

SK HYNIX, INC. and Subsidiaries

Consolidated Financial Statements

December 31, 2019 and 2018

(With Independent Auditors' Report Thereon)

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Independent Auditors' Report

Based on a report originally issued in Korean

To The Board of Directors and Shareholders of
SK hynix, Inc.:

Opinion

We have audited the accompanying consolidated financial statements of SK hynix, Inc. and its subsidiaries (the "Group"), which comprise the consolidated statements of financial position as of December 31, 2019 and 2018, the related consolidated statements of comprehensive income, changes in equity and cash flows for the years then ended, and notes to the consolidated financial statements, including significant accounting policies and other explanatory information.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2019 and 2018, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("K-IFRS").

Basis for Opinion

We conducted our audits in accordance with Korean Standards on Auditing. Our responsibilities under those standards are further described in the Auditor's 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 that are relevant to our audit of the consolidated financial statements in the Republic of Korea, and we have fulfilled our ethical responsibilities in accordance with these requirements. 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 as of and for the year ended December 31, 2019. 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 separate opinion on these matters.

(I) surement of fair value of financial instruments.

As described in note 6 and note 12 to the consolidated financial statements, the Group has equity investment ("SPC1") and convertible bonds ("SPC2") relating to investment in KIOXIA Holdings Corporation ("KIOXIA", formerly, Toshiba Memory Corporation). Those are measured at the fair value using significant unobservable inputs as of December 31, 2019 and amount to ₩4,216,218 million in the aggregate.

The fair values of financial instruments in connection with the investments in SPC1 and SPC2 are measured based on the equity value of KIOXIA, an unlisted company, which involves significant judgment in the application of probability-weighted expected return method and in determining the assumptions to be used, such as estimated future revenue, operating profit and discount rate. Accordingly, we identified the measurement of fair values of financial instruments in connection with the investments in SPC1 and SPC2 as a key audit matter.



The primary procedures we performed to address this key audit matter included:

- Testing certain internal controls relating to the fair value evaluation process of the financial instruments;
- Assessing the qualification and objectivity of the external institution engaged by the Group to assess the fair value of the financial instruments;
- Reading investment agreements to understand the relevant investment terms, identifying any conditions that were relevant to the valuation of financial instruments and confirming whether investment terms and conditions are considered in valuation;
- Involving our valuation professionals with specialized skills and knowledge who assisted us in evaluating the valuation result from the report issued by the external institution, and the valuation models (market approach, option-pricing method or present value method), and assumptions such as future revenue, operating profit and discount rate used by the Group to value investments in SPC1 and SPC2;
- Performing sensitivity analysis of significant unobservable inputs, including discount rate and weighting of different scenarios used in estimating the fair value of investments in SPC1 and SPC2 and assessing the impact of changes in the inputs on the fair value measurement and whether there were any indicators of management bias; and
- Assessing the appropriate disclosures of the consolidated financial statements for the valuation of fair value, key assumptions and source data in accordance with K-IFRS.

(II) Assessment and disclosure of contingencies for price-fixing class-action lawsuits in North America and the antitrust investigation in China.

As described in note 35, the price-fixing class-action lawsuits in North America and the antitrust investigation in China are ongoing, as of December 31, 2019. As described in note 3-(17) to the consolidated financial statements, a provision should be recognized for these litigation and investigation if they represent a present obligation as a result of past event; it is probable that an outflow of resources will occur; and reliable estimation of amounts can be made.

As the outcome of these litigation and regulatory investigation is uncertain, any position taking by management will involve significant judgment and estimation. The estimates underlying these contingent liabilities involve management's significant judgment in interpreting various relevant regulations, laws, and practices, and evaluation of past cases of jurisdictions. Accordingly, we identified the assessment of contingent liabilities and related disclosures for the above litigation and regulatory investigation as a key audit matter.

The primary procedures we performed to address this key audit matter included:

- Testing certain internal controls relating to the contingent liabilities evaluation and disclosure process;
- Discussing the status and potential exposures with the Group internal legal counsel and obtaining confirmation letters regarding the litigation and regulatory investigation from the Group's external legal counsels, including their views on the likely outcome of each litigation or regulatory investigation and whether the magnitude of potential exposure to the Group could be reliably estimated;
- Assessing the competence, capability and objectivity of external legal counsels, by considering professional qualifications, fee arrangements and other relevant factors;
- Assessing the recognition of provisions depending on whether those are a present obligation as a result of past event, probable that an outflow of resources, and reliable estimation of amounts in accordance with accounting standard; and
- Assessing whether the disclosures detailing the above litigation and regulatory investigation adequate in accordance with K-IFRS.

Other Matter

The procedures and practices utilized in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.



Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with K-IFRS, and for such internal controls as management determines 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 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.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditors' Responsibility 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 misstatements, 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 Korean Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in 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 Korean Standards on Auditing, 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, whether due to fraud or error, 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. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.
- 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 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, then 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 of business activities with 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 remain solely responsible for our audit opinion.

We communicate with those charged with governance 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 those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period 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 or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditors' report is Heon Chang Oh.

KPMG Samjong Accounting Corp.

Seoul, Korea
February 25, 2020

This report is effective as of February 25, 2020, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

SK HYNIX, INC. and Subsidiaries
Consolidated Statements of Financial Position
As of December 31, 2019 and 2018

(In millions of won)

	Note	2019	2018
Assets			
Current assets			
Cash and cash equivalents	5,6 ₩	2,306,070	2,349,319
Short-term financial instruments	5,6,7	298,350	523,579
Short-term investment assets	5,6	1,390,293	5,496,452
Trade receivables, net	5,6,8,34	4,261,674	6,319,994
Loans and other receivables, net	5,6,8,34	23,508	18,392
Inventories, net	9	5,295,835	4,422,733
Current tax assets	32	199,805	22,252
Other current assets	10	682,037	741,425
Other financial assets	5,6,7	30	-
		<u>14,457,602</u>	<u>19,894,146</u>
Non-current assets			
Investments in associates and joint ventures	11	768,767	562,194
Long-term trade receivables	5,6,8	44,775	-
Long-term investment assets	5,6,12	4,381,812	4,325,550
Loans and other receivables, net	5,6,8,34	109,079	68,514
Other financial assets	5,6,7	901	310
Property, plant and equipment, net	13,16,35	39,949,940	34,952,617
Right-of-use assets, net	3,14	1,250,576	-
Intangible assets, net	15	2,571,049	2,678,770
Investment property, net	13,16	258	1,400
Deferred tax assets	22,32	670,866	544,016
Employee benefit assets, net	21	3,406	5,164
Other non-current assets	10,35	580,463	625,654
		<u>50,331,892</u>	<u>43,764,189</u>
Total assets	₩	<u>64,789,494</u>	<u>63,658,335</u>

See accompanying notes to the consolidated financial statements.

SK HYNIX, INC. and Subsidiaries
Consolidated Statements of Financial Position, Continued
As of December 31, 2019 and 2018

(In millions of won)

	Note	2019	2018
Liabilities			
Current liabilities			
Trade payables	5,6,34 ₩	1,042,542	1,096,380
Other payables	5,6,34	2,367,673	3,681,933
Other non-trade payables	5,6,16,34	1,257,895	1,879,520
Borrowings	5,6,17,35	2,737,770	1,614,303
Provisions	20	10,701	56,208
Current tax liabilities	32	89,217	4,555,670
Lease liabilities	3,5,6,14	205,238	-
Other current liabilities	19	162,997	147,838
		<u>7,874,033</u>	<u>13,031,852</u>
Non-current liabilities			
Other non-trade payables	5,6,17	18,266	15,231
Borrowings	5,6,18,35	7,785,736	3,667,634
Defined benefit liabilities, net	21	53,624	5,387
Deferred tax liabilities	22	15,743	6,597
Lease liabilities	3,5,6,14	995,592	-
Other financial liabilities	5,6,23	15,532	-
Other non-current liabilities	19	87,773	79,303
		<u>8,972,266</u>	<u>3,774,152</u>
Total liabilities		<u>16,846,299</u>	<u>16,806,004</u>
Equity			
Equity attributable to owners of the Parent Company			
Capital stock	1,24	3,657,652	3,657,652
Capital surplus	24	4,143,736	4,143,736
Other equity	24,37	(2,504,713)	(2,506,451)
Accumulated other comprehensive loss	25	(298,935)	(482,819)
Retained earnings	26	42,930,675	42,033,601
Total equity attributable to owners of the Parent Company		<u>47,928,415</u>	<u>46,845,719</u>
Non-controlling interests		<u>14,780</u>	<u>6,612</u>
Total equity		<u>47,943,195</u>	<u>46,852,331</u>
Total liabilities and equity	₩	<u><u>64,789,494</u></u>	<u><u>63,658,335</u></u>

See accompanying notes to the consolidated financial statements.

SK HYNIX, INC. and Subsidiaries
Consolidated Statements of Comprehensive Income
For the years ended December 31, 2019 and 2018

(In millions of won, except per share information)

	Note	2019	2018
Revenue	4,27,34 ₩	26,990,733	40,445,066
Cost of sales	29,34	18,825,275	15,180,838
Gross profit		8,165,458	25,264,228
Selling and administrative expenses	28,29	5,452,740	4,420,478
Operating profit		2,712,718	20,843,750
Finance income	5,30	1,247,640	1,691,955
Finance expenses	5,30	1,514,869	1,142,134
Share of profit of equity-accounted investees	11	22,633	13,007
Other income	31	88,179	112,810
Other expenses	31	113,575	178,358
Profit before income tax		2,442,726	21,341,030
Income tax expense	32	426,335	5,801,046
Profit for the year		2,016,391	15,539,984
Other comprehensive income (loss)			
Item that will never be reclassified to profit or loss:			
Remeasurements of defined benefit liability, net of tax	21	(90,211)	(77,029)
Items that are or may be reclassified to profit or loss:			
Foreign operations – foreign currency translation differences, net of tax	25	150,037	7,534
Gain on valuation of derivatives, net of tax	23,25	12,753	-
Equity-accounted investees – share of other comprehensive income, net of tax	11,25	21,444	2,276
Other comprehensive income (loss) for the year, net of tax		94,023	(67,219)
Total comprehensive income for the year	₩	2,110,414	15,472,765
Profit (loss) attributable to:			
Owners of the Parent Company	₩	2,013,288	15,540,111
Non-controlling interests		3,103	(127)
Total comprehensive income attributable to:			
Owners of the Parent Company		2,106,961	15,471,792
Non-controlling interests		3,453	973
Earnings per share			
Basic earnings per share (in won)	33	2,943	22,255
Diluted earnings per share (in won)	33	2,943	22,252

See accompanying notes to the consolidated financial statements

SK HYNIX, INC. and Subsidiaries
Consolidated Statements of Changes in Equity
For the years ended December 31, 2019 and 2018

(In millions of won)

	Note	Attributable to owners of the Parent Company						Non- controlling interests	Total equity
		Capital stock	Capital surplus	Other equity	Accumulated other comprehensive income (loss)	Retained earnings	Total		
Balance at January 1, 2018		3,657,652	4,143,736	(771,100)	(491,529)	27,276,521	33,815,280	5,639	33,820,919
Total comprehensive income									
Profit for the year		-	-	-	-	15,540,111	15,540,111	(127)	15,539,984
Remeasurements of defined benefit liability, net of tax	21	-	-	-	-	(77,029)	(77,029)	-	(77,029)
Other comprehensive income from joint venture and associate, net of tax	11,25	-	-	-	2,276	-	2,276	-	2,276
Foreign currency translation differences for foreign operations, net of tax	25	-	-	-	6,434	-	6,434	1,100	7,534
Total comprehensive income		-	-	-	8,710	15,463,082	15,471,792	973	15,472,765
Transactions with owners of the Parent Company									
Acquisition of treasury shares		-	-	(1,736,514)	-	-	(1,736,514)	-	(1,736,514)
Dividends paid	26	-	-	-	-	(706,002)	(706,002)	-	(706,002)
Share-based payment transactions		-	-	1,163	-	-	1,163	-	1,163
Total transactions with owners of the Parent Company		-	-	(1,735,351)	-	(706,002)	(2,441,353)	-	(2,441,353)
Balance at December 31, 2018	₩	3,657,652	4,143,736	(2,506,451)	(482,819)	42,033,601	46,845,719	6,612	46,852,331

See accompanying notes to the consolidated financial statements.

SK HYNIX, INC. and Subsidiaries
Consolidated Statements of Changes in Equity, Continued
For the years ended December 31, 2019 and 2018

(In millions of won)

	Note	Attributable to owners of the Parent Company						Non-controlling interests	Total equity
		Capital stock	Capital surplus	Other equity	Accumulated other comprehensive income (loss)	Retained earnings	Total		
Balance at January 1, 2019	₩	3,657,652	4,143,736	(2,506,451)	(482,819)	42,033,601	46,845,719	6,612	46,852,331
Total comprehensive income									
Profit for the year		-	-	-	-	2,013,288	2,013,288	3,103	2,016,391
Remeasurements of defined benefit liability, net of tax	21	-	-	-	-	(90,211)	(90,211)	-	(90,211)
Other comprehensive income from joint venture and associate, net of tax	11,25	-	-	-	21,444	-	21,444	-	21,444
Gain on valuation of derivatives, net of tax	23	-	-	-	12,753	-	12,753	-	12,753
Foreign currency translation differences for foreign operations, net of tax	25	-	-	-	149,687	-	149,687	350	150,037
Total comprehensive income		-	-	-	183,884	1,923,077	2,106,961	3,453	2,110,414
Transactions with owners of the Parent Company									
Increase of non-controlling interests		-	-	-	-	-	-	4,715	4,715
Dividends paid	26	-	-	-	-	(1,026,003)	(1,026,003)	-	(1,026,003)
Share-based payment transactions		-	-	1,738	-	-	1,738	-	1,738
Total transactions with owners of the Parent Company		-	-	1,738	-	(1,026,003)	(1,024,265)	4,715	(1,019,550)
Balance at December 31, 2019	₩	3,657,652	4,143,736	(2,504,713)	(298,935)	42,930,675	47,928,415	14,780	47,943,195

See accompanying notes to the consolidated financial statements.

SK HYNIX, INC. and Subsidiaries
Consolidated Statements of Cash Flows
For the years ended December 31, 2019 and 2018

(In millions of won)

	Note	2019	2018
Cash flows from operating activities			
Cash generated from operating activities	36 ₩	11,822,354	25,825,017
Interest received		30,543	81,323
Interest paid		(231,382)	(126,029)
Dividends received		14,891	15,258
Income tax paid		(5,153,218)	(3,568,370)
Net cash provided by operating activities		6,483,188	22,227,199
Cash flows from investing activities			
Net change in short-term financial instruments		225,447	4,174,667
Net change in short-term investment asset		4,164,793	(4,519,395)
Decrease in other financial assets		-	116
Increase in other financial assets		(627)	(100)
Collection of loans and other receivables		13,057	21,824
Increase in loans and other receivables		(57,482)	(48,424)
Proceeds from disposal of long-term investment asset		4,316	7,118
Acquisition of long-term investment asset		(81,447)	(4,012,799)
Proceeds from disposal of property, plant and equipment		53,840	131,754
Acquisition of property, plant and equipment		(13,920,244)	(16,036,146)
Proceeds from disposal of intangible assets		183	2,532
Acquisition of intangible assets		(673,356)	(933,139)
Receipt of government grants		-	17,081
Acquisition of investments in associates		(176,954)	(200,508)
Acquisition of subsidiary, net of cash acquired		-	(33,330)
Net cash outflow from business combination		(2,462)	-
Net cash used in investing activities		(10,450,936)	(21,428,749)
Cash flows from financing activities			
Proceeds from borrowings	36	9,833,882	3,125,721
Repayments of borrowings	36	(4,585,425)	(2,078,522)
Payments of lease liabilities	36	(323,953)	-
Acquisition of treasury shares		-	(1,736,514)
Dividends paid		(1,026,003)	(706,002)
Increase of non-controlling interests		4,715	-
Net cash provided by (used in) financing activities		3,903,216	(1,395,317)
Effect of movements in exchange rates on cash and cash equivalents		21,283	(3,805)
Net decrease in cash and cash equivalents		(43,249)	(600,672)
Cash and cash equivalents at beginning of the year		2,349,319	2,949,991
Cash and cash equivalents at end of the year	₩	2,306,070	2,349,319

See accompanying notes to the consolidated financial statements.

