7)	77	51	-	104	39	-	(14)
Hanwha Solar Holdings Co., Ltd	53	765	-	-	-	-	818
PT. Hanwha Life Insurance Indonesia	-	-	138	-	-	16	122
S&P World Networks DMCC	71	6	-	49	0	-	27
HANWHA AERO ENGINES., LTD	24	70	-	8	60	-	27
Hanwha Q CELLS Americas Holdings. Corp.(*8)	128	135	-	136	63	-	66
Hanwha Life Insurance Company Limited. (Vietnam)	-	-	343	-	-	190	153
Samsung Opto-Electronics America, Inc.	90	6	-	-	-	-	32

(*1) Financial information of Hanwha Life Insurance Co., Ltd., which includes 56 beneficiary certificates as of December 31, 2018.

(*2) Financial information of Hanwha General Insurance Co., Ltd., which includes two beneficiary certificates as of December 31, 2018.

(*3) Consolidated financial information of Hanwha Investment & Securities Co., Ltd., which includes 29 SPCs and one beneficiary certificate as of December 31, 2018.

(*4) Consolidated financial information of Hanwha Europe GmbH, which includes the financial information of two subsidiaries.

(*5) Consolidated financial information of Hanwha Holdings (USA) Inc., which includes the financial information of 17 subsidiaries.

(*6) Consolidated financial information of Hanwha Q CELLS Co., Ltd., which includes the financial information of 19 subsidiaries.

(*7) Consolidated financial information of Hanwha Q CELLS Turkey, which includes the financial information of 55 subsidiaries.

(*8) Consolidated financial information of Hanwha Resources (USA) Corporation, which includes the financial information of eight subsidiaries.

(*9) The financial information of Hanwha Investment & Securities Co., including financial information of 29 SPCs, was restated in the prior term, but the consolidated financial information of the Group was not restated due to lack of significant influence.

(6) Summary of business performance of subsidiaries for the years ended December 31, 2018, is as follows:

	Sales	Operating profit (loss)	Net profit (loss)	Net comprehensive profit (loss)	Total comprehensive income (loss)
	(In millions of Korean won)				
Gyeonggi Yongin Techno Valley Co., Ltd.	₩ 11,946	₩ (2,993)	₩ (8,261)	₩ -	₩ (8,261)
Lake Park-H Co., Ltd.	-	(5,455)	(7,597)	-	(7,597)
Hanwha Galleria Co., Ltd.	356,784	18,189	15,683	(999)	14,684
Hanwha Galleria Timeworld Co., Ltd.	332,681	760	6,713	(31,450)	(24,738)
Hanwha Engineering and Construction Corp.	3,593,800	309,152	135,085	(27,307)	107,778
Hanwha City Development Co., Ltd	7,087	(5,300)	(18,864)	(266)	(19,129)
Hanwha Savings Bank Co., Ltd.	49,651	16,985	14,873	(16)	14,857
Hanwha Defense Systems Corp.	699,054	36,094	41,125	(2,580)	38,545
Hanwha Life Insurance Co., Ltd.(*1)	15,781,901	575,661	375,112	(1,099,611)	(724,499)
Hanwha General Insurance Co., Ltd.(*2)	7,436,199	107,693	79,191	111,247	190,438
Hanwha Systems Co., Ltd.	1,121,416	44,795	40,089	(941)	39,148
Hanwha Station Development Co., Ltd.	218,359	11,656	10,671	(189)	10,482
Hanwha Asset Management Co., Ltd.	100,496	30,731	22,081	(902)	21,179
Hanwha Precision Machinery Co., Ltd.	245,070	9,282	10,445	(2,062)	8,383
Hanwha Land Systems Co., Ltd.	773,277	61,242	59,197	(2,341)	56,856
Hanwha Q CELLS & Advanced Materials Co., Ltd.	898,537	18,356	25,178	(4,471)	20,707
Hanwha Compound Corporation Co., Ltd.	138,883	1,462	1,372	(306)	1,066
Hanwha Chemical Overseas Holdings, Co., Ltd.	-	(595)	9,577	-	9,577
Hanwha Chemical Co., Ltd.(*2)	3,997,665	353,653	522,469	(68,046)	454,424
Hanwha Aerospace Co., Ltd. (Formerly, Hanwha Techwin Co., Ltd.)	1,059,271	(88,627)	(27,609)	(146,641)	(174,249)
Hanwha Investment & Securities Co., Ltd.(*3)(*9)	1,902,945	99,199	73,178	(12,482)	60,696
Hanwha Techwin Co., Ltd.	363,416	1,054	1,286	(3,301)	(2,016)
Hanwha Power System Co., Ltd.	170,076	(4,310)	(149)	(1,192)	(1,341)
Hanwha Hotel & Resort Inc.	1,254,233	11,460	(17,149)	(18,069)	(35,218)
Hanwha Advanced Materials Europe, s.r.o.	98,884	1,059	(1,445)	(36)	(1,481)
Hanwha Advanced Materials Germany GmbH	49,818	(14,041)	(15,214)	274	(14,940)
Hanwha America Development Inc.	-	-	1,266	4,402	5,669
Hanwha Chemical (Ningbo) Co., Ltd.	374,497	14,114	8,941	(1,327)	7,614
Hanwha Europe GmbH(*4)	199,034	3,197	2,543	176	2,719
Hanwha Holdings(USA), Inc.(*5)	641,427	18,281	(23,298)	11,684	(11,614)
Hanwha Hong Kong Co., Ltd.	249,068	551	1,219	779	1,998
Hanwha Q CELLS Co., Ltd.(*6)	1,660,919	(69,648)	(311,456)	(16,576)	(328,032)
Hanwha Q CELLS Gmbh	802,292	(101)	753	(25)	729
Hanwha Q CELLS Investment Co., Ltd.	-	(496)	(536)	15,039	14,503
Hanwha Q CELLS Japan Co., Ltd.	781,869	25,511	16,125	5,864	21,989
Hanwha Q CELLS Malaysia Sdn. Bhd.	620,260	38,379	18,523	2,925	21,448
Hanwha Q CELLS Turkey(*7)	68,128	8,643	(35,171)	(1,903)	(37,074)
Hanwha Solar Holdings Co.,Ltd	-	(330)	(269)	35,122	34,852
PT. Hanwha Life Insurance Indonesia	17,517	(4,139)	(4,045)	(4,003)	(8,048)
S&P World Networks DMCC	166,896	2,630	(840)	1,496	656
HANWHA AERO ENGINES.,LTD	51	(11,553)	(13,096)	786	(12,310)
Hanwha Q CELLS Americas Holdings. Corp.(*8)	28,082	(6,019)	(5,816)	(552)	(6,368)
Hanwha Life Insurance Company Limited. (Vietnam)	121,483	(8,405)	(7,916)	3,225	(4,691)
Samsung Opto-Electronics America, Inc.	207,190	2,353	1,556	1,424	2,980

(*1) Financial information of Hanwha Life Insurance Co., Ltd., which includes 56 beneficiary certificates as of December 31, 2018.

(*2) Financial information of Hanwha General Insurance Co., Ltd., which includes two beneficiary certificates as of December 31, 2018.

(*3) Consolidated financial information of Hanwha Investment & Securities Co., Ltd., which includes 29 SPCs and one beneficiary certificate as of December 31, 2018.

(*4) Consolidated financial information of Hanwha Europe GmbH, which includes the financial information of two subsidiaries.
(*5) Consolidated financial information of Hanwha Holdings (USA) Inc., which includes the financial information of 17 subsidiaries.
(*6) Consolidated financial information of Hanwha Q CELLS Co., Ltd., which includes the financial information of 19 subsidiaries.
(*7) Consolidated financial information of Hanwha Q CELLS Turkey, which includes the financial information of 55 subsidiaries.
(*8) Consolidated financial information of Hanwha Resources (USA) Corporation, which includes the financial information of eight subsidiaries.
(*9) The financial information of Hanwha Investment & Securities Co., including financial information of 29 SPCs, was restated in the prior term, but the consolidated financial information of the Group was not restated due to lack of significant influence

(7) Changes of consolidated beneficiary certificates for the year ended December 31, 2018, are as follows:

	Beginning	Increase (*1)	Decrease	Ending
Beneficiary certificates and others	54	55	(16)	93

(*1) Newly included in the scope of consolidation by purchasing Hanwha Global Real Asset Investment Trust C-F and 54 other beneficiary certificates.

5. INVESTMENTS IN ASSOCIATES AND JOINT VENTURE:

(1) Details of major investments in associates as of December 31, 2018 and 2017, are as follows:

		Percentage of ownership (%)				
		2018	2017	Location	Closing month	Business
Joint venture	Yeochun NCC Co., Ltd.	50.00	50.00	Korea	December	Manufacture of basic compound
Investments in associates	Hanwha General Chemical Co., Ltd.	36.05	36.05	Korea	December	Manufacture of petrochemicals
Investments in associates	Hanwha Q CELLS Korea (*1)	-	39.88	Korea	December	Supplying total solution of photovoltaic business

(*1) HANWHA Q CELLS Korea Corp. merged into Hanwha Q CELLS and Advanced Materials Corporation in 2018.

(2) Changes in investments in associates for the years ended December 31, 2018 and 2017, are as follows:

	2018						
	Beginning	Acquisitions	Disposals	Equity income (loss) on investments	Comprehensive income (loss)	Others (*1)	Ending
	(In millions of Korean won)						
Yeochun NCC Co., Ltd.	₩ 770,602	₩ -	₩ -	₩ 230,585	₩ -	₩ (433,404)	₩ 567,783
Hanwha General Chemical Co., Ltd.	971,321	-	-	158,852	3,267	(2,299)	1,131,141
Hanwha Q CELLS Korea	186,287	-	-	32,159	1,107	(219,553)	-
Others	529,656	142,943	(21,224)	(765)	7,608	(101,441)	556,777
Total	₩ 2,457,866	₩ 142,943	₩ (21,224)	₩ 420,831	₩ 11,982	₩ (756,697)	₩ 2,255,701

(*1) Others include changes in scope of consolidation and receipts of dividends from associates.

	2017						
	Beginning	Acquisitions	Disposals	Equity income (loss) on investments	Comprehensive income (loss)	Others (*1)	Ending
	(In millions of Korean won)						
Yeochun NCC Co., Ltd.	₩ 586,850	₩ -	₩ -	₩ 383,150	₩ -	₩ (199,398)	₩ 770,602
Hanwha General Chemical Co., Ltd.	766,903	-	-	198,123	(747)	7,042	971,321
Hanwha Q CELLS Korea	191,924	-	-	(2,854)	(2,760)	(23)	186,287
Others	481,986	129,924	(21,516)	4,050	(27,770)	(37,018)	529,656
Total	₩ 2,027,663	₩ 129,924	₩ (21,516)	₩ 582,469	₩ (31,277)	₩ (229,397)	₩ 2,457,866

(*1) Others include changes in scope of consolidation and receipts of dividends from associates.

(3) Summary of financial information of major associates as of December 31, 2018 and 2017, is as follows:

	2018			
	Current assets	Non-current assets	Current liabilities	Non-current liabilities
	(In millions of Korean won)			
Yeochun NCC Co., Ltd.	₩ 1,140,900	₩ 954,697	₩ 601,890	₩ 289,059
Hanwha General Chemical Co., Ltd.	1,075,401	2,531,233	412,598	81,242

	2017			
	Current assets	Non-current assets	Current liabilities	Non-current liabilities
	(In millions of Korean won)			
Yeochun NCC Co., Ltd.	₩ 1,635,144	₩ 931,173	₩ 788,880	₩ 163,285
Hanwha General Chemical Co., Ltd.	1,460,802	3,557,747	1,219,277	862,437
Hanwha Q CELLS Korea	888,012	1,171,386	920,070	652,781

(4) Summary of business performance of major associates for the years ended December 31, 2018 and 2017, is as follows:

	2018				
	Revenue	Gain or loss from continuing operations	Other comprehensive income (loss)	Total comprehensive income (loss)	Receipts of dividends from associates
	(In millions of Korean won)				
Yeochun NCC Co., Ltd.	₩ 5,854,385	₩ 457,306	₩ (6,808)	₩ 450,497	₩ 430,000
Hanwha General Chemical Co., Ltd.	2,917,814	503,228	1,491	504,719	-

	2017				
	Revenue	Gain or loss from continuing operations	Other comprehensive income (loss)	Total comprehensive income (loss)	Receipts of dividends from associates
	(In millions of Korean won)				
Yeochun NCC Co., Ltd.	₩ 5,415,958	₩ 765,742	₩ 1,203	₩ 766,945	₩ 200,000
Hanwha General Chemical Co., Ltd.	2,519,572	572,714	(2,204)	570,510	-
Hanwha Q CELLS Korea	1,282,453	46,725	(3,980)	42,745	-

(5) Details of adjustments from financial information of major associates to the book value of investments in associates for the years ended December 31, 2018 and 2017, are as follows:

	2018	
	Yeochun NCC Co., Ltd.	Hanwha General Chemical Co., Ltd. (*1)
	(In millions of Korean won)	
Net assets (A)	₩ 1,204,648	₩ 3,112,794
Percentage of ownership (B)	50.00%	36.05%
Interests in net assets (AXB)	602,324	1,122,018
(+) Goodwill	-	-
(-) Intercompany transactions	(34,541)	9,123
Book value	567,783	1,131,141

(*1) The information is based on consolidated financial statements, and the Group has reflected net assets attributed to owners of the parent.

	2017		
	Yeochun NCC Co., Ltd.	Hanwha General Chemical Co., Ltd. (*1)	Hanwha Q CELLS Korea (*1)
	(In millions of Korean won)		
Net assets (A)	₩ 1,614,152	₩ 2,662,050	₩ 486,508
Percentage of ownership (B)	50.00%	36.05%	39.88%
Interests in net assets (AXB)	807,076	959,546	194,033
(+) Goodwill	-	-	8,446
(-) Intercompany transactions	(36,474)	11,775	(16,192)
Book value	770,602	971,321	186,287

(*1) The information is based on consolidated financial statements, and the Group has reflected net assets attributed to owners of the parent.

(6) Unrecognized accumulated loss as discontinued use of equity method for the years ended December 31, 2018 and 2017, is as follows:

	2018	2017
	(In millions of Korean won)	
Galleriaforet Corp.	₩ 15,598	₩ 15,779
SaltOne Co., Ltd.(*1)	-	308
Crystal Solar Inc.	3,386	2,211
Burdur Enerji A.S.	1,872	-
NINGBO ZHONGHUA JIAN HANWHA CHEMICAL	-	713
Bio Green Technology Sdn Bhd.	269	196
Enfinity Philippines Renewable Resources Fourth, Inc.	268	-

(*1) SaltOne Co., Ltd was sold for the year ended in 2018

(7) Investments in associates are provided as collateral for payables of the Group as of December 31, 2018 (Note 55).

6. SEGMENT INFORMATION:

(1) The Group's reportable segments and details are as follows:

Business section	Main business
Explosives and production	Manufacturing and selling of explosives
Trading and wholesale retails	Trading and retails
Petrochemical production	Manufacturing and selling of petrochemicals
Construction	Engineering and construction services for building, plant and environment facilities, and others
Leisure and service	Operating athletic facilities, tourism, hotel and catering businesses
Photovoltaic business	Manufacturing and selling of product related to sunlight and photovoltaic power generation
Financial business	Insurance business and management of deposits and instalment savings
Others	Manufacturing and selling of others

(2) A profit or loss by each segment for the years ended December 31, 2018 and 2017, is as follows:

2018 (In millions of Korean won)

	Explosives & Production	Trading & Wholesale Retails	Petrochemical Production	Construction	Leisure & Service	Photovoltaic business	Financial business	Others	Consolidation adjustment	Total
Revenue	₩ 7,530,143	₩ 4,905,693	₩ 5,888,290	₩ 3,850,092	₩ 1,625,286	₩ 3,376,656	₩ 25,497,274	₩ 1,172,251	₩ (5,105,531)	₩ 48,740,154
Operating profit (loss)	338,233	94,182	377,566	281,962	21,493	(20,452)	815,325	2,439	(104,599)	1,806,149
Finance income (loss) and others	66,226	(33,624)	159,489	(224,205)	(29,102)	(316,090)	(266,530)	(51,050)	(311,922)	(1,006,808)
Profit (loss) for the year	₩ 404,459	₩ 60,558	₩ 537,055	₩ 57,757	₩ (7,609)	₩ (336,542)	₩ 548,795	₩ (48,611)	₩ (416,521)	₩ 799,341

2017 (In millions of Korean won)

	Explosives & Production	Trading & Wholesale Retails	Petrochemical Production	Construction	Leisure & Service	Photovoltaic business	Financial business	Others	Consolidation adjustment	Total
Revenue	₩ 6,847,925	₩ 4,660,066	₩ 5,481,106	₩ 3,864,854	₩ 1,473,950	₩ 3,432,404	₩ 27,923,470	₩ 1,137,432	₩ (4,416,771)	₩ 50,404,436
Operating profit (loss)	310,796	90,070	638,677	39,344	22,773	22,230	998,690	38,714	(2,363)	2,158,931
Finance income (loss) and others	(62,445)	(81,812)	(125,923)	(330,739)	(47,779)	(65,973)	(243,935)	(50,690)	161,302	(847,994)
Profit (loss) for the year	₩ 248,351	₩ 8,258	₩ 512,754	₩ (291,395)	₩ (25,006)	₩ (43,743)	₩ 754,755	₩ (11,976)	₩ 158,939	₩ 1,310,937

(3) Segment assets and liabilities as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Reportable segment asset	Reportable segment liability	Reportable segment asset	Reportable segment liability
	(In millions of Korean won)			
Explosives and production	₩ 15,534,934	₩ 8,174,321	₩ 13,598,889	₩ 7,077,564
Trading and wholesale retails	3,802,962	2,457,964	3,602,776	2,266,074
Petrochemical production	11,834,003	5,260,534	9,272,128	3,797,851
Construction	5,719,912	5,751,322	5,645,757	5,565,210
Leisure and service	2,798,404	1,956,042	2,700,800	1,806,480
Photovoltaic business	5,574,337	3,059,565	5,206,876	2,589,369
Financial business	139,739,594	127,377,510	133,698,679	122,086,394
Others	1,768,589	931,787	1,817,559	957,995
Consolidation adjustment	(17,224,158)	(2,373,503)	(15,348,486)	(1,916,705)
Total	₩ 169,548,577	₩ 152,595,542	₩ 160,194,978	₩ 144,230,232

(4) The Group's sales for the years ended December 31, 2018 and 2017, and the book value of non-current assets as of December 31, 2018 and 2017, by regional groups, are as follows:

	Sales		Non-current assets (*1)	
	2018	2017	2018	2017
	(In millions of Korean won)			
Domestic	₩ 41,135,225	₩ 42,763,395	₩ 16,430,335	₩ 15,105,915
USA	904,594	916,401	563,194	711,981
Asia	3,459,294	3,557,343	925,533	803,854
Others	3,241,041	3,167,297	3,094,299	2,988,314
Total	₩ 48,740,154	₩ 50,404,436	₩ 21,013,361	₩ 19,610,064

(*1) Financial instruments, deferred income tax assets and others are excluded from 'Non-current assets.'

(5) No single customer accounts for more than 10% of consolidated net income for the years ended December 31, 2018 and 2017.

7. RESTRICTED-TO-USE AND SECURED FINANCIAL ASSETS (NON-FINANCIAL BUSINESS):

Restricted-to-use and secured financial assets as of December 31, 2018 and 2017, are as follows:

	Description	2018	2017
		(In millions of Korean won)	
Cash and cash equivalents	Guarantees for transaction and others	₩ 20,665	₩ 66,213
Short-term financial instrument	Guarantees for borrowings and transaction	326,383	211,734
Long-term financial instrument	Guarantees for deposit for opening of checking account and others	10,512	2,384
	Total	₩ 357,560	₩ 280,331

8. CASH AND CASH EQUIVALENTS (NON-FINANCIAL BUSINESS):

Details of cash and cash equivalents as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Cash on hand	₩ 235,935	₩ 71,042
Cash in bank	1,560,872	1,104,895
Other cash and cash equivalents	1,147,734	933,216
Total	₩ 2,944,541	₩ 2,109,153

9. FINANCIAL INSTRUMENTS BY CATEGORY (NON-FINANCIAL BUSINESS):

(1) Categorizations of financial instruments as of December 31, 2018 and 2017, are as follows:

	2018				
	Financial assets at amortized cost	Financial assets at FVTPL	Hedging derivative financial instruments	Financial assets at FVTOCI	Total
	(In millions of Korean won)				
Current assets:					
Cash and cash equivalents	₩ 2,944,541	₩ -	₩ -	₩ -	₩ 2,944,541
FVTPL – financial assets	-	15	-	-	15
FVTOCI – financial assets	-	-	-	156	156
Trade and other receivables(*1)	4,244,879	-	-	-	4,244,879
Other financial assets	700,488	9,847	805	-	711,140
Non-current assets:					
FVTPL – financial assets	-	155,203	-	-	155,203
FVTOCI – financial assets	-	-		23,669	23,669
Trade and other receivables	93,866	-	-	-	93,866
Other financial assets	194,660	15,914	767	-	211,341
Total	₩ 8,178,434	₩ 180,979	₩ 1,572	₩ 28,825	₩ 8,384,810

(*1) Unbilled construction is excluded from the classification of financial instruments.

	2017				
	Loans and receivables	Financial assets at FVTPL	Hedging derivative financial instruments	AFS financial assets	Total
	(In millions of Korean won)				
Current assets:					
Cash and cash equivalents	₩ 2,109,153	₩ -	₩ -	₩ -	₩ 2,109,153
AFS financial assets	-	-	-	291	291
Trade and other receivables(*1)	3,911,698	-	-	-	3,911,698
Other financial assets	659,505	14,000	3,247	-	676,752
Non-current assets:					
AFS financial assets	-	-	-	478,059	478,059
Trade and other receivables	84,751	-	-	-	84,751
Other financial assets	184,656	9,157	48	-	193,861
Total	₩ 6,949,763	₩ 23,157	₩ 3,295	₩ 478,350	₩ 7,454,565

(*1) Unbilled construction is excluded from the classification of financial instruments.

(2) Categorizations of financial liabilities as of December 31, 2018 and 2017, are as follows:

	2018			
	Financial liabilities at FVTPL	Hedging derivative financial instruments	Other financial liabilities at amortized cost	Total
	(In millions of Korean won)			
Current liabilities				
Trade and other payables	₩ 23,758	₩ -	₩ 2,981,563	₩ 3,005,321
Borrowings and debentures	-	-	7,062,482	7,062,482
Other financial liabilities	27,413	590	758,098	786,101
Non-current liabilities				
Trade and other payables	-	-	164,078	164,078
Borrowings and debentures	-	-	5,799,913	5,799,913
Other financial liabilities	2,740	1,527	322,283	326,550
Total	₩ 53,991	₩ 2,117	₩ 17,088,417	₩ 17,144,445

	2017			
	Financial liabilities at FVTPL	Hedging derivative financial instruments	Other financial liabilities at amortized cost	Total
	(In millions of Korean won)			
Current liabilities				
Trade and other payables	₩ 23,758	₩ -	₩ 3,361,313	₩ 3,385,071
Borrowings and debentures	-	-	5,804,804	5,804,804
Other financial liabilities	13,893	2,977	723,681	740,551
Non-current liabilities				
Trade and other payables	23,137	-	115,997	139,134
Borrowings and debentures	-	-	5,139,400	5,139,400
Other financial liabilities	46,152	4,258	298,136	348,546
Total	₩ 106,940	₩ 7,235	₩ 15,443,331	₩ 15,557,506

(3) Income and loss from financial instruments by category for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Financial assets and liabilities at FVTPL:		
Gain (loss) on transactions	₩ (14,220)	₩ 10,996
Gain (loss) on valuation	25,260	(29,479)
Others	(829)	(1,226)
Financial assets and liabilities at amortized cost		
Gain (loss) on transactions	(4,373)	(40,416)
Interest income	57,695	29,901
Interest expenses (*2)	(419,079)	(413,436)
Gain (loss) on valuation	(5,142)	(110,100)
Gains (loss) on foreign currency translation	(71,259)	29,378
Gains (loss) on foreign currency transaction	(8,513)	(13,848)
Financial assets at FVTOCI		
Gain (loss) on valuation (other comprehensive income and loss) (*1)	(118,694)	-
Gain (loss) on transactions	(61)	-
Dividend income	17,500	-
AFS financial assets:		
Gain (loss) on valuation (other comprehensive income and loss) (*1)	-	(483,200)
Gain (loss) on transactions	-	5,219
Impairment loss	-	(13,683)
Dividend income	-	7,447
Financial assets held to maturity		
Gain (loss) on valuation (other comprehensive income and loss) (*1)	-	184,723
Financial liabilities at amortized cost:		
Interest expenses (*2)	-	(413,436)

(*1) Gain (loss) on valuation of AFS financial assets in financial business is included and the amount is before tax effect.

(*2) Interest expenses that are directly attributable to qualifying asset are capitalized as part of the acquisition cost for the years ended December 31, 2018 and 2017 (see Note 52).

10. TRADE AND OTHER RECEIVABLES (NON-FINANCIAL BUSINESS):

(1) Details of trade and other receivables as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-Current	Current	Non-Current
	(In millions of Korean won)			
Trade receivables	₩ 4,338,953	₩ 110,392	₩ 3,994,230	₩ 88,026
Less: Provisions for impairment	(362,476)	(25,811)	(278,936)	(22,428)
Less: Present value discounts	(567)	(1,138)	-	(18)
Other receivables	291,485	15,902	204,056	337,682
Less: Provisions for impairment	(22,516)	(5,479)	(7,652)	(318,511)
Unbilled construction	-	-	1,123,632	-
Total	₩ 4,244,879	₩ 93,866	₩ 5,035,330	₩ 84,751

(2) Credit risk and Provisions for impairment

The Group always recognizes lifetime ECL for trade receivables. The ECLs on these trade receivables are estimated using a provision matrix based on the adjusted for factors that are specific to the debtors, general economic conditions and an assessment of both the current as well as the forecast direction of conditions at the reporting date, including time value of money where appropriate.

1) Changes in provisions for impairment of trade and other receivables for the years ended December 31, 2018 and 2017, are as follows.

	2018
	(In millions of Korean won)
Beginning(K-IFRS 1039)	₩ 627,527
Adjustments for Retained earning	7,352
Beginning(K-IFRS 1109)	634,879
Changes by increases of receivables	120,312
Write-offs	(206,483)
Reversal	(139,481)
Others(*1)	7,056
Ending(*2)	₩ 416,283

(*1) Others include the change from transfer and the effects of changes in exchange rate.
(*2) As of December 31, 2018, the Group elects to apply the prospect of K-IFRS 1109, and the changes in allowances for doubtful accounts for year ended December 31, 2017, are in accordance with K-IFRS 1039

2) Changes in provisions for impairment of trade and other receivables for the year ended December 31, 2017, are as follows.

	2017	
	Trade receivables	Other receivables
	(In millions of Korean won)	
Beginning	₩ 389,719	₩ 326,946
(±)Net, Provision for impairment	35,479	327
Others(*1)	(123,834)	(1,110)
Ending	₩ 301,364	₩ 326,163

(*1) Others include write-off, the change from transfer and the effects of changes in exchange rate.

(3) The aging analysis of the trade and other receivables as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Receivables not past due	₩ 3,219,341	₩ 2,482,306
Subtotal	3,219,341	2,482,306
Past due but not impaired		
Less than 3 months	785,646	560,132
Between 3 months and 6 months	155,611	359,259
Between 6 months and 1 year	104,539	222,827
More than 1 year	188,952	417,287
Subtotal	1,234,748	1,559,505
Impaired		
Less than 3 months	12,165	4,952
Between 3 months and 6 months	8,047	2,143
Between 6 months and 1 year	3,789	5,926
More than 1 year	278,642	569,162
Subtotal	302,643	582,183
Total	₩ 4,756,732	₩ 4,623,994

(*1) The aging analysis include trade and other receivables.

(4) Details of the amount of book value of transferred financial assets as of December 31, 2018 and 2017, are as follows: (In millions of Korean won)

	2018	2017
	(In millions of Korean won)	
Book value of transferred financial Assets	₩ 215,363	₩ 199,869
Related liabilities	(215,363)	(199,869)

(*1) The Group transferred trade receivables to banks and collected cash. The Group has responsibility of recourse as of December 31, 2018, In addition, the related liabilities are recognized as collateralized borrowing (see Note 20).

11. FAIR VALUE FINANCIAL ASSETS AND AFS FINANCIAL ASSETS (NON-FINANCIAL BUSINESS):

(1) Details of fair value financial assets and AFS financial assets as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Fair value financial assets Profit or loss	₩ 155,218	₩ -
Fair value financial assets at Other Comprehensive Income	23,825	-
AFS financial assets	-	478,350
Total	₩ 179,043	₩ 478,350

1) Fair value financial assets at profit or loss as of December 31, 2018, are as follows:

	2018
	(In millions of Korean won)
Equity securities	₩
Listed securities	5,270
Unlisted securities	2,000
Subtotal	7,270
Debt securities	
Public bonds	24
Unlisted debt securities	130,588
Subtotal	130,612
Beneficiary certificates(*1)	17,336
Total	₩ 155,218

(*1) The fair value of beneficiary certificate is determined by using valuation techniques performed by independent external institution.

2) Fair value financial assets at other comprehensive income as of December 31, 2018, are as follows:

	2018
	(In millions of Korean won)
Equity securities	₩
Listed securities	65
Unlisted securities	23,110
Subtotal	23,175
Debt securities	
Public bonds	571
Unlisted Debt securities	79
Subtotal	650
Total	₩ 23,825

3) AFS financial assets as of 2017 are as follows:

	2017		
	Current	Non-current	Total
	(In millions of Korean won)		
Equity instruments			
Listed stock	₩ -	₩ 294,961	₩ 294,961
Unlisted stock	-	167,697	167,697
Beneficiary certificate and others(*1)	-	14,809	14,809
Debt instruments			
Government bonds	291	592	883
Unlisted debts	-	-	-
Total	₩ 291	₩ 478,059	₩ 478,350

(*1) The fair value of beneficiary certificate is determined by using valuation techniques performed by independent external institution.

12. OTHER FINANCIAL ASSETS (NON-FINANCIAL BUSINESS):

Details of other financial assets as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-Current	Current	Non-Current
	(In millions of Korean won)			
Short- and long-term financial instruments	₩ 544,664	₩ 30,008	₩ 409,872	₩ 25,692
Accrued income	6,948	-	8,611	-
Loans	136,788	584,367	223,377	562,505
Less: Provision for impairment	(1,130)	(510,719)	(188)	(485,182)
Less: Present value discounts	(491)	(4,917)	(2,979)	(3,870)
Guarantee deposits	14,385	106,394	21,580	97,364
Less: Provision for impairment	-	(768)	-	(596)
Less: Present value discounts	(676)	(9,705)	(768)	(11,257)
Derivatives instruments	10,652	16,681	17,247	9,205
Total	₩ 711,140	₩ 211,341	₩ 676,752	₩ 193,861

13. DERIVATIVES FINANCIAL INSTRUMENTS (NON-FINANCIAL BUSINESS):

Details of derivative financial instruments as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Assets	Liabilities	Assets	Liabilities
	(In millions of Korean won)			
Trading				
Currency forward	₩ 6,839	₩ 1,985	₩ 15,383	₩ 9,885
Currency swap	1,213	14,721	-	22,141
Currency option	2,849	8,074	128	15,439
Interest swap	988	2,289	468	279
Others(*1,*2)	13,872	2,526	7,177	12,301
Fair value hedge				
Currency forward	45	429	12	1,624
Currency swap	-	57	-	1,458
Physical derivatives	750	750	2,217	2,217
Cash flow hedge				
Currency swap	763	1,136	-	1,766
Interest swap	14	304	1,067	170
Total	₩ 27,333	₩ 32,271	₩ 26,452	₩ 67,280

(*1) Other derivative liabilities include the fair value of the exchangeable rights and early repayment right that are embedded in the exchangeable bonds issued during the year 2016.