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

1. Reporting Entity

(1) General information about SK hynix, Inc. (the "Parent Company" or the "Company") and its subsidiaries (collectively the "Group") is as follows:

The Parent Company, incorporated in October 15, 1949, is engaged in the manufactures, distribution and sales of semiconductor products and its shares have been listed on the Korea Exchange since 1996. The Parent Company's headquarters is located at 2091 Gyeongchung-daero, Bubal-eup, Icheon-si, Gyeonggi-do, South Korea, and the Group has manufacturing facilities in Icheon-si and Cheongju-si, South Korea, and Wuxi and Chongqing, China.

As of December 31, 2019, the shareholders of the Parent Company are as follows:

Shareholder	Number of shares	Percentage of ownership (%)
SK Telecom Co., Ltd.	146,100,000	20.07
National Pension Service	74,571,776	10.24
Other investors	463,330,019	63.65
Treasury shares	44,000,570	6.04
	<u>728,002,365</u>	<u>100.00</u>

The Parent Company's common shares and depositary receipts (DRs) are listed on the Stock Market of Korea Exchange and the Luxembourg Stock Exchange.

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

1. Reporting Entity, Continued

(2) Details of the Group's consolidated subsidiaries as of December 31, 2019 and 2018 are as follows:

Company	Location	Business	Ownership (%)	
			2019	2018
SK hyeng Inc.	Korea	Construction service	100.00	100.00
SK hystec Inc.	Korea	Business support service	100.00	100.00
Happymore Inc.	Korea	Manufacturing and cleaning cleanroom suits	100.00	100.00
SK hynix system ic Inc.	Korea	Semiconductor manufacturing and sales	100.00	100.00
HAPPYNARAE Co., Ltd.	Korea	Industrial material supply	100.00	100.00
SK hynix America Inc.	U.S.A.	Semiconductor sales	97.74	97.74
SK hynix Deutschland GmbH	Germany	Semiconductor sales	100.00	100.00
SK hynix Asia Pte. Ltd.	Singapore	Semiconductor sales	100.00	100.00
SK hynix Semiconductor Hong Kong Ltd.	Hong Kong	Semiconductor sales	100.00	100.00
SK hynix U.K. Ltd.	U.K.	Semiconductor sales	100.00	100.00
SK hynix Semiconductor Taiwan Inc.	Taiwan	Semiconductor sales	100.00	100.00
SK hynix Japan Inc.	Japan	Semiconductor sales	100.00	100.00
SK hynix Semiconductor (Shanghai) Co., Ltd.	China	Semiconductor sales	100.00	100.00
SK hynix Semiconductor India Private Ltd. ¹	India	Semiconductor sales	100.00	100.00
SK hynix (Wuxi) Semiconductor Sales Ltd.	China	Semiconductor sales	100.00	100.00
SK hynix Semiconductor (China) Ltd.	China	Semiconductor manufacturing	100.00	100.00
SK hynix Semiconductor (Chongqing) Ltd. ²	China	Semiconductor manufacturing	100.00	100.00
SK hynix Italy S.r.l	Italy	Semiconductor research and development	100.00	100.00
SK hynix memory solutions America Inc.	U.S.A.	Semiconductor research and development	100.00	100.00
SK hynix memory solutions Taiwan Ltd.	Taiwan	Semiconductor research and development	100.00	100.00
SK hynix memory solutions Eastern Europe LLC.	Belarus	Semiconductor research and development	100.00	100.00
SK APTECH Ltd.	Hong Kong	Overseas investment	100.00	100.00
SK hynix Ventures Hong Kong Limited	Hong Kong	Overseas investment	100.00	100.00
SK hynix (Wuxi) Investment Ltd. ³	China	Overseas investment	100.00	100.00
SK hynix (Wuxi) Industry Development Ltd. ⁴	China	Foreign hospital construction	100.00	100.00
SK hynix Happiness (Wuxi) Hospital Management Ltd. ⁴	China	Foreign hospital operation	70.00	100.00
SK hynix system ic (Wuxi) Co., Ltd. ⁵	China	Overseas Semiconductor manufacturing and sales	100.00	100.00
SK hynix cleaning (Wuxi) Ltd. ⁴	China	Building maintenance	100.00	100.00
SUZHOU HAPPYNARAE Co., Ltd. ⁶	China	Overseas industrial material supply	100.00	100.00
CHONGQING HAPPYNARAE Co., Ltd. ⁷	China	Overseas industrial material supply	100.00	100.00
SkyHigh Memory Limited ⁸	Hong Kong	Overseas manufacturing and sales of semiconductor	60.00	-
SK hynix (Wuxi) Education Technology Co.,Ltd. ⁹	China	Education	100.00	-
MMT (Money Market Trust)	Korea	Money Market Trust	100.00	100.00

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

1. Reporting Entity, Continued

(2) Details of the Group's consolidated subsidiaries as of December 31, 2019 and 2018 are as follows, Continued:

¹ Subsidiary of SK hynix Asia Pte. Ltd.

² Subsidiary of SK APTECH Ltd.

³ Subsidiary of SK hynix Semiconductor (China) Ltd.

⁴ Subsidiary of SK hynix (Wuxi) Investment Ltd.

⁵ Subsidiary of SK hynix system ic Inc.

⁶ Subsidiary of HAPPYNARAE Co., Ltd.

⁷ Subsidiary of SUZHOU HAPPYNARAE Co., Ltd.

⁸ SkyHigh Memory Limited was established during the year ended December 31, 2019 and is a subsidiary of SK hynix system ic Inc.

⁹ SK hynix (Wuxi) Education Technology Co., Ltd. was established during the year ended December 31, 2019 and is a subsidiary of SK hynix (Wuxi) Investment Ltd.

(3) Changes in the consolidated subsidiaries for the year ended December 31, 2019 are as follows:

	Company	Description
Newly included	SkyHigh Memory Limited	Newly established
Newly included	SK hynix (Wuxi) Education Technology Co., Ltd.	Newly established

SK HYNIX, INC. and Subsidiaries
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1. Reporting Entity, Continued

(4) Major subsidiaries' summarized separate statements of financial position as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019			2018		
		Assets	Liabilities	Equity	Assets	Liabilities	Equity
SK hynix system ic Inc.	₩	666,171	130,880	535,291	550,323	92,989	457,334
SK hynix America Inc.		1,801,366	1,436,975	364,391	3,013,637	2,707,732	305,905
SK hynix Asia Pte. Ltd.		387,860	298,657	89,203	933,268	848,990	84,278
SK hynix Semiconductor Hong Kong Ltd.		195,262	44,405	150,857	347,109	204,622	142,487
SK hynix U.K. Ltd.		217,160	197,293	19,867	536,208	518,036	18,172
SK hynix Semiconductor Taiwan Inc.		247,671	219,056	28,615	449,054	427,498	21,556
SK hynix Japan Inc.		305,770	235,243	70,527	837,362	770,819	66,543
SK hynix (Wuxi) Semiconductor Sales Ltd.		1,646,998	1,510,156	136,842	535,819	492,934	42,885
SK hynix Semiconductor (China) Ltd.		9,605,890	4,937,517	4,668,373	6,390,490	2,158,715	4,231,775
SK hynix Semiconductor (Chongqing) Ltd.		837,339	309,283	528,056	540,284	124,451	415,833
Happynarae Co., Ltd.		186,079	136,257	49,822	185,177	143,517	41,660

(5) Major subsidiaries' summarized separate statements of comprehensive income for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019			2018		
		Revenue	Profit	Total comprehensive income	Revenue	Profit (loss)	Total comprehensive income (loss)
SK hynix system ic Inc.	₩	661,511	76,614	77,957	554,264	60,649	60,360
SK hynix America Inc.		8,353,658	47,947	47,947	14,296,762	30,800	30,800
SK hynix Asia Pte. Ltd.		1,662,315	1,965	1,965	3,531,313	3,999	3,999
SK hynix Semiconductor Hong Kong Ltd.		1,579,680	2,493	2,493	3,710,359	11,486	11,486
SK hynix U.K. Ltd.		907,945	1,057	1,057	1,517,706	1,005	1,005
SK hynix Semiconductor Taiwan Inc.		1,455,320	8,127	8,127	2,955,717	2,475	2,475
SK hynix Japan Inc.		672,393	701	700	1,084,079	(410)	(467)
SK hynix (Wuxi) Semiconductor Sales Ltd.		10,882,152	94,768	94,768	4,832,879	43,163	43,163
SK hynix Semiconductor (China) Ltd.		3,177,415	18,551	18,551	2,518,849	84,089	84,089
SK hynix Semiconductor (Chongqing) Ltd.		477,849	39,102	39,102	406,839	27,125	27,125
Happynarae Co., Ltd.		1,107,524	8,473	8,162	1,094,778	12,117	11,942

(6) There are no significant non-controlling interests to the Group as of December 31, 2019 and 2018.

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
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2. Basis of Preparation

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("K-IFRS"), as prescribed in the *Act on External Audits of Corporations in the Republic of Korea*.

The consolidated financial statements were authorized for issuance by the board of directors on January 30, 2020, which will be submitted for approval at the shareholders' meeting to be held on March 20, 2020.

This is the first set of the Group's annual financial statements in which K-IFRS No. 1116 '*Leases*' ("K-IFRS No. 1116") has been applied. Changes to significant accounting policies are described in note 3-(26).

(1) Basis of measurement

The consolidated financial statements have been prepared on the historical cost basis, except for the following material items in the consolidated statements of financial position:

- derivative financial instruments are measured at fair value
- financial instruments at fair value through profit or loss are measured at fair value
- assets or liabilities for defined benefit plans are recognized at the net of the total present value of defined benefit obligations less the fair value of plan assets

(2) Functional and presentation currency

Financial statements of entities within the Group are presented in functional currency and the currency of the primary economic environment in which each entity operates. Consolidated financial statements of the Group are presented in Korean won, which is the Parent Company's functional and presentation currency.

(3) Use of estimates and judgments

The preparation of the consolidated financial statements in conformity with K-IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

(a) Judgments

Information about critical judgments in applying accounting policies that have the significant effect on the amounts recognized in the consolidated financial statements is included in the note for investments in associates and joint ventures.

(b) Assumptions and estimation uncertainties

Information about assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next fiscal year is included in the accompanying notes for net realizable value of inventories, impairment of development costs and goodwill, recognition and measurement of provisions, measurement of defined benefit obligations, recognition of deferred tax assets, and valuation of short and long-term investment assets.

2. Basis of Preparation, Continued

(3) Use of estimates and judgments, Continued

(c) Fair value measurement

The Group establishes fair value measurement policies and procedures as its accounting policies and disclosures require fair value measurements for various financial and non-financial assets and liabilities. Such policies and procedures are executed by the valuation department, which is responsible for the review of significant fair value measurements including fair values classified as level 3 in the fair value hierarchy.

The valuation department regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation department assesses the evidence obtained from the third parties to support the conclusion that these valuations meet the requirements of K-IFRS, including the level in the fair value hierarchy in which the valuations should be classified.

The Group reports significant valuation issues to the audit committee.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows.

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 (i.e. as prices) or indirectly (i.e. derived from prices)

Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs)

If various inputs used to measure fair value of assets or liabilities fall into different levels of the fair value hierarchy, the Group classifies the assets and liabilities at the lowest level of inputs among the fair value hierarchy, which is significant to the entire measured value. The Group recognizes transfers between levels at the end of the reporting period of which such transfers occurred.

Information about assumptions used for fair value measurements is included in note 6 financial risk management.

3. Significant Accounting Policies

The significant accounting policies applied by the Group in preparation of its consolidated financial statements are explained below. Except for the new accounting standards that are effective for annual periods beginning on or after January 1, 2019, the accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements.

(1) Operating Segments

An operating segment is a component of the Group that: 1) engages in business activities from which it may earn revenues and incur expenses, including revenues and expenses that relate to transactions with other components of the Group, 2) whose operating results are reviewed regularly by the Group's chief operating decision maker ("CODM") in order to allocate resources and assess its performance, and 3) for which discrete financial information is available. The Group's CODM is the board of directors, who do not receive and therefore do not review discrete financial information for any component of the Group. Accordingly, no operating segment information is included in these consolidated financial statements. Entity wide disclosures of geographic, product and customer information are provided in note 4 and 27.

(2) Consolidation

(a) Business combination

A business combination is accounted for by applying the acquisition method, unless it is a combination involving entities or businesses under common control.

The consideration transferred in the acquisition is generally measured at fair value, as are the identifiable net assets acquired. Any goodwill that arises is tested annually for impairment. Any gain on a bargain purchase is recognized in profit or loss immediately. Transaction costs are expensed as incurred and during period of service, except if related to the issue of debt or equity securities according to K-IFRS No. 1032 and K-IFRS No. 1109.

The consideration transferred does not include amounts related to the settlement of pre-existing relationships. Such amounts are generally recognized in profit or loss.

Any contingent consideration is measured at fair value at the date of acquisition. If an obligation to pay contingent consideration that meets the definition of a financial instrument is classified as equity, then it is not remeasured and settlement is accounted for within equity. Otherwise, subsequent changes in the fair value of the contingent consideration are recognized in profit or loss.

If share-based payment awards (replacement awards) are required to be exchanged for awards held by the acquiree's employees (acquiree's awards), then all or a portion of the amount of the acquirer's replacement awards is included in measuring the consideration transferred in the business combination. This determination is based on the market-based measure of the replacement awards compared with the market-based measure of the acquiree's awards and the extent to which the replacement awards relate to pre-combination service.

(b) Non-controlling interests

Non-controlling interests are measured at their proportionate share of the acquiree's identifiable net assets at the date of acquisition.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

3. Significant Accounting Policies, Continued

(2) Consolidation, Continued

(c) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the entity. Consolidation of an investee begins from the date the Group obtains control of the investee and cease when the Group loses control of the investee.

(d) Loss of control

If the Group loses control of a subsidiary, the Group derecognizes the assets and liabilities of the former subsidiary from the consolidated statement of financial position and recognizes gain or loss associated with the loss of control attributable to the former controlling interest. Any investment retained in the former subsidiary is recognized at its fair value when control is lost.

(e) Interests in equity-accounted investees

The Group's interest in equity-accounted investees comprise interests in an associate and a joint venture. An associate are these entities in which the Group has significant influence, but not control or joint control, over the entity's financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and the joint venture are initially recognized at cost including transaction costs. Subsequent to initial recognition, their carrying amounts are increased or decreased to recognize the Group's share of the profit or loss and changes in equity of the associate or the joint venture. Distributions from equity-accounted investees are accounted for as deduction from the carrying amounts.

(f) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. The Group's share of unrealized gain incurred from transactions with equity-accounted investees are eliminated and unrealized loss are eliminated using the same basis if there are no evidence of asset impairments.

(g) Business combinations under common control

The assets and liabilities acquired in the combination of entities or business under common control are recognized at the carrying amounts recognized previously in the consolidated financial statements of the ultimate parent. The difference between consideration transferred and carrying amounts of net assets acquired is added to or deducted from other capital adjustments.

(3) Cash and cash equivalents

Cash and cash equivalents comprise cash balances and call deposits with maturities of three months or less from the acquisition date that are subject to an insignificant risk of changes in their fair value, and are used by the Group in the management of its short-term commitments.