(*2) Details of other derivative financial instruments as of December 31, 2018, is as follows:

Underlying assets	Residual equity of P&W NGPF Manufacturing Company Singapore. Ltd(70%)
Striking price of call option	70% of P&W NGPF Manufacturing Company Singapore. Ltd.'s net asset value plus $11,800,000 at the time of the exercise
Striking period of call option	January 1, 2022, to December 31, 2026
Owner of call option	Hanwha Aerospace Co., Ltd. (formerly, Hanwha Techwin Co., Ltd.)
Discount rate	Singapore Government bond interest rate curve

14. INVENTORIES (NON-FINANCIAL BUSINESS):

(1) Details of inventories as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Finished goods	₩ 761,342	₩ 516,204
Less: Valuation allowance	(29,020)	(19,078)
Merchandise	613,817	431,546
Less: Valuation allowance	(22,961)	(12,777)
Semifinished goods	247,354	216,958
Less: Valuation allowance	(5,205)	(2,841)
Work in progress	1,151,139	616,561
Less: Valuation allowance	(1,003)	(2,975)
Raw materials	878,083	700,794
Less: Valuation allowance	(34,697)	(32,024)
Supplies	89,327	80,846
Less: Valuation allowance	(119)	-
Good to arrive	231,751	197,577
Total	₩ 3,879,808	₩ 2,690,791

The cost of inventories recognized as expense and included in 'Cost of sales' amounts to ₩15,487,199 million won (2017: ₩15,055,788 million) for the year ended December 31, 2018. The Group recognized loss on inventory valuation of ₩23,310 million (2017: reverse of loss on inventory valuation ₩378 million) for the year ended December 31, 2018. The amount of loss on inventory has been included in 'Cost of sales.'

In addition, the Group recognized obsolescence loss on inventory included in 'Other losses' amounting to ₩278million (2017: ₩506 million) for the year ended December 31, 2018. The amount of loss on inventory has been included in 'Other losses.'

(2) The inventories are provided as collateral in relation to liabilities as of December 31, 2018 (see Note 56).

15. OTHER ASSETS (NON-FINANCIAL BUSINESS):

(1) Details of other assets as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-Current	Current	Non-Current
	(In millions of Korean won)			
Advance payment	₩ 1,153,440	₩ -	₩ 844,515	₩ -
Less: Provisions for impairment	(104,320)	-	(106,550)	-
Contract execution cost(*1)	6,342	-	114,382	-
Prepaid expense	194,658	47,352	92,671	55,792
Prepaid VAT	71,759	-	89,272	-
Unbilled construction(*2)	521,823	-	-	-
Refund asset	316	-	-	-
Others	-	107,554	-	15,578
Total	₩ 1,844,018	₩ 154,906	₩ 1,034,290	₩ 71,370

(*1) Includes the amount of prepaid construction costs
(*2) The unbilled construction at the end of December 31, 2017 is included in the TRADE AND OTHER RECEIVABLES (See Note 10).

(2) Details of contract assets as of December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Unbilled construction	₩	521,823
Others		54,787
Total	₩	576,610

As of the end of December 31, 2018, none of the contract assets are past due, and considering past experience of default and future prospects for the industry to which the customer belongs, management determines that none of the contract assets are damaged.

(3) Details of contract costs as of December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Contract settlement cost	₩	10,818
Contract execution cost		6,342

16. PROPERTY, PLANT AND EQUIPMENT (NON-FINANCIAL BUSINESS):

(1) Details of property, plant and equipment as of December 31, 2018 and 2017, are as follows:

	2018				
	Acquisition cost	Accumulated depreciation	Accumulated impairment loss	Government grants	Book value
	(In millions of Korean won)				
Land	₩ 4,267,408	₩ -	₩ (5,484)	₩ -	₩ 4,261,924
Buildings	4,022,260	(1,296,253)	(72,551)	(824)	2,652,632
Structures	799,179	(389,511)	(2,308)	(9)	407,351
Machinery	7,318,424	(3,879,257)	(338,096)	(293)	3,100,778
Vehicles	115,317	(76,996)	-	-	38,321
Tools and equipment	918,840	(673,765)	(900)	(135)	244,040
Construction in progress	725,142	-	(13,822)	(16,305)	695,015
Others	319,743	(239,656)	(8)	-	80,079
Mining properties in development	12,682	-	(12,682)	-	-
Total	₩ 18,498,995	₩ (6,555,438)	₩ (445,851)	₩ (17,566)	₩ 11,480,140

	2017				
	Acquisition cost	Accumulated depreciation	Accumulated impairment loss	Government grants	Book value
	(In millions of Korean won)				
Land	₩ 4,234,950	₩ -	₩ (16,343)	₩ -	₩ 4,218,607
Buildings	3,389,612	(1,182,013)	(3,842)	(794)	2,202,963
Structures	733,803	(360,728)	(2,100)	(10)	370,965
Machinery	6,459,343	(3,647,127)	(236,541)	(361)	2,575,314
Vehicles	114,193	(70,780)	-	-	43,413
Tools and equipment	831,689	(627,110)	(584)	(233)	203,762
Construction in progress	465,737	-	(630)	(5,376)	459,731
Others	317,730	(213,963)	(2,181)	-	101,586
Mining properties in development	12,682	-	(12,682)	-	-
Total	₩ 16,559,739	₩ (6,101,721)	₩ (274,903)	₩ (6,774)	₩ 10,176,341

(2) Changes in property, plant and equipment for the years ended December 31, 2018 and 2017, are as follows:

	2018					
	Beginning	Acquisitions	Disposals	Depreciation	Others (*1)	Ending
	(In millions of Korean won)					
Land	₩ 4,218,607	₩ 18,506	₩ (27,700)	₩ -	₩ 52,511	₩ 4,261,924
Buildings	2,202,963	29,892	(12,246)	(121,073)	553,096	2,652,632
Structures	370,965	9,706	(1,306)	(31,695)	59,681	407,351
Machinery	2,575,314	188,950	(13,878)	(409,616)	760,008	3,100,778
Vehicles	43,413	5,087	(536)	(9,306)	(337)	38,321
Tools and equipment	203,762	41,757	(8,755)	(73,985)	81,261	244,040
Construction in progress	459,731	918,266	(1,445)	-	(681,537)	695,015
Others	101,586	50,046	(1,634)	(31,544)	(38,375)	80,079
Total	₩10,176,341	₩ 1,262,210	₩ (67,500)	₩ (677,219)	₩ 786,308	₩11,480,140

(*1) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

	2017					
	Beginning	Acquisitions	Disposals	Depreciation	Others (*1)	Ending
	(In millions of Korean won)					
Land	₩ 4,125,172	₩ 2,748	₩ (1,972)	₩ -	₩ 92,659	₩ 4,218,607
Buildings	2,175,080	64,450	(5,316)	(116,005)	84,754	2,202,963
Structures	379,623	5,688	(355)	(30,054)	16,063	370,965
Machinery	2,612,965	98,460	(5,648)	(394,707)	264,244	2,575,314
Vehicles	40,049	3,238	(2,977)	(9,187)	12,290	43,413
Tools and equipment	210,651	44,458	(3,377)	(72,002)	24,032	203,762
Construction in progress	625,192	584,998	-	-	(750,459)	459,731
Others	158,966	15,084	(18,453)	(38,066)	(15,945)	101,586
Total	₩10,327,698	₩ 819,124	₩ (38,098)	₩ (660,021)	₩ (272,362)	₩10,176,341

(*1) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

Depreciation of ₩578,812 million (2017: ₩558,969 million) has been charged to 'Cost of sales' and ₩98,407 million (2017: ₩101,052 million) to 'Selling and administrative expenses' for the year ended December 31, 2018.

Certain property, plant and equipment are provided as collateral for borrowings as of December 31, 2018 (see Note 56).

17. INVESTMENT PROPERTY (NON-FINANCIAL BUSINESS):

(1) Details of investment property as of December 31, 2018 and 2017, are as follows:

	2018							
	Acquisition cost		Accumulated depreciation		Accumulated impairment loss		Book value	
	(In millions of Korean won)							
Land	₩	349,841	₩	-	₩	(53,776)	₩	296,065
Buildings		672,766		(150,879)		(5,951)		515,936
Others		8,643		(4,908)		(1,548)		2,187
Total	₩	1,031,250	₩	(155,787)	₩	(61,275)	₩	814,188

	2017							
	Acquisition cost		Accumulated depreciation		Accumulated impairment loss		Book value	
	(In millions of Korean won)							
Land	₩	380,430	₩	-	₩	(45,646)	₩	334,784
Buildings		756,894		(129,795)		(2,194)		624,905
Others		7,671		(4,598)		(609)		2,464
Total	₩	1,144,995	₩	(134,393)	₩	(48,449)	₩	962,153

(2) Changes in investment properties for the years ended December 31, 2018 and 2017, are as follows:

	2018											
	Beginning		Acquisitions		Disposals		Depreciation		Others(*1)		Ending	
	(In millions of Korean won)											
Land	₩	334,784	₩	12,825	₩	(4,612)	₩	-	₩	(46,932)	₩	296,065
Buildings		624,905		1,058		(19,577)		(23,812)		(66,638)		515,936
Others		2,464		-		-		(307)		30		2,187
Total	₩	962,153	₩	13,883	₩	(24,189)	₩	(24,119)	₩	(113,539)	₩	814,188

(*1) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

	2017											
	Beginning		Acquisitions		Disposals		Depreciation		Others(*1)		Ending	
	(In millions of Korean won)											
Land	₩	386,810	₩	16,358	₩	(28,919)	₩	-	₩	(39,465)	₩	334,784
Buildings		730,052		5,660		(54,208)		(31,068)		(25,531)		624,905
Others		2,532		-		(1)		(432)		365		2,464
Total	₩	1,119,394	₩	22,018	₩	(83,128)	₩	(31,500)	₩	(64,631)	₩	962,153

(*1) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

Depreciation of ₩20,000 million (2017: ₩26,145 million) has been charged to 'Cost of sales,' and ₩4,120 million (2017: ₩5,355 million) to 'Selling and administrative expenses' for the year ended December 31, 2018.

Certain investment property are provided as collateral for borrowings as of December 31, 2018 (see Note 56).

(3) Fair values of investment properties are ₩851,835 million (2017: ₩1,045,520 million) as of December 31, 2018, and rent income and maintenance cost in relation to investment properties for the years ended December 31, 2018 and 2017, are as follows:

	2018		2017
	(In millions of Korean won)		
Rent income	₩	66,483 ₩	66,654
Maintenance cost		(36,460)	(41,305)

18. INTANGIBLE ASSETS (NON-FINANCIAL BUSINESS):

(1) Details of intangible assets as of December 31, 2018 and 2017, are as follows:

	2018				
	Acquisition cost	Accumulated amortization	Accumulated impairment loss	Government grants	Book value
	(In millions of Korean won)				
Goodwill	₩ 1,104,043	₩ -	₩ (36,314)	₩ -	₩ 1,067,729
Development costs	344,193	(93,072)	(28,689)	-	222,432
Membership rights	71,428	(2,488)	(1,967)	-	66,973
Others	1,116,662	(388,161)	(26,106)	(32)	702,363
Development rights	3,927	-	(3,927)	-	-
Exploration mining areas	9,857	-	(9,857)	-	-
Total	₩ 2,650,110	₩ (483,721)	₩ (106,860)	₩ (32)	₩ 2,059,497

	2017				
	Acquisition cost	Accumulated amortization	Accumulated impairment loss	Government grants	Book value
	(In millions of Korean won)				
Goodwill	₩ 741,257	₩ -	₩ (20,108)	₩ -	₩ 721,149
Development costs	223,492	(59,869)	(26,539)	(1,976)	135,108
Membership rights	56,157	(2,195)	(1,791)	-	52,171
Others	898,354	(254,763)	(1,408)	(32)	642,151
Development rights	3,927	-	(3,927)	-	-
Exploration mining areas	9,857	-	(9,857)	-	-
Total	₩ 1,933,044	₩ (316,827)	₩ (63,630)	₩ (2,008)	₩ 1,550,579

(2) Changes in intangible assets for the years ended December 31, 2018 and 2017, are as follows:

	2018					
	Beginning	Acquisitions	Disposals	Amortization	Others (*1)	Ending
	(In millions of Korean won)					
Goodwill	₩ 721,149	₩ -	₩ -	₩ -	₩ 346,580	₩ 1,067,729
Development costs	135,108	70,408	-	(19,974)	36,890	222,432
Membership rights	52,171	569	(710)	(381)	15,324	66,973
Others	642,151	139,023	(42,940)	(97,447)	61,576	702,363
Total	₩ 1,550,579	₩ 210,000	₩ (43,650)	₩ (117,802)	₩ 460,370	₩ 2,059,497

(*1) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

	2017					
	Beginning	Acquisitions	Disposals	Amortization	Others (*1)	Ending
	(In millions of Korean won)					
Goodwill	₩ 716,085	₩ -	₩ -	₩ -	₩ 5,064	₩ 721,149
Development costs	59,971	79,760	(453)	(3,752)	(418)	135,108
Membership rights	49,507	985	(2,079)	(301)	4,059	52,171
Others	696,040	40,208	(6,208)	(83,431)	(4,458)	642,151
Total	₩ 1,521,603	₩ 120,953	₩ (8,740)	₩ (87,484)	₩ 4,247	₩ 1,550,579

(*1) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

Amortization of ₩42,280 million (2017: ₩31,835 million) is included in 'Cost of sales' and ₩75,522 million (2017: ₩55,649 million) is included in 'Selling and administrative expenses' for the year ended December 31, 2018.

Certain intangible assets are provided as collateral for borrowings as of December 31, 2018 (see Note 56).

(3) Details on non-chargeable allocation of emission permits held by the Group according to the enforcement of the Act on the Allocation and Trading of Greenhouse Gas Emission Permits, are as follows:

	2018	2019	2020	Total
	(In KAU)			
Emission permits	2,492,732	2,492,732	2,492,732	7,478,196

Meanwhile, the estimated amount of greenhouse gas emissions during the year 2018 was 2,706,659 KAU (2017: 2,661,796 KAU).

(4) Impairment tests for goodwill

A. Goodwill is monitored by the management at the CGU or group of CGUs level. The following is a summary of goodwill allocation for each CGU or group of CGUs, and the Group used the same goodwill allocation method as of December 31, 2018 and 2017:

	2018	2017
	(In millions of Korean won)	
Hanwha General Insurance Co., Ltd.	₩ 160,187	₩ 160,187
Hanwha Savings Bank Co., Ltd.	19,153	83,962
Photovoltaic division	212,631	203,938
Hanwha Aerospace Co., Ltd.	50,781	50,781
Hanwha Defense Co., Ltd.	271,180	271,180
Hanwha Systems Co., Ltd.(System)	127,334	127,334
Hanwha Systems Co., Ltd.(ICT)	324,398	-
Others	86,213	80,943
Total	₩ 1,251,877	₩ 978,325

(*1) Includes the distribution of goodwill of financial services.

B. The recoverable amounts of CGUs have been determined based on value-in-use calculations. The key assumptions used for value-in-use calculations as of December 31, 2018, are as follows:

Key assumptions	Hanwha Aerospace Co., Ltd.	Hanwha Defense Co., Ltd	Hanwha Systems Co., Ltd.(System).	Hanwha Systems Co., Ltd.(ICT)
Operating profit ratio (*1)	5.23%	5.07%	6.26%	11.19%
Growth rate (*2)	15.15%	6.47%	8.60%	8.73%
Discount rate	7.65%	8.29%	9.18%	10.97%

(*1) Operating profit ratio is a weighted-average operating profit-to-revenue ratio used to extrapolate cash flows for certain budget period.
(*2) Growth rate is a compounded annual growth rate used to extrapolate cash flows for certain budget period.

Key assumptions	Hanwha General Insurance Co., Ltd.
Investment earnings rate (*1)	3.10%
Discount rate	8.50%

(*1) Investment earnings rate is for calculating expected cash flow for certain prospective budget period.

C. The impairment test suggests that the carrying value of CGUs does not exceed the recoverable amount.

19. TRADE AND OTHER PAYABLES (NON-FINANCIAL BUSINESS):

Details of trade and other payables as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-current	Current	Non-current
	(In millions of Korean won)			
Trade payables	₩ 2,236,423	₩ 94,971	₩ 2,627,321	₩ 36,409
Other payables	768,898	69,107	757,750	102,725
Total	₩ 3,005,321	₩ 164,078	₩ 3,385,071	₩ 139,134

20. BORROWINGS AND DEBENTURES (NON-FINANCIAL BUSINESS):

(1) Details of borrowings and debentures as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-current	Current	Non-current
	(In millions of Korean won)			
Short-term borrowings	₩ 4,007,952	₩ -	₩ 3,161,855	₩ -
Long-term borrowings	1,313,054	3,283,493	1,343,825	2,664,386
Debentures	1,762,760	2,529,611	1,300,697	2,508,459
Less: Current portion (including discount on bonds)	(21,284)	(13,946)	(1,949)	(33,445)
Add: Redemption premium on bonds	-	755	376	-
Total	₩ 7,062,482	₩ 5,799,913	₩ 5,804,804	₩ 5,139,400

(2) Details of bank borrowings as of December 31, 2018 and 2017, are as follows:

A. Short-term borrowings (including current portion of long-term borrowings)

	Creditor	Annual interest rate (%)	2018	2017
			(In millions of Korean won)	
Bank overdraft	Korea Development Bank and others	1.50–3.79	₩ 20,147	₩ 43,624
Usance	Shinhan Bank and others	0.40–3.70	187,972	88,268
General borrowings	Woori Bank and others	0.77–6.64	3,584,470	2,830,094
Collateralized borrowings (*1)	Shinhan Bank and others	2.94–5.30	215,363	199,869
Add: Current portion			1,313,054	1,343,825
	Total		₩ 5,321,006	₩ 4,505,680

(*1) The Group transferred trade receivables to banks and collected cash. This transaction is accounted for as a collateralized borrowing (see Note 10).

B. Long-term borrowings

	Creditor	Annual interest rate (%)	2018	2017
			(In millions of Korean won)	
General loan (long term)	Kookmin Bank and others	0.88–5.70	₩ 3,324,492	₩ 3,264,355
Loan for industrial facilities	Korea Development Bank and others	1.23-5.80	630,284	350,319
Project financing ("PF")	Woori Bank and others	3.66-5.07	195,941	782
Loan for special operating funds	NH Bank	1.82-3.30	96,301	36,553
ABL (*1)	Shinhan Bank and others	4.23–5.00	349,000	355,000
Fund for energy	Woori Bank and others	1.75–2.00	529	1,202
	Sub total		4,596,547	4,008,211
Less: Current portion			(1,313,054)	(1,343,825)
	Total		₩ 3,283,493	₩ 2,664,386

(*1) The Group executed an asset-based lending based on the right of disposal and collateral security right on the redeemable convertible preferred shares of Hanwha Engineering and Construction Corp (see Note 56).

In addition, the Group provided property, plant and equipment and others as collateral in relation to the above long- and short-term borrowings (see Note 56).

(3) Details of debentures as of December 31, 2018 and 2017, are as follows:

	Creditor	Maturity date	Annual interest rate (%)	2018	2017
				(In millions of Korean won)	
Hanwha Corporation	211th Private subscription bond	2018.01.30	-	₩ -	₩ 100,000
	212th Private subscription bond	2018.02.13	-	-	130,000
	213th Public subscription bond	2018.12.03	-	-	150,000
	214th Public subscription bond	2019.02.17	3.05	100,000	100,000
	215th Public subscription bond	2019.07.05	2.97	100,000	100,000
	216th Public subscription bond	2020.03.09	3.29	150,000	150,000
	217th Public subscription bond	2020.06.07	2.67	100,000	100,000
	218th Public subscription bond	2020.08.31	2.56	100,000	100,000
	219th FRN	2020.10.19	3L+0.95	33.543	32,142
	220th Public subscription bond	2020.11.09	3.14	140,000	140,000
	221st Public subscription bond	2021.02.08	2.93	100,000	-
	222nd Public subscription bond	2021.04.13	2.78	100,000	-
	223rd Public subscription bond	2021.11.02	2.55	120,000	-
Hanwha Engineering and Construction Corp.	80th Private subscription bond	-	5.23	-	110,000
	85th Public subscription bond (EB)	2021.06.03	3.00	249,818	249,818
	85th Public subscription bond (EB) premium	2021.06.03	3.00	28,183	28,183
	86th Private subscription bond	2018.04.06	-	-	20,000
	87th Private subscription bond	2018.04.10	-	-	30,000
	88th Private subscription bond	2018.04.24	-	-	30,000
	89th Private subscription bond	2019.01.14	3.80	15,000	15,000
	90th Private subscription bond	2019.07.26	4.50	20,000	20,000
	91st Private subscription bond	2019.10.24	4.50	10,000	10,000
	92nd Private subscription bond	2019.02.01	3.90	30,000	-
	93rd Private subscription bond	2019.03.22	3.90	35,000	-
	94th Private subscription bond	2020.04.13	4.60	10,000	-
	95th Public subscription bond	2019.10.27	4.18	50,000	-
	96th Public subscription bond	2019.12.14	4.12	74,000	-
	97th FRN	2021.07.19	3L+0.90	33,543	-
	98th Private subscription bond	2019.07.19	3.60	30,000	-
	99th Public subscription bond	2020.09.11	3.82	85,000	-
Hanwha Hotels & Resorts Co., Ltd. Corp.	34th Private subscription bond	2018.06.14	-	-	20,000
	35th Private subscription bond	2018.08.24	-	-	10,000
	36th FRN	2020.05.26	3L+1.90	22,362	21,428
	37th FRN	2019.08.24	3L+1.90	20,000	20,000
	38th Private subscription bond	2019.02.26	3.10	20,000	-
	39th Private subscription bond	2019.06.14	3.20	15,000	-
	40th Private subscription bond	2020.08.07	3.30	10,000	-
Hanwha Galleria Co., Ltd.	63rd Public subscription bond	2018.09.09	-	-	50,000
	64th Private subscription bond	2018.08.17	-	-	20,000
	65th Private subscription bond	2018.02.28	-	-	10,000
	66th Private subscription bond	2018.10.04	-	-	10,000
	67th Private subscription bond	2020.04.14	3.65	20,000	20,000
	68th Private subscription bond	2021.02.26	3.08	30,000	-
	FRN	2020.05.26	3L+1.00	33,543	32,142
	FRN	2021.06.20	3L+1.05	33,543	-
Hanwha Precision Machinery Co., Ltd.	1st Private subscription bond	2020.11.28	3.90	10,000	-
Hanwha Defense Systems Corp.	FRN	2021.07.27	3L+1.36	33,543	-
	52nd FRN	2018.02.13	-	-	32,142
Hanwha Q CELLS & Advanced Materials Corporation	53rd Private subscription bond	2018.03.30	-	-	10,000
	55th FRN	2019.05.19	3L+1.80	33,543	32,142
	56th Private subscription bond	2018.01.29	2.40	20,000	20,000
	57th Private subscription bond	2018.08.27	2.70	10,000	10,000
	58th FRN	2021.02.16	3L+1.6	33,543	-
	59-1st Private subscription bond	2019.08.27	3.5	10,000	-
	59-2nd Private subscription bond	2020.02.27	3.69	20,000	-
	60th Private subscription bond	2020.08.24	3.50	20,000	-
	61st Private subscription bond	2020.04.16	3.30	10,000	-
	62nd Private subscription bond	2019.10.17	3.20	10,000	-

	Creditor	Maturity date	Annual interest rate (%)	2018	2017
				(In millions of Korean won)	
	1st Private subscription bond	2020.06.30	3.80	40,000	-
	2nd Private subscription bond	2019.08.18	3.60	50,000	-
	3rd Private subscription bond	2019.08.18	3.60	15,000	-
	3rd Private subscription bond	2019.08.18	3.60	20,000	-
	4th Private subscription bond	2019.08.18	3.60	5,000	-
	5th Private subscription bond	2020.08.25	3.80	40,000	-
	5th Private subscription bond	2020.08.25	3.80	20,000	-
	6th Private subscription bond	2019.08.25	3.60	10,000	-
	8th Private subscription bond	2020.01.26	3.80	30,000	-
	9th FRN	2021.06.29	3L+1.96	33,543	-
Hanwha Chemical Corporation	241st Private subscription bond	2018.11.17	-	-	100,000
	242nd Public subscription bond	2018.02.05	-	-	103,000
	243-1st Public subscription bond	2018.05.28	-	-	102,000
	243-2nd Public subscription bond	2020.05.28	3.07	98,000	98,000
	244th FRN	2018.10.08	-	-	53,570
	245-1st Public subscription bond	2018.10.28	-	-	50,000
	245-2nd Public subscription bond	2020.10.28	3.08	50,000	50,000
	246-1st Public subscription bond	2019.02.24	2.70	56,000	56,000
	246-2nd Public subscription bond	2021.02.24	3.09	50,000	50,000
	247th FRN	2019.04.08	3L+1.65	111,810	107,140
	248th Private subscription bond	2019.11.07	0.72	202,636	189,822
	249th Public subscription bond	2020.02.06	2.52	100,000	100,000
	250th Public subscription bond	2020.05.25	2.35	100,000	100,000
	251st Public subscription bond	2020.09.22	2.35	80,000	80,000
	252nd FRN	2021.07.23	3L+0.98	33,543	-
	253rd FRN	2021.10.04	3L+1.15	55,905	-
	254-1st Public subscription bond	2021.11.29	2.31	60,000	-
	254-2nd Public subscription bond	2023.11.29	2.50	90,000	-
HANWHA AEROSPACE CO., LTD.	115-1st Public subscription bond	2018.11.26	-	-	70,000
	115-2nd Public subscription bond	2020.11.26	2.79	30,000	30,000
	116-1st Public subscription bond	2019.06.22	1.93	110,000	110,000
	116-2nd Public subscription bond	2021.06.22	2.20	40,000	40,000
	117th Public subscription bond	2019.08.30	1.88	70,000	70,000
	118th Public subscription bond	2019.10.28	2.07	100,000	100,000
	119th Private subscription bond	2023.03.15	3.50	20,000	-
	120-1st Public subscription bond	2021.05.03	2.76	95,000	-
	120-2nd Public subscription bond	2023.05.02	3.18	55,000	-
	121-1st Public subscription bond	2021.11.05	2.71	60,000	-
	121-2nd Public subscription bond	2023.11.05	2.98	40,000	-
Hanwha Systems Co., Ltd.	1st Private subscription bond	2019.09.27	2.27	30,000	30,000
	2nd Private subscription bond	2021.03.12	3.48	10,000	-
Hanwha Galleria Timeworld Co., Ltd.	20th Convertible bond	2018.09.15	-	-	49,985
	21st Private subscription bond	2018.04.27	-	-	10,000
	22nd Private subscription bond	2019.06.28	3.30	20,000	20,000
	23rd public bond with warrant(*1)	2021.06.22	0.50	50,000	-
Hanwha Q CELLS Co., LTD.	FRN	2019.01.11	3L+2.90	111,770	106,642
Subtotal				4,292,371	3,809,156
Less: Present value discounts				(35,230)	(35,394)
Add: Redemption premium on bonds				755	376
Less: Current portion (including discount on bonds)				(1,741,476)	(1,299,124)
Total				₩ 2,516,420	₩ 2,475,014

(*1) Details of Bond with warrant as of December 31, 2018, are as follows:

	Detail
Issuance company	Hanwha Galleria Time World Co., Ltd.
Par value	₩50,000 million
Coupon rate	-
Maturity rate	0.50%
Terms	₩39,000 par value convertible into one share
Exercise period	The bonds are convertible to shares from one month after issuance (July 22, 2018) until one month before the maturity (May 22, 2021).

In addition, some borrowings and debentures are contracted to comply with credit ratings, debt ratios and EBITDA rates (see Note 56).

21. OTHER FINANCIAL LIABILITIES (NON-FINANCIAL BUSINESS):

(1) Details of other financial liabilities as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-current	Current	Non-current
	(In millions of Korean won)			
Derivatives	₩ 28,004	₩ 4,267	₩ 16,870	₩ 50,410
Deposits received	312,918	506,288	317,028	478,106
Less: Present value discounts	(1,537)	(231,444)	(1,365)	(227,353)
Accrued expenses	433,830	577	396,277	82
Financial guarantee contract liabilities(*1)	9,121	1,400	8,306	1,037
Others	3,765	45,462	3,435	46,264
Total	₩ 786,101	₩ 326,550	₩ 740,551	₩ 348,546

(*1) The Group provides credit guarantees for developers on housing project loans and others (see Note 56).

(2) Book value and fair value of non-current deposits received of non-financial business as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Book value	Fair value	Book value	Fair value
	(In millions of Korean won)			
Non-current deposits received	₩ 274,843	₩ 338,751	₩ 250,753	₩ 324,188

22. OTHER LIABILITIES (NON-FINANCIAL BUSINESS):

(1) Details of other liabilities as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-current	Current	Non-current
	(In millions of Korean won)			
Advances receivable	₩ 2,731,567	₩ 1,005,388	₩ 1,598,096	₩ 1,082,798
Withholdings	93,263	-	83,100	-
VAT payables	34,882	-	30,722	-
Unearned revenues	50,147	273,461	59,457	182,181
Refund liability	1,387	-	-	-
Contract liability(*1)	548,459	-	689,498	-
Total	₩ 3,459,705	₩ 1,278,849	₩ 2,460,873	₩ 1,264,979

(*1) Includes the amount of overbilled construction

(2) Details of contract liability as of December 31, 2018, are as follows

	2018	
	(In millions of Korean won)	
Overbilled construction	₩	524,888
Advances receivable		1,329,734
Membership, etc.		264,094
Customer loyalty		23,056
Others		18,729
Total	₩	2,160,501

23. NET DEFINED BENEFIT LIABILITIES (NON-FINANCIAL BUSINESS):

(1) Details of net defined benefit liabilities recognized in the statements of financial position as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	(In millions of Korean won)			
Present value of defined benefit obligations	₩	1,651,721	₩	1,469,668
Fair value of plan assets		(97,327)		(98,574)
Net defined benefit liabilities	₩	1,554,394	₩	1,371,094

(2) Changes in the defined benefit obligations for the years ended December 31, 2018 and 2017, are as follows:

	2018		2017	
	(In millions of Korean won)			
Beginning	₩	1,469,668	₩	1,424,690
Current service cost (*1)		181,016		175,168
Interest expense		56,961		49,430
Past service cost		639		1
Remeasurements:				
- Actuarial gains and losses arising from changes in demographic assumptions		1,928		534
- Actuarial gains and losses arising from changes in financial assumptions		50,723		(43,818)
- Actuarial gains and losses arising from experience adjustments		14,145		(3,549)
- Actuarial gains and losses arising from changes in adjustment of retirement age		45		3
Acquired in business combinations		128,712		-
Contributions		-		73
Payments from plans:				
- Benefit payments		(174,513)		(125,289)
- Settlements		(36,785)		(4,699)
Others (*2)		(40,818)		(2,876)
Ending	₩	1,651,721	₩	1,469,668

(*1) Current service cost amounting to ₩3,072 million, (2017: ₩286 million) is transferred to 'Construction in progress' for the year ended December 31, 2018.

(*2) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

(3) Changes in the fair value of plan assets for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Beginning	₩ 98,574	₩ 82,115
Interest income	10,277	7,633
Remeasurements (*1)	(6,959)	(4,339)
Acquired in business combinations	528	-
Contributions	23,028	33,564
Payments from plans:		
- Benefit payments	(21,966)	(17,852)
- Settlements	(29)	(630)
Others (*2)	(6,126)	(1,917)
Ending	₩ 97,327	₩ 98,574

(*1) Excluded the amount that is included in interest income.
(*2) Others include changes in scope of consolidation, the change from transfer and the effects of changes in exchange rate.

(4) The amounts recognized in the consolidated statements of comprehensive income for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Current service cost	₩ 181,016	₩ 175,168
Interest expense	56,961	49,430
Past service cost	639	1
Interest income of plan assets	(10,277)	(7,633)
Total	₩ 228,339	₩ 216,966

Amount of ₩145,434 million (2017: ₩138,461 million) is included in 'Cost of sales,' and ₩79,833 million, (2017: ₩78,219 million) is included in 'Selling and administrative expenses' for the year ended December 31, 2018.

(5) The principal actuarial assumptions as of December 31, 2018 and 2017, are as follows:

	2018	2017
Discount rate (%)	2.70–4.35	3.09–4.35
Salary growth rate (%)	3.00–5.79	3.00–8.00

(6) The sensitivity of the defined benefit obligations as of December 31, 2018, to changes in the weighted principal assumptions is as follows:

	Changes in principal assumption	Effect on defined benefit obligations
Discount rate	Increase of 1%	13.20% Decrease
	Decrease of 1%	15.75% Increase
Salary growth rate	Increase of 1%	15.76% Increase
	Decrease of 1%	13.32% Decrease

Because there is a correlation between actuarial assumptions, the sensitivity analysis above will not show actual changes in the defined benefit obligation, as changes in assumptions will not occur independently. Also, in the above sensitivity analysis, the present value of the defined benefit obligation was measured using the projected unit credit method applied to measure the defined benefit obligation in the consolidated financial statements.

(7) Plan assets as of December 31, 2018 and 2017, consist of:

	2018		2017	
	Amount	Composition	Amount	Composition
	(In millions of Korean won)			
Principal guaranteed financial instruments	₩ 93,092	95.65%	₩ 94,139	95.50%
Transferred to National Pension Fund and others	581	0.60%	761	0.77%
Others	3,654	3.75%	3,674	3.73%
Total	₩ 97,327	100.00%	₩ 98,574	100.00%

(8) Expected maturity analysis of undiscounted pension benefits as of December 31, 2018, is as follows:

	Less than 1 year	Between 1 and 2 years	Between 2 and 5 years	More than 5 years
	(In millions of Korean won)			
Pension benefits	₩ 87,222	₩ 255,656	₩ 392,277	₩ 4,791,663

The weighted-average duration of the defined benefit obligations is 3.31–14.36 years.

24. PROVISIONS (NON-FINANCIAL BUSINESS):

(1) Details of the provisions as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Current	Non-current	Current	Non-current
	(In millions of Korean won)			
Provision for construction warranties	₩ 1,977	₩ 84,006	₩ -	₩ 71,836
Provision for product warranties	54,886	41,972	48,685	28,959
Provision for construction losses	38,796	26,790	-	-
Others	268,465	126,821	191,245	99,792
Total	₩ 364,124	₩ 279,589	₩ 239,930	₩ 200,587

(2) Changes in the provisions for the years ended December 31, 2018 and 2017, are as follows:

	2018				
	Provision for construction warranties	Provision for product warranties	Provision for construction losses	Others	Total
	(In millions of Korean won)				
Beginning	₩ 71,836	₩ 77,644	₩ -	₩ 291,037	₩ 440,517
Changes in accounting policies	-	-	20,412	238	20,650
Beginning after adjustments	71,836	77,644	20,412	291,275	461,167
Increase	29,847	17,469	87,639	167,166	302,121
Used during the year	(12,572)	(4,158)	(13,770)	(23,348)	(53,848)
Reversal	(3,245)	(8,669)	(71,404)	(78,583)	(161,901)
Others (*1)	117	14,572	42,709	38,776	96,174
Ending	₩ 85,983	₩ 96,858	₩ 65,586	₩ 395,286	₩ 643,713

(*1) Adjustments transferred from 'Unbilled construction and Overbilled construction' for the year ended December 31, 2017.
(*2) Others include changes in scope of consolidation and the effect of changes in exchange rate.

	2017			
	Provision for construction warranties	Provision for product warranties	Others	Total
	(In millions of Korean won)			
Beginning	₩ 65,334	₩ 91,370	₩ 262,836	₩ 419,540
Increase	15,951	25,916	100,386	142,253
Used during the year	(9,188)	(20,030)	(15,958)	(45,176)
Reversal	(261)	(17,238)	(40,108)	(57,607)
Others (*1)	-	(2,374)	(16,119)	(18,493)
Ending	₩ 71,836	₩ 77,644	₩ 291,037	₩ 440,517

(*1) Others include changes in scope of consolidation and the effect of changes in exchange rate.

25. CONSTRUCTION CONTRACTS (NON-FINANCIAL BUSINESS):

(1) Changes in the remaining balance of construction contracts for the year ended December 31, 2018, are as follows:

	2018			
	Beginning	Changes	Recognized construction revenue	Ending
	(In millions of Korean won)			
Domestic architecture construction	₩ 2,514,459	₩ 3,948,676	₩ (1,535,055)	₩ 4,928,080
Domestic civil construction	1,329,511	194,171	(429,547)	1,094,135
Domestic plant construction	2,113,656	2,109,175	(1,365,654)	2,857,177
Overseas subcontract	8,339,565	702,390	(943,869)	8,098,086
Overseas plant construction	126,654	62,342	(132,574)	56,422
Total	₩ 14,423,845	₩ 7,016,754	₩ (4,406,699)	₩ 17,033,900

(*1) Changes in the opening balance are in accordance with IFRS 15

(2) Details of construction contracts in progress, such as recognized construction profit or loss, as of December 31, 2018 and 2017, are as follows:

	2018				
	Accumulated contract revenue	Accumulated contract cost of sales	Accumulated profit or loss	Advances receivable	Reserve
	(In millions of Korean won)				
Domestic architecture construction	₩ 10,140,393	₩ 8,963,204	₩ 1,177,189	₩ 27,610	₩ -
Domestic civil construction	4,183,144	3,889,082	294,062	17,653	-
Domestic plant construction	3,620,681	3,297,373	323,308	393,533	-
Overseas subcontract	9,743,699	10,097,450	(353,751)	838,180	46,078
Overseas plant construction	205,990	171,483	34,507	2,002	-
Total	₩ 27,893,907	₩ 26,418,592	₩ 1,475,315	₩ 1,278,978	₩ 46,078

	2017				
	Accumulated contract revenue	Accumulated contract cost of sales	Accumulated profit or loss	Advances receivable	Reserve
	(In millions of Korean won)				
Domestic architecture construction	₩ 8,465,651	₩ 7,541,805	₩ 923,846	₩ 77,116	₩ -
Domestic civil construction	4,390,246	4,025,695	364,551	16,652	-
Domestic plant construction	4,313,468	3,942,299	371,169	368,085	269
Overseas subcontract	8,942,386	9,397,034	(454,648)	941,649	107,626
Overseas plant construction	407,445	365,023	42,422	10,868	-
Total	₩ 26,519,196	₩ 25,271,856	₩ 1,247,340	₩ 1,414,370	₩ 107,895

(3) Details of unbilled construction and overbilled construction as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Contract Asset	Contract liability	Contract Asset	Contract liability
	(In millions of Korean won)			
Domestic architecture construction	₩ 142,891	₩ 171,642	₩ 137,854	₩ 148,496
Domestic civil construction	47,264	6,382	78,391	33,302
Domestic plant construction	223,006	185,441	360,676	224,432
Overseas subcontract (*1)	77,839	91,762	419,345	107,384
Overseas plant construction	20,531	21,607	86,248	33,891
Total	₩ 511,531	₩ 476,834	₩ 1,082,514	₩ 547,505

(*1) Certain fees related to overseas subcontract were received as payment for construction work in advance and accounted for advances receivable. Billings are made according to certain milestone; thus, unbilled construction can be increased prior to the milestone.

(4) Amount of effect on current and future profits and losses caused by changes in construction contract in progress for the years ended December 31, 2018 and 2017, is as follows:

	2018						
	Provision for construction losses	Changes in estimated total contract revenue	Changes in estimated total contract cost of sales	Effect on current profits and losses	Effect on future profits and losses	Changes in unbilled construction	Changes in overbilled construction
	(In millions of Korean won)						
Domestic architecture construction	₩ 6,494	₩ 28,797	₩ (42,696)	₩ 46,466	₩ 25,027	₩ 66,439	₩ (19,973)
Domestic civil construction	2,300	73,541	79,126	(13,507)	7,922	9,081	(22,588)
Domestic plant construction	13,556	74,789	56,878	12,404	5,507	15,839	(3,435)
Overseas subcontract	16,474	(44,339)	(56,639)	589	11,711	18,431	(17,842)
Overseas plant construction	-	8,844	3,142	3,914	1,788	5,036	(1,122)
Aviation engine division	6,734	21,105	19,377	1,728	-	1,728	-
Defense division	17,301	13,668	33,841	(13,767)	(6,406)	12,728	(26,495)
Total	₩ 62,859	₩ 176,405	₩ 93,029	₩ 37,827	₩ 45,549	₩ 129,282	₩ (91,455)

	2017						
	Provision for construction losses	Changes in estimated total contract revenue	Changes in estimated total contract cost of sales	Effect on current profits and losses	Effect on future profits and losses	Changes in unbilled construction	Changes in overbilled construction
	(In millions of Korean won)						
Domestic architecture construction	₩ 20,642	₩ (1,362)	₩ (37,692)	₩ 16,281	₩ 20,049	₩ 26,564	₩ 10,283
Domestic civil construction	6,360	25,868	24,033	(18,871)	20,706	11,076	29,947
Domestic plant construction	20,990	40,960	(43,010)	74,068	9,902	92,887	18,819
Overseas subcontract	45,103	(220,909)	85,744	(324,533)	17,880	-	324,533
Overseas plant construction	507	49,281	41,859	2,186	5,236	13,700	11,514
Total	₩ 93,602	₩ (106,162)	₩ 70,934	₩ (250,869)	₩ 73,773	₩ 144,227	₩ 395,096

(5) Details of construction contract in progress for which the amount of contract revenue is more than 5% of total revenue as of December 31, 2018 and 2017, are as follows:

	2018							
					Unbilled construction		Receivables of construction	
	Contract	Date of contract	Due date	Rate of progress (%)	Total amount	Provision	Total amount	Provision
	(In millions of Korean won)							
Overseas subcontract	BNCP	2012.05.30	2021.12.31	36.07	₩ 6,300	₩ -	₩109,864	₩ -

	2017							
					Unbilled construction		Receivables of construction	
	Contract	Date of contract	Due date	Rate of progress (%)	Total amount	Provision	Total amount	Provision
	(In millions of Korean won)							
Overseas subcontract	BNCP	2012.05.30	2021.12.31	32.71	₩127,373	₩ -	₩211,015	₩ -

26. FINANCIAL INSTRUMENTS BY CATEGORY (FINANCIAL BUSINESS):

(1) Categorizations of financial assets as of December 31, 2018 and 2017, are as follows:

	2018				
	Financial assets at amortized cost	Financial assets at fair value through profit and loss	Hedging Derivative financial instruments	Financial assets at fair value through OCI	Total
Cash and cash equivalents	₩ 2,114,197	₩ -	₩ -	₩ -	₩ 2,114,197
Deposits	967,047	165,547	-	253,162	1,385,756
Securities	32,319,331	19,517,802	-	22,364,398	74,201,531
Loans and other receivables	27,193,662	481,587	-	839,679	28,514,928
Derivative financial assets	-	146,995	346,282	-	493,277
Other financial assets	2,056,028	-	-	-	2,056,028
Total	₩ 64,650,265	₩ 20,311,931	₩ 346,282	₩ 23,457,239	₩ 108,765,717

	2017						
	Loans and receivables	Financial assets at FVTPL	AFS financial assets	Held-to-maturity investments	Hedging derivative financial instruments	Derivatives held for trading	Total
	(In millions of Korean won)						
Cash and cash equivalents	₩ 785,401	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 785,401
Deposits	1,001,668	-	-	-	-	-	1,001,668
Securities	-	7,305,010	31,470,962	31,529,787	-	-	70,305,759
Loans and other receivables	26,823,704	-	-	-	-	-	26,823,704
Derivative financial assets	-	-	-	-	1,206,071	440,007	1,646,078
Other financial assets	1,486,494	-	-	-	-	-	1,486,494
Total	₩ 30,097,267	₩ 7,305,010	₩ 31,470,962	₩ 31,529,787	₩ 1,206,071	₩ 440,007	₩ 102,049,104

(2) Categorizations of financial liabilities as of December 31, 2018 and 2017, are as follows:

	2018							
	Financial liabilities at fair value through profit and loss		Hedging derivative financial instruments		Financial liabilities carried at amortizes cost		Total	
	(In millions of Korean won)							
Deposit liabilities	₩	-	₩	-	₩	1,151,598	₩	1,151,598
Derivative financial liabilities		260,587		305,331		-		565,918
Other financial liabilities		1,972,055		-		5,712,344		7,684,399
Total	₩	2,232,642	₩	305,331	₩	6,863,942	₩	9,401,915

	2017							
	Financial liabilities designated as hedging instruments		Financial liabilities at amortized cost		Financial liabilities at FVTPL		Total	
	(In millions of Korean won)							
Deposit liabilities	₩	-	₩	1,243,860	₩	-	₩	1,243,860
Derivative financial liabilities		12,467		-		153,599		166,066
Other financial liabilities		-		5,248,654		1,214,882		6,463,536
Total	₩	12,467	₩	6,492,514	₩	1,368,481	₩	7,873,462

(3) Net gains or net losses on each category of financial instruments for the years ended December 31, 2018 and 2017, are as follows:

	2018													
	Interest income		Dividend income		Commission income		Bad debt expense		Gain (loss) on valuation andtransaction		Gain (loss) on foreign currency transaction and valuation		Total	
	(In millions of Korean won)													
Financial assets at FVTPL	₩	182,662	₩	215,747	₩	2,030	₩	-	₩	(407,137)	₩	130,749	₩	124,051
Financial assets at FVTOCI		675,635		16,303		-		-		158,190		217,141		1,067,269
Financial assets at amortized cost		2,428,227		-		23,908		-		(26,587)		540,657		2,966,205
Derivative financial instruments		-		-		-		-		(768,685)		-		(768,685)
Financial liabilities at amortized cost		-		-		-		(108,491)		-		(362)		(108,853)
Financial liabilities at FVTPL		-		-		-		(850)		42,348		-		41,498
Total	₩	3,286,524	₩	232,050	₩	25,938	₩	(109,341)	₩	(1,001,871)	₩	888,185	₩	3,321,485

	2017													
	Interest income		Dividend income		Commission income		Bad debt expense		Gain (loss) on valuation andtransaction		Gain (loss) on foreign currency transaction and valuation		Total	
	(In millions of Korean won)													
Loans and receivables	₩	1,393,637	₩	-	₩	16,399	₩	-	₩	(36,065)	₩	(106,132)	₩	1,267,839
Financial assets at FVTPL		107,279		61,446		-		-		126,621		(122,243)		173,103
AFS financial assets		856,193		324,708		1,012		-		367,973		(1,071,863)		478,023
Held-to-maturity investments		855,785		-		66		-		-		(1,152,616)		(296,765)
Derivative financial instruments		-		-		-		-		2,275,860		-		2,275,860
Financial liabilities at amortized cost		-		-		-		(86,806)		-		(5,440)		(92,246)
Financial liabilities at FVTPL		-		-		-		(345)		-		-		(345)
Total	₩	3,212,894	₩	386,154	₩	17,477	₩	(87,151)	₩	2,734,389	₩	(2,458,294)	₩	3,805,469

27. CASH AND CASH EQUIVALENTS AND DEPOSITS (FINANCIAL BUSINESS):

(1) Details of cash and cash equivalents and deposits as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Cash and cash equivalents		
Cash and demand deposits	₩ 2,114,197	₩ 785,401
Subtotal	2,114,197	785,401
Deposits		
Long-term deposits	722,650	502,470
Others	663,114	499,198
Provision for impairment	(8)	
Subtotal	1,385,756	1,001,668
Total	₩ 3,499,953	₩ 1,787,069

(2) Details of restricted to use deposits as of December 31, 2018 and 2017, are as follows:

	Financial institution	2018	2017	Reason for restrictions
		(In millions of Korean won)		
Cash and cash equivalents	Shinhan Bank and others	₩ 66	₩ 9,108	Restricted deposit for lawsuit and others
Other deposits	KB Bank and others	469,446	400,339	Collateral for transactions and others
	Shinhan Bank and others	15	22	Deposit for checking account
Total		₩ 469,527	₩ 409,469	

28. SECURITIES (FINANCIAL BUSINESS):

(1) Details of securities as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Financial assets at FVTPL	₩ 20,164,936	₩ 7,305,010
Financial assets at FVTOCI	23,457,239	-
Financial assets at amortized cost	60,480,040	-
AFS financial assets	-	31,470,962
Held-to-maturity investments	-	31,529,787
Total	₩104,102,215	₩ 70,305,759

(2) Details of financial assets at FVTPL as of December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Equity securities		
Stocks	₩	1,112,500
Subtotal		1,112,500
Debt securities		
Stocks		43,372
Government and public bonds		264,812
Special bonds		1,566,574
Financial bonds		63,576
Corporate bonds		1,923,001
Investments		44,114
Subtotal		3,905,449
Beneficiary certificates		6,277,103
Overseas securities		5,925,064
Other securities		2,297,686
Loan		481,587
Deposit		165,547
Total	₩	20,164,936

In addition, the Group provides certain of its financial assets at FVTPL as collateral for repurchase agreements (see Note 56).

(3) Details of financial assets at FVTOCI as of December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Equity securities		
Stocks	₩	388,675
Subtotal		388,675
Debt securities		
Government and public bonds		2,282,436
Special bonds		4,620,408
Financial bonds		847,150
Corporate bonds		2,704,820
Investments		604
Subtotal		10,455,418
Overseas securities		9,828,919
Other securities		1,691,386
Loan		839,679
Deposit		253,162
Total	₩	23,457,239

In addition, the Group provides certain of its financial assets at FVTOCI as collateral for derivative transactions (see Note 56).

(4) Details of financial assets at amortized cost as of December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Debt securities		
Government and public bonds	₩	9,745,511
Special bonds		8,559,943
Corporate bonds		808,151
Subtotal		19,113,605
Overseas securities		12,632,241
Loan		27,193,661
Deposit		967,048
Loaned securities(*1)		573,485
Total	₩	60,480,040

(*1) Loaned securities are the transfer deals that do not meet the elimination requirements of K-IFRS 1109. The Group receives the commission through the loan of financial assets currently held in the Korea Securities Depository as of December 31, 2018.

(5) Details of financial assets at FVTPL as of December 31, 2017, are as follows:

		2017
		(In millions of Korean won)
Trading securities		
Equity securities		
Stocks	₩	150,787
Beneficiary certificates		548,594
Subtotal		699,381
Debt securities		
Government and public bonds		413,203
Special bonds		1,324,519
Corporate bonds		1,522,718
Subtotal		3,260,440
Overseas securities		2,166,333
Other securities		1,120,363
Total of trading securities		7,246,517
Financial assets designated as at FVTPL		
Overseas securities		-
Other securities		58,493
Total financial assets designated as at FVTPL		58,493
Total	₩	7,305,010

(6) Details of AFS financial assets as of December 31, 2017, are as follows:

		2017
		(In millions of Korean won)
Equity securities		
Stocks	₩	1,084,862
Investments		33,152
Beneficiary certificates and others		4,980,768
Subtotal		6,098,782
Debt securities		
Government and public bonds		2,694,262
Special bonds		6,990,432
Financial bonds		1,279,280
Corporate bonds		4,371,804
Loaned securities(*1)		51,498
Subtotal		15,387,276
Overseas securities		9,758,333
Other securities		226,571
Total	₩	31,470,962

(*1) Loaned securities are the transfer deals that do not meet the elimination requirements of K-IFRS 1039. The Group receives the commission through the loan of financial assets currently held in the Korea Securities Depository as of December 31, 2017.

(7) Details of held-to-maturity investments as of December 31, 2017, are as follows:

		2017
		(In millions of Korean won)
Debt securities		
Government and public bonds	₩	10,292,764
Special bonds		8,624,230
Corporate bonds		629,174
Subtotal		19,546,168
Overseas securities		11,851,414
Loaned securities(*1)		132,205
Total	₩	31,529,787

(*1) Loaned securities are the transfer deals that do not meet the elimination requirements of K-IFRS 1039. The Group receives the commission through the loan of financial assets currently held in the Korea Securities Depository as of December 31, 2017.

In addition, the Group provides certain of its held-to-maturity investments as collateral for derivative transactions (see Note 56).

29. LOANS AND RECEIVABLES (FINANCIAL BUSINESS):

(1) Loans and receivables as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Loan at FVTPL	₩ 481,587	₩ -
Loan at FVTOCI	839,679	-
Loan at amortized cost	27,193,661	-
Loaned and others	-	26,823,704
Total	₩ 28,514,927	₩ 26,823,704

(2) Details of loans and receivables as of December 31, 2018 and 2017, are as follows:

		2018	2017
		(In millions of Korean won)	
Call loans	Principal	₩ -	₩ 31,600
Policy loans	Principal	7,326,592	6,911,254
	Provision for impairment	(64,285)	(92,049)
	Subtotal	7,262,307	6,819,205
Loans secured by securities	Principal	232,549	248,254
	Provision for impairment	(4,141)	(3,668)
	Subtotal	228,408	244,586
Loans secured by real estate	Principal	8,052,756	7,552,837
	Loan origination cost and fee ("LOCF")	57,260	54,326
	Present value discount	(599)	(793)
	Provision for impairment	(2,574)	(18,272)
	Subtotal	8,106,843	7,588,098
Unsecured loan	Principal	8,076,717	7,602,192
	LOCF	(6,181)	(10,026)
	Present value discount	(1,137)	(1,165)
	Provision for impairment	(5,178)	(5,867)
	Subtotal	8,064,221	7,585,134
Loans secured by third-party guarantee	Principal	672,664	652,739
	LOCF	307	246
	Present value discount	-	(1)
	Subtotal	672,971	652,984
Loans secured by deposit and instalment savings	Principal	₩ 1,175	₩ 836
	Provision for impairment	(8)	(4)
	Subtotal	1,167	832
Other loans	Principal	4,215,128	3,911,194
	LOCF	(1,610)	(2,078)
	Present value discount	(557)	(613)
	Provision for impairment	(33,951)	(7,238)
	Subtotal	4,179,010	3,901,265
	Total	₩ 28,514,927	₩ 26,823,704

(3) Changes in allowance for possible losses on loans and receivables for the years ended December 31, 2018, are as follows:

	2018	
	(In millions of Korean won)	
Beginning (K-IFRS 1039)	₩	127,098
Adjustments		1,264
Beginning (K-IFRS 1109)		128,362
(±)Transfer		26,505
(+)Recovery of impairment loss		14,343
(-)Loans written off and others		(51,978)
(-)Unwinding		(7,095)
Ending	₩	110,137

(4) Changes in allowance for possible losses on loans and receivables for the years ended December 31, 2017, are as follows:

	2017	
	(In millions of Korean won)	
Beginning	₩	123,095
(±)Transfer		33,282
(+)Recovery of impairment loss		24,120
(-)Loans written off and others		(43,799)
(-)Unwinding		(9,600)
Ending	₩	127,098

(5) Changes in LOCF for the year ended December 31, 2018, are as follows:

	2018	
	(In millions of Korean won)	
Beginning (K-IFRS 1039)	₩	42,468
Adjustments		(503)
Beginning (K-IFRS 1109)		41,965
Increase		8,359
Amortization		(548)
Ending	₩	49,776

(6) Changes in LOCF for the year ended December 31, 2017, are as follows:

	2017							
	Beginning		Increase		Amortization		Ending	
	(In millions of Korean won)							
LOCF	₩	33,655	₩	8,463	₩	350	₩	42,468

(7) Details of loans that are impaired and overdue as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Loans that are neither past due nor impaired	₩ 27,954,730	₩ 26,233,652
Loans past due but not impaired		
Less than 30 days	260,616	316,299
30–60 days	32,292	29,954
60–90 days	9,979	12,166
More than 90 days	26,385	24,252
Subtotal	329,272	382,671
Impaired loans	293,579	294,583
Total	₩ 28,577,581	₩ 26,910,906

(*1) The amount is classified on the basis of principal of loans.

30. OTHER FINANCIAL ASSETS (FINANCIAL BUSINESS):

(1) Details of other financial assets as of December 31, 2018 and 2017, are as follows:

		2018	2017
		(In millions of Korean won)	
Insurance receivables	Principal	₩ 421,098	₩ 546,183
	Provision for impairment	4	(8,932)
	Subtotal	416,339	537,251
Other accounts receivable	Principal	698,973	496,219
	Provision for impairment	4	(119,617)
	Subtotal	608,975	376,602
Accrued income	Principal	869,960	764,302
	Provision for impairment	4	(1,062)
	Subtotal	868,760	763,240
Deposit received for guarantee	Principal	164,677	171,596
	Present value discount	(2,847)	(2,816)
	Provision for impairment	(2,429)	(2,438)
	Subtotal	159,401	166,342
Others	Principal	2,553	3,059
Total		₩ 2,056,028	₩ 1,846,494

(2) Details of accrued income as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Interest on deposits	₩ 11,380	₩ 9,561
Interest on securities	656,422	563,317
Interest on loans	151,409	157,681
Dividend income	16,729	8,182
Others	34,020	25,561
Provision for impairment	(1,200)	(1,062)
Total	₩ 868,760	₩ 763,240

(3) Changes in provision for impairment on other financial assets for the year ended December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Beginning (K-IFRS 1039)	₩	132,049
Adjustments		
Beginning (K-IFRS 1109)		132,049
(±)Transfer		1,327
(+)Recovery of impairment loss		2,754
(-)Loans written off and others		(37,255)
(-)Unwinding		(498)
Effect of exchange rate change		9
Ending	₩	98,386

(4) Changes in provision for impairment on other financial assets for the year ended December 31, 2017, are as follows:

		2017
		(In millions of Korean won)
Beginning	₩	132,884
(±)Transfer		2,790
(+)Recovery of impairment loss		15
(-)Loans written off and others		(3,571)
(-)Unwinding		(16)
Effect of exchange rate change		(53)
Ending	₩	132,049

31. DERIVATIVE FINANCIAL INSTRUMENTS (FINANCIAL BUSINESS):

(1) Details of derivative financial instruments as of December 31, 2018 and 2017, are as follows:

	2018			
	Trading		Hedging	
	Assets	Liabilities	Assets	Liabilities
	(In millions of Korean won)			
Currency				
Currency forward	₩ 17,553	₩ 15,293	₩ 19,117	₩ 108,880
Currency swap (*1)	1,046	1,136	327,165	196,451
Stock index				
Stock index option	3,077	102,282	-	-
Credit				
Credit derivative	10,091	4,770	-	-
Derivatives-combined securities				
Stock warrants	143	-	-	-
Interest rate				
Interest rate swap	4,234	37,995	-	-
Others				
Option and swap	110,851	99,111	-	-
Total	₩ 146,995	₩ 260,587	₩ 346,282	₩ 305,331

(*1) The Group has entered into currency swap contracts to hedge the exposure to fluctuations in foreign currency receivables' future fair value and cash flows. The maximum exposure period is March 15, 2039.

	2017							
	Trading				Hedging			
	Assets		Liabilities		Assets		Liabilities	
	(In millions of Korean won)							
Currency								
Currency forward	₩	49,357	₩	7,605	₩	156,654	₩	290
Currency swap (*1)		91,096		54,813		1,049,417		12,177
Stock index								
Stock index option		33,124		8,038		-		-
Credit								
Credit derivative		27,092		9,091		-		-
Derivatives-combined securities								
Stock warrants		8,906		-		-		-
Interest rate								
Interest rate swap		4,049		32,893		-		-
Others								
Option and swap		226,383		41,159		-		-
Total	₩	440,007	₩	153,599	₩	1,206,071	₩	12,467

(*1) The Group has entered into currency swap contracts to hedge the exposure to fluctuations in foreign currency receivables' future fair value and cash flows. The maximum exposure period is November 6, 2027.

(2) Details of gains and losses from derivative financial instruments for the years ended December 31, 2018 and 2017, are as follows:

	2018				2017			
	Trading		Hedging		Trading		Hedging	
	(In millions of Korean won)							
Currency								
Currency forward	₩	(56,633)	₩	(159,907)	₩	41,916	₩	600,112
Currency swap		10,909		(608,778)		33,619		1,675,748
Stock index								
Stock index option		44,366		-		275,238		-
Credit								
Credit derivative		(87,629)		-		(43,688)		-
Derivatives-combined securities								
Stock warrants		(648)		-		4,021		-
Interest rate								
Interest rate swap		(1,394)		-		(752)		-
Total	₩	(91,029)	₩	(768,685)	₩	310,354	₩	2,275,860

(3) The securities are provided as collateral for derivative instrument transactions of the Group (see Note 56).

32. OTHER ASSETS (FINANCIAL BUSINESS):

(1) Details of other assets as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Deferred policy acquisition costs	₩ 2,609,260	₩ 2,865,817
Prepaid expenses	25,776	15,901
Prepaid VAT	195	281
Advance payments	64,144	78,683
Compensation receivables	25,521	21,422
Reinsurance assets	637,917	580,074
Others	5,340	1,584
Total	₩ 3,368,153	₩ 3,563,762

(2) Changes in deferred policy acquisition costs for the years ended December 31, 2018 and 2017, are as follows:

	2018						
	Individual insurance						
	Endowment	Term	Mixed	Group insurance	Long term	Pension	Total
	(In millions of Korean won)						
Beginning	₩ 332,716	₩ 1,550,897	₩ 64,520	₩ 1,968	₩ 911,890	₩ 3,826	₩ 2,865,817
Increase	53,808	640,377	10,668	950	565,908	820	1,272,531
Decrease	(173,346)	(751,391)	(36,415)	(904)	(564,336)	(2,696)	(1,529,088)
Ending	₩ 213,178	₩ 1,439,883	₩ 38,773	₩ 2,014	₩ 913,462	₩ 1,950	₩ 2,609,260

	2017						
	Individual insurance						
	Endowment	Term	Mixed	Group insurance	Long term	Pension	Total
	(In millions of Korean won)						
Beginning	₩ 456,917	₩ 1,603,798	₩ 99,243	₩ 1,960	₩ 929,201	₩ 6,957	₩ 3,098,076
Increase	159,366	862,991	37,006	1,167	487,271	1,019	1,548,820
Decrease	(283,567)	(915,892)	(71,729)	(1,159)	(504,582)	(4,150)	(1,781,079)
Ending	₩ 332,716	₩ 1,550,897	₩ 64,520	₩ 1,968	₩ 911,890	₩ 3,826	₩ 2,865,817

33. PROPERTY, PLANT AND EQUIPMENT, INVESTMENT PROPERTY AND INTANGIBLE ASSETS (FINANCIAL BUSINESS):

(1) Details of property, plant and equipment, investment property and intangible assets as of December 31, 2018 and 2017, are as follows:

		2018			
		Acquisition cost	Accumulated depreciation	Accumulated impairment losses	Book value
		(In millions of Korean won)			
Property, plant and equipment	Land	₩ 819,788	₩ -	₩ (28,497)	₩ 791,291
	Buildings	1,196,111	(376,025)	(18,339)	801,747
	Structures	624	(295)	(54)	275
	Vehicles	1,128	(1,073)	-	55
	Tools and equipment	378,556	(310,713)	-	67,843
	Others	75,921	(49,141)	(9,331)	17,449
	Construction in progress	3,329	-	-	3,329
	Subtotal	2,475,457	(737,247)	(56,221)	1,681,989
Investment property	Land	1,428,743	-	(11,472)	1,417,271
	Buildings	1,370,794	(373,876)	(9,512)	987,406
	Subtotal	2,799,537	(373,876)	(20,984)	2,404,677
Intangible assets	Goodwill	276,937	-	(92,789)	184,148
	Development costs	272,399	(215,178)	-	57,221
	Membership rights	41,148	-	-	41,148
	Others	261,040	(212,186)	(14,202)	34,652
	Subtotal	851,524	(427,364)	(106,991)	317,169
	Total	₩ 6,126,518	₩ (1,538,487)	₩ (184,196)	₩ 4,403,835

		2017			
		Acquisition cost	Accumulated depreciation	Accumulated impairment losses	Book value
		(In millions of Korean won)			
Property, plant and equipment	Land	₩ 846,045	₩ -	₩ (29,399)	₩ 816,646
	Buildings	1,156,378	(356,640)	(21,024)	778,714
	Structures	589	(277)	(54)	258
	Vehicles	1,337	(1,259)	-	78
	Tools and equipment	374,392	(307,611)	-	66,781
	Others	71,966	(44,197)	(9,331)	18,438
	Construction in progress	18,484	-	-	18,484
	Subtotal	2,469,191	(709,984)	(59,808)	1,699,399
Investment property	Land	1,423,710	-	(10,570)	1,413,140
	Buildings	1,308,625	(335,902)	(10,207)	962,516
	Subtotal	2,732,335	(335,902)	(20,777)	2,375,656
Intangible assets	Goodwill	276,908	-	(19,732)	257,176
	Development costs	256,347	(198,306)	-	58,041
	Membership rights	35,428	-	(553)	34,875
	Others	254,514	(201,917)	(14,620)	37,977
	Subtotal	823,197	(400,223)	(34,905)	388,069
	Total	₩ 6,024,723	₩ (1,446,109)	₩ (115,490)	₩ 4,463,124

(2) Changes in property, plant and equipment, investment property and intangible assets for the years ended December 31, 2018 and 2017, are as follows:

		2018						
		Beginning	Acquisitions	Disposals	Transfer	Depreciation and amortization	Others (*1)	Ending
		(In millions of Korean won)						
Property, plant and equipment	Land	₩ 816,646	₩ 6,885	₩ (29,990)	₩ (2,250)	₩ -	₩ -	₩ 791,291
	Buildings	778,714	15,127	(21,158)	57,099	(28,015)	(20)	801,747
	Structures	258	35	-	-	(18)	-	275
	Vehicles	78	21	(22)	-	(21)	(1)	55
	Tools and equipment	66,781	32,080	(44)	1,170	(32,117)	(27)	67,843
	Others	18,438	3,212	(21)	982	(5,155)	(7)	17,449
	Construction in progress	18,484	132,835	-	(147,977)	-	(13)	3,329
Subtotal		1,699,399	190,195	(51,235)	(90,976)	(65,326)	(68)	1,681,989
Investment property	Land	1,413,140	-	(6,061)	9,336	-	856	1,417,271
	Buildings	962,516	2,634	(4,416)	61,706	(38,493)	3,459	987,406
Subtotal		2,375,656	2,634	(10,477)	71,042	(38,493)	4,315	2,404,677
Intangible assets	Goodwill	257,176	-	-	-	-	(73,028)	184,148
	Development costs	58,041	15,912	-	6,945	(17,841)	(5,836)	57,221
	Membership rights	34,875	114	(738)	7,220	(3)	(320)	41,148
	Others	37,977	16,058	(2)	1,518	(20,674)	(225)	34,652
Subtotal		388,069	32,084	(740)	15,683	(38,518)	(79,409)	317,169
Total		₩ 4,463,124	₩ 224,913	₩ (62,452)	₩ (4,251)	₩ (142,337)	₩ (75,162)	₩ 4,403,835

(*1) Others include increase (decrease) due to changes in exchange rate and effects of changes in scope of consolidation.