3. Significant Accounting Policies, Continued

(4) Inventories

The cost of inventories is based on the weighted average method (except for goods in-transit that is based on the specific identification method), and includes expenditures incurred in acquiring the inventories, production or conversion costs and other costs incurred in bringing inventories to their existing location and condition. In the case of manufactured inventories and work-in-process, cost includes an appropriate share of production overheads based on the actual capacity of production facilities. However, the normal capacity is used for the allocation of fixed production overheads if the actual level of production is lower than the normal capacity.

Inventories are measured at the lower of cost and net realizable value. Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and selling expenses. The amount of any write-down of inventories to net realizable value and all losses of inventories shall be 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, shall be recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(5) Non-derivative financial assets

(a) Initial recognition and measurement

Trade and other receivables, and debt investment are initially recognized when they are originated. Other financial assets and financial liabilities are recognized when the Group becomes a party to the contractual provisions of the instruments.

A financial asset and financial liability (unless it is an account receivable - trade without a significant financing component that is initially measured at the transaction price) are initially measured at fair value plus, for an item not at fair value through profit or loss (FVTPL), transaction costs that are directly attributable to its acquisition.

(b) Classification and subsequent measurements

On initial recognition, a financial asset is classified as measured at: amortized cost; fair value through other comprehensive income (FVOCI) - debt investment; FVOCI - equity investment; or FVTPL. The classification of financial assets is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics. In case of changing its business model, all affected financial asset are reclassified on the first day of the first reporting period after the change in the business model.

A financial asset is measured at amortized cost if it meets both of the following conditions and is not designated as at FVTPL:

- it is held within a business model whose objective is to hold assets to collect contractual cash flow; and
- its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

A debt investments is measured at FVOCI if it meets both of the following conditions and is not designated as at FVTPL:

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

On initial recognition of an equity investment that is not held for trading, the Group may irrevocably elect to present subsequent changes in the investment's fair value in other comprehensive income. This election is made on an investment-by-investment basis and irrevocable election can be made at initial recognition.

3. Significant Accounting Policies, Continued

(5) Non-derivative financial assets, Continued

(b) Classification and subsequent measurements, Continued

All financial assets not classified as measured at amortized cost or FVOCI as described above are measured at FVTPL. This includes all derivative financial assets. On initial recognition, the Group may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortized cost or at FVOCI as at FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

The Group makes an assessment of the objective of the business model in which, financial assets is held at a portfolio level because this best reflects the way the business is managed and information is provided to management. The information considered includes:

- The stated policies and objectives for the portfolio and the operation of those policies in practice;
- how the performance of the business model and the financial assets held within that business model are evaluated and reported to the entity's key management personnel;
- the risks that affect the performance of the business model (and the financial assets held within that business model) and, in particular, the way in which those risks are managed;
- how managers of the business are compensated (e.g. whether the compensation is based on the fair value of the assets managed or on the contractual cash flows collected); and
- the frequency, volume and timing of sales of financial assets in prior periods, the reason for those sales and expectation about future sales activity for financial asset.

Transfers of financial assets to third parties in transactions that do not qualify for derecognition are not considered sales for this purpose, consistent with the Group's continuing recognition of the assets.

For the purpose of this assessment, 'principal' is defined as the fair value of the financial assets on initial recognition. 'Interest' is defined as consideration for the time value of money and for the credit risk associated with the principal amount outstanding during a particular period of time and for other basic lending risks and costs (e.g. liquidity risk and administrative costs), as well as a profit margin.

In assessing whether the contractual cash flows are solely payments of principal and interest, the Group considers the contractual terms of the instrument. This includes assessing whether the financial asset contains a contractual term that could change the timing or amount of contractual cash flows such that it would not meet this condition. In making this assessment, the Group considers:

- contingent events that would change the amount or timing of cash flows;
- terms that may adjust the contractual coupon rate, including variable-rate features;
- prepayment and extension features; and
- terms that limit the Group's claim to cash flows from specified assets (e.g. non-recourse features).

A prepayment feature is consistent with the solely payments of principal and interest criterion if the prepayment amount substantially represents unpaid amounts of principal and interest on the principal amount outstanding, which may include reasonable additional compensation for early termination of the contract. Additionally, for a financial asset acquired at a discount or premium to its contractual par amount, a feature that permits or requires prepayment at an amount that substantially represents the contractual par amount plus accrued (but unpaid) contractual interest (which may also include reasonable additional compensation for early termination) is treated as consistent with this criterion if the fair value of the prepayment feature is insignificant at initial recognition.

SK HYNIX, INC. and Subsidiaries
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3. Significant Accounting Policies, Continued

(5) Non-derivative financial assets, Continued

(b) Classification and subsequent measurements, Continued

The following accounting policies apply to subsequent measurements of financial assets.

Financial assets at FVTPL	These assets are subsequently measured at fair value. Net gains and losses, including any interest or dividend income, are recognized in profit or loss.
Financial assets at amortized cost	These assets are subsequently measured at amortized cost using the effective interest method. The amortized cost is reduced by impairment losses. Interest income, foreign exchange gains and losses and impairment are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.
Debt investments at FVOCI	These assets are subsequently measured at fair value. Interest income is calculated using the effective interest method. Foreign exchange gains and losses and impairment are recognized in profit or loss. Other net gains and losses are recognized in OCI. On derecognition, gains and losses accumulated in OCI are reclassified to profit or loss.
Equity investments at FVOCI	These assets are subsequently measured at fair value. Dividends are recognized as income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognized in OCI and are never reclassified to profit or loss.

(c) De-recognition

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred or in which the Group neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

The Group enters into transactions whereby it transfers assets recognized in its statement of financial position, but retain either all or substantially all of the risks and rewards of the transferred assets. In these cases, the transferred assets are not derecognized.

3. Significant Accounting Policies, Continued

(5) Non-derivative financial assets, Continued

(d) Offsetting between financial assets and financial liabilities

Financial assets and financial liabilities are offset and the net amount is presented in the consolidated statement of financial position only when the Group currently has a legally enforceable right to offset the recognized amounts, and there is the intention to settle on a net basis or to realize the asset and settle the liability simultaneously.

(6) Derivative financial instruments

Derivatives are initially recognized at fair value. Subsequent to initial recognition, derivatives are measured at fair value at the end of each reporting period, and changes in the fair value of derivatives therein are accounted for as described below.

(a) Hedge accounting

The Group enters into a fixed-to-fixed cross currency swap contract and a floating-to-fixed cross currency interest rate swap contract to hedge interest rate risk and currency risk.

On initial designation of the hedge, the Group formally documents the relationship between the hedging instrument(s) and hedged item(s), including the risk management objectives and strategy in undertaking the hedge transaction. In addition, the document includes hedging instruments; hedged items; initial commencement date of those hedge relationship; fair value of hedged items based on hedged risk during the subsequent period; and the method of valuation on hedging instruments offsetting changes in cash flow.

- Cash flow hedge

When a derivative is designated to hedge the variability in cash flows attributable to a particular risk associated with a recognized asset or liability, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income, net of tax, and presented in accumulated other comprehensive income. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss. If the hedging instrument no longer meets the criteria for hedge accounting, expires or is sold, terminated, exercised, or the designation is revoked, then hedge accounting is discontinued prospectively. The cumulative gain or loss on the hedging instrument that has been recognized in other comprehensive income is reclassified to profit or loss in the periods which the forecasted transaction occurs.

(b) Other derivative financial instruments

Other derivative financial instrument not designated as a hedging instrument are measured at fair value, and the changes in fair value of the derivative financial instrument is recognized immediately in profit or loss.

3. Significant Accounting Policies, Continued

(7) Impairment of financial assets

(a) Recognition of impairment on financial assets

The Group recognizes loss allowances for expected credit losses (ECLs) on:

- financial assets measured at amortized costs; and
- contract assets.

The Group measures impairment losses at an amount equal to lifetime ECLs except for the below assets, which are measured at 12-month ECLs.

- credit risk of debt instruments is low at the end of reporting date
- credit risk has not increased significantly since the initial recognition of debt investment (lifetime ECL: ECL that resulted from all possible default events over the expected life of a financial instrument)

The Group adopted an accounting policy to recognize loss allowances at an amount equal to lifetime expected credit losses for trade receivables and contract assets.

In assessing whether the credit risk on a financial instrument has increased significantly since initial recognition and estimating expected credit loss, the Group considers both quantitative and qualitative information that is reasonable and supportable, including historical experience and forward-looking information that is available without undue cost or effort.

12-month ECLs are the portion of ECLs that result from all default events that are possible within the 12 months after the reporting date (or a shorter period if the expected life of the instrument is less than 12 months).

The maximum period considered when estimating ECLs is the maximum contractual period over which the Group is exposed to credit risk.

(b) Measurement of expected credit loss

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all cash shortfalls (i.e. the difference between the cash flows due to the entity in accordance with the contract and the cash flows that the Group expects to receive). ECLs are discounted at the effective interest rate of the financial instrument.

(c) Credit-impaired financial instrument

A debt instrument carried at amortized cost and fair value through other comprehensive income (FVOCI) is assessed at the end of each reporting period to determine whether there is objective evidence that it is impaired. A financial asset is credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of that asset have occurred.

Objective evidence that a financial asset is impaired includes:

- significant financial difficulty of the issuer or borrower;
- a breach of contract, such as default or delinquency in interest or principal payments;
- the Group, for economic or legal reasons relating to the borrower's financial difficulty, granting to the borrower a concession that the Group would not otherwise consider;
- it becoming probable that the borrower will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for the financial asset because of financial difficulties.

3. Significant Accounting Policies, Continued

(7) Impairment of financial assets, Continued

(d) Presentation of credit loss allowance on financial position

Loss allowances for financial assets measured at amortized cost are deducted from the gross carrying amount of the assets.

(e) Write-off

The Group writes off a financial asset when it has no reasonable expectations of recovering the contractual cash flows on a financial asset in its entirety or a portion thereof. For corporate customers, the Group individually makes an assessment with respect to the timing and amount of write-off based on whether there is a reasonable expectation of recovery. However financial assets that are written off could still be subject to collection activities according to the Group's past due collection process.

(8) Property, plant and equipment

Property, plant and equipment are initially measured at cost. The cost of property, plant and equipment includes expenditures arising directly from the construction or acquisition of the asset, 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 and the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

Subsequent to initial recognition, an item of property, plant and equipment is carried at its cost less any accumulated depreciation and any accumulated impairment losses.

Subsequent costs are recognized in the carrying amount of property, plant and equipment at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the cost will flow to the Group and it can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day repair and maintenance are recognized in profit or loss as incurred.

Property, plant and equipment, except for land, are depreciated on a straight-line basis over estimated useful lives that appropriately reflect the pattern in which the asset's future economic benefits are expected to be consumed.

Gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment and are recognized as other income or expenses.

The estimated useful lives of the Group's property, plant and equipment are as follows:

	<u>Useful lives (years)</u>
Buildings	10 - 50
Structures	10 - 30
Machinery	4 - 15
Vehicles	4 - 10
Other	3 - 15

Depreciation methods, useful lives, and residual values are reviewed at the end of each reporting period and, if appropriate, accounted for as changes in accounting estimates.

3. Significant Accounting Policies, Continued

(9) Borrowing costs

The Group capitalizes borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset as part of the cost of that asset. Other borrowing costs are recognized in expense as incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale. Financial assets and inventories that are manufactured or otherwise produced over a short period of time are not qualifying assets. Assets that are ready for their intended use or sale when acquired are not qualifying assets.

To the extent that the Group borrows funds specifically for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings. To the extent that the Group borrows funds generally and uses them for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate is the weighted average of the borrowing costs applicable to the borrowings of the Group that are outstanding during the period, other than borrowings made specifically for the purpose of obtaining a qualifying asset. The amount of borrowing costs that the Group capitalizes during a period does not exceed the amount of borrowing costs incurred during that period.

(10) Intangible assets

Intangible assets are measured initially at cost and, subsequently, are carried at cost less accumulated amortization and accumulated impairment losses.

Goodwill arising from business combinations is recognized as the excess of the consideration transferred in the acquisition over the net fair value of the identifiable assets acquired and liabilities assumed. Any deficit is a bargain purchase that is recognized in profit or loss. Goodwill is measured at cost less accumulated impairment losses.

Amortization of intangible assets is calculated on a straight-line basis over the estimated useful lives of intangible assets from the date that they are available for use. The residual value of intangible assets is zero. However, certain intangible assets are determined as having indefinite useful lives and not amortized as there is no foreseeable limit to the period over which the assets are expected to be available for use.

The estimated useful lives of the Group's intangible assets are as follows:

	Useful lives (years)
Industrial rights	5 - 10
Development costs	2
Other intangible assets	4 - 10

Useful lives and the amortization methods for intangible assets with finite useful lives are reviewed at the end of each reporting period. The useful lives of intangible assets that are not being amortized are reviewed at the end of each reporting period to determine whether events and circumstances continue to support indefinite useful life assessments for those assets. Changes are accounted for as changes in accounting estimates.

Expenditures on research activities, undertaken with the prospect of gaining new scientific or technical knowledge and understanding, are recognized in profit or loss as incurred. Development expenditures are capitalized only if development costs can be measured reliably, the product or process is technically and commercially feasible, future economic benefits are probable, and the Group intends to and has sufficient resources to complete development and to use or sell the asset. Other development expenditures are recognized in profit or loss as incurred.

3. Significant Accounting Policies, Continued

(10) Intangible assets, continued

Subsequent expenditures are capitalized only when they increase the future economic benefits embodied in the specific asset to which it relates. All other expenditures, including expenditures on internally generated goodwill and others, are recognized in profit or loss as incurred.

(11) Government grants

Government grants are not recognized unless there is reasonable assurance that the Group will comply with the grant's conditions and that the grant will be received.

(a) Grants related to assets

Government grants whose primary condition is that the Group purchases, constructs or otherwise acquires non-current assets are deducted in calculating the carrying amount of the asset. The grant is recognized in profit or loss over the useful lives of depreciable assets.

(b) Grants related to income

Government grants which are intended to compensate the Group for expenses incurred are recognized in profit or loss by as deduction of the related expenses.

(12) Investment property

Property held for the purpose of earning rental income or benefiting from capital appreciation is classified as investment property. Investment property is initially measured at its cost. Transaction costs are included in the initial measurement. Subsequently, investment property is carried at cost less accumulated depreciation and impairment losses.

Subsequent costs are recognized in the carrying amount of investment property at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the cost will flow to the Group and it can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day repair and maintenance are recognized in profit or loss as incurred.

Investment property is depreciated on a straight-line basis over 40 years.

Depreciation methods, useful lives and residual values are reviewed at the end of each reporting period and, if appropriate, accounted for as changes in accounting estimates.

(13) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets, other than assets arising from employee benefits, inventories, and deferred tax assets, are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Goodwill and intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amount to their carrying amount.

The Group estimates the recoverable amount of an individual asset; however if it is impossible to measure the individual recoverable amount of an asset, the Group estimates the recoverable amount of cash-generating unit ("CGU"). A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell.

3. Significant Accounting Policies, Continued

(13) Impairment of non-financial assets, continued

The value in use is estimated by applying a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized if the carrying amount of an asset or a CGU exceeds its recoverable amount.

Goodwill acquired in a business combination is allocated to each CGU that is expected to benefit from the synergies arising from business combination. Any impairment identified at the CGU level will first reduce the carrying value of goodwill and then be used to reduce the carrying amount of the other assets in the CGU on a pro rata basis.

Except for impairment losses in respect of goodwill, which are never reversed, an impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

(14) Leases

The Group has applied K-IFRS No. 1116 using the modified retrospective approach by recognizing the cumulative effect of initial application of K-IFRS No. 1116 as of January 1, 2019 (the date of initial application). Accordingly, the comparative information presented in accordance with K-IFRS No. 1017 has not been restated. The details of the accounting policies applied under K-IFRS No. 1017 and K-IFRS No. 1116 are as follows:

(a) Accounting policies applied from January 1, 2019.