		2017						
		Beginning	Acquisitions	Disposals	Transfer	Depreciation and amortization	Others (*1)	Ending
		(In millions of Korean won)						
Property, plant and equipment	Land	₩ 822,601	₩ 132	₩ (39,865)	₩ 33,778	₩ -	₩ -	₩ 816,646
	Buildings	771,913	3,038	(4,442)	35,789	(27,478)	(106)	778,714
	Structures	273	-	-	-	(15)	-	258
	Vehicles	270	1	(56)	-	(129)	(8)	78
	Tools and equipment	61,622	33,976	(187)	2,708	(29,848)	(1,490)	66,781
	Others	17,225	5,267	(110)	1,273	(5,190)	(27)	18,438
	Construction in progress	85,971	56,748	-	(124,184)	-	(51)	18,484
Subtotal		1,759,875	99,162	(44,660)	(50,636)	(62,660)	(1,682)	1,699,399
Investment property	Land	1,571,072	-	(1,178)	(33,723)	-	(123,031)	1,413,140
	Buildings	1,138,189	4,289	(336,109)	90,300	(35,892)	101,739	962,516
Subtotal		2,709,261	4,289	(337,287)	56,577	(35,892)	(21,292)	2,375,656
Intangible assets	Goodwill	257,176	-	-	-	-	-	257,176
	Development costs	45,371	20,230	-	9,042	(16,569)	(33)	58,041
	Membership rights	35,858	128	(1,028)	-	(3)	(80)	34,875
	Others	53,762	8,379	(61)	3,336	(26,418)	(1,021)	37,977
Subtotal		392,167	28,737	(1,089)	12,378	(42,990)	(1,134)	388,069
Total		₩ 4,861,303	₩ 132,188	₩ (383,036)	₩ 18,319	₩ (141,542)	₩ (24,108)	₩ 4,463,124

(*1) Others include increase (decrease) due to changes in exchange rate and effects of changes in scope of consolidation.

Certain property, plant and equipment, investment property and intangible assets are provided as collateral for borrowings as of December 31, 2018 (see Note 56).

(3) Fair value of investment property as of December 31, 2018, is ₩2,727,358 million. Rent income and expenses from investment property for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Rent income	₩ 140,554	₩ 157,275
Related expense	(125,954)	(121,703)

34. INSURANCE CONTRACT LIABILITIES (FINANCIAL BUSINESS):

(1) Details of insurance contract liabilities as of December 31, 2018 and 2017, are as follows:

		2018	2017
		(In millions of Korean won)	
Premium reserve	Endowment	₩ 25,611,934	₩ 24,823,552
	Term	39,923,778	38,205,583
	Mixed	10,645,251	10,230,164
	Group	640,575	655,269
	Long term	12,403,972	11,243,933
Subtotal		89,225,510	85,158,501
Reserve for outstanding claims	Endowment	499,663	495,661
	Term	695,698	740,327
	Mixed	505,067	435,735
	Group	32,015	35,354
	IBNR	370,511	359,896
	General	508,296	248,926
	Automobile	171,158	167,476
	Long term	297,041	425,785
Subtotal		3,079,449	2,909,160
Reserve for unearned premium	Endowment	2,156	1,441
	Term	931	1,026
	Mixed	2	3
	Group	3,907	5,070
	General	199,905	204,797
	Automobile	501,984	488,461
	Long term	20,333	15,717
Subtotal		729,218	716,515
Reserve for minimum guaranteed benefit	Endowment	61,495	65,486
	Term	1,074,834	989,799
	Mixed	3,158	756
Subtotal		1,139,487	1,056,041
Reserves for policyholders' dividends	Endowment	250,269	243,042
	Term	47,419	54,252
	Mixed	2,217	2,767
	Group	1,232	1,620
	Long term	15,480	13,268
Subtotal		316,617	314,949
Reserve for policyholders' profit dividends		48,793	40,843
Reserve for loss preservation		33,046	26,038
Total		₩ 94,572,120	₩ 90,222,047

(2) Amendments to Detailed Regulations on Supervision of Insurance Business

The method for assessing the adequacy of insurance contract liabilities was changed according to the amendments to Detailed Regulations on Supervision of Insurance Business. The amendment includes changes in determining discount rates and adjustments to the current estimates. The Group has changed its accounting policies, as the new method is considered to provide more reliable and relevant information about the current estimates of future cash flows. The comparative notes information as at December 31, 2017 and 2016, has been restated to reflect the changes in accounting policies retrospectively.

Description	Basis
Method of determining discount rate	- Exclude the weight of the investment in risk assets that has been applied to each company - Stepwise elimination of the credit risk spread in industry spread.
Adjustment to the current estimates of insurance liabilities	- Stepwise application of weighted-average interest rate for the current estimation of insurance liability.
Reflecting cash flows of policy loans	- Cash flows of policy loans are reflected in liability adequacy test.

(3) Contracts subject to liability adequacy test

The Group has performed the adequacy test for premium reserve and unearned premium reserve as at December 31, 2018. Premium reserves are net premium reserves after deducting deferred acquisition cost and policy loans.

(4) Assumptions used for test are as follows:

1) Life insurance

Description	Applied assumptions	Basis
Discount rate	3.05% averages	Risk free interest rate plus risk spread in accordance with the scenario prepared by Korean Financial Supervisory Service.
Business expense rates	Acquisition costs	Calculated to be paid in the future based on the actual data for the recent one year by channels, products and payment methods in accordance with the relevant provisions.
	Maintenance costs	Calculated by channels using the actual statistical data for the recent one year based on the number of contracts held, premium revenue, etc.
Lapse ratio	1.5%–60%	Calculated by payment methods, channels, product groups and elapsed time based on our experience in the recent five years.
Risk ratio	15%–180%	Calculated as a ratio by life tables, product groups, dividend types and elapsed time based on the actual statistical data for the recent five years as a ratio of risk insurance premium to insurance paid.

2) Non - life insurance

Description	Basis
Discount rate	Risk free interest rate plus risk spread in accordance with the scenario prepared by Korean Financial Supervisory Service.
Business expense rates	Calculated to be paid in the future based on the actual statistical data for the recent one year.
Lapse ratio	Calculated by payment methods, channels, product groups and elapsed time based on our experience in the recent five years.
Ratio of risk	Calculated as a ratio based on the actual statistical data for recent five years as a ratio of risk insurance premium to insurance paid.

(5) Liability adequacy test is performed by insurance contract types, and insurance contract types were classified into insurance with fixed rate insurance, floating rate insurance and variable life insurance. Surplus and deficiency by insurance types and result of liability adequacy test as at December 31, 2018, 2017 and 2016, are as follows:

1) Life insurance

		Surplus (deficiency)				
			2017		2016	
		2018	Prior to Change	After Change	Prior to Change	After Change
		(In millions of Korean won)				
Fixed-rate insurance	Participating	₩ (8,935,268)	₩ (6,974,026)	₩ (8,086,044)	₩ (7,367,071)	₩ (8,079,843)
	Non-participating	(1,018,136)	(18,150)	(686,282)	(1,442,446)	(2,176,065)
Floating-rate insurance	Participating	(444,894)	(278,379)	(371,605)	(335,459)	(393,412)
	Non-participating	7,145,101	9,381,230	8,082,029	7,168,502	6,277,715
Variable life insurance		4,444,349	4,962,083	4,960,514	4,721,091	4,535,215
Total		₩ 1,191,152	₩ 7,072,758	₩ 3,898,612	₩ 2,744,617	₩ 163,610

2) Non - life insurance

	Surplus (deficiency)				
		2017		2016	
	2018	Prior to Change	After Change	Prior to Change	After Change
	(In millions of Korean won)				
Premium reserve and reserve for unearned premium	₩ 6,583,404	₩ 3,404,168	₩ 2,704,572	₩ 2,080,890	₩ 1,409,544

As a result of liability adequacy test, as at December 31, 2018, no additional insurance premium reserve has been generated. The changes in accounting policies have no effect on the consolidated financial statements of prior years, presented herein for comparative purposes.

35. INSURANCE CONTRACT LIABILITIES AND INVESTMENT CONTRACT LIABILITIES (FINANCIAL BUSINESS):

Details of insurance contract liabilities and investment contract liabilities as of December 31, 2018 and 2017, are as follows:

		2018	2017
		(In millions of Korean won)	
General account	Insurance contract liabilities	₩ 94,572,120	₩ 90,222,047
Separate account	Insurance contract liabilities	16,592,385	16,905,277
	Investment contract liabilities	5,147,768	5,180,748
	Subtotal	21,740,153	22,086,025
	Total	₩ 116,312,273	₩ 112,308,072

36. POLICYHOLDERS' EQUITY ADJUSTMENT (FINANCIAL BUSINESS):

Details of policyholders' equity adjustment as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Net change in fair value of OCI financial assets	₩ 65,989	₩ -
Net change in fair value of AFS financial assets	-	138,810
Net change in fair value of held-to-maturity investments	-	447,078
Net change in property revaluation surplus(*1)	106,520	115,561
Total	₩ 172,509	₩ 701,449

(*1) The property revaluation surplus is the amount of revaluation of property assets revalued by using K-IFRS adoption cost according to the percentage of contractors.

37. WITHHELD LIABILITIES (FINANCIAL BUSINESS):

Details of withheld liabilities as of December 31, 2018 and 2017, are as follows:

	Interest rate (%)	2018	2017
		(In millions of Korean won)	
Ordinary deposits	0.10	₩ 2,546	₩ 4,060
Time deposits	1.00–5.00	720,221	544,337
Installment deposits	1.50–11.50	25,522	25,340
Investor's deposits	-	390,466	631,975
Deposits received for margin accounts	-	11,326	36,698
Others	0.00–10.50	1,517	1,450
Total		₩ 1,151,598	₩ 1,243,860

38. SEPARATE ACCOUNT (FINANCIAL BUSINESS):

(1) Separate account assets and liabilities as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Separate account assets before offset	₩ 22,140,236	₩ 22,599,362
Separate account payables before offset	(729,546)	(948,701)
Separate account assets after offset	21,410,690	21,650,661
Separate account liabilities before offset	22,106,771	22,605,905
Separate account receivables before offset	(71,762)	(793,790)
Separate account liabilities after offset	22,035,009	21,812,115
Separate account accumulated other comprehensive income	₩ 33,465	₩ (6,543)

(2) Consolidated statements of financial position of separate accounts as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Assets		
I. Cash and deposits	₩ 378,515	₩ 331,839
II. Securities	19,468,239	19,530,050
III. Loans	1,561,999	1,300,978
IV. Other assets	731,483	1,436,495
Total	22,140,236	22,599,362
Liabilities		
I. Other liabilities	366,618	519,880
II. Insurance contract liabilities	16,592,385	16,905,277
III. Investment contract liabilities	5,147,768	5,180,748
Total	22,106,771	22,605,905
Accumulated other comprehensive income	33,465	(6,543)
Liabilities and accumulated other comprehensive income	₩ 22,140,236	₩ 22,599,362

(3) Consolidated statements of comprehensive income of separate accounts for the years ended December 31, 2018 and 2017, are as follows:

	2018		2017	
	Trust accounts guaranteeing the repayment of principal	Performance-based trust accounts	Trust accounts guaranteeing the repayment of principal	Performance-based trust accounts
	(In millions of Korean won)			
Revenues				
Premium income	₩ -	₩ 2,521,144	₩ -	₩ 2,713,086
Interest income	119,317	316,358	117,132	265,300
Gain on disposal and valuation of securities	19,455	443,318	14,898	1,033,196
Gain on disposal and valuation of derivatives	26,906	3,784	132,598	412,397
Gain on exchange differences	10,267	169,678	37	2,237
Other income	12,730	115,860	7,018	85,376
Total	188,675	3,570,142	271,683	4,511,592
Expenses				
Change in reserves for insurance contracts	74,798	(683,788)	78,712	1,138,300
Insurance claims paid	21,486	1,732,215	10,491	1,835,076
Separate account commission	38,769	1,011,716	46,013	929,362
Commission expense	92	29,411	51	26,865
Taxes and dues	223	14,693	-	10,598
Loss on disposal and valuation of securities	14,289	1,091,941	3,067	344,099
Loss on disposal and valuation of derivatives	36,108	299,140	41,398	163,918
Loss on exchange differences	2,474	2,065	91,699	4,262
Other expenses	436	72,749	252	59,112
Total	₩ 188,675	₩ 3,570,142	₩ 271,683	₩ 4,511,592

Revenues and expenses on performance-based trust accounts (variable insurance contract) are not reflected in the general account of the consolidated statements of comprehensive income. However, revenue and expenses on trust accounts guaranteeing the repayment of principal are accounted for as other income and expenses for financial business in the general account in the consolidated statements of comprehensive income.

(4) Separate account assets include equity securities amounting to ₩25,793 million (equivalent to $ million) and debt securities amounting to ₩159,901 million (equivalent to $ million) taken over from assignment ares provided as collateral in relation to derivative transactions of separate account as of December 31, 2018 (see Note 56).

(5) Restricted separate account assets as of December 31, 2018, are as follows:

	2018	
	Stocks	Bonds
	(In millions of Korean won)	
Total	₩ 25,793	₩ 159,901

Restricted separate account assets are provided as collateral in relation to derivative transactions of separate account.

39. NET DEFINED BENEFIT LIABILITIES (FINANCIAL BUSINESS):

(1) Details of net defined benefit liabilities as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Present value of defined benefit obligations	₩ 529,252	₩ 508,310
Fair value of plan assets	(355,849)	(354,921)
Net defined benefit liabilities	₩ 173,403	₩ 153,389

(2) Changes in the carrying amount of defined benefit obligations for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Beginning	₩ 508,310	₩ 510,276
Current service cost	53,798	56,523
Interest expense	19,531	17,672
Gain (loss) on settlement		
Remeasurements		
- Actuarial gains and losses arising from changes in demographic assumptions	-	-
- Actuarial gains and losses arising from changes in financial assumptions	19,194	(18,208)
- Actuarial gains and losses arising from experience adjustments	(5,337)	(3,314)
- Actuarial gains and losses arising from changes in adjustment of retirement age	49	-
Payments from plan	(56,136)	(55,201)
Others (*1)	(10,157)	562
Ending	₩ 529,252	₩ 508,310

(*1) Others include the impact of changes in consolidations scope, exchange gains and losses and transfer to and from affiliates.

(3) Changes in the fair value of plan assets for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Beginning	₩ 354,921	₩ 325,182
Interest income	15,925	13,478
Remeasurements (*1)	(9,872)	(8,659)
Contribution	50,861	85,918
Payments from plan	(41,456)	(49,636)
Others (*2)	(14,530)	(11,362)
Ending	₩ 355,849	₩ 354,921

(*1) The amount that is included in interest income is excluded.
(*2) Others include the impact of changes in consolidations scope, exchange gains and losses and transfer to and from affiliates.

(4) Amounts recognized in the consolidated statements of comprehensive income for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Current service cost	₩ 53,798	₩ 56,523
Net interest cost	19,531	17,672
Interest income of plan assets	(15,925)	(13,478)
Amounts recognized in the consolidated statements of comprehensive income (*1)	₩ 57,404	₩ 60,717

(*1) Entire expenses are included in 'cost of sales.'

(5) The principal actuarial assumptions as of December 31, 2018 and 2017, are as follows:

	2018	2017
Discount rate(%)	3.36–3.97	3.36–4.42
Salary growth rate(%)	3.06–5.62	3.68–5.36

(6) The sensitivity of the defined benefit obligations as of December 31, 2018, to changes in the weighted principal assumptions is as follows:

	Changes in principal assumption	Changes in liabilities
Discount rate	Increase of 1%	7.59% Decrease
	Decrease of 1%	8.69% Increase
Salary growth rate	Increase of 1%	8.71% Increase
	Decrease of 1%	7.75% Decrease

Because there is a correlation between actuarial assumptions, the sensitivity analysis above will not show actual changes in the defined benefit obligation, as changes in assumptions will not occur independently. Also, in the above sensitivity analysis, the present value of the defined benefit obligation was measured using the projected unit credit method applied to measure the defined benefit obligation in the consolidated financial statements.

(7) Plan assets as of December 31, 2018 and 2017, consist of the following:

	2018		2017	
	Amount	Composition	Amount	Composition
	(In millions of Korean won)			
Principal guaranteed financial instruments	₩ 354,706	99.68%	₩ 354,099	99.77%
Transferred to National Pension Fund	1,143	0.32%	822	0.23%
Total	₩ 355,849	100.00%	₩ 354,921	100.00%

(8) Expected maturity analysis of undiscounted pension benefits as of December 31, 2018, is as follows:

	Less than 1 year	Between 1 and 2 years	Between 2 and 5 years	More than 5 years
	(In millions of Korean won)			
Pension benefits	₩ 31,968	₩ 75,244	₩ 138,803	₩ 1,264,460

The weighted average duration of the defined benefit obligations is 4.03–13.50 years.

40. PROVISIONS (FINANCIAL BUSINESS):

Changes in the provisions for the years ended December 31, 2018 and 2017, are as follows:

	2018			
	Provision for rehabilitation	Provision for unused credit limit	Provision for others	Total
	(In millions of Korean won)			
Beginning	₩ 16,999	₩ 18	₩ 32,861	₩ 49,878
Increase	974	-	12,504	13,478
Used	(762)	-	(3,229)	(3,991)
Reversal	(680)	(99)	(60)	(839)
Other	595	216	(536)	275
Ending	₩ 17,126	₩ 135	₩ 41,540	₩ 58,801

	2017			
	Provision for rehabilitation	Provision for unused credit limit	Provision for others	Total
	(In millions of Korean won)			
Beginning	₩ 17,011	₩ 241	₩ 37,943	₩ 55,195
Increase	1,317	-	7,882	9,199
Used	(2,002)	(1)	(6,798)	(8,801)
Reversal	(350)	(222)	(3,867)	(4,439)
Other	1,023	-	(2,299)	(1,276)
Ending	₩ 16,999	₩ 18	₩ 32,861	₩ 49,878

41. OTHER FINANCIAL LIABILITIES (FINANCIAL BUSINESS):

(1) Details of other financial liabilities as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Insurance benefits payable	₩ 407,588	₩ 444,162
Accounts payable	466,220	501,882
Accrued expenses	376,168	388,746
Leasehold deposits received	97,555	137,077
Borrowings and debentures	4,115,504	3,668,745
Financial liabilities at FVTPL	1,972,055	1,214,882
Dividend payable	245	-
Others	249,064	108,042
Total	₩ 7,684,399	₩ 6,463,536

(2) Details of borrowings as of December 31, 2018 and 2017, are as follows:

Description	Creditor	Annual interest rate (%)	2018	2017
			(In millions of Korean won)	
Bonds sold under repurchase agreements	The Korea Securities Finance Corporation and others	0.10–3.29	₩ 2,021,505	₩ 2,380,519
Borrowings under securities finance	The Korea Securities Finance Corporation	1.92–2.31	427,666	434,784
Corporate paper	HI Investment & Securities Co. Ltd. and others	2.10–2.50	200,000	105,000
Electronic short-term bond	HI Investment & Securities Co. Ltd. and others	2.17–2.70	656,611	277,398
Loans on land and buildings	Samsung Fire & Marine Insurance Co., Ltd. and others	3.05–3.80	121,047	118,649
ABSTB	KB Bank and others	3.16-4.40	62,272	25,000
Net value			₩ 3,489,101	₩ 3,341,350

In addition, the Group provided property, plant and equipment and others as collateral for the above borrowings (see Note 56).

(3) Repayment schedules of borrowings for the year ended December 31, 2018, are as follows:

	Less than 1 year	Between 1 and 5 years	More than 5 years	Total
	(In millions of Korean won)			
Expected repayment amount	₩ 3,353,463	₩ 135,638	₩ -	₩ 3,489,101

(4) Details of debentures as of December 31, 2018 and 2017, are as follows:

	Description	Date of issue	Date of maturity	Interest rate (%)	2018	2017
					(In millions of Korean won)	
Hanwha General Insurance Co., Ltd.	7th Public subscription bond	2012.06.28	2019.06.28	5.80	₩ 90,000	₩ 90,000
	8th Public subscription bond	2016.06.07	2023.06.07	4.35	128,000	128,000
	11th Public subscription bond	2018.10.31	2028.10.31	4.50	350,000	-
Hanwha Investment & Securities Co., Ltd.	23-1st Public subscription bond	2013.04.09	2018.10.09	4.16	-	50,000
	23-2nd Public subscription bond	2013.04.09	2020.04.09	4.56	20,000	20,000
	24th Public subscription bond	2015.12.10	2021.12.10	5	40,000	40,000
	Total				628,000	328,000
Less: Present value discounts					(1,597)	(605)
	Net value				₩ 626,403	₩ 327,395

42. OTHER LIABILITIES (FINANCIAL BUSINESS):

Details of other liabilities as of December 31, 2018 and 2017, is as follows:

	2018	2017
	(In millions of Korean won)	
VAT payables	₩ 4,106	₩ 2,249
Advance receipts	17,964	17,668
Unearned revenues	12,920	9,044
Unearned insurance income	91,581	126,852
Others	33,970	25,249
Total	₩ 160,541	₩ 181,062

43. CAPITAL STOCK AND SHARE PREMIUM (CAPITAL SURPLUS):

(1) Capital stock as of December 31, 2018 and 2017, are as follows:

	Number of authorized shares	Number of stocks(issued)	Common stocks	2018	2017
				(In millions of Korean won)	
Common stocks		74,958,735	₩ 5,000	₩ 374,794	₩ 374,794
1st Preferred stocks(*1)		479,294	5,000	2,396	2,396
3rd Preferred stocks (*2)	200,000,000	22,472,000	5,000	112,360	112,360
Total				₩ 489,550	₩ 489,550

(*1) The 1st preferred stock, which is non-cumulative, is eligible to receive cash dividends, if declared, equal to that declared for common shares plus an additional 1%.

(*2) As of October 2016, the Company increased paid-in capital preferred stock without voting rights (22,472,000 shares).

(2) Share premium (capital surplus) as of December 31, 2018 and 2017, is as follows:

	2018	2017
	(In millions of Korean won)	
Share premium	₩ 342,536	₩ 342,536
Revaluation reserve	62,898	62,898
Other share premium	90,950	141,720
Total	₩ 496,385	₩ 547,154

44. CAPITAL ADJUSTMENT:

Capital adjustment as of December 31, 2018 and 2017, is as follows:

	2018	2017
	(In millions of Korean won)	
Treasury stock(*1)	₩ (20,751)	₩ (20,751)
Other capital adjustments	44,090	59,046
Total	₩ 23,339	₩ 38,295

(*1) As of December 31, 2018 and 2017, the number of treasury stocks is unchanged at 5,800,000 shares. Treasury stocks do not have voting rights according to the Commercial law.

45. ACCUMULATED OTHER COMPREHENSIVE INCOME:

Details of accumulated other comprehensive income as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Gain on valuation of AFS financial assets	₩ -	₩ (66,466)
Gain on valuation of held-to-maturity investments	-	326,336
Gain on valuation of debt instruments at FVTOCI	78,024	-
Gain on valuation of equity instruments at FVTOCI	(369,350)	-
Gain on valuation of financial liabilities at FVTPL designated(self-credit)	105	-
Loss on valuation of investment in associates	(26,446)	(30,987)
Gain on valuation of derivatives qualifying cash flow hedge	25,852	23,090
Translation of foreign currency financial statements	(155,829)	(146,243)
Accumulated other comprehensive income of separate accounts	11,089	(4,533)
Adjustment amount for profit or loss (overlay adjustment)	(47,592)	-
Total	₩ (484,146)	₩ 101,197

46. RETAINED EARNINGS:

Details of retained earnings as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Legal reserves(*1)	₩ 53,000	₩ 47,300
Discretionary reserves	1,231,133	1,244,467
Retained earnings before appropriation	2,376,124	2,073,329
Total	₩ 3,660,257	₩ 3,365,096

(*1) The Commercial Code of the Republic of Korea requires the Company to appropriate, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid, until such reserve equals 50% of its issued capital stock. The reserve is not available for the payment of cash dividends, but may be transferred to capital stock, or used to reduce accumulated deficit, if any, with the ratification of the Company's majority shareholder.

47. REVENUE:

(1) Details of non-financial business's revenue for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Finished goods	₩ 10,047,326	₩ 10,448,170
Merchandise	6,833,159	5,749,068
Construction	4,276,885	4,456,489
Service and others	2,360,389	2,104,539
Total	₩ 23,517,759	₩ 22,758,266

(2) Details of financial business's revenue for the years ended December 31, 2018 and 2017, are as follows:

		2018	2017
		(In millions of Korean won)	
Insurance income	Endowment insurance	₩ 2,188,854	₩ 2,306,560
	Term insurance	5,410,773	5,381,569
	Mixed insurance	1,635,997	1,890,089
	General	432,425	419,314
	Motor vehicles	835,374	836,322
	Long term	4,292,645	3,983,815
	Group insurance	97,591	98,211
	Subtotal	14,893,659	14,915,880
Reinsurance income		1,245,079	984,549
Other income	Commission income	309,976	272,628
	Interest income	3,286,524	3,212,894
	Investment operation income	3,853,178	6,753,938
	Other financial income	1,649,200	1,375,566
	Others	110,841	130,715
	Subtotal	9,209,719	11,745,741
Adjustment amount for profit or loss (overlay adjustment)		(126,063)	-
Total		₩ 25,222,394	₩ 27,646,170

(3) The details of financial assets and financial liabilities subject to the profit or loss adjustment approach at the end of December 31, 2018, are as follows:

		2018
		(In millions of Korean won)
Financial assets at FVTPL		
Deposits	₩	162,083
Equity securities		720,866
Debt securities		8,786,752
Derivative assets		2,107
Sub total		9,671,808
Financial liabilities at FVTPL		
Derivative liabilities		10,186
Sub total	₩	10,186

(4) The details of changes in profit or loss adjustment gains and losses for the year ended December 31 2018, are as follows:

		2018
		(In millions of Korean won)
Beginning balance	₩	130,387
Recognition of other comprehensive income from acquisition and retention		(133,813)
Reclassification of profit or loss due to current disposal		(95,114)
Recognition in other comprehensive income from profit or loss due to re-designation		-
Recognized in profit or loss from other comprehensive income resulting from the withdrawal of the designation		-
Ending balance	₩	(98,540)

(*) The above amount has been prepared post tax.

48. COST OF SALES:

(1) Details of non-financial business's cost of sales for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Finished goods	₩ 9,816,755	₩ 8,994,080
Merchandise	4,706,287	4,394,388
Construction	3,700,326	4,052,757
Service and others	1,982,098	1,932,694
Total	₩ 20,205,466	₩ 19,373,919

(2) Details of financial business's cost of sales for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Insurance claims paid	₩ 11,295,390	₩ 9,913,968
Business expenses	1,748,906	1,434,480
Responsibility reserve	4,289,371	5,239,420
Others	7,448,076	9,959,331
Adjustment amount for profit or loss (overlay adjustment)	(507,978)	-
Total	₩ 24,273,765	₩ 26,547,199

(3) Insurance claims paid of financial business for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Insurance expenses	₩ 3,733,183	₩ 3,169,214
Refund expenses	7,517,735	6,706,685
Dividend expenses	44,472	38,069
Total	₩ 11,295,390	₩ 9,913,968

(4) Business expenses of financial business for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Deferred policy acquisition costs	₩ 330,186	₩ 53,054
Wages and salaries	507,419	503,701
Severance benefits	54,420	57,558
Employee welfare	116,464	106,349
General administrative expense	317,316	310,656
Others	423,101	403,162
Total	₩ 1,748,906	₩ 1,434,480

49. SELLING AND ADMINISTRATIVE EXPENSES:

Details of selling and administrative expenses for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Salaries	₩ 690,616	₩ 651,956
Bad debts expenses	110,843	35,529
Freight and storage expenses	233,571	254,502
Commission expenses	267,268	212,062
Rental expenses	52,883	69,303
Depreciation (*1)	102,527	106,407
Amortization	75,522	55,649
Employees benefits	92,348	80,609
Severance benefits	76,004	73,211
Sales commission expenses	33,029	35,559
Advertising expenses	81,133	95,297
Taxes and dues	50,955	49,843
Entertainment expenses	22,740	16,128
Transportation fees	42,888	37,928
Outsourcing fees	69,929	42,648
Overseas branch maintenance fees	4,595	5,098
Insurance expenses	18,759	17,982
Others	429,164	484,676
Total	₩ 2,454,774	₩ 2,324,387

(*1) Depreciation of investment property is included.

50. EXPENSES BY NATURE:

Details of expenses by nature for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Changes in inventories (*1)	₩ (1,006,038)	₩ 192,301
Raw materials used	7,621,359	7,351,741
Merchandise purchased	4,912,547	4,482,396
Salaries and wages (*2)	3,094,020	3,301,411
Employee benefit	615,488	495,327
Rental expenses	279,946	470,477
Depreciation (*3)	805,157	790,073
Amortization	156,320	130,474
Taxes and dues	327,984	322,454
Research and development	230,026	290,205
Responsibility reserve	4,289,371	5,239,420
Insurance expenses	3,733,184	3,169,214
Refund expenses	7,517,735	6,706,685
Dividend expense	44,472	38,069
Other expenses	14,312,435	15,265,258
Total(*4)	₩ 46,934,006	₩ 48,245,505

(*1) Changes in raw materials are excluded.
(*2) Severance benefits are included.
(*3) Depreciation of investment property is included.
(*4) The amount before adjustment amount for profit or loss (overlay adjustment) is deducted.

51. OTHER GAINS AND LOSSES:

(1) Details of other gains for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Gains on foreign currency transaction and translation	₩ 387,591	₩ 599,352
Gains on transactions of derivatives	69,916	62,626
Gains on valuation of derivatives	52,081	20,512
Gains on valuation of financial assets at FVTPL	4,896	-
Gains on disposal of financial assets at FVTPL	80	-
Gains on disposal of financial assets at FVTOCI	-	-
Others	327,578	234,404
Total	₩ 842,142	₩ 916,894

(2) Details of other losses for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Losses on foreign currency transaction and translation	₩ 467,363	₩ 583,822
Losses on transaction of derivatives	84,200	51,630
Losses on valuation of derivatives	10,640	49,990
Commission	36,857	9,673
Losses on disposal of associate investment stock	60,228	-
Losses on valuation of financial assets at FVTPL	21,077	-
Losses on disposal of financial assets at FVTPL	16	-
Losses on disposal of financial assets at FVTOCI	61	-
Others	744,954	591,946
Total	₩ 1,425,396	₩ 1,287,061

52. FINANCE INCOME AND COSTS:

(1) Details of finance income for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Finance income - Interest income according to the effective interest rate method		
Financial assets at amortized cost, etc.	₩ 5,662	₩ -
Finance income - others		-
Cash and cash equivalents, advance deposit, etc.	33,637	24,553
Financial assets at amortized cost, etc.	2,023	-
Loans and receivables	-	2,350
Others	16,372	2,998
Dividend income	17,500	7,447
Total	₩ 75,194	₩ 37,348

(2) Details of finance costs for the years ended December 31, 2018 and 2017, are as follows:

A. Finance costs (interest expense)

	2018	2017
	(In millions of Korean won)	
Interest expense		
Borrowings and debentures	₩ 368,600	₩ 356,658
Others	43,055	47,007
Sub total	411,655	403,665
Less: Amounts on qualifying assets capitalized(*1)	(15,256)	(18,387)
Total	₩ 396,399	₩ 385,278

(*1) Borrowing costs were capitalized at the weighted average rate of 2.63%–4.95% (2017: 2.31%–5.50%) for the year ended December 31, 2018.

B. Finance costs (amortization expense on financial liabilities)

	2018	2017
	(In millions of Korean won)	
Amortization expense on financial liabilities	₩ 22,680	₩ 28,158

53. INCOME TAX EXPENSES AND DEFERRED INCOME TAX:

(1) Income tax expense for the years ended December 31, 2018 and 2017, consists of the following:

	2018	2017
	(In millions of Korean won)	
Current tax		
Current tax on profits for the year	₩ 711,634	₩ 390,054
Adjustments in respect of prior years	3,903	8,930
	715,537	398,984
Deferred tax		
Increase (decrease) in temporary differences	(417,757)	152,498
Impact of change in tax rate	15	6,960
	(417,742)	159,458
Income tax effect charged directly to equity	214,570	94,304
Changes in scope of consolidation	(11,865)	31,462
Income tax expense	₩ 500,500	₩ 684,208

(2) The income taxes charged directly to equity for the years ended December 31, 2018 and 2017, are as follows:

	2018			2017		
	Before tax	Tax effect	After tax	Before tax	Tax effect	After tax
	(In millions of Korean won)					
Gain (loss) on valuation of FVTOCI financial securities	₩ (184,328)	₩ 64,769	₩ (119,559)	₩ -	₩ -	₩ -
Gain (loss) on valuation of AFS financial securities	-	-	-	(483,200)	328,468	(154,732)
Gain (loss) on valuation of HTM financial securities	-	-	-	184,723	(260,987)	(76,264)
Gain (loss) on valuation of investments in associates	11,449	(1,482)	9,967	(31,277)	3,894	(27,383)
Gain (loss) on valuation of derivatives qualifying cash flow hedge	₩ 8,260	₩ (1,920)	₩ 6,340	₩ 14,275	₩ (4,902)	₩ 9,373
Translation of foreign currency financial statements	(5,180)	(5,741)	(10,921)	(87,427)	22,365	(65,062)
Remeasurements of the net defined benefit liability	(90,619)	24,134	(66,485)	55,514	(14,479)	41,035
Other comprehensive income of separate accounts	46,064	(10,771)	35,293	(59,671)	19,945	(39,726)
Gain (loss) on valuation of FVTPL financial liability (credit risk fluctuation)	1,223	(358)	865	-	-	-
Adjustment amount for profit or loss (overlay adjustment)	(260,085)	31,158	(228,927)	-	-	-
Total	₩ (473,216)	₩ 99,789	₩ (373,427)	₩ (407,063)	₩ 94,304	₩ (312,759)

(3) The differences between profit before tax and income tax expense for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Profit before tax	₩ 1,299,841	₩ 1,995,145
Tax calculated at tax rates applicable to profits	467,656	623,991
Adjustments:		
Income not subject to tax	(89,105)	(48,386)
Expenses not deductible for tax purposes	40,455	20,319
Tax credit and tax reduction	(25,529)	(52,574)
Impact of change in tax rate	(3,007)	13,725
Others	110,031	127,133
Income tax expense	₩ 500,501	₩ 684,208
Average effective tax rate	38.5%	34%

(*) As of the end of the reporting period, the legal tax rate is applied differently by each tax authority for the profits of the consolidated company.

(4) Changes in deferred income tax account for the years ended December 31, 2018 and 2017, are as follows:

	2018				
	Beginning	Charged to profit or loss	Charged to OCI	Others	Ending
	(In millions of Korean won)				
Trade receivables	₩ 343,468	₩ (43,791)	₩ -	₩ 1,564	₩ 301,241
Accumulated deficit and others	120,655	(15,610)	-	7,800	112,845
Appropriated retained earnings	240,642	11,199	-	-	251,841
Inventories	8,656	3,932	-	(421)	12,167
Securities	(97,991)	23,443	367,225	(332)	292,345
Revaluation reserve	(163,716)	16,113	-	-	(147,603)
Accrued income	(61,795)	3,555	-	-	(58,240)
Gain on business split-off	(38,198)	-	-	-	(38,198)
Investments in subsidiaries and others	(1,135,246)	(80,687)	(22,742)	(4,195)	(1,242,869)
Others	(651,347)	345,252	18,681	(32,299)	(319,714)
Total	₩ (1,434,872)	₩ 263,406	₩ 363,164	₩ (27,883)	₩ (836,185)

	2017				
	Beginning	Charged to profit or loss	Charged to OCI	Others	Ending
	(In millions of Korean won)				
Trade receivables	₩ 362,667	₩ (19,199)	₩ -	₩ -	₩ 343,468
Accumulated deficit and others	174,844	(54,189)	-	-	120,655
Appropriated retained earnings	242,123	(1,481)	-	-	240,642
Inventories	8,060	596	-	-	8,656
Securities	(579,820)	461,400	20,429	-	(97,991)
Revaluation reserve	(163,750)	34	-	-	(163,716)
Accrued income	(68,181)	6,386	-	-	(61,795)
Gain on business split-off	(38,198)	-	-	-	(38,198)
Investments in subsidiaries and others	(1,109,976)	(61,125)	35,855	-	(1,135,246)
Others	(184,491)	(450,219)	(13,739)	(2,898)	(651,347)
Total	₩ (1,356,722)	₩ (117,797)	₩ 42,545	₩ (2,898)	₩ (1,434,872)

54. EARNING PER SHARE:

(1) Profits attributable to common shares and 1st preferred shares for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Profit for the year	₩ 468,400	₩ 405,379
Dividend to 3rd preferred share	(13,371)	(14,517)
Profit attributable to common shares and 1st preferred shares	₩ 455,029	₩ 390,862

(2) Basic earnings per share for the years ended December 31, 2018 and 2017, are as follows:

	2018		2017	
	Common shares	1st preferred shares (*2)	Common shares	1st preferred shares (*2)
	(In millions of Korean won)			
Profit attributable to equity holders of the Company	₩ 451,870	₩ 3,159	₩ 388,145	₩ 2,717
Weighted-average number of ordinary shares in issue	69,078,735	479,294	69,078,735	479,294
Basic earnings per share (*1)	₩ 6,541	₩ 6,591	₩ 5,619	₩ 5,669

(*1) Basic earnings per share from continuing operations of 2018 and 2017 are identical to basic earnings per share.

(*2) Preferred shares are issued under the former commercial law before amendments in 1997. These preferred shares hold the same priority as common shares in terms of dividend pay-out and distribution of residual properties, thus earnings per share were calculated accordingly.

A. For the years ended December 31, 2018 and 2017, there was no adjustment for the number of ordinary shares in issue; thus, the weighted-average number of common stocks in issue is identical to the number of issued shares at the beginning.

The Group did not issue potential ordinary shares. Therefore, basic earnings per share are identical to diluted earnings per share.

55. RELATED-PARTY TRANSACTIONS:

(1) Lists of the Group's related parties as of December 31, 2018, are as follows:

	Company
Associates and joint venture	Yeochun NCC Co., Ltd., Hanwha General Chemical Co., Ltd., Jeju Ocean Science Museum Corporation, Bio Green Technology Sdn Bhd, Gulf Advanced Cables Insulation Company and others
Large-scale business group affiliates (*1)	H-Solution, Hanwha Energy Corporation, Hanwha Total Petrochemical Co., Ltd. and others

(*1) Large-scale business group affiliates (other related parties) do not correspond to the related parties defined in paragraph 9 of K-IFRS 1024. However, the large-scale business group affiliation designated by the Fair Trade Commission is a company classified as a related party in accordance with the resolution of the Securities and Futures Commission as a related party in accordance with the substantive relationship stipulated in paragraph 10 of K-IFRS 1024.

(2) Details of receivables and payables arising from transaction with related parties, including large-scale business group affiliates, as of December 31, 2018 and 2017, are as follows:

	2018					
	Receivables			Payables.		
	Trade receivables	Other receivables	Loans(*2)	Trade payables	Other payables	Borrowings
	(In millions of Korean won)					
Associates and joint venture						
Galleriaforet Corp. (*1)	₩ 46,287	₩ -	₩ 1,500	₩ -	₩ -	₩ -
Yeochun NCC Co., Ltd.	38,709	1,022	-	211,100	67,158	-
Jeju Ocean Science Museum Corporation	1,113	-	-	-	6,455	-
The Ulsan Harbour Bridge	-	-	-	-	133	-
WONJU GREEN CORP.	2,769	-	-	-	-	-
Hanwha General Chemical Co., Ltd.	2,050	61	-	2,713	69,481	-
Sermatech Korea Co., Ltd	14	12	-	1,816	5,131	-
Daehan 5 Newstay Consignment Managemnet real estate Investment Co., Ltd.	-	-	31,552	-	3,981	-
Arabia One For Clean Energy Investments PSC	-	-	558	-	-	-
Bio Green Technology Sdn Bhd(*5)	-	444	624	91	-	-
Enfinity Philippines Renewable Resources Fourth, Inc.	-	-	12,510	-	-	-
Gulf Advanced Cables Insulation Company	-	632	15,733	-	-	-
International Polymers Company	-	1,695	-	29,674	-	-
Saudi Specialized Products Company	-	196	15,839	-	-	-
Others	263	1,301	274,776	39	2,013	3,036
Large-scale business group affiliates						
Hanwha Energy Corporation	938	8	-	12,024	4,699	-
HANWHA TOTAL PETROCHEMICAL CO., LTD.	42,440	5,387	-	9,286	156,286	-
Q Solar A G.K..	-	-	-	-	1,609	-
SIT Co., Ltd.	34	-	-	1,295	-	-
Hanwha Energy Corporation Japan	-	113	17,306	-	7	-
Others	18,742	312	-	1,060	10,093	-
Total	₩ 153,360	₩ 11,184	₩ 370,399	₩ 269,100	₩ 327,046	₩ 3,036

(*1) As of December 31, 2018, the Company sets up a full provision against receivables from construction contract.

(*2) Accrued revenue for the loan is included.

(*3) Taekyung Chemical Co., Ltd. was excluded from the scope of related parties due to liquidation

(*4) HANWHA Q CELLS Korea Corp and Hanwha Q CELLS Americas Holdings. Corp. were excluded from the scope of related parties due to changes in scope of consolidation

(*5) As of December 31, 2018, the Company sets up a full provision against loans.

	2017					
	Receivables			Payables.		
	Trade receivables	Other receivables	Loans(*2)	Trade payables	Other payables	Borrowings
	(In millions of Korean won)					
Associates and joint venture						
Galleriaforet Corp.(*1)	₩ 46,287	₩ -	₩ -	₩ -	₩ -	₩ -
Yeochun NCC Co., Ltd.	6,216	1,695	-	332,023	30,694	-
Jeju Ocean Science Museum Corporation	2,185	-	-	-	99	-
The Ulsan Harbour Bridge	7,758	-	-	-	1,419	-
WONJU GREEN CORP.	2,457	302	-	-	-	-
Hanwha General Chemical Co., Ltd.	1,135	155	-	2,475	26,210	1,520
Hanwha Q CELLS Korea	107,196	15,429	-	209,529	13,022	-
Sermatech Korea Co., Ltd.	15	11	-	3,139	4,771	-
Daehan 5 Newstay Consignment Managemnet real estate Investment Co., Ltd.	-	3,329	12,941	-	-	-
Bio Green Technology Sdn Bhd.	-	628	569	96	-	-
Gulf Advanced Cables Insulation Company	-	470	14,775	-	-	-
International Polymers Company	-	1,361	9,487	32,796	-	-
Saudi Specialized Products Company	291	249	10,418	-	-	-
Arabia One For Clean Energy Investments PSC	-	661	874	-	-	-
Others	120	812	286,921	89	2,235	-
Large-scale business group affiliates						
Taekyung Chemical Co., Ltd.	2,222	-	-	-	766	-
Hanwha Energy Corporation	8,406	35	-	15,504	18,619	-
HANWHA S&C Co., Ltd.	295	688	-	12,275	40,316	-
HANWHA TOTAL PETROCHEMICAL CO., LTD.	17,670	10,021	-	11,067	192,312	-
Hanwha Q CELLS Americas Holdings Corp.	79,901	4	-	-	140	-
Q Solar A G.K.	-	-	-	-	31,287	-
SIT Co., Ltd.	3	177	-	3,916	-	-
Others	130	22	3,831	451	1,041	-
Total	₩ 282,287	₩ 36,049	₩ 339,816	₩ 623,360	₩ 362,931	₩ 1,520

(*1) As of December 31, 2017, the Company sets up a full provision against receivables from construction contract.

(*2) Accrued revenue for the loan is included.

(3) Details of transactions with related parties, including large-scale business group affiliates, for the years ended December 31, 2018 and 2017, are as follows:

	2018				
	Sales, etc.			Purchases, etc.	
	Sales	Other income	Proceeds from disposal of PPE	Purchases	Other expenses
	(In millions of Korean won)				
Associates and joint venture					
Gyeongju Enviro Co., Ltd.	₩ 1,101	₩ -	₩ -	₩ -	₩ -
Yeochun NCC Co., Ltd.	250,018	19	-	1,761,041	1,289
Jeju Ocean Science Museum Corporation	6,809	-	-	1,027	197
The Ulsan Harbour Bridge	2,235	-	-	7	-
Hanwha General Chemical Co., Ltd.	17,430	1	-	29,835	1,614
Hanwha Q CELLS Korea(*1)	295,749	11	-	820,081	-
Sermatech Korea Co., Ltd.	193	1,664	-	21,688	7
Daehan 5 Newstay Consignment Management real estate Investment Co., Ltd.	90,456	-	-	-	-
A&D Credit Information Co., Ltd.	-	49	-	7,847	-
Bio Green Technology Sdn Bhd	-	31	-	690	-
International Polymers Company	-	74	-	155,008	3
Others	20,091	9,095	-	2,379	1
Large-scale business group affiliates					
Taekyung Chemical Co., Ltd. (*2)	₩ 49,239	₩ -	₩ -	₩ 10	₩ -
Hanwha Energy Corporation	42,801	2	314	163,123	1,152
H-Solution	263	5	-	34	-
HANWHA S&C Co., Ltd.(*3)	5,592	8	-	71,297	79,369
HANWHA TOTAL PETROCHEMICAL CO., LTD.	503,027	12	-	264,564	83
Daiichi Q Solar G.K.	13,159	-	-	-	-
Daiyon Q Solar G.K.	5,537	-	-	-	-
Hanwha Q CELLS Americas Holdings. Corp.(*4)	36,774	292	-	30,084	569
TRI ENERGY GLOBAL PTE. LTD.	341	-	-	-	-
Others	66,705	581	-	10,774	2,026
Total	₩ 1,400,520	₩ 11,844	₩ 314	₩ 3,339,489	₩ 86,310

(*1) Since HANWHA Q CELLS Korea Corp. merged into Hanwha Q CELLS & Advanced Materials Corporation on November 1, the transaction details are from January 1 to October 31.

(*2) Taekyung Chemical Co., Ltd. was excluded from the scope of related parties as of December 13, and transaction details are from January 1 to December 13.

(*3) Since HANWHA S&C CO., LTD. merged into Hanwha System Corporation on August 1, the transaction details are from January 1 to July 31.

(*4) Since Hanwha Q CELLS Americas Holdings. included in the scope of related parties as of November 1, the transaction details are from January 1 to October 31.

	2017											
	Sales, etc.						Purchases, etc.					
		Sales		Other income		Proceeds from disposal of PPE		Purchases		Other expenses		Acquisition of PPE
	(In millions of Korean won)											
Associates and joint venture												
Yeochun NCC Co., Ltd.	₩	243,250	₩	-	₩	-	₩	1,519,309	₩	596	₩	-
Jeju Ocean Science Museum Corporation		11,996		-		-		1,242		224		-
The Ulsan Harbour Bridge		84		-		-		-		-		-
WONJU GREEN CORP.		2,207		-		-		-		-		-
Hanwha General Chemical Co., Ltd.		12,143		1		-		24,934		1,421		421
Hanwha Q CELLS Korea		657,457		291		20,869		733,481		2,078		-
Sermatech Korea Co., Ltd.		159		1,502		-		18,683		8		-
Daehan 5 Newstay Consignment Management real estate Investment Co., Ltd.		72,716		-		-		-		-		-
Bio Green Technology Sdn Bhd		-		20		-		8,346		-		-
Gulf Advanced Cables Insulation Company		-		383		-		-		-		-
International Polymers Company		-		313		-		162,266		-		-
Saudi Specialized Products Company		1,120		241		-		-		-		-
Arabia One For Clean Energy Investments PSC		2,362		-		-		-		-		-
Others		18,983		8,658		-		11,627		-		-
Large-scale business group affiliates												
Taekyung Chemical Co., Ltd.	₩	60,496	₩	-	₩	-	₩	8	₩	-	₩	-
Hanwha Energy Corporation		75,130		20		-		156,053		75		-
H-Solution (formerly, Hanwha S&C Co., Ltd.)		5,405		7		-		101,707		90,199		-
Hanwha S&C		1,539		2		-		33,859		34,385		-
HANWHA TOTAL PETROCHEMICAL CO., LTD.		185,374		5		-		190,025		103		-
Hanwha Q CELLS Americas Holdings. Corp.		124,216		1,553		-		261		764		-
SIT Co., Ltd.		155		1		-		9,909		182		-
Others		22,225		882		-		4,019		2,799		-
Total	₩	1,497,017	₩	13,879	₩	20,869	₩	2,975,729	₩	132,834	₩	421

(4) Changes in loans to related parties for the years ended December 31, 2018 and 2017, are as follows:

		2018					
	Related Parties	Beginning	Increase	Decrease	Changes in scope of consolidation	Others(*1)	Ending
		(In millions of Korean won)					
Associates and joint venture	Gulf Advanced Cables Insulation Company	₩ 14,775	₩ -	₩ -	₩ -	₩ 958	₩ 15,733
	International Polymers Company	9,487	-	(8,260)	-	(1,227)	-
	Saudi Specialized Products Company	10,418	4,681	-	-	740	15,839
	Crystal Solar Inc.(*2)	1,802	1,658	(1,600)	-	195	2,055
	Bio Green Technology Sdn Bhd.(*2)	569	31	-	-	23	624
	Galleriaforet Corp.	-	9,700	(8,200)	-	-	1,500
	Enfinity Philippines Renewable Resources Fourth, Inc.(*3)	-	-	-	12,510	-	12,510
	Luxbon Solar S.A.(*2)	-	-	-	8,583	-	8,583
	Others	298,934	18,612	(19,699)	-	(1,598)	296,249
Large-scale business group affiliates	Primo Gunes Enerjisi A.S.	3,831	-	(2,447)	-	(1,384)	-
	Hanwha Energy Corporation Japan	-	17,306	-	-	-	17,306

(*1) Changes in loans to related parties include accrued interest income.
(*2) As of December 31, 2018, the Company sets up a full provision against loans.
(*3) This is a loan that transferred to the scope of consolidation since HANWHA Q CELLS Korea Corp. merged into HanwhaQ CELLS & Advanced Materials Corporation for the year ended December 31, 2018.

	Related parties	2017 Beginning	Increase	Decrease	Others(*1)	Ending
		(In millions of Korean won)				
Associates and joint venture	Gulf Advanced Cables Insulation Company	₩ 24,007	₩ -	₩ (6,026)	₩ (3,206)	₩ 14,775
	International Polymers Company	10,383	-	-	(896)	9,487
	Saudi Specialized Products Company	9,513	1,897	-	(992)	10,418
	Crystal Solar	1,849	-	-	(47)	1,802
	Bio Green Technology Sdn Bhd.	805	17	(174)	(79)	569
	The Ulsan Harbour Bridge	-	25,164	(25,164)	-	-
	Others	300,204	53,815	(54,269)	(816)	298,934
Large-scale business group affiliates	Hanwha Q CELLS USA Corp.	20,144	-	(17,953)	(2,191)	-
	Primo Gunes Enerjisi A.S.	3,728	-	-	103	3,831
	HW SOLAR POWER 2 G.K.	-	5,143	(5,143)	-	-

(*1) Changes in loans to related parties include accrued interest income.

(5) Changes in borrowings to related parties for the years ended December 31, 2018 and 2017, are as follows:

	Related parties	2018 Beginning	Increase	Decrease	Others	Ending
		(In millions of Korean won)				
Associates and joint venture	Hanwha General Chemical Co., Ltd.	₩ 1,520	₩ 79,226	₩ (80,746)	₩ -	₩ -
	Hanwha Susung Special Purpose Acquisition	-	1,014	-	-	1,014
	Hanwha Ace Special Purpose Acquisition 3rd CO., LTD	-	1,011	-	-	1,011
	Hanwha Ace Special Purpose Acquisition 4th CO., LTD	-	1,011	-	-	1,011

	Related parties	2017 Beginning	Increase	Decrease	Others(*1)	Ending
		(In millions of Korean won)				
Associates and joint venture	Hanwha General Chemical Co., Ltd.	₩ -	₩ 1,520	₩ -	₩ -	₩ 1,520
	Hanwha MGI Special Purpose Acquisition(*2)	1,529	1,533	(3,062)	-	-
	Hanwha ACPC Special Purpose Acquisition(*2)	2,000	4,000	(6,000)	-	-
Large-scale business group affiliates	Primo Gunes Enerjisi A.S.	85	-	(75)	(10)	-

(*1) Changes in loans to related parties include accrued interest income.
(*2) Excluded from related parties due to liquidation for the year ended December 31, 2017.

(6) Details of equity contributions in cash to related parties for the years ended December 31, 2018 and 2017, are as follows:

	Transaction	Related parties	2018 (In millions of Korean won)
Associates and joint venture	Capital increase	P&W NGPF Manufacturing Company Singapore PTE. LTD.	₩ 4,492
		Daehan 5 Newstay Consignment Management real estate Investment Co., Ltd.	78,063
		KDB Asia Private equity investment	3,116
		AI Alliance LLC	2,204
		PBA-HANWHA ROBOTICS PTE. LTD.	392
		Hanwha Kalyon Gunes Enerjisi Uretim Anonim Sirketi	26,008
	Capital decrease	Seoul Global Bio Medical New Growth Power Investment Fund	3,552
		Air Innovation Korea Corp.	8,749
		2011 KIF-Hanwha IT specialty Investment Fund	2,880
		1st Science Technology Private Equity Fund	2,170
		KoFC Kyobo Hanwha Growth Champ 2010-6 Private Investment Company	500
	Disposal of shares	Hanwha Hawaii LLC and others	35,934
		Kyoungju environment Corp	4,457

	Transaction	Related parties	2017 (In millions of Korean won)
Associates and joint venture	Capital increase	P&W NGPF Manufacturing Company Singapore PTE. LTD.	₩ 9,271
		Gyeonggi-E&W Ring Road Corp.	2,300
		Gulf Advanced Cables Insulation Company	7,197
		Sino Korea Life Insurance. co, Ltd(China)	40,900
		KDB Asia Private equity investment	1,426
		Hanwha Kalyon Gunes Teknolojiler Uretim Anonim Sitketi	21,872
		Hanwha Kalyon Gunes Enerjisi Uretim Anonim Sirketi	6,065
	Capital decrease	KoFC Kyobo Hanwha Growth Champ 2010-6 Private Investment Company	1,125
		Seoul Global Bio Medical New Growth Power Investment Fund	2,496
		1st Science Technology Private Equity Fund	132
		KoFC Posco Hanwha KB Growth Private Equity Fund No. 2	8,757
	Disposal of shares	09-4 Hanwha Venture Investment Fund	1,238
		KoFC-Hanwha Pioneer Champ 2010-No. 14 Investment Fund	337
		KoFC-Hanwha Pioneer Champ 2011-No. 10 Investment Fund	1,576

(7) Details of payment guarantees provided by the Group for a related party as of December 31,2018, are as follows:

	Guarantee	Guaranteed amount		Purpose of Payment guarantee
	(In thousands of USD and JPY and in millions of Korean won)			
Associates and joint venture	Gulf Advanced Cables Insulation Company	USD	7,333	Financial institution borrowings
	International Polymers Company	USD	24,000	
	Saudi Specialized Products Company	USD	4,347	
	Burdur Enerji A.S.	USD	40,000	
	Alterpower Specialist, Inc	USD	1,000	
	Enfinity Philippines Renewable Resources Fourth, Inc.	USD	52,000	
	Daehan 5 Newstay Consignment Management real estate Investment Co., Ltd.	KRW	133,000	Contract performance guarantee
	Seoul Global Bio Medical New Growth Power Investment Fund	KRW	462	
Large-scale business group affiliates	HW Solar Power 1 G.K.	JPY	382,666	Financial institution borrowings
	HW Solar Power 4 G.K.	JPY	653,334	
	HW Solar Power 5 G.K.	JPY	161,328	Facility leasing
	HW Solar Power 7 G.K.	JPY	203,356	
	HW Solar Power 9 G.K.	JPY	317,654	
	HW Solar Power 10 G.K.	JPY	377,498	
	HW Solar Power 13 G.K.	JPY	108,644	
	HW Solar Power 26 G.K.	JPY	352,000	
	Employees	KRW	23,769	Loans for housing

(8) Details of collateral provided by the Group for the funding sources of related parties as of December 31, 2018, are as follows:

		Pledged asset	Book value	Maximum collateral	Mortgagee
			(In millions of Korean won)		
Associates and joint venture	Gyungbook Eco, Edu Co., Ltd	Shares	₩ 362	₩ 49,598	KBTL
	Ulsan Harbor Bridge Co., Ltd.	Shares	3,537	351,000	Kookmin Bank and others
	Wonju Green Corporation	Shares	754	54,860	Nonghyup Bank and others
	Jeju Ocean Science Museum Corporation	Shares	956	148,745	Jeju Ocean Science Museum Private Special Asset Trust Security I, Nonghyup Bank

(9) Details of cash deficiency support agreements provided by the Group for related parties as of December 31, 2018, are as follows:

		Type of Business	Amount	
		(In millions of Korean won and in thousands of EUR)		
Associates and joint venture	Luxbon Solar S.A.	Operation and Modular Supply of Solar Power Plants in Portugal	EUR	18,977
	Wonju Green Corporation	SOC	KRW	9,400
	Jeju Ocean Science Museum Corporation	SOC	KRW	53,984

Additional losses may occur in relation to the above arrangements, but these effects were not reflected in the consolidated financial statements at the end of the current term because they are not likely to be incurred.

(10) As of the end of the current term, the consolidation entity is required to provide funds for the amount that is insufficient to repay the principal of the loan with termination notice or purchase value if the agreement is terminated or a purchase claim is made from the competent authority in connection with SOC projects by the related parties below.

		Type of Business
Associates and joint venture	Gyungbook Eco, Edu Co., Ltd	SOC
	Wonju Green Corporation.	SOC
	Ulsan Harbor Bridge Co., Ltd.	SOC
	Jeju Ocean Science Museum Corporation	SOC

(11) The key management compensation for the years ended December 31, 2018 and 2017, consists of the following:

	2018	2017
	(In millions of Korean won)	
Salaries and other short-term employee benefits	₩ 131,046	₩ 120,372
Retirement benefits	25,677	23,194
Other long-term benefits	73	33

56. COMMITMENTS AND CONTINGENCIES:

(1) The outstanding borrowing agreements with banks as of December 31, 2018, are as follows:

	Limit	
	Currency	Amount
	(In millions of Korean won and in thousands of foreign currency)	
Bank overdraft	KRW	740,100
	USD	81,714
	EUR	7,000
	THB	30,000
Usance-related import	USD	790,340
	JPY	1,950,000
D/A, D/P, local and foreign trade-related export	KRW	382,000
	USD	455,243
	THB	70,000
Other borrowings	KRW	5,916,246
	USD	1,894,704
	EUR	47,000
	JPY	7,314,933
	CNY	2,873,466
	THB	90,000
	CZK	1,183,350
	MYR	597,231
	VND	134,400
	MXN	90,000

(2) As of December 31, 2018, 14 blank promissory notes, 25 blank checks, 25 promissory notes amounting to ₩72,592 million and one check amounting to ₩3,000 million have been provided as collaterals for short-term and long-term debts, agreements for discounting notes receivable, performance guarantees and others.

(3) Payment guarantees provided for others as of December 31, 2018, are as follows:

Guarantees received	Breakdown of guarantee	Amount	
(In millions of Korean won and in thousands of foreign currency)			
Vendee in lot sale contracts	Joint surety of loan	KRW	1,571,059
Operation developers	Developer's lot sale guarantee	KRW	2,088,821
Private business places of authorized offices	Performance guarantee	KRW	6,564
Woori bank and others	Credit guarantees	KRW	678,578
Construction Guarantee Korea	Performance guarantees	KRW	52,692
Korea Aerospace Industries, Ltd.	Performance guarantees	KRW	16,294
LIG NEX1	Performance guarantees	KRW	19
KB bank and others	Payment guarantee	KRW	65,000
DGB bank and others	Payment guarantee	USD	10,000
KDB bank and others	Payment guarantee	KRW	16,000
Shinhan bank and others	Payment guarantee	USD	50,000

(*1) The maximum exposure to credit risk is identical to the maximum value of guarantee provided as of December 31, 2018.

(*2) The Group has provided financial guarantee and others for related parties as of December 31, 2018 (see Note 55).

In addition to above guarantees, the Group invested in S-Y Highway Co., Ltd. and 44 investees for private sector investment projects and environmental water-treatment projects under the Act on Private Investment for Social Overhead Capital. As of December 31, 2018, the Group provides Financial assets at FVTPL to ₩84,348 million (equivalent to $75 million) as the right of pledge to the lenders of investees. Further, the Group provides investment securities in associates as collateral for financing related parties (see Note 55).