The Group assesses whether a contract is or contains a lease at inception of a contract. Under K-IFRS No. 1116, a contract is, or contains, a lease if the contract conveys a right to control the use of an identified asset for a period of time in exchange for consideration.

(i) As a lessee

The Group recognizes for a right-of-use asset and a lease liability at the lease commencement date. The right-of-use asset is initially measured at cost, the initial amount of the lease liability, adjusted for any lease payments made at or before the commencement date, plus any initial direct costs incurred and an estimate of costs to dismantle and remove of the underlying asset, or to restore the underlying asset or the site on which the underlying asset is located, less any lease incentives received.

The right-of-use asset is subsequently depreciated using the straight-line method from the commencement date to the end of the lease term. In case that ownership of the right-of-use asset is transferred at the end of the lease term, or the cost of the right-of-use asset includes the exercise price of a purchase option, the right-of-use asset will be depreciated over the useful life of the underlying asset, which is determined on the same basis as those of property and equipment. In addition, the right-of-use asset may be reduced by an impairment loss or adjusted for remeasurements of the lease liability.

3. Significant Accounting Policies, Continued

(14) Leases, Continued

(a) Accounting policies applied from January 1, 2019, Continued

(i) As a lessee, Continued

The lease liability is initially measured at the present value of the lease payments that are not paid at the commencement date, discounted using the interest rate implicit in the lease or, if that rate cannot be readily determined, the Group's incremental borrowing rate. The Group generally uses its incremental borrowing rate as the discount rate.

Lease payments included in the measurement of the lease liability consist of the following:

- fixed payments (including in-substance fixed payments)
- variable lease payments that depend on an index or a rate, initially measured using the index or rate as at the commencement date
- amounts expected to be payable under a residual value guarantee
- the exercise price under a purchase option that the Group is reasonably certain to exercise
- lease payments in an optional renewal period, if the Group is reasonably certain to exercise extension option, and penalties for early termination of a lease unless the Group is reasonably certain not to terminate early.

The lease liability is subsequently increased by the interest expense recognized for the lease liability and decreased by reflecting the payment of the lease. The lease liability is remeasured when there is a change in future lease payments arising from changes in an index or a rate (interest rate), if there's a change in the Group's estimate of the amount expected to be paid under a residual value guarantee, or if the Group changes in the assessment of whether the option to buy or extend is reasonably certain to be exercised or not to exercise the termination option.

When the lease liabilities are remeasured, a corresponding adjustment is made to the carrying amount of the right-of-use asset, or is recorded in profit or loss if the carrying amount of the right-of-use asset has been reduced to zero.

A lessee shall remeasure the lease liability as an adjustment to the right-of-use asset, if either:

- a change in the lease term or a change in circumstances or significant events that result in a change in the assessment of the exercise of the purchase option. In such cases, the lease liability is remeasured by discounting the modified lease payment at the revised discount rate;
- the lease payment changes due to changes in the index or rate (interest rate) or the amount expected to be paid according to the residual value guarantee. In such cases, the lease liability measures the modified lease fee again by discounting it at an unchanged discount rate. However, if a change in the variable interest rate causes a change in the lease payments, the revised discount rate that reflects the change in interest rates is used; or
- the lease agreement changes and is not accounted for as a separate lease. In such cases, the lease liability is remeasured by discounting the modified lease payment at the revised discount rate as of the effective date of the lease change, based on the lease term of the modified lease.

The Group has elected not to recognize right-of-use assets and lease liabilities for some leases of low-value assets and short-term leases. The Group recognizes the lease payments associated with these leases as an expense on a straight-line basis over the lease term.

3. Significant Accounting Policies, Continued

(14) Leases, Continued

(a) Accounting policies applied from January 1, 2019, Continued

(i) As a lessee, Continued

At inception or on reassessment of a contract that contains a lease component, the Group allocates the consideration in the contract to each lease and non-lease component on the basis of their relative stand-alone prices. However, for certain agreements, the Group has elected practical expedient not to separate non-lease components and account for the lease and non-lease components as a single lease component.

The Group separately presents right-of-use assets that do not meet the definition of investment property in the statement of financial position.

Subsequently, the right-of-use asset is accounted for consistently with the accounting policies applicable to the asset.

(ii) As a lessor

As a lessor, the Group determines whether the lease is a finance lease or an operating lease at the inception of the lease.

To classify each lease, the Group generally determines whether the lease transfers most of the risks and rewards of ownership of the underlying asset. If most of the risks and rewards of ownership of the underlying asset are transferred to the lessee, the lease is classified as a finance lease, otherwise the lease is classified as an operating lease. As part of this assessment, the Group considers whether the lease term represents a significant portion of the economic life of the underlying asset.

When the Group is an intermediate lessor, it accounts for its interests in the head lease and the sublease separately. In addition, the classification of a lease is determined by the right-of-use asset arising from the head lease, not the underlying asset. If a head lease is a short-term lease to which the Group applies the recognition exemption, then the sub-lease is classified as an operating lease.

The Group has applied K-IFRS No. 1115 '*Revenue from Contracts with Customers*' to allocate consideration in the contract to each lease and non-lease components.

The Group recognizes the lease payments received from operating leases on a straight-line basis over the lease term as revenue in 'other revenue'.

The accounting policies that the Group has applied to the comparative period as lessors are not different from those in K-IFRS No. 1116.

3. Significant Accounting Policies, Continued

(14) Leases, Continued

(b) Accounting policies applied before January 1, 2019.

The Group classifies and accounts for leases as either a finance or operating lease, depending on the terms. Leases where the Group assumes substantially all of the risks and rewards of ownership are classified as finance leases. All other leases are classified as operating leases.

(i) Finance leases

At the commencement of the lease term, the Group recognizes as finance lease assets initially at the lower of their fair value and the present value of the minimum lease payments. Any initial direct costs are added to the amount recognized as an asset.

Minimum lease payments consist of finance expense and the repayment of lease liabilities. The finance expense is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability. Contingent rents are charged as expenses in the periods in which they are incurred.

The depreciable amount of a leased asset is charged to each accounting period during the period of expected use on a systematic basis consistent with the depreciation policy the lessee adopts for depreciable assets that are owned. If there is no reasonable certainty that the lessee will obtain ownership by the end of the lease term, the asset is fully depreciated over the shorter of the lease term and its useful life. The Group reviews whether the leased asset is impaired.

(ii) Operating leases

Payments made under operating leases are recognized as expenses on straight-line basis over the lease term. Lease incentives received are recognized as an integral part of the lease expense, over the term of the lease.

(iii) Determining whether an arrangement contains a lease

Determining whether an arrangement is, or contains, a lease is based on the substance of the arrangement and requires an assessment of whether fulfillment of the arrangement is dependent on the use of a specific asset or assets (the asset) and the arrangement conveys a right to use the asset.

If an arrangement contains lease, at inception or amendment of the arrangement, the Group separates payments and other consideration required by such an arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the Group concludes for a finance lease that it is impracticable to separate the payments reliably, the Group recognizes an asset and a liability at an amount equal to the fair value of the underlying asset that was identified as the subject of the lease. Subsequently, the liability is reduced as payments are made and an imputed finance expense on the liability recognized using the purchaser's incremental borrowing rate.

3. Significant Accounting Policies, Continued

(15) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities at fair value through profit or loss or other financial liabilities in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

(a) Financial liabilities at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, any directly attributable transaction costs are recognized in profit or loss as incurred.

(b) Other financial liabilities

Non-derivative financial liabilities other than financial liabilities at fair value through profit or loss are classified as other financial liabilities. At the date of initial recognition, other financial liabilities are measured at fair value less any directly attributable transaction costs. Subsequent to initial recognition, other financial liabilities are measured at amortized cost using the effective interest rate method.

(c) Derecognition of financial liability

The Group derecognizes financial liability when its contractual obligations are discharged, cancelled or expire. The Group also derecognizes a financial liability, when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognized at fair value. On derecognition of a financial liability, the difference between the carrying amount extinguished and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

(16) Employee benefits

(a) Short-term employee benefits

Short-term employee benefits are employee benefits that are due to be settled within 12 months after the end of the reporting period in which the employees render the related service. When an employee has rendered service to the Group during an accounting period, the Group recognizes the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service.

(b) Other long-term employee benefits

Other long-term employee benefits include employee benefits that are settled beyond 12 months after the end of the reporting period in which the employees render the related service, and are calculated at the present value of the amount of future benefit that employees have earned in return for their service in the current and prior periods. Remeasurements are recognized in profit or loss in the period in which they arise.

(c) Retirement benefits: defined benefit plans

As of the end of reporting period, defined benefits liabilities relating to defined benefit plans are recognized as present value of defined benefit obligations, net of fair value of plan assets.

The calculation is performed annually by an independent actuary using the projected unit credit method. When the fair value of plan assets exceeds the present value of the defined benefit obligation, the Group recognizes an asset, to the extent of the present value of any economic benefits available in the form of refunds from the plan or reduction in the future contributions to the plan.

3. Significant Accounting Policies, Continued

(16) Employee benefits, Continued

(c) Retirement benefits: defined benefit plans, Continued

Remeasurements of the net defined benefit liability (asset) comprise of actuarial gains and losses, the return on plan assets excluding amounts included in net interest on the net defined benefit liability (asset), and any change in the effect of the asset ceiling, excluding amounts included in net interest on the net defined benefit liability (asset), and are recognized in other comprehensive income.

The Group determines net interests on net defined benefit liability (asset) by multiplying discount rate determined at the beginning of the annual reporting period and considers changes in net defined benefit liability (asset) from contributions and benefit payments. Net interest costs and other costs relating to the defined benefit plan are recognized through profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognized immediately in profit or loss. The Group recognizes gains or losses on a settlement of defined benefit plan when the settlement occurs.

(d) Retirement benefits: defined contribution plans

When an employee has provided service for a certain period of time in relation to the defined contribution plan, the contribution to the defined contribution plan is recognized in profit or loss except to be included in the cost of the asset. The contributions to be paid are recognized as liabilities (accrued expenses) less the contributions that have been already paid.

(e) Termination benefits

The Group recognizes a liability and expense for termination benefits at the earlier of the period when the Group can no longer withdraw the offer of those benefits and the period when the Group recognizes costs for a restructuring. If benefits are not payable within 12 months after the end of the reporting period, then they are discounted to their present value.

(17) Provisions

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

The risks and uncertainties that inevitably surround many events and circumstances are taken into account in reaching the best estimate of a provision. Where the effect of the time value of money is material, provisions are determined at the present value of the expected future cash flows.

Where some or all of the expenditures required to settle a provision are expected to be reimbursed by another party, the reimbursement is recognized when, and only when, it is virtually certain that reimbursement will be received if the Group settles the obligation. The reimbursement is treated as a separate asset.

Provisions are reviewed at the end of each reporting period and adjusted to reflect the current best estimates. If it is no longer probable that an outflow of resources embodying economic benefits will be required to settle the obligation, the provision is reversed.

A provision is used only for expenditures for which the provision was originally recognized.

3. Significant Accounting Policies, Continued

(18) Emissions Rights

The Group accounts for greenhouse gases emission right and the relevant liability as below pursuant to the *Act on Allocation and Trading of Greenhouse Gas Emission* in Korea.

(a) Greenhouse Gases Emission Right

Greenhouse Gases Emission Right consists of emission allowances, which are allocated from the government free of charge or purchased from the market. The cost includes any directly attributable costs incurred during the normal course of business.

Emission rights held for the purpose of performing the obligation are classified as intangible asset and are initially measured at cost and after initial recognition are carried at cost less accumulated impairment losses. Emission rights held for short-swing profits are classified as current asset and are measured at fair value with any changes in fair value recognized as profit or loss in the respective reporting period.

The Group derecognizes an emission right asset when the emission allowance is unusable, disposed or submitted to government in which the future economic benefits are no longer expected to be probable.

(b) Emission liability

Emission liability is a present obligation of submitting emission rights to the government with regard to emission of greenhouse gas. Emission liability is recognized when it is probable that outflows of resources will be required to settle the obligation and the costs required to perform the obligation are reliably estimable. Emission liability is an amount of estimated obligations for emission rights to be submitted to the government for the performing period. The emission liability is measured based on the expected quantity of emission for the performing period in excess of emission allowance in possession and the unit price for such emission rights in the market at the end of the reporting period.

(19) Foreign currencies

(a) Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are retranslated to the functional currency at the exchange rate at the reporting data. Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are translated to the functional currency at the exchange rate at the date that the fair value was determined.

Foreign currency differences arising on the settlement or retranslation of monetary items are recognized in profit or loss, except for differences arising on the retranslation of the net investment in a foreign operation, which are recognized in other comprehensive income. When a gain or loss on a non-monetary item is recognized in other comprehensive income, any exchange component of that gain or loss is recognized in other comprehensive income. Conversely, when a gain or loss on a non-monetary item is recognized in profit or loss, any exchange component of that gain or loss is recognized in profit or loss.

(b) Foreign operations

If the presentation currency of the Group is different from a foreign operation's functional currency, the financial statements of the foreign operation are translated into the presentation currency using the following methods:

The assets and liabilities of foreign operations, whose functional currency is not the currency of a hyperinflationary economy, are translated to presentation currency at exchange rates at the end of reporting period. The income and expenses of foreign operations are translated to functional currency at exchange rates at the dates of the transactions. Foreign currency differences are recognized in other comprehensive income.

3. Significant Accounting Policies, Continued

(19) Foreign currencies, Continued

(b) Foreign operations, Continued

Any goodwill arising on the acquisition of a foreign operation and any fair value adjustments to the carrying amounts of assets and liabilities arising on the acquisition of that foreign operation is treated as assets and liabilities of the foreign operation. Thus, they are expressed in the functional currency of the foreign operation and translated at the exchange rates at the end of reporting date.

When a foreign operation is disposed of, the relevant amount in the translation is transferred to profit or loss as part of the profit or loss on disposal. On the partial disposal of a subsidiary that includes a foreign operation, the relevant proportion of such cumulative amount is reattributed to non-controlling interest. In any other partial disposal of a foreign operation, the relevant proportion is reclassified to profit or loss.

(20) Equity capital

Ordinary shares are classified as equity. Incremental costs directly attributable to the issuance of ordinary shares is recognized as a deduction from equity, net of any tax effects.

When the Group repurchases its share capital, the amount of the consideration paid is recognized as a deduction from equity and classified as treasury shares. The profits or losses from the purchase, disposal, reissue, or retirement of treasury shares are not recognized as current profit or loss. If the Group acquires and disposes treasury shares, the consideration paid or received is directly recognized in equity.

(21) Share-based payment

The Group has granted shares or share options to its employees. For equity-settled share-based payment transactions, the Group measures the goods or services received, and the corresponding increase in equity as a capital adjustment at the fair value of the goods or services received, unless that fair value cannot be estimated reliably. If the Group cannot reliably estimate the fair value of the goods or services received, the Group measures their value, and the corresponding increase in equity, indirectly, by reference to the fair value of the equity instruments granted. If the fair value of the equity instruments cannot be estimated reliably at the measurement date, the Group measures them at their intrinsic value and recognizes the goods or services received based on the number of equity instruments that ultimately vest.

For cash-settled share-based payment transactions, the Group measures the goods or services acquired and the liability incurred at the fair value of the liability. Until the liability is settled, the Group remeasures the fair value of the liability at each reporting date and at the date of settlement, with changes in fair value recognized in profit or loss for the period.

The Group accounts for share-based payment, with options to choose either cash-settled or equity-settled share-based payment, in accordance with the substance of transactions.

(22) Revenue from contracts with customers

The Group's accounting policies relating to revenue from contracts with customers are described in note 27.

3. Significant Accounting Policies, Continued

(23) Finance income and finance expenses

The Group's finance income and finance expenses include:

- Interest income;
- Interest expense;
- Dividend income;
- The net gain or loss on financial assets at fair value through profit or loss;
- Gain or loss on foreign exchange(currency) translation for financial asset and liabilities;
- Impairment losses and reversals on investment in debt securities carried at amortized cost method; and
- The gain on the remeasurement to fair value of any pre-existing interest in an acquire in a business combination

The Group uses effective interest rate method for recognizing interest income and expense. Dividend income is recognized in profit or loss on the date that the Group's right to receive dividend is established.

The 'effective interest rate' is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument to:

- The gross carrying amount of the financial asset; or
- The amortized cost of the financial liability

In calculating interest income and expense, the effective interest rate is applied to the gross carrying amount of the asset (when the asset is not credit-impaired) or to the amortized cost of the liability. However, for financial assets that have become credit-impaired subsequent to initial recognition, interest income is calculated by applying the effective interest rate to the amortized cost of the financial asset. If the asset is no longer credit-impaired, then the calculation of interest income reverts to the gross basis.

(24) Income taxes

Income tax expense comprises current and deferred tax. Current and deferred tax are recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

(a) Current tax

Current tax is the expected tax payable or refundable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the end of the reporting period and any adjustment to tax payable in respect of previous years. The amount of current tax payable or receivable is the best estimate of tax amount expected to be paid or received that reflects uncertainty related to income taxes. The taxable income is different from the accounting profit for the period since the taxable profit is calculated excluding the temporary differences, which will be taxable or deductible in determining taxable profit (tax loss) of future periods, and non-taxable or non-deductible items from the accounting profit. The tax expense is calculated on the basis of the tax laws enacted or substantively enacted at the end of the reporting period.

(b) Deferred tax

Deferred tax is recognized, using the asset-liability method, in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes.

3. Significant Accounting Policies, Continued

(24) Income taxes, Continued

(b) Deferred tax, Continued

The Group recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, associates and interests in joint ventures except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. The Group recognizes deferred tax assets for all deductible temporary differences including unused tax loss and tax credit to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and reduces the carrying amount to the extent that it is no longer probable that sufficient taxable profit will be available to allow the benefit of part or all of that deferred tax asset to be utilized.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realized or the liability is settled, 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 deferred tax 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 only if there is a legally enforceable right to offset the related current tax liabilities and assets, and they relate to income taxes levied by the same tax authority and they intend to settle current tax liabilities and assets on a net basis. If there are any additional income tax expense incurred in accordance with dividend payments, such income tax expense is recognized when liabilities relating to the dividend payments are recognized.

(25) Earnings per share

The Group presents basic and diluted earnings per share (EPS) data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Parent Company by the weighted average number of ordinary shares outstanding during the period, adjusted for own shares held. Diluted EPS is determined by adjusting the profit or loss attributable to ordinary shareholders and the weighted average number of outstanding ordinary shares, adjusted for own shares held, for the effects of all dilutive potential ordinary shares including stock options.

(26) Changes in accounting policies

The Group has initially adopted K-IFRS No. 1116 'Leases' from January 1, 2019. A number of other new standards are effective from January 1, 2019 and they do not have significant impact on the Group's consolidated financial statements.

K-IFRS No. 1116 introduced a single, on-balance sheet accounting model for lessees. As a result, the Group, as a lessee, has recognized right-of-use assets representing its rights to use the underlying assets and lease liabilities representing its obligation to make lease payments. Lessor accounting remains similar to previous accounting policies.

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3. Significant Accounting Policies, Continued

(26) Changes in accounting policies, Continued

The Group recognized the cumulative effect of the initial application of K-IFRS No. 1116 in right-of-use assets and lease liabilities as of January 1, 2019 (the date of initial application). Accordingly, the comparative information presented for the prior year has not been restated - i.e. it is presented, as previously reported, under K-IFRS No. 1017 and related interpretations. Details of changes to the accounting policies are disclosed below.

(a) Definition of a lease

Previously, the Group determined at contract inception whether an arrangement was or contained a lease under K-IFRS Interpretation No. 2104, *'Determining Whether an Arrangement contains a Lease'*. The Group now assesses whether a contract is or contains a lease based on the new definition of a lease. Under K-IFRS No. 1116, a contract is, or contains, a lease if the contract conveys a right to control the use of an identified asset for a period of time in exchange for consideration.

(b) As a lessee

The Group leases many assets, including structures and production machinery. As a lessee, the Group previously classified leases as operating or finance leases based on its assessment of whether the lease transferred substantially all of the risks and rewards of ownership. Under K-IFRS No. 1116, the Group recognizes right-of-use assets and lease liabilities for most leases on the consolidated statements of financial position.

The Group separately presents right-of-use assets that do not meet the definition of investment property in the statement of financial position. The carrying amounts of right-of-use assets are as below.

(In millions of won)

		Properties	Structures	Machinery	Vehicles	Others	Total
Balance at January 1, 2019	₩	31,652	867,864	279,952	10,688	3,214	1,193,370
Balance at December 31, 2019	₩	97,855	975,996	153,447	11,491	11,787	1,250,576

Previously, the Group classified certain lease contracts for equipment and others as operating leases under K-IFRS No. 1017.

On transition, for leases classified as operating leases under K-IFRS No. 1017, lease liabilities were measured at the present value of the remaining lease payments, discounted at the Group's incremental borrowing rate as of January 1, 2019. Right-of-use assets are measured at an amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments.

The Group used the following practical expedients when applying K-IFRS No. 1116 to leases previously classified as operating leases under K-IFRS No. 1017.

- Excluded initial direct costs from the measurement of the right-of-use assets at the date of initial application.
- Used hindsight when determining the lease term if the contract contains options to extend or terminate the lease.
- Did not recognize right-of-use assets and liabilities for leases of which the lease term ends within 12 months of the date of initial application.
- Did not recognize right-of-use assets and liabilities for leases of low value assets.

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3. Significant Accounting Policies, Continued

(26) Changes in accounting policies, Continued

(b) As a lessee, Continued

The Group leases a number of production equipment and others. Certain items were classified as finance leases under K-IFRS No. 1017. For these finance leases, the carrying amount of the right-of-use assets and the lease liability at January 1, 2019 were determined at the carrying amount of the lease asset and lease liability under K-IFRS No. 1017 immediately before that date.

(c) As a lessor

The Group leases out its investment property and property, plant and equipment. The Group has classified these leases as operating leases. The accounting policies applicable to the Group as a lessor are not different from those under K-IFRS No. 1017.

The Group is not required to make any adjustments on transition to K-IFRS No. 1116 for leases in which it acts as a lessor. However, the Group has applied K-IFRS No. 1115 '*Revenue from Contracts with Customers*' to allocate consideration in the contract to each lease and non-lease component.

(d) Impacts on consolidate financial statements

(i) Impacts on transition

On transition to K-IFRS No. 1116, the Group recognized additional right-of-use assets and lease liabilities. The impact on transition is summarized below.

(In millions of won)

	January 1, 2019
Right-of-use assets	₩ 1,193,370
Property, plant and equipment	(73,069)
Intangible Assets	(5,582)
Lease liabilities	1,191,579
Borrowings	(68,158)
Other current liabilities	(8,702)

When measuring lease liabilities for leases that were classified as operating leases, the Group discounted lease payments using its incremental borrowing rate at January 1, 2019. The weighted average incremental borrowing rate is 2.22%.

(In millions of won)

	Amount
Operating lease commitment at January 1, 2019	₩ 1,291,372
Discounted using the incremental borrowing rate at January 1, 2019	1,127,847
Finance lease liabilities recognized as of December 31, 2018	68,158
- Recognition exemption for leases of low-value assets	(835)
- Recognition exemption for leases of short-term leases	(3,591)
Lease liabilities recognized at January 1, 2019	₩ 1,191,579

3. Significant Accounting Policies, Continued

(26) Change in accounting policies, Continued

(d) Impacts on consolidated financial statements, Continued

(ii) Impacts for the period

As a result of initially applying K-IFRS No. 1116, in relation to the leases that were previously classified as operating leases, the Group recognized ~~₩~~1,183,600 million of right-of-use assets and ~~₩~~1,141,106 million of lease liabilities as of December 31, 2019.

Also in relation to those leases under K-IFRS No. 1116, the Group has recognized depreciation and interest expenses, instead of operating lease expense. For the year ended December 31, 2019, the Group recognized ~~₩~~240,304 million of depreciation expenses and ~~₩~~23,317 million of interest expense from these leases.

(e) K-IFRS No. 1116, '*Leases*' – 'Enforceable period' and determination of the '*Lease term*'

In December 2019, the International Financial Reporting Standards Interpretations Committee ("IFRIC") issued its final agenda decision that the concept of penalty that should be considered in determining the enforceable period under IFRS 16 '*Leases*', shall be determined considering broader economics of the contract, and not only contractual termination payments. Further, if only one party has the right to terminate the lease without permission from the other party with no more than an insignificant penalty, the contract is enforceable beyond the date on which the contract can be terminated by that party.

In preparing the 2019 consolidated financial statements, the Group only considered the specified amount of termination payments in the contract in determining enforceable period. Therefore, applying the above-mentioned agenda decision may change the judgment of the enforceable period for certain lease contracts the Group has entered into.

However, considering the type, number and complexity of lease contracts entered into as of and from January 1, 2019, the Group does not believe it had sufficient time to complete the analysis on its lease portfolios to reflect the impact of the above IFRIC agenda decision, if any, in its 2019 consolidated financial statements. The Group plans to complete the assessment and reflect the impact, if any, in its consolidated financial statements and related notes during 2020. Any change as a result will be accounted for as an in accounting policy change in the 2020 consolidated financial statements.

(27) Standards issued but not yet effective

The following new standards and amendments to standards are effective for accounting periods beginning on or after January 1, 2020 and earlier application is permitted; however, the Group has not early adopted them in preparing these consolidated financial statements.

(a) K-IFRS No. 1103, '*Business Combinations*' (Amendment)

This amendment clarifies that a business generally has outputs, but that an integrated set of activities and assets is not essential to meet the definition of a business. For acquired activities and groups of assets to be considered business, they should include at least inputs and substantive processes with the ability to contribute significantly together to the generation of output. It also provides judgment guidelines to help determine whether a substantive process has been acquired.

3. Significant Accounting Policies, Continued

(27) Standards issued but not yet effective, Continued

(a) K-IFRS No. 1103, '*Business Combinations*' (Amendment), Continued

This amendment introduces optional concentration tests that provide a brief assessment of whether acquired activities and groups of assets are not business. This is an assessment that results in an asset acquisition if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a similar identifiable group of assets.

This amendment applies prospectively to all business combinations and acquisitions of assets beginning the accounting period on or after January 1, 2020, and early application is permitted.

(b) K-IFRS Conceptual Framework for Financial Reporting (Amendment)

In addition to the revised '*Framework (2018)*', which was introduced with the announcement on December 21, 2018, the International Accounting Standards Board also published 'Amendments to the Conceptual Framework Reference' in the International Accounting Standards. This document includes amendments to K-IFRS No. 1102, 1103, 1106, 1114, 1001, 1008, 1034, 1037, 1038, 2112, 2119, 2120, 2122, and 2032.

However, not all amendments require such references or references to the revised '*Framework (2018)*'. Some statements have been amended to clarify whether the referenced '*Conceptual Framework*' is a '*Conceptual Framework for the Preparation and Presentation of Financial Statements (2007)*', the '*Conceptual Framework (2010)*', or the newly revised '*Conceptual Framework (2018)*', and some other wordings have been amended to state that the definition in International Accounting Standards has not changed to the new definition developed in the revised '*Conceptual Framework (2018)*'.

The amendment shall be applied prospectively for accounting periods beginning on or after January 1, 2020, if any changes are made, and early application is permitted.

(c) Other Restated/Amended Standards

The following new standards and amendments to standards are not expected to have a significant impact on the Group's consolidated financial statements.

- Definition of materiality (Amendments to K-IFRS No. 1001 '*Presentation of Financial Statements*' and K-IFRS No. 1008 '*Accounting Policies, Changes in Accounting Estimates and Errors*')
 - K-IFRS No. 1117 '*Insurance Contracts*'

SK HYNIX, INC. and Subsidiaries
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4. Geographic and Customer Information

The Group has a single reportable segment that is engaged in the manufacture and sale of semiconductor products. The Board of Directors of the Group reviews the operation result of the single reportable segment when establishing the Group's business strategy.

(1) The Group's non-current assets (excluding financial assets, loans and other receivables, equity-accounted investees and deferred tax assets) information by region based on the location of subsidiaries as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Korea	₩ 35,109,665	32,768,811
China	8,814,465	5,100,869
Asia (other than China)	21,497	7,710
U.S.A.	395,772	376,307
Europe	14,293	9,908
	₩ <u>44,355,692</u>	<u>38,263,605</u>

(2) Revenue from customer A, and B each constitutes more than 10% of the Group's consolidated revenue for the year ended December 31, 2019 and amounts to ₩4,947,483 million (2018: ₩5,265,807 million) and ₩3,051,211 million (2018: ₩5,407,782 million), respectively.

SK HYNIX, INC. and Subsidiaries
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5. Categories of Financial Instruments

(1) Categories of financial assets as of December 31, 2019 and 2018 are as follows:

(In millions of won)

2019			
	Financial assets at fair value through profit or loss	Financial assets at amortized cost	Total
Cash and cash equivalents	₩ -	2,306,070	2,306,070
Short-term financial instruments	-	298,350	298,350
Short-term investment assets	1,390,293	-	1,390,293
Trade receivables	-	4,306,449	4,306,449
Loans and other receivables	-	132,587	132,587
Other financial assets	-	931	931
Long-term investment assets	4,381,812	-	4,381,812
	₩ <u>5,772,105</u>	<u>7,044,387</u>	<u>12,816,492</u>

(In millions of won)

2018			
	Financial assets at fair value through profit or loss	Financial assets at amortized cost	Total
Cash and cash equivalents	₩ -	2,349,319	2,349,319
Short-term financial instruments	-	523,579	523,579
Short-term investment assets	5,496,452	-	5,496,452
Trade receivables	-	6,319,994	6,319,994
Loans and other receivables	-	86,906	86,906
Other financial assets	-	310	310
Long-term investment assets	4,325,550	-	4,325,550
	₩ <u>9,822,002</u>	<u>9,280,108</u>	<u>19,102,110</u>

SK HYNIX, INC. and Subsidiaries
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5. Categories of Financial Instruments, Continued

(2) Categories of financial liabilities as of December 31, 2019 and December 31, 2018 are as follows:

(In millions of won)

		2019	
	Financial liabilities at fair value through profit or loss	Financial liabilities measured at amortized cost	Total
Trade payables	₩ -	1,042,542	1,042,542
Other payables	13,006	2,354,667	2,367,673
Other non-trade payables	-	1,276,161	1,276,161
Borrowings	-	10,523,506	10,523,506
Lease liabilities	-	1,200,830	1,200,830
Other financial liabilities	15,532	-	15,532
	₩ 28,538	16,397,706	16,426,244

(In millions of won)

		2018
		Financial liabilities measured at amortized cost
Trade payables	₩	1,096,380
Other payables		3,681,933
Other non-trade payables		1,894,751
Borrowings ¹		5,281,937
	₩	11,955,001

¹ As of December 31, 2018, borrowings include finance lease liabilities amounting to ₩68,158 million in accordance with K-IFRS No. 1017. Upon transition to K-IFRS No. 1116, lease liabilities are presented separately from borrowings in the consolidated statement of financial position as of December 31, 2019.