(4) Credit guarantees provided to others on PF

(a) Details of credit guarantees provided by the Group to developers for their borrowings as of December 31, 2018 and 2017, are as follows:

	2018		2017	
	Guarantee balances	Loan balances	Guarantee balances	Loan balances
	(In millions of Korean won)			
ABCP	₩ 40,000	₩ 40,000	₩ 78,990	₩ 72,300
ABSTB	429,500	356,500	417,500	346,000
Other PF loan	120,162	120,198	497,249	411,449
Total	₩ 589,662	₩ 517,418	₩ 993,739	₩ 829,749

(b) Details of outstanding balances of major projects as of December 31, 2018, are as follows:

Customer	Lender	PF balances (In millions of Korean won)		Loan period	Progress	Description
Classeville(*1)	Korea Investment & Securities Co., Ltd. and 4 others	Loan: ABSTB:	37,200 80,000	2016.06.01–2019.06.02 2017.11.10–2019.02.08	Completion	Refunding
Galleriaforet Corp. (*1)	HI SECURITIES CO., LTD.	ABSTB:	57,000	2018.08.23–2019.02.23	Completion	Refunding
Metta DND Co., Ltd. (*1)	KDB Capital Corp. and 3 others	Loan:	40,000	2017.10.31–2019.11.02	Construction commencement	New loan
Woorim moonhwasa (*2)	YOOJIN INVESTMENT SECURITIES Co., Ltd.	ABSTB: ABCP:	29,500 40,000	2018.08.02–2019.07.31 2018.08.02-2019.01.31	Before construction commencement	Refunding
Joong Woo Construction Co., Ltd(*1)	Korea Investment & Securities Co., Ltd. and 3 others	ABSTB:	190,000	2018.11.23–2019.02.23	Before construction commencement	Refunding
Housing Redevelopment. Reconstruction Union for Doma 8th complex(*1) and others	Woori Bank and 2 others	Loan:	43,718	2018.05.31–2022.08.31	Before construction commencement	New loan
Total		₩	602,749			

(c) The Group provides conditioned contract of debt assumption amounting to ₩1,097,403 million for First E Development Co. and 19 others as of December 31, 2018.

(5) Guarantees provided to the Company as of December 31, 2018, are as follows:

Guarantor	Breakdown of guarantee	Amount	
	(In millions of Korean won and in thousands of foreign currency)		
Construction Guarantee Cooperative	Guarantees for construction and housing sale	KRW	2,296,069
Korea Trade Insurance Corporation	BOND Guarantees about overseas construction	USD	8,500
Daegu bank	Guarantees for debentures	USD	10,000
Korea Defense Industry association	Performance guarantees	KRW	4,040,004
Seoul Guarantee Insurance Co., Ltd.	Performance guarantees and others	KRW	1,892,944
		USD	19,905
		EUR	7
Software Guarantee Insurance	Performance guarantees	KRW	127,960
Engineering Guarantee Insurance	Performance guarantees	KRW	150,634
Korea Housing & Urban Guarantee Corporation	Guarantees for construction and housing sale	KRW	3,023,617
Korea Federation of Small and Medium Business	Performance guarantees	KRW	137,654
		USD	10,000
Kookmin bank	BOND Guarantees about overseas construction	USD	134,500
Korea Development Bank	BOND Guarantees about overseas construction and others	USD	31,374
The Export-Import Bank of Korea	BOND Guarantees about overseas construction and others	KRW	85,822
		USD	1,740,962
		KWD	17,189
		CAD	10,763
		DZD	919,648
		INR	30,000
Shinhan bank	Guarantees for debentures and others	USD	167,055
		EUR	114
		PHP	363,525
Woori bank	Payment guarantees in foreign currency	USD	107,940
SC Jeil bank	Payment guarantees in foreign currency	USD	8
KEB Hana bank	Payment guarantees in foreign currency and others	KRW	50
		USD	140,717
		EUR	5,723
		AED	1,606
		KWD	105
		QAR	4,615
Arab Bank Singapore	Guarantees for debentures and others	USD	4,497
BNI bank	Guarantees for bids	USD	410

(6) Details of assets provided as collateral for the Group's liabilities as of December 31, 2018, are as follows:

		Mortgage amount	Mortgagee	Classification
	(In millions of Korean won and in thousands of foreign currencies)			
Inventories	KRW	208,680	Industrial Bank of Korea and others	Collateral for borrowings and others
	USD	13,905	The Korea Development Bank and others	
	MYR	95,378	Minister of Finance, Malaysia	
	JPY	1,673,200	Mizuho Bank	
Property, plant and equipment	KRW	3,489,263	The Korea Development Bank and others	
	USD	43,664	Woori Bank and others	
	JPY	1,125,000	Woori Bank and others	
	CNY	995,874	Bank of China and others	
	EUR	3,819	Ober Bank	
	MYR	449,234	Minister of Finance, Malaysia	
Investment property	KRW	654,755	KEB Hana Bank and others	
Intangible assets	USD	7,218	The Korea Development Bank and others	
	CNY	136,208	Bank of China and others	
Financial assets	KRW	2,222,687	The Korea Development Bank and others	
	USD	60,616	The Korea Development Bank and others	
	JPY	77,931	H&S Solar G.K.	
	CNY	938,103	Agricultural Bank of China and others	
	MYR	372,987	Minister of Finance, Malaysia	
	EUR	15,508	KEB Hana Bank and others	
	AED	1,360	Emirates NBD Bank	
Investment property	KRW	1,279	KEB Hana Bank and others	

Shares of Hanwha Chemical Corporation, Hanwha Life Insurance Co., Ltd. and the Group's subsidiaries are provided as collateral for trading purposes, such as borrowings and collateral for advance payments, as of December 31, 2018. The maximum value of guarantee provided by collateral amounts to ₩1,681,708 million.

(7) Financial assets at FVTPL amounting to ₩2,297,644 million are provided as collateral in relation to bonds sold under repurchase agreement as of December 31, 2018.

(8) Corporate bond amounting to ₩17,000 million taken over from assignment is provided as collateral to Korea Securities Finance Corp. as of December 31, 2018.

(9) Certificate of beneficial interest in investor's deposit (trust) at Kookmin Bank in relation to replacement services of net settlement is provided as collateral for amounts of ₩37,000 million as of December 31, 2018.

(10) Stocks taken by transferring of security amounting to ₩760,341 million is provided as collateral to Korea Securities Finance Corp. in relation to margin loans and collateral loans as of December 31, 2018.

(11) The Group sold its shares in POSCO ENERGY Co., Ltd. to POSCO on July 11, 2005. According to the stock sale agreement, the Group is liable for 25% of third-party claims for damages related to the water facilities and drainages until the termination of the electric power supply agreement between POSCO ENERGY Co., Ltd. and Korea Electric Power Corporation or until the cause of such damage is remedied. Management believes that the outcome of these cases will not materially affect the Group's consolidated financial statements.

(12) As of December 31, 2018, the Group has 1,513 pending cases, including the aforementioned cases. The Group is the plaintiff in 902 cases aggregating to ₩302,764 million, EUR 3 million and CNY 586 million and the defendant in 611 cases aggregating to ₩801,790 million and $8 million. Management believes that the outcome of these cases will not materially affect the Group's consolidated financial statements.

(13) The Group granted stock options (put-back options) amounting to ₩34,982 million to the financial investors in relation to the Second West Coast Highway Inc.

(14) As of December 31, 2018, the Group provides a cash deficiency support agreement for its real estate development business amounting to ₩42,390 million to developers including Meta DND Corp and other 4. Additional losses can incur in relation to this agreement. However, the accompanying consolidated financial statements do not include any effect from the possible losses because the losses are not probable to be realized. In connection with the SOC project, the Group provides cash deficiency support agreements of up to ₩ 537,000 million with the investors of the construction and operation of the project for the shortfall of the loan, which is borne by 12 SOC corporations including Gyeongju N Biro Corp. Further, in connection with the SOC project, the construction investors have a contract to provide the deficit fund if the agreement is terminated or the purchase request from the competent administrative agency is insufficient to repay the loan with refund upon cancellation or the purchase price.

(15) On April 30, 2015, the Group acquired 27.62% of Hanwha General Chemical Co., Ltd. shares in order to enhance competitiveness in petrochemistry field and secure a stable foundation for profitable growth by diversifying products. According to the corresponding stock purchase agreement, the Group might need to pay additional charges in the future based on operational performance of Hanwha Total Petrochemical Co., Ltd.

Meanwhile, Samsung C&T Corporation and Samsung SDI, which have the residual equity of Hanwha General Chemical Co., Ltd., have a preferential right of sales to the Group regarding the residual equity when Hanwha General Chemical Co., Ltd. goes public. If Hanwha General Chemical Co., Ltd. does not go public within six years (seven years if the Group requests) from the termination date of trade, Samsung C&T Corporation and Samsung SDI have a put option against the Group and the Group holds a call option regarding the residual equities of Samsung C&T Corporation and Samsung SDI. Furthermore, the Group has the right of preemption when the residual equities of Samsung C&T Corporation and Samsung SDI are sold. When the Group sells the shares, Samsung C&T Corporation and Samsung SDI have tag-along rights and the Group has drag-along rights.

(16) On December 31, 2008, Hanwha Defense Co., Ltd., a subsidiary of the Company, is responsible for repayment of corporate debts in solidarity before division based on the division plan. If a contingent liability arises after division due to the action of cause before the division date, the liability is the joint responsibility of the company established or the surviving company, and the burden ratio is the net asset value ratio at the time of the division. As of December 31, 2018, the Group did not establish a provision because it cannot reliably estimate the amount guaranteed.

(17) In order to develop new products, the Group has entered into a technology introduction contract with General Electric Company of USA and others.

(18) The Group has concluded an agreement for accompanied growth of large, medium and small corporations, with Woori Bank to support cooperation enterprises of the Group. According to the agreement, Woori Bank organized funds based on the deposit of the Group amount to ₩12 billion. Woori Bank provides funds to cooperating small and medium-sized enterprises by establishing special funds with double the amount of the deposit.

(19) Financial statements of the Group include conditional loan, and the obligation of payment is confirmed when the Company succeed in commercial production as a result of oil and mineral developing project. As of December 31, 2018, three blank promissory notes and two blank checks have been provided as collaterals in relation to conditional loan.

(20) The Group pledges to comply with the terms of credit ratings, EBITDA ratios and debt ratios in relation to some of borrowings, debentures and PF loans.

(21) The Group entered into shareholders’ agreement with Recon Co., Ltd. a preferred stock investor, in relation to the issuance of redeemable convertible preferred stocks of Hanwha Engineering and Construction Corp. in the year ended December 31, 2017. The details of the contract are as follows:

A. Shareholders' agreement

	Details
Settlement	With respect to the entire shares of the redeemable convertible preferred stocks, the amount equal to the net sale price less the initial issue price will be settled in cash on June 26, 2020. If the settlement amount is positive, the investors make payment to the Company, and if the settlement amount is negative, the Company makes payment to the investors.
Early settlement	The investors can claim a settlement before the settlement date in case the following circumstances arise. The calculation of the settlement amount is the same as the above. - Hanwha Engineering and Construction Corp. is unable to pay the dividend determined for the redeemable convertible preferred stock to Recon Co., Ltd. - Rehabilitation, bankruptcy, workout or at the commencement of other similar proceedings for Hanwha Engineering and Construction Corp. - Credit rating of Hanwha Engineering and Construction Corp. is degraded to a rating equal to or below BBB- Early.
Appraisal rights	The Company has a right to purchase all or part of the redeemable convertible preferred shares held by the investors, on 25th of each month. The price determined by sum of issue price and commission rate varies with issuing time. (It cannot be issued after commencement of the settlement procedure)
Collateral	The 10,900,832 shares of Hanwha Chemical Co., Ltd. owned by the Company are provided as collateral for guarantees on performance of the settlement.

B. Redeemable convertible preferred stocks

Details of the redeemable convertible preferred stocks issued by Hanwha Engineering and Construction Corp. for the year ended December 31, 2017, are as follows:

	Details
Purpose of the issuance	Securing liquidity and improving financial structure
Type of the issued stocks	Non-cumulative non-participating preferred stock
Total number of stocks issued	1,435,406 shares (1,913,800 shares are issued and 478,394 shares were redeemed)
Issue price per share	₩209,000 won
Voting right	No voting right
Rate of dividend	2017–2020: 3.17%, 8.23%, 3.73% and 0%, respectively After 2021: Preferred dividend could be changed by according to the method or procedure allowed by the statute.
Redemption right	i) Redemption: Hanwha Engineering and Construction Corp. has a right to request a redemption of all or part of the preferred shares, assuming that distributable income is available (Notice date: March 24, 2020/ Redemption date: June 26, 2020). ii) Redemption after maturity: Hanwha Engineering and Construction Corp. has a right to redeem all or part of the preferred shares every year, assuming that distributable income is available.
Conversion right	i) Conversion right: Preferred shareholders and publishing company have conversion right. ii) Exercise date: On 26th of each month from July 7, 2017, to June 26, 2024. iii) Conversion rate: Five common shares per one preferred share.

C. Asset-backed securities loan

	Details
Underlying asset	Right of disposal and collateral security right on the redeemable convertible preferred stocks of Hanwha Engineering and Construction Corp.
Date of loan	June 26, 2017
Date of maturity	three years from date of loan (June 26, 2020)
Principal redemption	Lump-sum payment at maturity. However, if Hanwha Engineering and Construction Corp. exercises early redemption right or the Company exercises early appraisal rights, principal will be repaid early with relevant amount.
Securitization structure	Recon Co., Ltd. invests in redeemable convertible preferred stocks of Hanwha Engineering and Construction Corp. after raising funds through asset-backed securities loan. Hanwha Engineering and Construction Corp. repays the principal based on the preferred stock dividend to Recon Co., Ltd.
Borrowings amount	₩300,000 million (equivalent to $280 million)
Interest rate	5.00%

(22) Details of securities borrowed as of December 31, 2018 and 2017, are as follows:

	Counter-party	2018	2017
		(In millions of Korean won)	
Listed stocks (SK Hynix Inc. and others)	Korea Securities Depository	₩ 163,018	₩ 46,200
Government bond/municipal bond	The Korea Securities Finance Corporation	422,211	545,479
Total		₩ 585,229	₩ 566,817

(23) Securities received as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Trustor securities in custody	₩ 13,141,902	₩ 15,916,778
Beneficial securities in custody	16,584,228	13,656,359
Other securities in custody	84,000	143,900
Total	₩ 29,810,130	₩ 29,717,037

(24) Accounts receivable from the companies, which are under the court receivership, as of December 31, 2018, are as follows:

	Details
	(In millions of Korean won)
Companies under legal management and commencement of composition	₩ 857
Allowance for doubtful accounts (*1)	(700)

(*1) The Group accounted for ₩700 million as allowance after measuring fair value. However, collectible balance of above receivables can be changed since corresponding companies are currently under the court receivership. Current consolidated financial statements are not adjusted due to uncertainty.

(25) The Group has a purchase commitment of outstanding commercial papers with a maximum limit of ₩809 million that are not purchased or paid on the issue date among the commercial papers of ₩809 million issued by Multiplex Series 6th L.L.C., YKK 2nd Co., Ltd. and IBS 16 Co., Ltd.

(26) As of December 31, 2018, the Group has entered into 11 credit derivatives contracts, including credit default (the guaranteed purchase of five cases and fair value amount of ₩529 billion equivalent to $473 million; the guaranteed sale of six cases and fair value amount of ₩535 billion equivalent to $478 million). The Group is obliged to indemnify the fair value amount less the recovery rate when certain specific credit events occur.

(27) Commitment of loan on collateral and underwriting debenture

Commitment of loan on collateral and underwriting debenture as of December 31, 2018, is as follows:

	Project related to	Amount (In millions of Korean won)
Dream Tech Development co., Ltd.	Short-term bridge loan of Hyundai Engineering Pyeongtaek Dream Tech General Industrial Complex project	₩ 20,000
ELF The 4th Co., Ltd.	Present and future credit card bonds of E-Land World Co., Ltd.	8,400
Capston The 8th Co., Ltd.	Leasehold fund guaranteeing lease revenue of Signature tower.	35,140

(28) Commitment of allowance for loss in relation to distribution of cooperative assets.

Cooperative is regulating commitment of allowance for loss in relation to distribution of cooperative assets. Investment is distributed to Hanwha Investment Corp., the executive member of each cooperative, after allowance for loss in accordance with commitment has been set. Since this commitment is affecting valuation of cooperative investment, details of commitment of allowance for loss that is finalized at liquidation are as follows:

	Details
2011KIF-HVC IT Fund	When the amounts after deducting operating expenses are under the total amount invested in capital, an allowance is set for loss within 5% range of the total amount invested in capital.
Science and Technology Private Equity fund No. 1	When the amounts after deducting operating expenses are under the total amount invested in capital, an allowance is set for loss within 5% range of the total amount invested in capital.
Seoul Global Bio-medical New Growth Engine Investment Fund	When the amounts after deducting operating expenses are under the total amount invested in capital, an allowance is set for loss within ₩2.5 billion (equivalent to $2 million) range of the total amount invested in capital.
KoFC Value-up Private Equity Fund	When the amounts after deducting operating expenses are under the total amount invested in capital, an allowance is set for loss within ₩2.5 billion (equivalent to $2 million) range of the total amount invested in capital.

As of December 31, 2018, the maximum allowance for doubtful receivables related to the contract is ₩7,750 million (equivalent to $7 million), and the Group recognizes provisions amounting to ₩2,500 million (equivalent to $2 million) for the case of assuming losses.

(29) As at December 31, 2018, there is controversy regarding certain annuity pension payments of the immediate annuity products that the Group has sold in the past, and the amount and timing of the payment cannot be determined.

57. CASH FLOW INFORMATION:

(1) Details of cash generated from operations for the years ended December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Profit for the year	₩ 1,299,841	₩ 1,995,145
Addition of expenses not involving cash outflows:		
Finance income (non-financial business)	(75,194)	(37,348)
Finance cost (non-financial business)	419,079	413,436
Finance income (financial business)	(3,518,574)	(3,599,048)
Finance cost (financial business)	109,341	87,601
Bad debts expense	32,975	146,599
Depreciation	742,545	722,681
Depreciation of investment property	62,613	67,392
Amortization	156,321	130,474
Severance benefits	285,743	277,397
Provision	152,623	84,398
Losses on foreign currency translation	396,397	2,683,557
Gains on foreign currency transaction	(1,115,209)	(410,264)
Gains and losses on valuation of equity-method investment	(420,831)	(582,469)
Gains and losses on valuation of financial instruments	541,477	(1,798,896)
Gains and losses on the disposal of financial instruments	152,031	(1,101,340)
Overlay adjustment	(381,915)	-
Reserves	4,289,371	5,239,420
Others	1,940,951	2,003,791
	5,069,685	4,327,381
Changes in working capital:		
Trade receivables	₩ 411,174	₩ (198,812)
Other receivables	20,971	(176,518)
Inventories	(295,760)	67,339
AFS financial assets	-	24,507
Loan receivables and other receivables	(1,945,540)	(845,835)
Financial assets at FVTPL	(2,374,218)	(605,578)
Other financial assets	338,998	(1,234,071)
Other assets	(76,496)	(166,193)
Trade payables	(767,028)	98,873
Other payables	73,811	(21,152)
Defined benefit liability	(246,758)	(217,376)
Provisions for liabilities and charges	(33,023)	(43,044)
Other financial liabilities	(41,445)	(940,126)
Other liabilities	598,245	181,515
Separate assets	280,767	(1,826,123)
Separate liabilities	199,422	1,201,101
Deferred policy acquisition costs	(1,272,836)	(1,548,820)
Others	(88,841)	316,115
Changes in net working capital, total	(5,218,557)	(5,934,198)
Cash generated from operations	₩ (148,872)	₩ 388,328

(2) Changes in the debts generated from financing activities for the years ended December 31, 2018, are as follows:

	Beginning	Changes resulting from financing Activities	Others(*1)	Ending
	(In millions of Korean won)			
Bank borrowings	₩ 8,130,897	₩ 214,661	₩ 1,730,216	₩ 10,075,774
Other borrowings	2,380,520	492,675	(851,539)	2,021,656
Debentures	4,052,355	796,690	663,253	5,512,298
Convertible bond	49,177	(49,177)	-	-
Deposits received	703,493	(41,137)	21,425	683,781
Long-term payables	-	(3,213)	3,213	-
Liabilities resulting from financing activities	₩ 15,316,442	₩ 1,410,499	₩ 1,566,568	₩ 18,293,509

(*1) Others include interest expense and gain (loss) of foreign currency translation.

58. ASSETS AND LIABILITIES HELD FOR SALE:

Assets and liabilities held for sale as of December 31, 2018 and 2017, are as follows:

	Predicted date of sale	2018	2017
		(In millions of Korean won)	
Assets held for sale			
Land	In 2019	₩ 16,113	₩ 25,361
Buildings	In 2019	18,964	33,615
Others	In 2019	45,457	2,146
Subtotal		₩ 80,534	₩ 61,122
Liabilities held for sale			
Automotive parts division		₩ 6,989	₩ -

59. RISK MANAGEMENT:

(1) Financial risk factors of non-financial businesses

The Group’s activities expose it to a variety of financial risks: market risk (including currency risk and interest rate risk), credit risk and liquidity risk. The Group’s overall risk management program seeks to minimize potential adverse effects on the Group’s financial performance.

The objects of financial risk management are financial assets, including cash and cash equivalents, AFS financial instruments, trade receivables and other receivables, and financial liabilities, including trade and other payables, borrowings, and debentures.

A. Market risk

① Foreign exchange risk

Foreign exchange risk of the Group arises when future commercial transactions or recognized assets or liabilities are denominated in a currency that is not the Group's functional currency. The Group is exposed to foreign exchange risk arising from various currency exposures, primarily with respect to USD, EUR and JPY. The Group operates hedging policies for each company within the Group, considering the nature of business and the existence of instruments to cope with the risks of exchange rate fluctuation. Additionally, the Group periodically evaluates and handles such risks exposed through managing system for receivables and payables denominated in foreign currencies, and reports the results to the management.

The impacts of weakened/strengthened Korean won by 10% against foreign currencies with all variables held constant on post-tax profit for the year ended December 31, 2018, are as follows:

	10% increase	10% decrease
	(In millions of Korean won)	
USD	₩ (134,353)	₩ 134,353
EUR	10,809	(10,809)
JPY	2,178	(2,178)

The above sensitivity analysis is performed based on monetary assets and liabilities denominated in a currency that is not the Group's functional currency.

② Interest rate risk

The Group's interest rate risk arises mainly from borrowings. Borrowings issued at variable rates expose the Group to cash flow interest rate risk, which is partially offset by currency swap. Also, fixed-rate borrowings expose the Group to fair value interest rate risk. The Group analyzes and manages its interest rate exposure through various manners, such as to share excess cash within the Group to minimize external borrowings, to avoid high-rate borrowings, to reform capital structure, to manage an appropriate ratio of fixed-rate borrowings and variable-rate borrowings and to monitor a fluctuation of domestic and foreign interest rates.

The impact of 1% higher/lower of interest rate (on floating rate borrowings) with all other variables held constant on the Group's post-tax profit for the year ended December 31, 2018, would have been ₩43,969 million (equivalent to $ million) lower/higher.

B. Credit risk

Credit risk is managed on a group basis. Credit risk arises from cash and cash equivalents, derivative financial instruments and deposits with banks and financial institutions, as well as credit exposures to retail customers, including outstanding receivables and committed transactions. In order to manage credit risk, the Group opens and maintains its business only with customers whose credit qualities exceed a required minimum rating and periodically revaluates credit qualities of customers to amend a credit limit, if necessary. As of December 31, 2018, management does not expect any losses from non-performance by counterparties. The maximum exposure to credit risk in relation to the financial guarantees provided to related parties is ₩409,863 million (equivalent to $ million) as of December 31, 2018 (see Note 55).

C. Liquidity risk

The Group finance monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs while maintaining sufficient headroom on its undrawn committed borrowing facilities at all times. Group treasury invests surplus cash in time deposits, interest-bearing money market deposits, choosing instruments with appropriate maturities or sufficient liquidity to provide sufficient head-room.

Details of the Group's maturity analysis on financial liabilities as of December, 31 2018, and 2017, are as follows. The amounts disclosed in the table are the contractual undiscounted cash flows.

	2018			
	Less than 1 year	Between 1 and 5 years	More than 5 years	Total
	(In millions of Korean won)			
Bank borrowings (*1)	₩ 5,480,993	₩ 3,204,092	₩ 167,186	₩ 8,852,271
Debentures (*1)	1,838,478	2,644,635	-	4,483,113
Trade and other payables	3,005,634	119,279	54,806	3,179,719
Derivative financial instruments(*2)	28,008	4,267	-	32,275
Other financial liabilities (*3)	723,137	38,077	515,604	1,276,818
Total	₩ 11,076,250	₩ 6,010,350	₩ 737,596	₩ 17,824,196

	2017			
	Less than 1 year	Between 1 and 5 years	More than 5 years	Total
	(In millions of Korean won)			
Bank borrowings (*1)	₩ 4,751,504	₩ 2,546,550	₩ 191,049	₩ 7,489,103
Debentures (*1)	1,400,855	2,601,059	-	4,001,914
Trade and other payables	3,385,071	81,880	70,145	3,537,096
Derivative financial instruments(*2)	16,908	50,496	-	67,404
Other financial liabilities (*3)	657,523	36,513	489,377	1,183,413
Total	₩ 10,211,861	₩ 5,316,498	₩ 750,571	₩ 16,278,930

(*1) Cash flows of related interest expenses are included.
(*2) Derivative liabilities are cash flows that take into account time value and other factors.
(*3) Cash flows of accrued interest and interest expenses are excluded.

The Group has entered into both financial guarantee contracts and performance guarantee contracts, which are not considered in the above table. If a principal debtor fails to meet an obligation, additional cash outflows from the Group may be incurred within a year (see Note 56).

(2) Fair value measurement of non-financial businesses

Assets measured at fair value or for which the fair value is disclosed are categorized within the fair value hierarchy and the defined levels are as follows:

	Details
Level 1	Quoted prices (unadjusted) in active markets for identical assets or liabilities
Level 2	Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (that is, prices) or indirectly (that is, derived from prices)
Level 3	Inputs for the asset or liability that are not based on observable market data (that is, unobservable inputs)

A. Fair value hierarchy classifications of the financial assets and the financial liabilities that are measured at fair value or their fair value is disclosed as of December 31, 2018 and 2017, are as follows:

	2018			
	Level 1	Level 2	Level 3	Total
	(In millions of Korean won)			
Recurring fair value measurements				
ASSETS:				
Fair value financial assets Profit or loss				
Equity securities	₩ 5,270	₩ -	₩ 2,000	₩ 7,270
Collective Investment Fund	-	105	17,231	17,336
Debt securities	24	-	130,588	130,612
Fair value financial assets at Other Comprehensive Income				
Equity securities	₩ 65	₩ -	₩ 23,110	₩ 23,175
Debt securities	-	650	-	650
Derivative financial assets	-	13,086	14,247	27,333
Total	₩ 5,359	₩ 13,841	₩ 187,176	₩ 206,376
LIABILITIES:				
Derivative financial liabilities	₩ -	₩ 28,183	₩ 4,088	₩ 32,271
Trade and other payables	-	-	23,758	23,758
Total	₩ -	₩ 28,183	₩ 27,846	₩ 56,029

B. Changes in Level 3 of the fair value hierarchy for the recurring fair value measurements are as follows:

	2018	2017
	(In millions of Korean won)	
Beginning	₩ 55,302	₩ 59,721
Purchase	15,095	8,339
Sales	(3,379)	(17)
Gains and losses recognized in profit or loss	(5,747)	(5,653)
Gains and losses recognized in other comprehensive income	(5,024)	8,081
Others	103,085	(15,169)
Ending	₩ 159,332	₩ 55,302

C. Valuation techniques and inputs

Valuation techniques and inputs used in the fair value measurements categorized within Level 2 and Level 3 of the fair value hierarchy as of December 31, 2018, are as follows:

(In millions of Korean won)

	Fair value	Level	Valuation techniques	Inputs	Range of inputs (weighted average)
Fair value financial assets Profit or loss					
	₩ 23,721	3	Market approach	N/A	N/A
	24,039	3	Profit approach	N/A	N/A
				Risk-free interest rate	2.58%
	81,361	3	Interest value approach	Market interest rate	10.52%
				Inflation rate	1.6%–1.9%
Debt securities	956	3	Asset value approach	N/A	N/A
	511	3	Present value technique	N/A	N/A
	105	2	Market approach	N/A	N/A
Beneficiary certificate	17,149	3	Market approach	N/A	N/A
	82	3	Present value technique	N/A	N/A
Equity instruments	2,000	3	Profit approach	N/A	N/A
Fair value financial assets at Other Comprehensive Income					
Debt securities	650	2	Present value technique	N/A	N/A
	429	3	Profit approach	N/A	N/A
Equity instruments	19,844	3	Present value technique	N/A	N/A
	2,837	3	Market approach	N/A	N/A

	Fair value	Level	Valuation techniques	Inputs	Range of inputs (weighted average)
			(In millions of Korean won)		
Derivative financial assets:					
Currency option	2,474	2	Market approach	N/A	N/A
Currency forward	6,439	2	Market approach	N/A	N/A
	445	2	Option-pricing model	N/A	N/A
Currency swap	1,976	2	Market approach	N/A	N/A
Interest swap	1,002	2	Present value technique	N/A	N/A
Physical derivatives	750	2	Present value technique	N/A	N/A
Others	13,872	3	Binomial model	N/A	N/A
Derivative financial liabilities:					
Currency option	7,068	2	Market approach	N/A	N/A
Currency forward	2,415	2	Market approach	N/A	N/A
Currency swap	15,261	2	Market approach	N/A	N/A
	655	2	Option-pricing model	N/A	N/A
Interest swap	2,591	2	Market approach	N/A	N/A
Physical derivatives	193	2	Option-pricing model	N/A	N/A
Others	4,088	3	Binomial model	Risk-free interest rate	2.24%
				Discount Rate	6.44%
				Volatility	9.55%
Trade and other payables:					
Contingent consideration	23,758	3	Present value technique	Rate	2.69%

D. Financial instruments measured at cost

Details of financial instruments measured at cost as of December 31, 2017, are as follows:

	2017
	(In millions of Korean won)
Equity instruments	₩ 67,238
Debt instruments	768

(3) Financial risk management of financial business

A. Risk management policy

INSURANCE BUSINESS:

The Group does its best to make stable growth and profit for shareholders and policyholders in managing insurance risk, interest rate risk, credit risk, market risk, liquidity risk and operation risk in accordance with its principle of the risk management.

① Objectives of the risk management

The Group’s objectives of the risk management are to maximize its value and sustain its stable growth by preventing, evaluating and managing uncertainty and possibility of loss.

② Risk management strategy

In the short term, the Group establishes and manages maximum permissible limit to maintain entire risk level below or within a certain level of available capital. In addition, the Group operates the risk management process for investment activity and insurance product development. In the middle and long term, the Group seeks to maximize its value and profit-oriented business strategy, which reflects asset and liability management ("ALM") investment strategy (the characteristics of insurance asset management strategy) in its management plan and asset management plan. Also, risk management organization and management's reporting system maintain independence and principle of checks and balances.

③ Structure and function of the risk management organization

The Group has the risk management committee; the risk management action officers committee for insurance division, investment division and common division; and the risk management team. The Group operates asset management committee, product development committee, operating expense management committee and reinsurance management committee with regard to worksite operations.

(a) Risk management committee

The risk management committee is composed of more than three directors who are elected at the board of directors. The risk management committee establishes standards and measures of the risk management and approves the permissible risk limit and others.

(b) Risk management council

The risk management council is composed of chairman who is chief operating officer of the risk management and members who are managers of various departments. The risk management council performs predeliberation on plans of insurance division and investment division, checking running state, establishment and revision of detailed regulations for risk management and others.

Categories and functions of subcommittees:

Name of subcommittee	Details
Asset management council	Establishment of quarterly asset management strategy and target portfolio, transaction of investment and loan, related instructions, choice of asset management companies and others
Official interest rate council	Deliberation on determination of the official interest rate
Product development council	Development, revision and sale of insurance product and others
Operating expense management council	Discussion between divisions for operating expense and management of operating expense
Reinsurance management council	Management of reinsurance ceded and assumed, selection of reinsurer, analysis for reinsurance transaction and others

④ Internal capital adequacy assessment and management procedures

The Group calculates risk-based capital ("RBC") ratio (solvency ratio) regulated by the regulator. RBC ratio is an insurance company's risk-based capitalization system that allows financial institutions to retain their own capital to cover unexpected losses.

RBC ratio means the ratio of the required capital to the available capital. The available capital consists of capital stock, capital surplus and retained earnings, and the required capital is computed based on the insurance; interest rate; and credit, market and operating risks, considering dispersion effect.

The regulator requires RBC ratio to retain more than 100% based on financial statements. Otherwise, prompt corrective action will be made to prevent insolvency according to the solvency ratio as follows:

RBC ratio	Corrective action
Recommendation for management improvement (100%–50%)	Increase or decrease of capital stock, restriction of entry into new business and others
Request for management improvement (50%–0%)	Request for replacement of executives, partial suspension of business and others
Order for management improvement (below 0%)	Stock retirement, transfer of business, merger, transfer of contract and others

The Group classifies risk into insurance, interest rate, credit, market and operational risks to calculate the required capital; considers the impact of RBC ratio when establishing a portfolio strategy; and measures the amount of internal risk by internal management model for insurance, interest rate, credit and market risks.

INVESTMENT AND SECURITIES BUSINESS:

The Group is exposed to various financial risks while engaged in the operating activities; the types include credit risk, liquidity risk, market risk and operational risk. The purpose of the Group's overall risk management policy is to maximize revenue compared to the risk management within the appropriate level, and for that purpose, the Group performs awareness and definition of the danger, measurement and evaluation and control and reporting.

① Basic principles

Basic principles of the risk management are as follows:
- Risk management is the final responsibility of the board of directors, and the risk management objectives and policies are the core of the business strategy.
- Clear understanding of the risks of various types and appropriate system for risk management should be established.
- Risk management should be accomplished in all teams and shall be performed independent of the sales activities.
- The risk management organization in charge of comprehensive risk management and control functions should be formed and manage risks that may occur in various management activities.

The Group operates the risk management committee, the working-level risk management committee and the risk management department for risk management.

② Board of directors

As the top body of the risk management organization, the board of directors performs to appoint and dismiss the risk management committee; to deliberate and vote the establishment of risk management policy; and to report business planning, results and implementation of risk management.

③ Risk management committee

Installed in the board of directors, the risk management committee exercises overall rights in the risk management. The risk management committee performs to establish the risk management policy and strategy, to appoint the CRO and to set the overall company risk limits.

④ Risk management execution committee

As the decision-making party installed in the risk management committee, the risk management execution committee performs to set and allocate departmental risk limits, to introduce computerized systems of risk management and to deliberate and vote such transactions above a certain size.

⑤ Working-level risk management committee

As the working-level decision-making party, the working-level risk management committee performs to approve the risk management measurements and review adequacy and to deliberate and vote such transactions above a certain size, which are not raised up to the risk management execution committee.

⑥ Risk management team

The risk management team performs various practices, such as implementation of the risk management policy and strategy decisions in the committee, measurement and reporting of the individual risks to support committee, etc.

B. Insurance risk management

INVESTMENT AND SECURITIES BUSINESS:

① Concept

Insurance risk is the risk, other than financial risk, transferred from the holder of a contract to the issuer. It is composed of insurance value risk and reserve risk. Insurance value risk is the risk of loss due to difference between premium that is received from policyholders and actual claims paid. Reserve risk is the risk of loss due to difference between reserve for outstanding claims and actual claims paid in the future.

② Status of exposure of insurance risk

Insurance risk is the probability of loss due to the difference between the insurance premium received from the policyholder and the actual payment. Exposure pursuant to the RBC standard as of December 31, 2018 and 2017, are as follows:

- Life insurance

	2018	2017
	(In millions of Korean won)	
Death	₩ 626,061	₩ 641,108
Disability	54,163	56,483
Hospitalization	337,519	341,371
Operation/diagnosis	765,957	735,143
Medical expense	228,851	207,936
Other life insurance	82,225	79,709
Total	₩ 2,094,776	₩ 2,061,750

- Non-life insurance

	2018	2017
	(In millions of Korean won)	
General insurance	₩ 193,489	₩ 185,347
Long-term insurance	695,692	663,107
Automobile insurance	578,841	583,353
Total	₩ 1,468,022	₩ 1,431,807

③ Status of exposure of reserve risk

Exposure pursuant to the RBC standard as of December 31, 2018 and 2017, is as follows:

	2018	2017
	(In millions of Korean won)	
General insurance	₩ 41,183	₩ 32,291
Long-term insurance	73,618	63,890
Automobile insurance	124,989	129,515
Total	₩ 239,790	₩ 225,696

④ Measurement method

Both standard measurement method and internal model are used to measure the insurance risk. Standard measurement method (Article 7-2 Clause 2 of the Supervisory Regulation on Insurance Industry) means calculation of insurance risk by the RBC standard provided by Korean Financial Services Commission (“FSC”). Reserve risk is calculated on non-life insurance contracts under Article 1-2 item 11 of the Supervisory Regulation on Insurance Industry.

The amount of insurance risk, calculated using an internal model, is calculated by estimating risk insurance premium for the next 10 years, which is applied by experimental statistics to contracts held during measurement of insurance risk, which is the difference between maximum probability and average level of insurance claims paid and applying value at risk (“VaR”), which applies experimental scenario.

⑤ Management method

The Group operates ALM system and insurance risk measurement system to measure the amount of insurance risk. The amount of insurance risk, which is calculated quarterly, is reported to the risk management committee in a risk analysis report.

⑥ Reinsurance policy

The Group manages reinsurance for improving ability to pay claims at concerned risk exposure level and effective diversification of risks.

The concentration level to top 5 reinsurers as of December 31, 2018 and 2017, are as follows:

	2018		
	More than AA-	A+–A-	Below BBB+
	(In millions of Korean won)		
Premium for reinsurance ceded	₩ 1,344,974	₩ -	₩ -
Percentage (*1)	95.10%	-	-

	2017		
	More than AA-	A+–A-	Below BBB+
	(In millions of Korean won)		
Premium for reinsurance ceded	₩ 1,234,104	₩ -	₩ -
Percentage (*1)	99%	-	-

(*1) The percentage of premium for reinsurance ceded is of the total reinsurance.

Premium for reinsurance ceded for reinsurer category as of December 31, 2018 and 2017, are as follows:

	2018							
	More than AA-		A+–A-		Below BBB+		Others	
	(In millions of Korean won)							
Premium for reinsurance ceded	₩	1,414,802	₩	435	₩	-	₩	95
Percentage (*1)		99.96%		0.03%		-		0.01%

	2017							
	More than AA-		A+–A-		Below BBB+		Others	
	(In millions of Korean won)							
Premium for reinsurance ceded	₩	1,295,791	₩	96	₩	-	₩	-
Percentage (*1)		99.90%		0.01%		-		-

(*1) The percentage of premium for reinsurance ceded is of the total reinsurance.

⑦ The amount of guarantee risk to variable insurance

Details of guarantee risk to variable insurance as of December 31, 2018 and 2017, are as follows:

	2018							
	Premium income		Policyholder's reserve		Reserve for guaranteed benefit		Amount of risk to minimum guaranteed benefit	
	(In millions of Korean won)							
Variable whole life insurance	₩	62,594	₩	390,423	₩	116,556	₩	18,605
Variable annuity life insurance		1,214,221		7,803,343		61,495		106,277
Variable universal indemnity life insurance		908,286		2,294,926		194,725		144,076
Variable universal saving life insurance		167,121		1,277,490		3,158		3,308
Others		714,654		4,261,989		702,151		151,727
Total	₩	3,066,876	₩	16,028,171	₩	1,078,085	₩	423,993

	2017							
	Premium income		Policyholder's reserve		Reserve for guaranteed benefit		Amount of risk to minimum guaranteed benefit	
	(In millions of Korean won)							
Variable whole life insurance	₩	48,554	₩	381,818	₩	138,679	₩	9,978
Variable annuity life insurance		1,374,419		8,336,933		65,486		113,759
Variable universal indemnity life insurance		933,000		2,246,285		175,305		104,717
Variable universal saving life insurance		201,433		1,487,537		756		1,475
Others		745,408		4,254,244		644,493		106,409
Total	₩	3,302,814	₩	16,706,817	₩	1,024,719	₩	336,338

⑧ Remaining contract expiration of insurance contract liabilities

Details of analysis results on remaining contract expiration of insurance contract liabilities as of December 31, 2018 and 2017 are as follows:

	2018				
	Less than 1 year	Between 1 and 5 years	Between 5 and 10 years	More than 10 years	Total
	(In millions of Korean won)				
Premium reserves (*1)	₩ 1,082,940	₩ 8,409,847	₩ 7,396,128	₩ 58,318,749	₩ 75,207,664

(*1) It was prepared based on cancellation saved money.

	2017				
	Less than 1 year	Between 1 and 5 years	Between 5 and 10 years	More than 10 years	Total
	(In millions of Korean won)				
Premium reserves (*1)	₩ 931,817	₩ 7,369,679	₩ 9,058,685	₩ 65,170,763	₩ 82,530,944

(*1) It was prepared based on cancellation saved money.

C. Interest rate risk management

INSURANCE BUSINESS:

① Concept

Interest rate risk is risk of loss due to fluctuation of interest rate in the future market and the difference between the maturity structure of asset and liability.

② Measurement method

Both standard measurement method and internal model are used to measure the interest rate. Standard measurement method (Article 7-2 Clause 3 of the Supervisory Regulation on Insurance Industry) means calculation of interest rate risk by the RBC standard provided from FSC. The assets and liabilities of general account, pension savings insurance and asset-linked insurance contracts are underlying components of the Group's internal model. Interest rate risk is calculated by directly estimating future cash flows of assets and liabilities using the duration gap method through unitizing effective duration to value assets and liabilities and by considering the estimated maximum net asset value fluctuation (stochastic interest rate projection VaR).

③ Management method

(a) The Group reports to the risk management committee the credit risk computed based on the duration gap method and credit risk applied by statistical scenario on quarterly basis. Also, the Group especially manages further the credit risk computed based on the duration gap method by establishing permissible limit.

(b) The Group establishes a target duration on a security asset; enlarges mid- to long-term safety assets, such as long-term Treasury bond; and decreases mismatched duration on asset and liability though management of sales of products with fluctuating interest rate.

(c) The Group establishes a portfolio with mid- to long-term target though ALM investment strategy reflecting cash flow properties of insurance liabilities and manages guidelines reflecting market interest rate that is applied specifically on insurance products.

(d) Establishment of ALM investment strategy and interest rate based on disclosure is determined by the risk management committee, and guideline for applying interest rate (includes the lowest guaranteed interest rate of linked products) as well as disclosing interest rate is determined by the risk management council.

(e) Individual product committee determines applying interest rate (includes the lowest guaranteed interest rate of linked products) as well as disclosing interest rate.

④ Status of floating-rate-type liabilities for minimum guaranteed interest rate

Exposure of floating-rate-type liabilities for minimum guaranteed interest rate level by the RBC standard as of December 31, 2018 and 2017, are as follows:

	2018					
	Below 0%(*1)	0%–2%	2%−3%	3%−4%	More than 4%	Total
	(In millions of Korean won)					
Floating-rate-type liabilities(*2)	₩ 6,440,017	₩ 15,743,792	₩ 13,646,540	₩ 13,763,074	₩ 4,577,554	₩ 54,170,977

(*1) Liabilities without minimum guarantee option, are presented as “Below 0%.”
(*2) Liabilities that are fixed rate type and floating rate type are classified as the type at the time of closing date of the fiscal year.

	2017					
	Below 0%(*1)	0%–2%	2%−3%	3%−4%	More than 4%	Total
	(In millions of Korean won)					
Floating-rate-type liabilities(*2)	₩ 11,350,859	₩ 12,732,205	₩ 14,554,068	₩ 9,820,243	₩ 2,584,163	₩ 51,041,538

(*1) Liabilities without minimum guarantee option, are presented as “Below 0%.”
(*2) Liabilities that are fixed rate type and floating rate type are classified as the type at the time of closing date of the fiscal year.

D. Credit risk management

① Concept

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation.

② Measurement method

INSURANCE BUSINESS:

Both standard measurement method and internal model are used to measure the credit risk. Standard measurement method (Article 7-2 Clause 4 of the Supervisory Regulation on Insurance Industry) means calculation of credit risk by the RBC standard provided from FSC. If the Group uses an internal model, it calculates portfolio credit risk using Credit Manager (Credit Metrics measurement method), which is a credit risk measurement engine provided by MSCI. JPMorgan, Moody’s, S&P, KMV, Royal Bank of Canada and 20 other companies use Credit Manager to calculate their risk.

③ Management method

INSURANCE BUSINESS:

(a) Management by permissible limit
The Group calculates VaR on a monthly basis, which is the maximum unsuspected loss (99% confidence level) to investment portfolio due to the deterioration of credit rating or bankruptcy of lender and investment instrument. The Group manages to keep VaR less than the available capital by providing permissible limit to the VaR.

(b) Management by individual evaluation to lender and investment instrument
When operating an asset, the Group evaluates individual lender and investment instrument at asset RM division. As a result of the evaluation, the Group invests in lender and investment instrument.

(c) Management by diversified investment and operating limit
The Group manages limits for industry, group, lender and product to prevent concentration risk that may arise during investment. Also, the Group manages limits for low-rated assets that are considered to be at high risk.

(d) Overlapping management to high-risk asset
When the Group invests in high-risk assets (derivative and alternative investment), it conducts more intensive analysis than low-risk assets. The risk management team analyzes credit risk, and the asset RM division analyzes capability to repay the principal and pay interest.

INVESTMENT AND SECURITIES BUSINESS:

a) Recognition and Measurement of ECLs

The Group recognizes ECLs by considering all reasonable and supportable information without undue cost or effort since initial recognition of the financial instrument.

Thus, the Group categorizes credit risk in three stages, depending on changes in the credit risk index and the occurrence of impairment events since the date of initial recognition of the financial instrument. The three-step classification is based on whether there has been a significant increase in credit risk and the occurrence of an impairment event since the date of initial recognition and is classified as follows:

- Stage 1: The credit risk has not increased significantly since the date of initial recognition (12-month ECLs)
- Stage 2: In case the credit risk has increased significantly (Overall period ECLs)
- Stage 3: Impairment (Overall period ECLs)

If evidence of significant increases in credit risk is subsequently derecognized at the end of the reporting period, it is classified as Stage1 and 12-month ECLs are recognized. However, for some other financial assets, an entity may apply a simplification method to measure overall period ECLs without considering significant increases in credit risk.

The Group recognises a significant increase in credit risk from initial recognition when there are any of the following indications for financial assets measured at amortized cost and off balance account (loan commitments and financial guarantee contracts).

FINANCIAL ASSETS MEASURED AT AMORTIZED COST:

- Deposits: For deposits at financial institutions whose external credit ratings are within the investment qualification grade, credit risk is considered low. In addition, the credit risk is considered to have increased significantly if the number of days past due for principal or interest on a financial asset is 30 days or more.

- Credit contribution: The entity sets up a sufficient percentage of collateral for normal bond recovery at initial execution, so if the collateral ratio is satisfied as of the end of the reporting period, the credit risk is considered low. The credit risk is considered to have increased significantly for bonds subject to closed-trading because their collateral ratio is less than 140%.

- Consignor account receivable: In the case of a normal consignor account receivable, the Group determines that the credit risk is low because it establishes a sufficient percentage of collateral for normal bond recovery during initial execution. The credit risk is considered to have increased significantly in the case of sales of security due to insufficient payment in the customer account at the date of settlement of the securities transaction.

- Other financial assets: For bonds that do not result in a delay in principal or interest on a financial asset, credit risk is considered low. The credit risk is considered to have increased significantly if the number of days past due on principal or interest is 30 days or more

OFF-BALANCE ACCOUNT (LOAN COMMITMENTS AND FINANCIAL GUARANTEE CONTRACTS):

For loan commitments and financial guarantee contracts, credit risk is considered to have increased significantly if the number of days past due on principal or interest of the related financial asset is 30 days or more. In addition, the criteria for classifying asset soundness under the Financial Investment Business Regulations are considered to have increased credit risk significantly for loan commitments and financial guarantee contracts that are blacklist. Credit risk is considered low if there is no delay in principal or interest on the related financial assets and if the rating is rated as normal on the basis of the classification of asset soundness under the Financial Investment Business Regulations.

b) Financial assets defaulted and credit-impaired

The Group defines a financial asset as default if it has an objective reason to reduce reliably estimated future cash flows since its initial acquisition. These objective reasons are as follows:

- If a default is expected due to a continuation of principal and interest deferral (including an unquestionable 90 days or more in arrears)
- A deterioration in credit standing, with checking transactions suspended.
- The bankruptcy or bankruptcy of a debtor.
- The occurrence of a major lawsuit or claim of indemnity that could have effect on the existence of a debtor.
- In case the project itself is on the verge of being abolished due to a delay in the project schedule due to important factors at stake in the project's success or not, and the debtor's financial situation is not good.
- The occurrence of other events that may have a significant effect on the solvency of the debtor.
- In case of non-recoverable balance occurring after execution of security sales (in case of credit contribution and consignor account receivable)
- In case the external credit rating assessed by a credit rating agency has dropped significantly.

c) A method of organizing a set when measuring ECLs

The Group assesses credit risk by considering the product attributes, size and condition of the assets measured for ECLs according to significant increases in credit risk and calculates the loss provision individually and collectively accordingly. If the ECLs are separately identifiable among the assets from which the impairment (Stage 3) occurred and the assets with significant increases in credit risk, the ECLs are calculated by estimating the future cash flows of the individual assets. The target assets, excluding individual targets, are classified into groups of assets managed by a similar credit risk and are collectively assessed. The asset group consisted of similar or homogeneous assets considering the nature of the credit risk and types of products that could occur. ECLs on a group of financial assets are calculated using a formalized approach defined by the credit risk management index used to identify the group of assets.

d) The write-off financial asset

The Group will write-off any or all portions of the loan or debt securities that it deems to be impracticable to collect the principal and interest on the principal. Generally, when a borrower is deemed to have no sufficient resources or income to cover the principal and interest payments, the write-off is made in accordance with the Group internal regulations, but with approval from an external authority, if necessary. The Group may continue to exercise its right of recovery in accordance with its own recovery policy even after the financial assets are discharged. Subsequent assets recovered are deducted from ECLs in the income statement.

e) Assumptions and techniques and input variables used to measure ECLs

The credit risk measurement factors were estimated externally from the credit rating, and from the statistical techniques developed internally and past experience data, and they were adjusted through the reflection of forward-looking information.

For financial assets subject to individual assessment, ECLs are calculated by considering estimates of future cash flows of individual assets and collateral or other credit enhancements. For financial assets such as credit contribution and consignor account receivable subject to collective evaluation, ECLs are calculated by taking into account the cumulative recovery rate of the past.

On the other hand, the credit risk measurement component is applied as follows when applying the expected loss calculation methodology of Basel when measuring ECLs.

- Probability of default (PD)

The Group apply the default rate obtained from the credit rating agency. Based on the statistical model, the PD was estimated to reflect the characteristics of the counterparty and the exposure.

- Loss Given default (LGD)

LGD means the degree of loss expected in the event of bankruptcy. In general, the Group uses a 45% loss rate for bankruptcy and a 75% loss rate for unsecured and subordinate financial assets.

- Exposure at default (EAD)

EAD means the expected exposure at the time of bankruptcy. EAD of a financial asset is the same as the total carrying amount of the asset and the exposure to default on loan commitments and financial guarantee contracts is calculated as the sum of the amount of use and the amount expected to be further used.

- Expiration

When measuring ECLs on a financial asset, the Group reflects the period over which the ECLs are measured based on the contractual maturity.

- Reflection of forward-looking information

The Group reflects forward-looking information based on various information when measuring expected credit losses. To predict such forward-looking information, the Group utilizes economic forecasts disclosed by domestic and foreign research institutes or government and public organizations.

④ Maximum exposure to credit risk

The maximum exposure to credit risk related to financial instruments as of December 31, 2018 and 2017, are as follows:

INSURANCE BUSINESS:

	2018	2017
	(In millions of Korean won)	
Cash equivalents	₩ 1,838,710	₩ 582,203
Deposits	766,085	640,408
Financial assets at FVTPL	1,605,366	-
Financial assets at FVTOCI	21,902,726	-
Financial assets measured at amortized cost	32,319,331	-
Securities at FVTPL	-	225,094
AFS securities	-	24,022,130
HTM securities	-	31,529,786
Loans	26,920,204	25,426,145
Other financial assets	1,451,255	1,490,621
Derivative financial assets	364,881	1,313,852
Total	₩ 87,168,558	₩ 85,230,239

INVESTMENT AND SECURITIES BUSINESS:

	2018	2017
	(In millions of Korean won)	
Financial assets at FVTPL	₩ 4,136,098	₩ 3,828,103
Derivative financial assets	128,396	332,225
AFS financial assets	-	4,951
Financial assets measured at amortized cost :		
Cash and cash equivalents	109,750	91,149
Deposits	623,268	459,695
Loans	980,728	1,038,148
Other financial assets	633,930	428,218
Subtotal	2,347,676	2,017,211
Off balance account:		
Purchase agreement amount(*1)	80,900	138,450
Commitment of loan on collateral and underwriting debenture(*1)	63,535	76,100
Subtotal	144,435	214,551
Total	₩ 6,756,605	₩ 6,397,041

(*1) In addition to, the Group is under obligation to cover the losses of the distribution of union property.

⑤ Status of exposure for credit rating

Exposure of bonds, loans and OTC derivatives by credit rating as of December 31, 2018 and 2017, are as follows:

INSURANCE BUSINESS:

(a) Bonds

	2018						
	Risk free	AAA	AA+–AA-	A+–BBB-	Below BBB-	Others	Total
	(In millions of Korean won)						
Government and public bonds	₩ 12,603,332	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 12,603,332
Special bonds	5,402,624	7,949,360	113,856	-	-	-	13,465,840
Financial bonds	-	211,913	628,715	-	-	-	840,628
Corporate bonds	-	1,601,384	1,804,734	183,129	-	-	3,589,247
Overseas securities	7,298,617	11,355,719	5,428,008	976,833	-	-	25,059,177
Others	-	132,672	137,900	-	-	-	270,572
Total	₩ 25,304,573	₩ 21,251,048	₩ 8,113,213	₩ 1,159,962	₩ -	₩ -	₩ 55,828,796

	2017						
	Risk free	AAA	AA+–AA-	A+–BBB-	Below BBB-	Others	Total
	(In millions of Korean won)						
Government and public bonds	₩ 12,965,565	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 12,965,565
Special bonds	6,477,704	9,062,180	70,737	4,041	-	-	15,614,662
Financial bonds	-	387,933	828,142	53,057	-	10,148	1,279,280
Corporate bonds	-	2,414,637	2,228,831	391,877	-	6,471	5,041,815
Overseas securities	6,162,905	7,665,501	4,696,624	793,092	-	-	19,318,122
Total	₩ 25,606,174	₩ 19,530,251	₩ 7,824,334	₩ 1,242,067	₩ -	₩ 16,619	₩ 54,219,444

(b) Loans

	2018							
	Risk free	AAA	AA+–AA-	A+–BBB-	Below BBB-	Non-rating	Others	Total
	(In millions of Korean won)							
Call loans, unsecured loans, CP, loans secured by third-party guarantee	₩ 2,250,413	₩ -	₩ 219,261	₩ 112,445	₩ -	₩ 2,902,535	₩ 3,058,539	₩ 8,543,193
Loans secured by real estate	117	-	40,000	86,967	-	2,778,700	4,908,672	7,814,456
Policy loans	-	-	-	-	-	-	7,326,592	7,326,592
Other loans	967,725	1,499,265	202,167	268,389	30,341	302,566	11,452	3,281,905
Total	₩ 3,218,255	₩ 1,499,265	₩ 461,428	₩ 467,801	₩ 30,341	₩ 5,983,801	₩ 15,305,255	₩ 26,966,146

	2017							
	Risk free	AAA	AA+–AA-	A+–BBB-	Below BBB-	Non-rating	Others	Total
	(In millions of Korean won)							
Call loans, unsecured loans, CP, loans secured by third-party guarantee	₩ 2,302,388	₩ 105,702	₩ 113,468	₩ 116,628	₩ -	₩ 2,796,423	₩ 1,785,432	₩ 7,220,043
Loans secured by real estate	-	397,384	-	-	-	1,959,349	4,594,790	6,951,522
Policy loans	-	-	-	-	-	-	6,909,146	6,909,146
Other loans	1,283,399	1,102,653	206,634	137,836	-	252,842	36,948	3,020,312
Total	₩ 3,585,788	₩ 1,605,739	₩ 320,102	₩ 254,464	₩ -	₩ 5,008,614	₩ 13,326,316	₩ 24,101,023

INVESTMENT AND SECURITIES BUSINESS:

a) The credit risk of financial assets measured at amortized cost

The exposure of financial assets measured at amortized cost and off-balance agreement by credit risk rating as of December 31, 2018, is as follows:

	12 months expected credit losses measurement	Overall period Expected credit losses	Total
	(In millions of Korean won)		
Deposit and other loan receivables			
AA- to AAA+	₩ 58,803	₩ -	₩ 58,803
A- to A+	-	51,855	51,855
BBB- to BBB+	-	317,072	317,072
subtotal	58,803	368,927	427,730
Purchase agreement, payment guarantee, Purchase commitment			
AA- to AAA+	₩ 40,900	₩ -	₩ 40,900
A- to A+	40,000	-	40,000
BBB- to BBB+	28,400	35,135	63,535
subtotal	109,300	35,135	144,435
Total	168,103	404,062	572,165

Changes in provision for financial assets measured at amortized cost for the year ended December 31, 2018, are as follows:

	12 months expected credit losses	Overall period Expected credit losses	Total
	(In millions of Korean won)		
Beginning	₩ 280	₩ -	₩ 280
Impairment loss on credit losses	1,928	3,410	5,338
Ending	2,208	3,410	5,618

b) The credit risk of debt securities

The exposure of debt securities at FVTPL by credit risk rating as of December 31, 2018, is as follows:

	2018
	Financial assets at FVTPL
	(In millions of Korean won)
AAA	₩ 2,325,839
AA +–BBB -	1,512,180
BB	514
Non-rating (*1)	49,562
Total	₩ 3,888,095

(*1) The bonds did not receive any external evaluation. It does not imply a bond with a significant credit risk.

The exposure of financial assets held for trading and AFS financial assets by credit risk rating as of December 31, 2017, is as follows:

	2017			
	Financial assets at FVTPL		AFS financial assets	
	(In millions of Korean won)			
AAA	₩	2,191,855	₩	-
AA +–BBB -		1,246,392		-
BB		479		-
Non-rating (*1)		104,217		4,951
Total	₩	3,542,943	₩	4,951

(*1) The bonds did not receive any external evaluation. It does not imply a bond with a significant credit risk.

The credit quality of securities was classified using credit ratings calculated by credit rating agencies such as Korea Investors Service, Inc., Korea Asset Pricing Corporation, NICE P&I Co., Ltd., FN Asset Evaluation Co., Ltd.

⑥ Concentration level for industry

The concentration level by industries of bonds and loans as of December 31, 2018 and 2017, is as follows:

INSURANCE BUSINESS:

	2018													
	Governmental and Public Institutions (Government and Municipal bonds)		Financial and Insurance		Electricity, Gas, Steam and Water Supply		Construction		Real Estate and Leasing Service		Others		Total	
	(In millions of Korean won)													
Debt securities	₩	19,785,413	₩	13,974,089	₩	4,557,766	₩	2,160,343	₩	1,406,824	₩	13,944,362	₩	55,828,797
Loans(*1)		164,874		3,231,631		955,300		313,344		3,759,724		18,541,273		26,966,146
Total	₩	19,950,287	₩	17,205,720	₩	5,513,066	₩	2,473,687	₩	5,166,548	₩	32,485,635	₩	82,794,943

(*1) Loans are classified by principal amount

	2017													
	Governmental and Public Institutions (Government and Municipal bonds)		Financial and Insurance		Electricity, Gas, Steam and Water Supply		Construction		Real Estate and Leasing Service		Others		Total	
	(In millions of Korean won)													
Debt securities	₩	18,813,334	₩	14,568,289	₩	5,707,187	₩	2,119,293	₩	1,432,155	₩	11,579,185	₩	54,219,444
Loans(*1)		-		3,041,034		793,321		429,878		3,062,296		16,896,820		24,223,348
Total	₩	18,813,334	₩	17,609,323	₩	6,500,507	₩	2,549,171	₩	4,494,451	₩	28,476,005	₩	78,442,792

(*1) Loans are classified by principal amount

INVESTMENT AND SECURITIES BUSINESS:

(a) The Configuration details by industries of debt securities (including corporate bill securities) and loans as of December 31, 2018 and 2017, is as follows

	2018				2017			
	Amount		Ratio		Amount		Ratio	
	(In millions of Korean won)							
FVTPL-financial assets (Financial assets held for trading)								
Government and government-investment institutions	₩	1,543,317	%	31.66	₩	1,737,722	%	31.87
Finance and insurance industries		1,062,890		21.80		821,546		17.91
Others(*1)		1,281,889		26.30		983,675		21.44
Financial assets measured at amortized cost (loans)								
Finance and insurance industries	₩	1,229	%	0.03	₩	1,238	%	0.03
Others(*1)		985,355		20.21		1,044,147		22.76
Total		4,874,680		100.00		4,588,328		100.00

(*1) All non-financial and non-government classifications and loans with an individual counterpart were classified as others.

(b) The configuration details by country of debt securities(including corporate bill securities) and loans as of December 31, 2018 and 2017, is as follows

	2018				2017			
	Amount		Ratio		Amount		Ratio	
	(In millions of Korean won)							
FVTPL-financial assets (financial assets held for trading)								
Republic of Korea	₩	3,735,349	%	76.63	₩	3,324,861	%	72.46
Others		152,746		3.13		218,082		4.75
Financial assets measured at amortized cost (loans)								
Republic of Korea	₩	986,584	%	20.24	₩	1,045,385	%	22.78
Others		-		-		-		-
Total		4,874,680		100.00		4,588,327		100.00

E. Market risk management

① Concept

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices.

② Measurement method

INSURANCE BUSINESS:

Both standard measurement method and internal model are used to measure the market risk. Under the standard measurement method (Article 7-2 of the Supervisory Regulation on Insurance Industry), both general market risk and variable annuity insurance guarantee risk are measured using risk index by the RBC standard. If the Group uses an internal model, it calculates credit risk by Credit Manager (Credit Metrics measurement method), which is a credit risk measurement engine provided by MSCI.

③ Management method

INSURANCE BUSINESS:

(a) Management by permissible limit of VaR

The Group calculates VaR daily, which is maximum unsuspected loss (99% confidence level) to investment portfolio due to fluctuation of stock prices, interest rate and exchange rate. The Group manages to keep VaR less than the available capital by granting a limit.

(b) Management by loss limit

The Group establishes loss limit for trading assets and high-risk assets. If loss from the trading assets and the high-risk assets is exceeding the limit, the Group sells them to prevent additional loss. The Group manages to keep loss from the trading assets and the high-risk assets less than the loss limit.

(c) Management by operating limit

The Group establishes operating limit for investment category to prevent excessive investment on specific investment category.

INVESTMENT AND SECURITIES BUSINESS:

For the management of market risk, the Group measures ongoing market risk over the entire assets and liabilities, which are changed according to fluctuations in the market factors. Market risk is measured and managed in accordance with standard methods on the financial investment industry standards regulation and the VaR calculated by the amount of risk by the internal model. In addition, the Group manages the market risk by setting the sensitivity limits and the loss limits, including the operating limits. The Group's VaR is calculated in 99% of trust level-based retention period of one day, and it means that the actual loss in excess of the calculated VaR causes one day of 100 business days on average.

④ VaR of market

INVESTMENT AND SECURITIES BUSINESS:

The details of VaR of current market are as follows:

	2018 (*1)	2017 (*1)
	(In millions of Korean won)	
Spot investment	₩ 7,194	₩ 14,935
Beneficiary certificate	627	808
Bond	7,479	12,430
Listed derivatives	99,557	11,731
OTC derivatives	56,253	18,188
Deposits and others	2	7

(*1) VaR based on 10 days is calculated by conversion of VaR based on retention period of one day

⑤ Sensitivity analysis to risk factors

The Group operates daily, weekly, monthly and quarterly sensitivity analysis for 50 scenarios, which are historical scenarios and user-designated scenarios, and others. The results of sensitivity analysis are as follows:

INSURANCE BUSINESS:

	Variable factors	Effect on profit (loss) (*2)	Effect on equity (*2)
		(In millions of Korean won)	
Exchange rate (*1)	₩100 increase against won-dollar exchange rate	₩ 71,528	₩ 3,269
	₩100 decrease against won-dollar exchange rate	(71,528)	(3,269)
Interest rate	100 bp increase	(36,769)	(820,174)
	100 bp decrease	36,769	967,743
Stock index	10% increase	188,830	44,619
	10% decrease	(188,830)	(44,619)

(*1) Sensitive to fluctuation of exchange rate, including effects on profit and equity from fluctuation of assets and liabilities denominated in foreign currency and derivatives.
(*2) The Group separately manages the owned assets and financial assets at FVTPL, derivatives held for trading are managed at income level and financial assets at FVTOCI is managed at equity level.