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5. Categories of Financial Instruments, Continued

(3) Details of gain and loss on financial assets and liabilities by category for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Financial assets at amortized cost		
Interest income	₩ 30,062	62,478
Foreign exchange differences	229,649	573,349
Reversal of impairment	85	44
	<u>259,796</u>	<u>635,871</u>
Financial assets at fair value through profit or loss		
Dividend income	429	2,136
Gain on disposal	59,217	41,853
Gain on valuation	(227,423)	197,919
Foreign exchange differences	209,563	122,375
	<u>41,786</u>	<u>364,283</u>
Financial liabilities measured at amortized cost		
Interest expenses	(238,508)	6(94,635)
Foreign exchange differences	(330,218)	(355,654)
	<u>(568,726)</u>	<u>(450,289)</u>
	<u>₩ (267,144)</u>	<u>549,865</u>

SK HYNIX, INC. and Subsidiaries
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6. Financial Risk Management

(1) Financial risk management

The Group's activities are exposed to a variety of financial risks: market risk (including foreign exchange risk, interest rate risk and price risk), credit risk and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the Group's financial performance.

Risk management is carried out by the Parent Company's corporate finance division in accordance with policies approved by the board of directors. The Parent Company's corporate finance division identifies, evaluates and hedges financial risks in close cooperation with the Group's operating units. The board of directors provides written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, and credit risk, use of derivative financial instruments and non-derivative financial instruments, and investment of excess liquidity.

(a) Market risk

(i) Foreign currency risk

The Group operates internationally and is exposed to foreign currency risk arising from various currency exposures, primarily with respect to US dollar, Chinese Yuan, Euro and Japanese Yen. Foreign currency risk arises from future commercial transactions, recognized assets and liabilities in foreign currencies, and net investments in foreign operations.

Monetary foreign currency assets and liabilities as of December 31, 2019 are as follows:

(In millions of won and millions of foreign currencies)

	Assets		Liabilities	
	Foreign currencies	Korean won equivalent	Foreign currencies	Korean won equivalent
USD	6,996	₩ 8,100,306	8,668	₩ 10,036,300
JPY	382	4,058	129,137	1,373,335
CNY	1,101	182,423	8	1,335
EUR	11	14,246	46	59,749

Also, as described in note 23, the Group entered into a fixed-to-fixed cross currency swap and a floating-to-fixed cross currency interest rate swap to hedge foreign currency rate risk relating to bonds and borrowings denominated in foreign currencies.

As of December 31, 2019, effects on profit before income tax as a result of strengthening or weakening of the foreign currencies by 10% are as follows:

(In millions of won)

	If strengthening by 10%	If weakening by 10%
USD	₩ (78,582)	78,582
JPY	(136,928)	136,928
CNY	18,109	(18,109)
EUR	(4,550)	4,550

6. Financial Risk Management, Continued

(1) Financial risk management, Continued

(a) Market risk, Continued

(ii) Interest rate risk

Interest rate risk of the Group is defined as the risk that the interest expenses arising from borrowings will fluctuate because of changes in future market interest rate. The interest rate risk mainly arises through floating rate borrowings.

As of December 31, 2019, if interest rates on borrowings were 100 basis points higher/lower with all other variables held constant, profit before income tax for the following year would be ₩55,093 million (2018: ₩19,418 million) lower/higher, mainly as a result of higher/lower interest expense on floating rate borrowings (except for floating-rate borrowings amounting to ₩578,900 million under floating-to-fixed cross currency interest rate swap agreement) and interest income on floating rate financial assets.

(iii) Price risk

The Group invests in equity and debt securities resulted from its business needs and the purpose of liquidity management. The Group's equity and debt securities are exposed to price risk as of December 31, 2019.

(b) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises mainly from operating and investing activities. In order to manage credit risk, the Group periodically evaluates the credit worthiness of each customer or counterparty through the analysis of its financial information, historical transaction records and other factors, based on which the Group establishes credit limits for each customer or counterparty.

(i) Trade and other receivables

For each new customer, the Group individually analyzes its credit worthiness before standard payment and delivery terms and conditions are offered. In addition, the Group is consistently managing trade and other receivables by reevaluating the overseas customer's credit worthiness and securing collaterals in order to limit its credit risk exposure.

The Group reviews at the end of each reporting period whether trade and other receivables are impaired and maintains credit insurance policies to manage credit risk exposure from overseas customers. The maximum exposure to credit risk as of December 31, 2019 is the carrying amount of trade and other receivables.

(ii) Other financial assets

Credit risk also arises from other financial assets such as cash and cash equivalents, short-term financial instruments, and deposits with banks and financial institutions as well as short-term and long-term loans mainly due to the bankruptcy of each counterparty to those financial assets. The maximum exposure to credit risk as of December 31, 2019 is the carrying amount of those financial assets. The Group transacts only with banks and financial institutions with high credit ratings, and accordingly management does not expect any significant losses from non-performance by these counterparties.

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6. Financial Risk Management, Continued

(1) Financial risk management, Continued

(c) Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in having sufficient funds needed to meet obligations associated with its financial contracts until maturity. The Group forecasts its cash flow and liquidity status and sets action plans on a regular basis to manage liquidity risk proactively.

The Group invests surplus cash in interest-bearing current accounts, time deposits, and demand deposits, choosing instruments with appropriate maturities or sufficient liquidity based on the above-mentioned forecasts.

Contractual maturities of financial liabilities as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019				
		Less than 1 year	1 - 2 years	2 - 5 years	More than 5 years	Total
Borrowings ¹	₩	2,988,176	2,974,910	4,535,800	794,687	11,293,573
Lease liabilities		207,501	171,420	279,691	717,080	1,375,692
Trade payables		1,042,542	-	-	-	1,042,542
Other payables		2,367,673	-	-	-	2,367,673
Other non-trade payables		1,257,895	15,611	2,655	-	1,276,161
Other financial liabilities		(15,826)	(13,862)	(16,732)	5,522	(40,898)
Financial guarantee contract		69,468	-	-	-	69,468
	₩	<u>7,917,429</u>	<u>3,148,079</u>	<u>4,801,414</u>	<u>1,517,289</u>	<u>17,384,211</u>

¹ The cash flow includes payment of interest under terms and conditions of borrowing contracts and excludes the amount of lease liabilities as of December 31, 2019.

(In millions of won)

		2018				
		Less than 1 year	1 - 2 years	2 - 5 years	More than 5 years	Total
Borrowings ¹	₩	1,691,585	977,990	2,688,574	94,536	5,452,685
Finance lease liabilities		10,773	10,773	31,860	24,369	77,775
Trade payables		1,096,380	-	-	-	1,096,380
Other payables		3,681,933	-	-	-	3,681,933
Other non-trade payables		1,879,519	1,096	14,135	-	1,894,750
Financial guarantee contract		4	-	-	-	4
	₩	<u>8,360,194</u>	<u>989,859</u>	<u>2,734,569</u>	<u>118,905</u>	<u>12,203,527</u>

¹ The cash flow includes payment of interest under terms and conditions of borrowing contracts and excludes the amount of finance lease liabilities as of December 31, 2018.

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6. Financial Risk Management, Continued

(1) Financial risk management, Continued

(c) Liquidity risk, Continued

The table above analyzes the Group's financial liabilities into relevant maturity groups based on the remaining period at the statement of financial position date to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows and include estimated interest payments.

(2) Capital management

The Group's objectives when managing capital are to safeguard the Group's ability to continue as a going concern in order to provide returns for shareholders and benefits for other stakeholders and to maintain an optimal capital structure to reduce the cost of capital.

In order to maintain or adjust the capital structure, the Group may adjust the amount of dividends to shareholders, proceeds and repayments of borrowings, issue new shares or sell assets to repay debt.

The debt-to-equity ratio and net borrowing ratio as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Total liabilities (A)	₩ 16,846,299	16,806,004
Total equity (B)	47,943,195	46,852,331
Cash and cash equivalents; short-term financial instruments; and short-term investment asset (C)	3,994,713	8,369,350
Total borrowings (D) ¹	10,523,506	5,281,937
Debt-to-equity ratio (A/B)	35.14%	35.87%
Net borrowing ratio (D-C)/B ²	13.62%	-

¹ As of December 31, 2018, borrowings include finance lease liabilities amounting to ₩68,158 million in accordance with K-IFRS No. 1017. Meanwhile, as a result of the transition to K-IFRS No. 1116, lease liabilities are presented separately from borrowings in the consolidated statement of financial position as of December 31, 2019.

² Net borrowing ratio as of December 31, 2018 is not presented as the ratio was negative.

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6. Financial Risk Management, Continued

(3) Fair value

Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in valuation techniques as follows:

- 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 (i.e. as prices) or indirectly (i.e. derived from prices)
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs)

(a) The following table presents the carrying amounts and fair values of financial instruments by categories, including their levels in the fair value hierarchy, as of December 31, 2019 and 2018:

(In millions of won)

		2019			
	Carrying amounts	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value					
Short-term investment asset	₩ 1,390,293	-	1,390,293	-	1,390,293
Long-term investment asset	4,381,812	-	-	4,381,812	4,381,812
	5,772,105	-	1,390,293	4,381,812	5,772,105
Financial assets not measured at fair value					
Cash and cash equivalents ¹	2,306,070	-	-	-	-
Short-term financial instruments ¹	298,350	-	-	-	-
Trade receivables ¹	4,306,449	-	-	-	-
Loans and other receivables ¹	132,587	-	-	-	-
Other financial assets ¹	931	-	-	-	-
	7,044,387	-	-	-	-
Financial liabilities measured at fair value					
Other financial liabilities	15,532	-	15,532	-	15,532
Other payables	13,006	-	-	13,006	13,006
	28,538	-	15,532	13,006	28,538
Financial liabilities not measured at fair value					
Trade payables ¹	1,042,542	-	-	-	-
Other payables ¹	2,354,667	-	-	-	-
Other non-trade payables ¹	1,276,161	-	-	-	-
Borrowings	10,523,506	-	10,585,029	-	10,585,029
Lease liabilities	1,200,830	-	-	-	-
	₩ 16,397,706	-	10,585,029	-	10,585,029

¹ Does not include fair values of financial assets and liabilities of which fair values have not been measured as carrying amounts are reasonable approximation of fair values.

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6. Financial Risk Management, Continued

(3) Fair value, Continued

(a) The following table presents the carrying amounts and fair values of financial instruments by categories, including their levels in the fair value hierarchy, as of December 31, 2019 and 2018, Continued:

(In millions of won)

		2018			
	Carrying amounts	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value					
Short-term investment asset	₩ 5,496,452	-	5,496,452	-	5,496,452
Long-term investment asset	4,325,550	-	-	4,325,550	4,325,550
	9,822,002	-	5,496,452	4,325,550	9,822,002
Financial assets not measured at fair value					
Cash and cash equivalents ¹	2,349,319	-	-	-	-
Short-term financial instruments ¹	523,579	-	-	-	-
Trade receivables ¹	6,319,994	-	-	-	-
Loans and other receivables ¹	86,906	-	-	-	-
Other financial assets ¹	310	-	-	-	-
	9,280,108	-	-	-	-
Financial liabilities not measured at fair value					
Trade payables ¹	1,096,380	-	-	-	-
Other payables ¹	3,681,933	-	-	-	-
Other non-trade payables ¹	1,894,751	-	-	-	-
Borrowings ²	5,281,937	-	5,300,120	-	5,300,120
	₩ 11,955,001	-	5,300,120	-	5,300,120

¹ Does not include fair values of financial assets and liabilities of which fair values have not been measured as carrying amounts are reasonable approximation of fair values.

² As of December 31, 2018, borrowings include finance lease liabilities in accordance with K-IFRS No. 1017.

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6. Financial Risk Management, Continued

(3) Fair value, Continued

(b) Valuation Techniques

The valuation techniques of recurring and non-recurring fair value measurements and quoted prices classified as level 2 or level 3 are as follows:

(In millions of won)

		<u>Fair value</u>	<u>Level</u>	<u>Valuation Techniques</u>
Financial assets at fair value through profit or loss:				
Short-term investment assets	₩	1,390,293	2	Present value technique
Long-term investment assets		4,381,812	3	Present value technique and others
Financial liabilities at fair value through profit or loss:				
Fixed-to-fixed cross currency swap and floating-to-fixed cross currency interest rate swap	₩	15,532	2	Present value technique
Other payables		13,006	3	Present value technique

Long-term investments measured at level 3 in the fair value hierarchy include investments in special purpose companies of BCPE Pangea Intermediate Holdings Cayman, L.P. ("SPC1") amounting to ₩2,780,758 million and BCPE Pangea Cayman2 Limited ("SPC2") amounting to ₩1,435,460 million in connection with the acquisition of KIOXIA Holdings Corporation ("KIOXIA", formerly Toshiba Memory Corporation) (see note 12). The fair value of the long-term investments is measured based on the equity value of the underlying asset, KIOXIA.

The fair value of equity investment in SPC1 is measured using probability-weighted expected return method that represents the probability-weighted average of possible future cash flows. The fair values of different scenarios (such as initial public offering, merger and acquisition, and liquidation) are determined based on the KIOXIA's equity value, calculated using either market approach, option-pricing method or present value method. KIOXIA's estimated equity value is allocated to shareholder's value of each class of shares depending the capital structure of the investment. For the allocation, a waterfall approach is used, which allocates value based on the distribution priority described in SPC1 investment agreement depending on the nature of liquidity transaction or an ultimate liquidation.

The fair value of debt investment in SPC2 convertible bonds is measured based on KIOXIA's equity value, using binomial model.

SK HYNIX, INC. and Subsidiaries
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6. Financial Risk Management, Continued

(3) Fair value, Continued

(b) Valuation Techniques, Continued

The valuation techniques and key inputs used in valuation of the equity investment in SPC1 and investment in SPC2 convertible bonds are as follows:

(In millions of won)

	Fair value	Valuation Techniques	Level 3 inputs	Input Range
Equity investment in SPC1	₩ 2,780,758	Present value technique, probability-weighted expected return method, market approach, and option-pricing method	Terminal growth rate Weighted-average capital cost EV/EBITDA multiples Cost of equity	0% 8.6% 4.7 ~ 5.3 10.3%
SPC2 convertible bonds	1,435,460	Present value technique and binomial model	Terminal growth rate Weighted-average capital cost Volatility Risk free rate	0% 8.6% 21.3% -0.13%

In these level 3 significant unobservable inputs, an increase in terminal growth rate, and EV/EBITDA multiples or a decrease in weighted-average capital cost, cost of equity will result in higher fair value of the equity investment in SPC1. In addition, an increase in terminal growth rate and volatility and a decrease in weighted-average capital cost will result in higher fair value of the investment in SPC2 convertible bonds, while any change in risk free rate may have either positive or negative impact on the fair value of the investment in SPC2 convertible bonds.

Any positive or negative changes in the above inputs will have a significant and direct impact on the fair value of investments in SPC1 and SPC2, respectively. They are significant, but unobservable. Accordingly, the investments are classified as fair value hierarchy level 3.