F. Liquidity risk management

① Concept

Liquidity risk is the risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities.

② Management method

INSURANCE BUSINESS :

The Group manages liquidity by considering the total monthly cash flows of daily insurance cash flows.

INVESTMENT AND SECURITIES BUSINESS:

The Group performs liquidity risk management on all assets and liabilities related to investment securities business and off-book trading. The Group analyzes the cash flows of the assets and the liabilities and calculates the liquidity gap and the liquidity ratio. Also, the Group sets a funding limit for each department and manages it so that it does not exceed the appropriate amount of funding.

③ The details of the remaining maturity of liabilities including the interest amount for the period as of December 31, 2018 and 2017, are as follows.

INSURANCE BUSINESS:

	2018				
	Less than 1 year	Between 1 and 5 years	Between 5 and 10 years	More than 10 years	Total
	(In millions of Korean won)				
Other financial liabilities	₩ 1,311,967	₩ -	₩ -	₩ -	₩ 1,311,967
Borrowings	162,329	290,299	426,204	-	878,832
Derivative financial liabilities	211,529	109,704	-	527	321,760
Total	₩ 1,685,825	₩ 400,003	₩ 426,204	₩ 527	₩ 2,512,559

	2017				
	Less than 1 year	Between 1 and 5 years	Between 5 and 10 years	More than 10 years	Total
	(In millions of Korean won)				
Other financial liabilities	₩ 1,304,616	₩ 240,781	₩ 130,426	₩ -	₩ 1,675,823
Derivative financial liabilities	2,743	23,404	-	410	26,557
Total	₩ 1,307,359	₩ 264,185	₩ 130,426	₩ 410	₩ 1,702,380

INVESTMENT AND SECURITIES BUSINESS:

	2018				
	Less than 1 month	Between 1 and 3 months	Between 3 and 12 months	More than 12 months	Total
	(In millions of Korean won)				
Withheld liabilities	₩ 404,079	₩ -	₩ -	₩ -	₩ 404,079
Financial liabilities at FVTPL	476,254	27,442	183,363	1,284,996	1,972,055
Borrowings	2,035,760	1,052,797	206,968	149	3,295,674
Debentures	228	500	2,184	64,456	67,368
Derivative financial liabilities	8,076	34,030	75,978	126,074	244,158
Other financial liabilities	323,969	-	43,872	4,571	372,412
Purchase agreement amount	80,900	-	-	-	80,900
Commitment of loan on collateral and underwriting debenture	63,535	-	-	-	63,535
Total	₩ 3,392,801	₩ 1,114,769	₩ 512,365	₩ 1,480,246	₩ 6,500,181

(*1) As of December 31, 2018, the Group bears obligation of allowance for loss in relation to distribution of cooperative assets (see Note 56).

	2017				
	Less than 1 month	Between 1 and 3 months	Between 3 and 12 months	More than 12 months	Total
	(In millions of Korean won)				
Withheld liabilities	₩ 709,725	₩ -	₩ -	₩ -	₩ 709,725
Financial liabilities at FVTPL	390,268	108,214	162,659	553,741	1,214,882
Borrowings	2,695,405	541,144	169,130	159	3,405,838
Debentures	748	500	3,744	117,368	122,360
Derivative financial liabilities	3,637	18,841	45,940	71,091	139,509
Other financial liabilities	368,907	75	37,871	4,462	411,315
Purchase agreement amount	138,500	-	-	-	138,500
Commitment of loan on collateral and underwriting debenture	134,739	-	-	-	134,739
Total	₩ 4,441,929	₩ 668,774	₩ 419,344	₩ 746,821	₩ 6,276,868

(*1) As of December 31, 2017, the Group bears obligation of allowance for loss in relation to distribution of cooperative assets (see Note 56).

G. Operating risk management

① Concept

Operating risk is the risk of financial risk and non-financial risk due to inappropriate internal processes, manpower, external events, reputation and regulations. Operating risk management improves safety and soundness of the Company by identifying weaknesses in the internal process and systematic complement.

② Management method

The Group collects data by event types, causes and task types. Based on the accumulated data, the Group measures Op-VaR and reports to the risk management committee. In addition, the Group monitors the KPI-like unqualified contract index, incomplete selling rate, number of internal complaints and others and reports these to the risk management committee on a quarterly basis.

(4) Fair value hierarchy (financial business)

	Details
Level 1	Quoted prices (unadjusted) in active markets for identical assets or liabilities
Level 2	Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (that is, prices) or indirectly (that is, derived from prices)
Level 3	Inputs for the asset or liability that are not based on observable market data (that is, unobservable inputs)

① Fair value hierarchy classifications of the financial assets and the financial liabilities that are measured at fair value or their fair value is disclosed as of December 31, 2018 and 2017, are as follows:

	2018			
	Level 1	Level 2	Level 3	Total
	(In millions of Korean won)			
Financial assets				
FVTPL-financial assets	₩ 2,746,737	₩ 8,621,112	₩ 8,797,087	₩ 20,164,936
FVTOCI-financial assets	3,955,926	19,310,986	190,326	23,457,238
Derivative financial assets	5,873	411,748	75,656	493,277
Sub total	6,708,536	28,343,846	9,063,069	44,115,451
Financial liabilities				
Financial liabilities at FVTPL	₩ 465,707	₩ 29,066	₩ 1,477,282	₩ 1,972,055
Derivative financial liabilities	115,871	373,564	76,483	565,918
Sub total	581,578	402,630	1,553,765	2,537,973

	2017			
	Level 1	Level 2	Level 3	Total
	(In millions of Korean won)			
Financial assets				
Securities	₩ 6,299,839	₩ 57,018,540	₩ 6,835,319	₩ 70,153,698
Derivative financial assets	33,335	1,557,930	54,813	1,646,078
Financial liabilities				
Securities	₩ 379,286	₩ 22,775	₩ 812,821	₩ 1,214,882
Derivative financial liabilities	7,629	113,274	45,163	166,066

② Changes in Level 3 of the fair value hierarchy for the recurring fair value measurements are as follows:

	2018	2017
	(In millions of Korean won)	
Beginning	₩ 6,032,148	₩ 4,597,054
Purchase	4,976,920	3,577,700
Sales	(3,677,852)	(3,525,223)
Transfer out of Level 3 (*1)	35,358	(3,976)
Others (*2)	(2,909)	(49,575)
Amount recognized in profit or loss	142,254	(209,993)
Amount recognized in other comprehensive income	3,384	1,646,161
Ending	₩ 7,509,304	₩ 6,032,148

(*1) For the years ended December 31, 2018 and 2017, they are reclassified to Level 1 and Level 2 since valuation method of financial assets has been changed to assessment based on the observable inputs or prices in active markets following KOSDAQ listing.

(*2) The impact of changes in consolidations scope is included.

③ Financial instruments measured at cost

The Financial instruments measured at cost of December 31, 2018, are as follows:

	2018
	(In millions of Korean won)
Equity securities	₩ 144,061
Purchase debit instrument	8,000

(5) Capital risk management

The purpose of the consolidation entity's capital management is to maintain an optimal capital structure to protect its ability as a continuing entity to provide benefits to shareholders and stakeholders and to reduce capital costs.

The consolidation entity manages capital based on the capital procurement ratio, as is the case with other companies in the same industry. The capital procurement ratio is calculated by dividing the net debt into total capital. The net debt is the amount of cash and cash equivalents deducted from the gross borrowing (borrowing and debentures in the consolidated statement of financial position) and the total capital is the sum of the net debts added to the "Capital total" of the consolidated statement of financial position.

The gearing ratios as of December 31, 2018 and 2017, are as follows:

	2018	2017
	(In millions of Korean won)	
Total borrowings	₩ 16,977,899	₩ 14,612,949
Less: Cash and cash equivalents	(5,058,739)	(2,894,554)
Net debt (A)	11,919,160	11,718,395
Total equity (B)	16,953,036	15,964,746
Total capital (A+B)	₩ 28,872,196	₩ 27,683,141
Gearing ratio (A/(A+B))	41.28%	42.33%

(6) Details of financial information in accordance with trust type of Investment and Securities business for the year ended December 31, 2018, are as follows:

	Specified money in trust
	(In millions of Korean won)
Assets:	
Cash and deposits	₩ 749,313
Stocks	22,297
Investments	34,148
Bonds	162,389
Corporate accommodation note	972,845
Asset-backed short-term receivables	651,000
Derivatives-combined securities	4,027
Purchase under repurchase agreements	3,175
Beneficiary certificates	5,710
Monetary bond	848,432
Foreign bond	669,468
Beneficiary certificates in foreign currency	26,126
Other assets	41,469
	4,190,399
Liabilities:	
Specified money in trust	3,280,470
Property trust	852,632
Unearned revenues	7,316
Accrued trust fee	2,458
Accrued trust income	47,523
	₩ 4,190,399

60. CHANGES IN ACCOUNTING POLICIES :

(1) Effect of adoption of K-IFRS 1109

1) The classification and measurement of financial assets and financial liabilities in accordance with K-IFRS 1109 and K-IFRS 1039 as of January 1, 2018, the initial application date, are as follows:

	Category		Book Value (In millions of Korean won)		
	K-IFRS 1039	K-IFRS 1109	K-IFRS 1039	K-IFRS 1109	Adjustments
NON-FINANCIAL BUSINESS Assets					
Cash and cash equivalents	Loans and receivables	Financial assets measured at amortized cost	2,109,153	2,109,153	-
Trade receivables and other receivables	Loans and receivables	Financial assets measured at amortized cost	5,120,081	5,112,729	(7,352)
Other financial assets	Loans and receivables	Financial assets measured at amortized cost	844,162	843,993	(169)
Equity instruments	AFS financial assets	Fair value financial assets' profit or loss	3,801	3,801	-
Equity instruments	AFS financial assets	Fair value financial assets at other comprehensive income	324,024	324,024	-
Equity instruments	AFS financial assets	Fair value financial assets profit or loss	149,642	149,046	(596)
Debt instruments	AFS financial assets	Fair value financial assets at other comprehensive income	884	884	-
Derivatives financial instruments	Derivative assets	Fair value financial assets' profit or loss	26,452	26,452	-
FINANCIAL BUSINESS Assets					
Cash and cash equivalents	Loans and receivables	Financial assets measured at amortized cost	785,401	785,401	-
Deposits	Loans and receivables	Financial assets measured at amortized cost	988,823	988,823	-
Deposits	Loans and receivables	Fair value financial assets' profit or loss	10,855	10,855	-
Deposits	Loans and receivables	Fair value financial assets at other comprehensive income	1,991	1,991	-
Other financial assets	Loans and receivables	Financial assets measured at amortized cost	2,426,568	2,422,277	(4,291)
Financial assets at FVTPL	Financial assets at FVTPL	Fair value financial assets' profit or loss	7,305,010	7,305,010	-
Equity instruments	AFS financial assets	Fair value financial assets' profit or loss	864,131	864,131	-
Equity instruments	AFS financial assets	Fair value financial assets at other comprehensive income	447,302	447,302	-
Debt instruments	AFS financial assets	Fair value financial assets' profit or loss	10,227,137	10,240,809	13,672
Debt instruments	AFS financial assets	Fair value financial assets at other comprehensive income	19,931,353	19,931,353	-
Debt instruments	Held-to-maturity investments	Financial assets measured at amortized cost	31,529,786	31,489,836	(39,950)
Loans	Loans and receivables	Financial assets measured at amortized cost	25,563,506	25,521,158	(42,348)
Loans	Loans and receivables	Fair value financial assets' profit or loss	597,202	606,336	9,134
Loans	Loans and receivables	Fair value financial assets at other comprehensive income	662,996	668,129	5,133
Embedded derivatives	Derivative assets	Fair value financial assets' profit or loss	7,247	7,247	-
Derivative assets	Derivative assets	Fair value financial assets' profit or loss	1,638,831	1,625,239	(13,592)
Financial liabilities					
Short-term trading financial liabilities	Financial liabilities at FVTPL	Fair value financial liabilities' profit or loss	379,286	379,286	-

	Category		Book Value (In millions of Korean won)		
	K-IFRS 1039	K-IFRS 1109	K-IFRS 1039	K-IFRS 1109	Adjustments
Financial liabilities designated at FVTPL	Financial liabilities at FVTPL	Fair value financial liabilities' profit or loss	835,596	835,596	-
Contingent consideration	Financial liabilities at FVTPL	Fair value financial liabilities' profit or loss	47,202	47,202	-
Derivative liabilities	Derivative liabilities	Fair value financial liabilities' Profit or loss	233,346	233,346	-
Financial guarantee liabilities	Financial liabilities at amortized cost	Financial liabilities measured at amortized cost	9,342	9,354	12

2) The effect of changes in the classification and measurement of Financial Instrument on the beginning retained earnings is as follows:

Adjustments	Amount (In millions of Korean won)
Beginning retained earnings (K-IFRS 1039)	3,365,096
Reclassification of AFS financial assets to fair value financial assets' profit or loss	17,902
Increase in doubtful accounts of trade and other receivables	(7,352)
Increase in doubtful accounts of financial assets at amortized cost	(2,817)
Effect of the reclassification of loans	8,534
Increase in doubtful accounts of fair value financial liabilities at other comprehensive income	5,133
Effect of the retrospective application of gain of held-to-maturity investments	(39,950)
A reversal of an impairment loss of fair value financial assets at other comprehensive income	33,545
Increase in doubtful accounts of financial guarantee contracts	(743)
Reclassification of the Company's own credit risk on financial liabilities designated as at FVTPL	(512)
Other	(15,830)
Adjustments of total surplus in accordance with K-IFRS 1109	(2,090)
Beginning retained earnings (K-IFRS 1109)	3,363,006

3) The effect of changes in equity in accordance with K-IFRS 1109 is as follows:

	Capital stock	Capital surplus	Capital adjustments	Accumulated other comprehensive income	Retained earnings	Non-controlling interests	Total
	(In millions of Korean won)						
2017.12.31	₩ 489,550	₩ 547,154	₩ 38,295	₩ 101,197	₩ 3,365,096	₩11,423,453	₩15,964,745
K-IFRS 1109	-	-	-	(414,589)	(2,090)	(417,932)	(834,611)
K-IFRS 1115	-	-	-	(136)	(118,558)	(46,634)	(165,328)
2018.1.1	₩ 489,550	₩ 547,154	₩ 38,295	₩ (313,528)	₩ 3,244,448	₩10,958,887	₩14,964,806

(2) Effect of adoption of K-IFRS 1115**:**

1) The effect of adoption of K-IFRS 1115 on each item of the consolidated financial statements for the first application date January, 1, 2018, is as follows.

	2017.12.31 Previous Policy	Adjustments	2018.01.01 K-IFRS 1115
		(In millions of Korean won)	
Assets			
Current Assets	₩ 11,619,692	₩ 174,853	₩ 11,794,545
Non-current Assets	16,152,146	39,864	16,192,010
Financial Assets	132,423,140	-	132,423,140
Total Assets	160,194,978	214,717	160,409,695
Liabilities			
Current Liabilities	₩ 12,930,690	₩ 566,757	₩ 13,497,447
Non-current Liabilities	9,637,772	(186,711)	9,451,061
Financial Liabilities	121,661770	-	121,661,770
Total Liabilities	144,230,232	380,046	144,610,278
Equity			
Equity attributable to owner of the Company	₩ 4,541,292	₩ (118,695)	₩ 4,422,597
Non-controlling interests	11,423,454	(46,634)	11,376,820
Total Equity	15,964,746	(165,329)	15,799,417
Total Liabilities and Equity	160,194,978	214,717	160,409,695

2) The effect of adoption of K-IFRS 1115 on each item of the financial statements for the year ended December 31, 2018, and the causes of significant changes are as follows.

STATEMENTS OF FINANCIAL POSITON		2018.12.31 Previous Policy		Adjustments		2018.12.31 K-IFRS 1115
				(In millions of Korean won)		
Assets						
Current Assets	₩	13,662,966	₩	(57,556)	₩	13,720,522
Non-current Assets		17,343,155		(117,692)		17,460,847
Financial Assets		138,367,208		-		138,367,208
Total Assets		169,373,329		(175,248)		169,548,577
Liabilities						
Current Liabilities	₩	14,353,507	₩	(516,494)	₩	14,870,001
Non-current Liabilities		10,710,715		(67,484)		10,643,231
Financial Liabilities		127,082,310		-		127,082,310
Total Liabilities		152,146,532		(449,010)		152,595,542
Equity						
Equity attributable to owner of the Company	₩	4,453,113	₩	267,728	₩	4,185,385
Non-controlling interests		12,773,684		6,034		12,767,650
Total Equity		17,226,797		273,762		16,953,035
Total Liabilities and Equity		169,373,329		(175,248)		169,548,577

STATEMENTS OF COMPREHENSIVE INCOME		2018.12.31 Previous Policy		Adjustments		2018.12.31 K-IFRS 1115
				(In millions of Korean won)		
Revenue	₩	48,692,879	₩	(47,274)	₩	48,740,153
Cost of Sales		44,356,508		(122,723)		44,479,231
Selling and administrative expenses		2,435,977		(18,797)		2,454,774
Operating profit		1,900,394		94,246		1,806,148
Other gains		842 142		-		842 142
Other losses		1,425,396		-		1,425,396
Profit before income tax expense		1,390,116		90,276		1,299,840
Income tax expense		507,625		7,124		500,501
Profit for the year		882,492		83,152		799,340
Equity holders of the parent company’s profit for the year		545,518		77,118		468,400
Non-controlling interests’ profit for the year		336,974		6,034		330,940

There are no material impacts on the Company’s consolidated statements of cash flows upon adoption of K-IFRS 1115.

61. INFORMATION ABOUT NON-CONTROLLING INTERESTS:

(1) Changes in accumulated non-controlling interests

The profit or loss allocated to non-controlling interests and accumulated non-controlling interests of subsidiaries that are material to the Group for the years ended December 31, 2018 and 2017, is as follows:

	2018						
	Percentage of ownership (%)	Percentage of voting rights (%)	Accumulated non-controlling interests at the beginning of the year	Profit or loss allocated to non-controlling interests	Dividends paid to non-controlling interests	Others	Accumulated non-controlling interests at the end of the year
	(In millions of Korean won)						
Hanwha Life Insurance Co., Ltd.	55.00	48.00	₩ 4,843,698	₩ 195,295	₩ (110,165)	₩ 564,963	₩ 5,493,791
Hanwha Chemical Corporation	63.70	63.50	3,781,809	30,375	(36,697)	(53,029	3,722,458
Hanwha Aerospace Co., Ltd..	67.00	67.00	1,492,606	10,041	-	335,427	1,830,075

	2017						
	Percentage of ownership (%)	Percentage of voting rights (%)	Accumulated non-controlling interests at the beginning of the year	Profit or loss allocated to non-controlling interests	Dividends paid to non-controlling interests	Others	Accumulated non-controlling interests at the end of the year
	(In millions of Korean won)						
Hanwha Life Insurance Co., Ltd.	55.00	48.00	₩ 3,804,720	₩ 286,373	₩ (42,992)	₩ 795,597	₩ 4,843,698
Hanwha Chemical Corporation	64.10	63.50	3,283,222	554,605	(36,697)	(19,321)	3,781,809
Hanwha Aerospace Co., Ltd...	67.30	67.30	1,610,142	(41,056)	-	(76,480)	1,492,606

(2) Summarized financial information on subsidiaries

The summarized financial information for each subsidiary with non-controlling interests that are material to the Group before intercompany eliminations is as follows:

A. Summarized consolidated statements of financial position as of December 31, 2018 and 2017, are as follows:

HANWHA LIFE INSURANCE CO., LTD.:

	2018	2017
	(In millions of Korean won)	
Assets for financial business	₩ 130,849,493	₩ 125,994,472
Liabilities for financial business	120,083,577	115,756,370
Equity	10,765,916	10,238,102

HANWHA CHEMICAL CORPORATION:

	2018	2017
	(In millions of Korean won)	
Current assets	₩ 5,012,471	₩ 4,222,467
Non-current assets	10,219,005	9,427,021
Current liabilities	5,132,516	4,894,190
Non-current liabilities	3,871,864	2,567,825
Equity	6,227,096	6,187,473

HANWHA AEROSPACE CO., LTD.:

	2018	2017
	(In millions of Korean won)	
Current assets	₩ 3,876,999	₩ 2,835,095
Non-current assets	3,519,687	2,912,478
Current liabilities	3,144,141	2,140,555
Non-current liabilities	1,616,795	1,426,065
Equity	2,635,750	2,180,953

B. Summarized consolidated statements of comprehensive income for the years ended December 31, 2018 and 2017, are as follows:

HANWHA LIFE INSURANCE CO., LTD.:

	2018	2017
	(In millions of Korean won)	
Operating revenue	₩ 23,453,995	₩ 26,087,054
Profit for the year	414,947	688,724

HANWHA CHEMICAL CORPORATION:

	2018	2017
	(In millions of Korean won)	
Operating revenue	₩ 9,046,042	₩ 9,341,813
Profit for the year	160,445	834,534
Other comprehensive loss	(85,137)	(43,151)
Total comprehensive income	75,308	791,383

HANWHA AEROSPACE CO., LTD:

	2018	2017
	(In millions of Korean won)	
Operating revenue	₩ 4,453,177	₩ 4,215,471
Profit for the year	49,251	(47,748)
Other comprehensive (loss) income	(1,961)	(84,816)
Total comprehensive income	47,290	(132,564)

C. Summarized consolidated statements of cash flows for the years ended December 31, 2018 and 2017, are as follows:

HANWHA LIFE INSURANCE CO., LTD.:

	2018	2017
	(In millions of Korean won)	
Cash flows from operating activities	₩ 1,642,876	₩ 3,318,659
Cash flows from investing activities	(1,832,157)	(4,066,206)
Cash flows from financing activities	1,433,437	480,646
Net increase in cash and cash equivalents	1,244,156	(266,901)
Cash and cash equivalents at the beginning of year	582,203	851,474
Exchange gains/ (losses) on cash and cash equivalents	12,351	(2,370)
Cash and cash equivalents at the end of year	1,838,710	582,203

HANWHA CHEMICAL CORPORATION:

	2018	2017
	(In millions of Korean won)	
Cash flows from operating activities	₩ 726,704	₩ 916,232
Cash flows from investing activities	(434,645)	(403,185)
Cash flows from financing activities	(69,584)	(685,641)
Net increase in cash and cash equivalents	222,475	(172,594)
Cash and cash equivalents at the beginning of year	804,983	1,012,313
Exchange losses on cash and cash equivalents	(3,337)	(34,736)
Cash and cash equivalents at the end of year	1,024,121	804,983

HANWHA AEROSPACE CO., LTD:

	2018	2017
	(In millions of Korean won)	
Cash flows from operating activities	₩ 56,343	₩ (9,741)
Cash flows from investing activities	(213,054)	72,610
Cash flows from financing activities	332,716	140,434
Net increase in cash and cash equivalents	176,005	203,303
Cash and cash equivalents at the beginning of year	461,380	257,418
Exchange gains/ (losses) on cash and cash equivalents	(663)	659
Cash and cash equivalents at the end of year	636,722	461,380

(3) Transactions with non-controlling interests

Effects arising from transactions with non-controlling interests on the equity attributable to owners of the parent for the years ended December 31, 2018 and 2017, are as follows:

	2018 (*1)	2017 (*2)
	(In millions of Korean won)	
Carrying amount of the non-controlling interests increased (decreased)	₩ 1,060,047	₩ 1,021,209
Paid-in capital increase/consideration paid to non-controlling interests	1,060,047	844,356
Excess of consideration paid recognized in parent's equity	-	176,853

(*1) Major transactions with non-controlling interests for the year ended December 31, 2018, are issue of Hybrid securities of Hanwha Life Insurance Co., Ltd.

(*2) Major transactions with non-controlling interests for the year ended December 31, 2017, are derived from sale of stock of Hanwha Life Insurance Co., Ltd., and issue of hybrid securities of Hanwha Life Insurance Co., Ltd., and Hanwha General Insurance Co., Ltd. and paid-in capital increase transaction.

62. UNCONSOLIDATED STRUCTURED ENTITIES:

(1) The Group is involved in structured entities by investing SOC, asset securitization, structured finance and investment funds. Details of structured entities' major information are as follows:

Business	Description	Remarks (nature, purpose, activities and others)
Non-financial business	SOC	Unconsolidated structured entity that is classified as SOC is granted a right to manage and operate and receives management fee. Management fee is used to recover costs associated with investments in infrastructure, such as roads, ports, railroads, schools and environmental infrastructure, which are donated to the government by civilians. In other words, SOC, an SPC, is a corporation for business enforcement that manages construction and operations of the SOC, and the management fee received is used to recover cost incurred by civilians for investment in SPC. The Group, after receiving the right to construct for structured finance, generates return of investment and income from providing construction service and equity investment.
	Asset securitization	Unconsolidated structured entities classified as 'asset securitization' are engaged in issuing asset-backed securities based on securitized assets as underlying assets and distribute principal and dividends of the asset-backed securities with sources, such as borrowings or proceeds from management, operation and disposition of the securitized asset. 'Asset securitization' transfers risks related to the issuance of asset-backed securities through purchasing agreements with the Group or credit offering. In relation to this, the Group recognizes interest income or commission income.
Financial business	Structured finance	Unconsolidated structured entity, which is classified as a structured entity, includes SPE, such as property PF IE, developer of infrastructure facilities business and ships (aircraft) finance. Structured finance is a way of funding large-scale businesses with risks. Investment decisions on the projects are made based on the economic feasibilities of the specific project, not on credit or physical collateral of the company leading the project. The Group provides loans and equity investments as funds to structured entities for structured finance.
	Investment funds	Unconsolidated structured entities, which are classified as investment funds, include investment trust company and private equity fund. An investment trust company is a form of collective investment organization where a consignor delegates responsibility to trustee to invest and manage a fiduciary estate. PEF, a form of collective investment organization under the Capital Market Consolidation Act, invests in shares using a company's assets in order to enhance the value of the company in which the organization invests by participating in management, improving business structure and governance. PEF is a limited partnership company under the commercial law as it distributes income from investment to the investors through private placement. The Group, an investor to the investment fund, recognizes income from valuation of equity investments and dividend income in proportion to its share ratio. If the value of the investment fund decreases, the Group will be exposed to the risk of principal losses.
	Investment association	The structure instructs the business executive to invest and operate in accordance with the cooperative agreement and allocates operating income to the limited employees of the investment association. The Group, an investor to the investment association, recognizes income from valuation of equity investments and dividend income in proportion to its share ratio. If the value of the investment trust decreases, the Group will be exposed to the risk of principal losses.

(2) Details of unstructured entities' scale and the Group's risks to unstructured entities as of December 31, 2018, are as follows:

	SOC	Asset securitization	Structured finance	Investment funds	Investment association	Total
			(In millions of Korean won)			
Assets in the consolidated statements of financial position						
Trade and other receivables	₩ 71,375	₩ -	₩ -	₩ -	₩ -	₩ 71,375
Securities	42,799	276,842	1,840,846	2,844,243	-	5,004,730
Investments in associates	3,898	-	75,338	48,700	16,711	144,647
Loans	-	363,710	4,695,721	248,417	-	5,307,848
Total	118,072	640,552	6,611,905	3,141,360	16,711	10,528,600
Liabilities in the consolidated statements of financial position						
Other provisions	-	-	-	-	-	-
Total	-	-	-	-	-	-
Maximum exposure to loss (*1)	655,072	784,987	7,870,772	3,717,107	24,461	13,052,399

(*1) Financial assets and financial liabilities were measured based on the book value; financial guarantee contracts, loan commitments and financing arrangements were measured based on the contractual limit amount. In addition, the maximum exposure amount above is the total amount that does not reflect the effect of the group's hedging activities to reduce the risk of exposure to unconsolidated companies.

63. BUSINESS CONSOLIDATION :

(1) The Group merged Hanwha S&C Ltd. on August 1, 2018. As Hanwha S&C Ltd. development and consulting business, the Group expects improved corporation value by expanding its business segment and maximizing synergy through the merger with Hanwha S&C Ltd. and Hanwha System Co., Ltd.

Hanwha Advanced Materials Corporation, a subsidiary of the Group, merged Hanwha Q CELLS Korea Corp. for improvement of business segment and corporation value. In addition, Hanwha Advanced Materials Co., Ltd acquired the solar cell and solar power system sales sector from Hanwha Q CELL Co., Ltd in order to unify the solar energy business on the same day. After the merger, the surviving company Hanwha Advanced Materials Co., Ltd., changed its name to Hanwha Q CELLS & Advanced Materials Co., Ltd.

(2) Details of the amount paid for business combination as of December 31, 2018, are as follows

	Hanwha S&C	Hanwha Q CELLS Korea
	(In millions of Korean won)	
Cash	₩ -	₩ 327,996
Fair value of pre-acquired company's equity	-	111,519
Shares	512,276	₩ 116,790
Total amount	₩ 512,276	₩ 556,305

(3) The fair values of the identifiable assets acquired and liabilities assumed at the acquisition date as a result of a business combination occurring is as follows:

	Hanwha S&C	Hanwha Q CELLS Korea
	(In millions of Korean won)	
Recognized amounts of identifiable assets acquired	₩ 331,167	₩ 2,290,217
Cash and cash equivalents	43,195	100,483
Trade and other receivables	77,029	663,494
Other assets	10,678	155,861
Inventories	2,595	190,482
Investment in associates and joint ventures	4,633	7,237
Other financial assets	13,060	35,472
Property, plant and equipment	70,798	1,045,482
Intangible assets	95,471	82,216
Deferred income tax assets	13,708	9,490
Recognized amounts of identifiable liabilities assumed	143,289	1,752,609
Trade and other payables	32,191	287,925
Borrowings	22,296	1,339,053
Other liabilities	15,374	45,432
Deferred income tax liabilities	19,832	21,744
Other financial liabilities	3,618	38,200
Employee benefits	49,978	20,255
Recognized amounts of total identifiable net assets	₩ 187,878	₩ 537,608

(4) Goodwill amount at the merger date of August 1, 2018 is as follows

	Hanwha S&C	Hanwha Q CELLS Korea
	(In millions of Korean won)	
I. Acquisition price	₩ 512,276	₩ 556,305
II. Net identifiable assets	187,878	537,608
III. Goodwill (I- II)	324,398	18,697

(5) Net cash outflows from business combination for the year ended December 31, 2018, are as follows:

	Amounts
	(In millions of Korean won)
Consideration of cash and cash equivalents	₩ 439,515
Less: acquired cash and cash equivalents	(100,483)
Net cash outflows	339,032

(6) Includes a net profit of ₩34,611 million for additional projects created by the merged entity and its subsidiaries. The revenue recognized in the current period include sale of ₩333,028 million from Hanwha Q CELLS Korea Corp and its subsidiaries.

64. SUBSEQUENT EVENTS:

- To enhance management efficiency and expertise and to establish the foundation for a responsible management system by specializing the expertise of the auto parts business sector and carrying out activities suitable for its specific characteristics, the parent company established a new company on February 1, 2019, by dividing the auto parts business sector and sold the total number of shares issued by the company for ₩37 billion on February 13, 2019.

- Merger between Hanwha Q CELLS Co., Ltd. And Hanwha Solar Holdings Co., Ltd and delisting from NASDAQ.

As of October 15, 2018, Hanwha Q CELLS CO., Ltd. decided to merge Hanwha Solar Holdings CO., Ltd. because of the decrease of necessities of listing in NASDAQ and improvement of management efficiency. On January 16, 2019, Hanwha Solar Holdings Co., Ltd. completed the merging process of Hanwha Q CELLS CO., Ltd. and Hanwha Q CELLS Co., Ltd. delisted from NASDAQ as of January 28, 2019. As a result of the merger, the surviving company Hanwha Solar Holdings Co., Ltd. changed its name to Hanwha Q CELLS Co., Ltd.