(c) There was no transfer between fair value hierarchy levels during the year ended December 31, 2019 and the changes in financial assets and financial liabilities classified as level 3 fair value measurements during the year ended December 31, 2019 are as follows:

(In millions of won)

	Beginning Balance	Acquisition	Disposals	Payments	Loss on Valuation	Foreign Exchange Difference	Ending Balance
Financial assets:							
Long-term investment assets	₩ 4,325,550	82,861	(3,884)	-	(233,234)	210,519	4,381,812
Financial liabilities:							
Other payables	-	15,116	-	(2,462)	-	352	13,006

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7. Restricted Financial Instruments

Details of restricted financial instruments as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018	Description
Short-term financial instruments	₩	227,500	227,500	Restricted for supporting small businesses
		6,381	6,079	Pledged for consumption tax
		<u>233,881</u>	<u>233,579</u>	
Other financial assets		11	11	Bank overdraft guarantee deposit
		269	265	Others
		<u>280</u>	<u>276</u>	
	₩	<u>234,161</u>	<u>233,855</u>	

8. Trade Receivables and Loans and Other Receivables

(1) Details of trade receivables as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Current			
Trade receivables	₩	4,175,470	6,207,936
Trade receivables to be collected from related parties		86,204	112,058
		<u>4,261,674</u>	<u>6,319,994</u>
Non-current			
Trade receivables		44,775	-
		<u>4,306,449</u>	<u>6,319,994</u>

(2) Details of loans and other receivables as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Current			
Other receivables	₩	11,104	8,465
Accrued income		2,043	3,899
Short-term loans		6,816	4,807
Short-term guarantee and other deposits		3,545	1,221
		<u>23,508</u>	<u>18,392</u>
Non-current			
Long-term other receivables		2	54
Long-term loans		35,299	28,125
Guarantee deposits		73,550	40,117
Others		228	218
		<u>109,079</u>	<u>68,514</u>
	₩	<u>132,587</u>	<u>86,906</u>

SK HYNIX, INC. and Subsidiaries
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December 31, 2019 and 2018

8. Trade Receivables and Loans and Other Receivables, continued

(3) Trade receivables and loans and other receivables, net of provision for impairment, as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019		
	Gross amount	Provision for impairment	Carrying amount
Trade receivables	₩ 4,306,458	(9)	4,306,449
Current loans and other receivables	24,788	(1,280)	23,508
Non-current loans and other receivables	110,241	(1,162)	109,079
	₩ 4,441,487	(2,451)	4,439,036

(In millions of won)

	2018		
	Gross amount	Provision for impairment	Carrying amount
Trade receivables	₩ 6,320,042	(48)	6,319,994
Current loans and other receivables	19,715	(1,323)	18,392
Non-current loans and other receivables	69,631	(1,117)	68,514
	₩ 6,409,388	(2,488)	6,406,900

(4) Details of provision for impairment

Changes in the provision for impairment of trade receivables for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Beginning balance	₩ 48	46
Reversal	(40)	(3)
Foreign exchange difference	1	-
Business combination	-	5
Ending balance	₩ 9	48

Changes in the provision for impairment of current loans and other receivables for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Beginning balance	₩ 1,323	1,327
Reversal	(45)	(4)
Foreign exchange difference	2	-
Ending balance	₩ 1,280	1,323

SK HYNIX, INC. and Subsidiaries
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8. Trade Receivables and Loans and Other Receivables, continued

(4) Details of provision for impairment, continued

Changes in the provision for impairment of non-current loans and other receivables for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Beginning balance	₩	1,117	1,087
Reversal		-	(37)
Foreign exchange difference		45	67
Ending balance	₩	<u>1,162</u>	<u>1,117</u>

(5) The aging analysis of trade receivables and loans and other receivables as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019					
		Not impaired				Impaired	Total
		Overdue					
		Not past due	Less than 3 months	Over 3 months and less than 6 months	Over 6 months		
Trade receivables	₩	4,306,453	-	-	-	5	4,306,458
Current loans and other receivables		23,508	-	-	-	1,280	24,788
Non-current loans and other receivables		109,079	-	-	-	1,162	110,241
	₩	4,439,040	-	-	-	2,447	4,441,487

(In millions of won)

		2018				
		Not impaired				Total
		Overdue			Impaired	
		Over 3 months and less than 6 months				
		Not past due	Less than 3 months	Over 6 months		
Trade receivables	₩	6,320,038	-	-	4	6,320,042
Current loans and other receivables		18,392	-	-	1,323	19,715
Non-current loans and other receivables		68,514	-	-	1,117	69,631
	₩	6,406,944	-	-	2,444	6,409,388

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
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9. Inventories

(1) Details of inventories as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019		
	Acquisition cost	Inventory valuation allowance	Carrying amount
Merchandise	₩ 2,843	(21)	2,822
Finished goods	1,253,542	(195,108)	1,058,434
Work-in-process	3,383,814	(395,052)	2,988,762
Raw materials	659,893	(34,114)	625,779
Supplies	544,271	(23,203)	521,068
Goods in transit	98,970	-	98,970
	₩ 5,943,333	(647,498)	5,295,835

(In millions of won)

	2018		
	Acquisition cost	Inventory valuation allowance	Carrying amount
Merchandise	₩ 1,648	(14)	1,634
Finished goods	1,532,188	(127,749)	1,404,439
Work-in-process	2,327,178	(208,197)	2,118,981
Raw materials	486,436	(24,894)	461,542
Supplies	433,017	(17,138)	415,879
Goods in transit	20,258	-	20,258
	₩ 4,800,725	(377,992)	4,422,733

(2) The amount of the inventories recognized as cost of sales and loss on valuation allowance of inventories charged to cost of sales are as follows:

(In millions of won)

	2019	2018
Inventories recognized as cost of sales	₩ 18,822,989	15,178,673
Loss on valuation allowance of inventories	269,506	195,881

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
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10. Other Current and Non-current Assets

Details of other current and non-current assets as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Current		
Advance payments	₩ 64,429	113,030
Prepaid expenses	218,365	260,064
Value added tax refundable	343,434	343,821
Contract asset	55,715	24,294
Others	94	216
	<u>682,037</u>	<u>741,425</u>
Non-current		
Long-term advance payments	44,746	96,817
Long-term prepaid expenses	535,717	528,837
	<u>580,463</u>	<u>625,654</u>
	₩ <u>1,262,500</u>	<u>1,367,079</u>

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

11. Investments in Associates and Joint Ventures

(1) Details of investments in associates and joint ventures as of December 31, 2019 and 2018 are as follows:

(In millions of won)

Type	Investee	Location	Business	Owner ship (%)	2019		2018	
					Net asset value	Carrying amount	Owner ship (%)	Carrying amount
Associate	Stratio, Inc. ¹	U.S.A	Development and manufacturing	9.12	₩ 89	395	9.12	₩ 2,079
	SK China Company Limited ²	China	Consulting and investment	11.87	206,922	259,272	11.87	246,052
	Gemini Partners Pte. Ltd.	Singapore	Consulting	20.00	2,735	2,735	20.00	2,601
	TCL Fund ¹	China	Investment	11.06	4,995	4,995	11.06	3,464
	SK South East Asia Investment Pte. Ltd.	Singapore	Consulting and investment	20.00	237,599	237,599	20.00	111,810
	Hushan Xinju (Chengdu) Venture Investment Center (Smartsources) ²	China	Venture Capital	16.67	5,659	5,659	46.30	3,241
	WooYoung Farm Co., Ltd. ³	Korea	Growing crops	31.95	448	1,000	-	-
Joint venture	HITECH Semiconductor (Wuxi) Co., Ltd.	China	Manufacturing semiconductor parts	45.00	114,518	114,518	45.00	109,708
	Hystars Semiconductor (Wuxi) Co., Ltd.	China	Foundry factory construction	50.10	141,030	142,594	50.10	83,239
					₩ 713,995	768,767	₩ 562,194	

¹ The Group is able to exercise significant influence through its right to appoint a director to the board of directors of each investee. Accordingly, the investments in these investees have been classified as associates.

² The management of the Group is able to exercise significant influence over the entity by participating board of directors. Accordingly, the investments in these investees have been classified as associates.

³ The Group acquired 31.95% of ownership in WooYoung Farm Co., Ltd. during year ended December 31, 2019, and the Group has significant influence over WooYoung Farm Co., Ltd. Accordingly the investment in this investee has been classified as an associate.

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

11. Investments in Associates and Joint Ventures, continued

(2) Changes in investments in associates and joint ventures for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019						
	Beginning balance	Acquisition	Share of profit (loss)	Other equity movement	Dividend	Impairment	Ending balance
Stratio, Inc.	₩ 2,079	-	8	3	-	(1,695)	395
SK China Company Limited	246,052	-	3,358	9,862	-	-	259,272
Gemini Partners Pte. Ltd.	2,601	-	(10)	144	-	-	2,735
TCL Fund	3,464	1,406	84	41	-	-	4,995
SK South East Asia Investment Pte. Ltd.	111,810	113,470	5,752	6,567	-	-	237,599
Hushan Xijiu (Chengdu) Venture Investment Center (Smartsource)	3,241	2,531	(67)	(46)	-	-	5,659
WooYoung Farm Co., Ltd.	-	1,000	-	-	-	-	1,000
HITECH Semiconductor (Wuxi) Co., Ltd.	109,708	-	15,725	3,543	(14,458)	-	114,518
Hystars Semiconductor (Wuxi) Co., Ltd.	83,239	58,547	(522)	1,330	-	-	142,594
	₩ 562,194	176,954	24,328	21,444	(14,458)	(1,695)	768,767

(In millions of won)

(In millions of won)	2018							
	Beginning balance	Acquisition	Disposal	Share of profit (loss)	Other equity movement	Dividend	Impairment	Ending balance
Stratio, Inc.	₩ 2,105	-	-	(30)	4	-	-	2,079
SK China Company Limited	244,912	-	-	2,394	(1,254)	-	-	246,052
Gemini Partners Pte. Ltd.	4,003	-	-	256	37	-	(1,695)	2,601
TCL Fund	2,634	1,123	(254)	79	(31)	(87)	-	3,464
SK South East Asia Investment Pte. Ltd.	-	110,880	-	-	930	-	-	111,810
Hushan Xinju (Chengdu) Venture Investment Center (Smartsource)	-	3,225	-	(14)	30	-	-	3,241
HITECH Semiconductor (Wuxi) Co., Ltd.	106,210	-	-	12,347	4,271	(13,120)	-	109,708
Hystars Semiconductor (Wuxi) Co., Ltd.	-	85,280	-	(330)	(1,711)	-	-	83,239
	₩ 359,864	200,508	(254)	14,702	2,276	(13,207)	(1,695)	562,194

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

11. Investments in Associates and Joint Ventures, continued

(3) Associates and joint ventures' summarized consolidated statements of financial position as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019			
	Current assets	Non-current assets	Current liabilities	Non-current liabilities
Stratio, Inc.	₩ 431	715	169	-
SK China Company Limited	604,127	1,357,238	46,747	170,812
Gemini Partners Pte. Ltd.	6,851	6,912	54	33
TCL Fund	12,652	35,809	3,256	-
SK South East Asia Investment Pte. Ltd.	108,465	1,705,297	91	-
Hushan Xijiu (Chengdu) Venture Investment Center (Smartsources)	20,623	13,657	329	-
WooYoung Farm Co., Ltd.	1,016	610	2	222
HITECH Semiconductor (Wuxi) Co., Ltd.	193,377	442,510	84,071	297,330
Hystars Semiconductor (Wuxi) Co., Ltd.	167,238	388,318	48,984	225,075

(In millions of won)

	2018			
	Current assets	Non-current assets	Current liabilities	Non-current liabilities
Stratio, Inc.	₩ 403	617	159	-
SK China Company Limited	646,779	1,148,281	65,037	97,633
Gemini Partners Pte. Ltd.	5,357	7,649	-	-
TCL Fund	915	33,596	3,188	-
SK South East Asia Investment Pte. Ltd.	559,050	-	-	-
Hushan Xijiu (Chengdu) Venture Investment Center (Smartsources)	6,187	814	-	-
HITECH Semiconductor (Wuxi) Co., Ltd.	211,273	376,266	114,756	228,987
Hystars Semiconductor (Wuxi) Co., Ltd.	145,509	19,295	1,490	-

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
December 31, 2019 and 2018

11. Investments in Associates and Joint Ventures, continued

(4) Associates and joint ventures' summarized consolidated statements of income (loss) for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019		2018	
	Revenue	Profit (loss) for the period	Revenue	Profit (loss) for the period
Stratio, Inc.	₩ 242	81	88	(330)
SK China Company Limited	120,317	28,309	94,966	20,176
Gemini Partners Pte. Ltd.	-	(49)	-	1,279
TCL Fund	-	759	-	713
SK South East Asia Investment Pte. Ltd.	10,294	28,763	-	-
Hushan Xinju (Chengdu) Venture Investment Center (Smartsources)	-	(837)	-	(31)
WooYoung Farm Co., Ltd.	19	(105)	-	-
HITECH Semiconductor (Wuxi) Co., Ltd.	657,741	36,398	621,528	27,438
Hystars Semiconductor (Wuxi) Co., Ltd.	-	(1,044)	-	(658)

SK HYNIX, INC. and Subsidiaries
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12. Long-term Investment Asset

(1) Details of long-term investment assets as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019		2018
	Ownership (%)/ Type	Acquisition cost	Book value	Book value
ProMOS Technologies Inc.	13.34	₩ 21,847	-	-
Intellectual Discovery	4.80	4,000	2,392	1,376
MEMS DRIVE, INC.	3.25	2,397	1,251	919
Semiconductor Growth Fund	Certificate	25,000	24,480	24,878
China Walden Venture Investments II, L.P.	Certificate	7,895	9,138	7,611
China Walden Venture Investments III, L.P.	Certificate	5,448	5,790	3,487
Keyssa, Inc.	2.81	6,174	822	838
AutoTech Fund I, L.P.	Certificate	3,152	3,198	2,789
RENO SUB-SYSTEM, INC.	4.09	2,597	657	226
TransLink Capital Partners IV, L.P.	Certificate	2,386	2,175	1,627
Impact Venture Capital I, L.P.	Certificate	3,174	4,010	2,707
BCPE Pangea Intermediate Holdings Cayman, L.P. ¹	Certificate	2,694,692	2,780,758	2,721,554
BCPE Pangea Cayman2, Ltd. ¹	Convertible bond	1,280,294	1,435,460	1,461,451
FemtoMetrix, Inc.	Convertible bond	4,387	4,387	3,209
TidalScale, Inc.	4.79	3,360	1,278	3,360
GigaIO Networks, Inc.	8.97	4,066	4,066	1,678
Aeye, Inc.	1.46	2,819	1,187	2,819
Lion Semiconductor Inc.	6.55	3,539	3,474	-
TetraMem Holdings, Incorporation	Convertible bond	2,349	2,349	-
Beijing Starblaze Technology Co., Ltd.	5.43	3,315	2,143	3,255
Shanghai Natlinear Electronics Co., Ltd.	3.67	1,657	2,010	1,628
Shanghai IoT Phase II Venture Capital Fund Partnership, L.P.	Certificate	8,287	7,729	5,909
Beijing Horizon Robotics Technology Co., Ltd.	2.57	58,340	63,550	56,029
Shanghi Citrus Microelectronics Technology Co., Ltd.	4.55	4,144	1,360	4,069
Shinhan AIM Social Enterprise Private Equity I	Certificate	3,550	3,162	585
Others	-	14,605	14,986	13,546
		₩ 4,173,474	4,381,812	4,325,550

¹ In 2017, the Group participated in a consortium that includes Bain Capital in connection with acquisition of a stake in Toshiba Memory Corporation ("TMC"). On March 1, 2019 Toshiba Memory Holdings Corporation ("TMCHD") was established as the holding company for TMC. Subsequently TMCHD and TMC were renamed KIOXIA Holdings Corporation ("KIOXIA") and KIOXIA Corporation respectively. As of December 31, 2019, the Group holds equity interests in SPC1, which holds equity interests in KIOXIA, and convertible bonds issued by SPC2, which may be later convertible to 15% stake in KIOXIA upon certain events. Management and decision-making rights of the Group for SPC1 and SPC2 are limited. Accordingly, the Group does not control or have any significant influence on SPC1 and SPC2. The investments in SPC1 and SPC2 are classified as financial assets which are debt instruments measured at fair value through profit or loss.

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12. Long-term Investment Asset, continued

(2) Changes in the carrying amount of long-term investment assets for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Beginning balance	₩	4,325,550	43,226
Acquisition		82,861	4,012,799
Disposal		(3,884)	(1,614)
Gain (loss) on valuation		(233,234)	181,179
Foreign exchange difference		210,519	87,246
Business combination		-	2,714
Ending balance	₩	<u>4,381,812</u>	<u>4,325,550</u>

13. Property, Plant and Equipment

(1) Changes in property, plant and equipment for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019						
		Land	Buildings	Structures	Machinery	Vehicles	Others	Construction -in-progress
Beginning balance	₩	1,020,229	4,529,947	1,281,816	22,642,498	11,315	623,311	4,843,501
Impacts on transition to K-IFRS No. 1116		-	-	-	(73,069)	-	-	-
Beginning balance after transition adjustments		1,020,229	4,529,947	1,281,816	22,569,429	11,315	623,311	4,843,501
Changes during 2019								
Acquisitions		16,882	375,243	325,189	8,428,185	1,715	328,079	3,100,165
Disposals		(48)	(447)	(432)	(37,468)	(3)	(1,110)	(337)
Depreciation		-	(211,287)	(95,114)	(6,952,920)	(2,124)	(250,349)	-
Transfers ¹		3,051	848,071	106,110	2,982,080	32,184	62,397	(4,032,788)
Exchange differences and others		1,657	6,217	1,495	(15,036)	9	1,715	49,411
Ending balance		<u>1,041,771</u>	<u>5,547,744</u>	<u>1,619,064</u>	<u>26,974,270</u>	<u>43,096</u>	<u>764,043</u>	<u>3,959,952</u>
Acquisition cost		1,041,771	6,794,238	2,193,817	67,650,975	48,061	1,882,254	3,959,952
Accumulated depreciation		-	(1,207,184)	(555,649)	(40,510,568)	(4,949)	(1,118,187)	-
Accumulated impairment		-	(23,699)	(19,104)	(163,270)	-	(24)	-
Government grants		-	(15,611)	-	(2,867)	(16)	-	-
	₩	<u>1,041,771</u>	<u>5,547,744</u>	<u>1,619,064</u>	<u>26,974,270</u>	<u>43,096</u>	<u>764,043</u>	<u>3,959,952</u>

¹ Certain investment property was transferred to property, plant and equipment during the year ended December 31, 2019.

SK HYNIX, INC. and Subsidiaries
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13. Property, Plant and Equipment, Continued

(1) Changes in property, plant and equipment for the years ended December 31, 2019 and 2018 are as follows,
Continued :

(In millions of won)

		2018							
		Land	Buildings	Structures	Machinery	Vehicles	Others	Construction-in-progress	Total
Beginning balance	₩	581,541	2,930,753	839,620	16,130,068	777	442,221	3,137,621	24,062,601
Changes during 2018									
Acquisitions		313,288	1,087,457	390,687	10,512,072	11,486	353,658	4,355,503	17,024,151
Receipt of		-	(14,976)	-	-	(25)	-	-	(15,001)
Business combination		-	-	-	18	-	973	-	991
Disposals		-	(25,545)	(3,133)	(93,989)	-	(1,301)	(28,562)	(152,530)
Depreciation		-	(146,962)	(67,392)	(5,500,710)	(914)	(188,178)	-	(5,904,156)
Transfers ¹		124,356	707,556	124,659	1,619,073	-	15,823	(2,590,483)	984
Exchange differences and others		1,044	(8,336)	(2,625)	(24,034)	(9)	115	(30,578)	(64,423)
Ending balance		1,020,229	4,529,947	1,281,816	22,642,498	11,315	623,311	4,843,501	34,952,617
Acquisition cost		1,020,229	5,561,516	1,760,456	57,335,240	14,333	1,572,747	4,843,501	72,108,022
Accumulated depreciation		-	(992,088)	(459,536)	(34,524,095)	(2,997)	(949,408)	-	(36,928,124)
Accumulated impairment		-	(23,699)	(19,104)	(164,916)	-	(28)	-	(207,747)
Government grants		-	(15,782)	-	(3,731)	(21)	-	-	(19,534)
	₩	1,020,229	4,529,947	1,281,816	22,642,498	11,315	623,311	4,843,501	34,952,617

¹ Certain investment property was transferred to property, plant and equipment during the year ended December 31, 2018.

(2) Details of depreciation expense allocation for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Cost of sales	₩	6,878,303	5,421,324
Selling and administrative expenses		574,961	365,508
Other expenses		14,923	10,152
Development costs and other		43,607	107,172
	₩	<u>7,511,794</u>	<u>5,904,156</u>

(3) Certain machinery and others are pledged as collaterals for borrowings of the Group as of December 31, 2019 (see note 35).

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13. Property, Plant and Equipment, Continued

(4) The Group capitalized borrowing costs amounting to ₩36,302 million (2018: ₩33,086 million) on qualifying assets during the year ended December 31, 2019. Borrowing costs were calculated using a capitalization rate of 2.84% (2018: 3.08%) for the year ended December 31, 2019.

(5) Details of insured assets as of December 31, 2019 is as follows:

(In millions of won)

	Insured assets	Insured amount	Insurance Company
Package insurance	Property, plant and equipment; investment property; inventories; and business interruption	₩ 95,928,300	Hyundai Marine & Fire Insurance Co., Ltd. and others
Fire insurance	Property, plant and equipment; investment property	74,552	
Erection all risks insurance	Property, plant and equipment	8,147,662	
		<u>₩ 104,150,514</u>	

In addition to the assets stated above, vehicles are insured by vehicle comprehensive insurance and liability insurance.

(6) The Group provides certain property, plant, and equipment as operating leases. Rental income from the property, plant and equipment during the year ended December 31, 2019 are ₩29,746 million (2018: ₩15,277 million).

14. Leases

(1) Leases as lessee

(a) Changes in right-of-use assets for the year ended December 31, 2019 are as follows

(In millions of won)

	2019					
	Properties	Structures	Machinery	Vehicles	Others	Total
Beginning balance	₩ -	-	-	-	-	-
Adjustment on initial application of K-IFRS No.1116	31,652	867,864	279,952	10,688	3,214	1,193,370
Beginning balance after transition adjustments	31,652	867,864	279,952	10,688	3,214	1,193,370
Increase	79,295	170,887	18,051	11,776	-	280,009
Others	4,163	-	-	1,250	13,647	19,060
Depreciation	(16,949)	(67,586)	(144,532)	(12,255)	(5,074)	(246,396)
Foreign exchange difference	(306)	4,831	(24)	32	-	4,533
Ending balance	<u>97,855</u>	<u>975,996</u>	<u>153,447</u>	<u>11,491</u>	<u>11,787</u>	<u>1,250,576</u>
Acquisition cost	144,208	1,058,738	234,006	17,959	16,330	1,471,241
Accumulated amortization	(14,546)	(82,742)	(80,559)	(6,468)	(4,543)	(188,858)
Government grants	(31,807)	-	-	-	-	(31,807)
	<u>₩ 97,855</u>	<u>975,996</u>	<u>153,447</u>	<u>11,491</u>	<u>11,787</u>	<u>1,250,576</u>

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14. Leases, continued

(b) Changes in lease liabilities for the year ended December 31, 2019 are as follows.

(In millions of won)

	2019
Beginning balance	₩ -
Impacts on transition to K-IFRS No. 1116	1,191,579
Beginning balance after transition adjustments	1,191,579
Increase	280,009
Others	19,357
Interest expense	25,656
Payments	(327,578)
Foreign exchange difference	11,807
Ending balance	₩ 1,200,830

(c) The details of the minimum lease payment to be paid in the future for each period in connection with lease liabilities, present value and current/non-current classification of lease liabilities as of December 31, 2019 are as follows:

(In millions of won)

	2019
Less than 1 year	₩ 207,501
1~5 years	451,111
More than 5 years	717,080
Total lease liabilities undiscounted as of December 31, 2019	1,375,692
Present value of lease liabilities recognized as of December 31, 2019	1,200,830
Current lease liabilities	205,238
Non-current lease liabilities	995,592

(d) The amounts recognized in profit or loss in relation to right-of-use assets and lease liabilities for the year ended December 31, 2019 are as follows:

(In millions of won)

	2019
Depreciation of right-to-use assets	₩ 246,396
Interest expenses of lease liabilities	25,656
Expenses relating to short-term leases	14,489
Expenses relating to leases of low-value assets	1,234

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14. Leases, continued

(2) Leases as lessor

The Group provides certain property, plant, and equipment and investment property as leases (See note 12,17). All leases are classified as operating leases.

Details of the undiscounted operating lease payments to be received in the future periods subsequent to December 31, 2019 are as follows:

(In millions of won)

		Property, Plant and Equipment	Investment Property	Total
Less than 1 year	₩	25,856	9	25,865
1~2 years		9,476	-	9,476
2~3 years		9,476	-	9,476
3~4 years		9,476	-	9,476
4~5 years		3,958	-	3,958
	₩	<u>58,242</u>	<u>9</u>	<u>58,251</u>

15. Intangible Assets

(1) Changes in intangible assets for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019				
		Goodwill	Industrial property rights	Development costs	Others	Total
Beginning balance	₩	709,811	96,065	1,153,956	718,938	2,678,770
Impacts on transition to K-IFRS No. 1116		-	-	-	(5,582)	(5,582)
Beginning balance after transition adjustments		709,811	96,065	1,153,956	713,356	2,673,188
Changes during 2019						
Internal development		-	-	332,888	-	332,888
External acquisition		-	9,626	-	331,704	341,330
Business combination		-	-	-	18,333	18,333
Disposals		-	(3,964)	-	(6,589)	(10,553)
Amortization		-	(16,003)	(555,056)	(224,110)	(795,169)
Impairment		-	-	-	(71)	(71)
Exchange differences		10,386	-	-	717	11,103
Ending balance		720,197	85,724	931,788	833,340	2,571,049
Acquisition cost		720,197	184,942	2,926,382	1,568,718	5,400,239
Accumulated amortization and impairment		-	(99,218)	(1,994,594)	(735,378)	(2,829,190)
	₩	720,197	85,724	931,788	833,340	2,571,049

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15. Intangible Assets, continued

(1) Changes in intangible assets for the years ended December 31, 2019 and 2018 are as follows, continued

(In millions of won)

(in millions of won)

		2018				
		Goodwill	Industrial property rights	Development costs	Others	Total
Beginning balance	₩	695,073	104,853	882,250	565,114	2,247,290
Changes during 2018						
Internal development	-	-	-	610,954	-	610,954
External acquisition	-	-	12,767	-	309,418	322,185
Disposals	-	-	(5,175)	-	(2,901)	(8,076)
Receipt of government grants	-	-	-	-	(2,080)	(2,080)
Business combination	3,207	-	-	-	22,539	25,746
Amortization	-	-	(16,380)	(334,766)	(172,949)	(524,095)
Impairment	-	-	-	(4,482)	-	(4,482)
Exchange differences	11,531	-	-	-	(203)	11,328
Ending balance		709,811	96,065	1,153,956	718,938	2,678,770
Acquisition cost		709,811	186,057	2,900,071	1,272,127	5,068,066
Accumulated amortization and impairment	-	-	(89,992)	(1,746,115)	(521,179)	(2,357,286)
Government grants	-	-	-	-	(32,010)	(32,010)
	₩	709,811	96,065	1,153,956	718,938	2,678,770

(2) Details of amortization expense allocation for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Cost of sales	₩ 88,445	65,885
Selling and administrative expenses	705,383	456,269
Development costs	1,341	1,941
	₩ <u>795,169</u>	<u>524,095</u>

(3) Goodwill impairment tests

The Group performs goodwill impairment tests annually. For the purpose of impairment tests, goodwill is allocated to CGU. The recoverable amount of the CGU as of December 31, 2019 was determined based on fair value less costs to sell, which was determined using the current stock price as of December 31, 2019. No impairment loss of goodwill was recognized since the recoverable amount is higher than the carrying value of the CGU as of December 31, 2019.

(4) Details of development costs

(a) Detailed criteria for capitalization of development costs

The Group's development projects for a new product proceeds in the process of review and planning phases (Phase 0 ~ 4) and product design and mass production phases (Phase 5 ~ 8). The Group recognizes expenditures incurred after Phase 4 in relation with the development for new technology is recognized as an intangible asset. Expenditures incurred at phase 0 through 4 are recognized as expenses.

(b) Development cost capitalized and expenses on research and development

Among costs associated with development activities, ₩332,888 million (2018: ₩610,954 million) that met capitalization criteria, were capitalized as development cost for the year ended December 31, 2019. In addition, costs associated with research activities and other development expenditures that did not meet the criteria in the amount of ₩2,855,643 million (2018: ₩2,284,000 million) were recognized as expenses for the year ended December 31, 2019.

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15. Intangible Assets, continued

(4) Details of development costs, continued

(c) Details of development costs as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	
		Book value	Residual amortization period
DRAM	₩	263,262	11 ~23 months
		1,068	1
NAND		203,307	12 months
		351,745	1
CIS		19,613	1~14 months
		92,793	1
	₩	<u>931,788</u>	

¹ Amortization has not started as of December 31, 2019

(In millions of won)

		2018	
		Book value	Residual amortization period
DRAM	₩	457,682	7 ~23 months
		7,261	1
NAND		37,055	6 months
		573,658	1
CIS		4,298	13 months
		74,002	1
	₩	<u>1,153,956</u>	

¹ Amortization has not started as of December 31, 2018

(d) The Group did not recognize impairment loss in development costs for the year ended December 31, 2019. The Group recognized ₩4,482 million as an impairment loss in development costs for the year ended December 31, 2018. There are no accumulated impairment losses in development costs as of December 31, 2019 and 2018.

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16. Investment Property

(1) Changes in investment property for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Beginning net book amount	₩ 1,400	2,468
Depreciation	(37)	(84)
Transfer ¹	(1,105)	(984)
Ending net book amount	<u>258</u>	<u>1,400</u>
Acquisition cost	511	2,911
Accumulated depreciation	(253)	(1,511)
Ending net book amount	₩ <u>258</u>	<u>1,400</u>

¹ Certain investment property was transferred to property, plant and equipment during the year ended December 31, 2019 and 2018.

(2) The depreciation expense of ₩37 million was charged to cost of sales for the year ended December 31, 2019 (2018: ₩84 million).

(3) Rental income from investment property during the year ended December 31, 2019 was ₩123 million (2018: ₩308 million).

17. Other Payables

Details of other payables as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Current		
Accrued expenses	₩ 1,257,895	1,879,520
Non-current		
Rent deposits payable	13,487	14,135
Long-term accrued expenses	4,779	1,096
	<u>18,266</u>	<u>15,231</u>
	₩ <u>1,276,161</u>	<u>1,894,751</u>

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18. Borrowings

(1) Details of borrowings as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Current			
Short-term borrowings	₩	1,168,354	585,788
Current portion of long-term borrowings ¹		1,259,593	578,665
Current portion of debentures		309,823	449,850
		<u>2,737,770</u>	<u>1,614,303</u>
Non-current			
Long-term borrowings ¹		5,040,371	2,161,566
Debentures		2,745,365	1,506,068
		<u>7,785,736</u>	<u>3,667,634</u>
	₩	<u>10,523,506</u>	<u>5,281,937</u>

¹ As of December 31, 2018, the current portion of long-term borrowings and long-term borrowings include finance lease liabilities amounting to ₩10,563 million and ₩57,595 million, respectively, in accordance with K-IFRS No. 1017. Meanwhile, as a result of the transition to K-IFRS No. 1116, lease liabilities are presented separately from borrowings in the consolidated statement of financial position as of December 31, 2019.

(2) Details of short-term borrowings as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	Financial Institutions	Maturity date	Interest rate per annum in 2019 (%)¹	2019	2018
General borrowings	Shinhan Bank	2020.09.27	3.10 ~ 3.61	₩ 4,000	4,920
	Hyundai Card	2020.01.17 ~ 2020.03.18	1.94 ~ 1.96	215,073	-
Usance	Hana Bank and others	2020.04.20 ~ 2020.05.15	2.91 ~ 2.92	569,164	-
	Industrial & Commercial Bank of China	2020.11.24 ~ 2020.12.04	3.05	107,731	-
	China Construction Bank and others	2020.08.14 ~ 2020.08.20	3M USD LIBOR + 0.95	173,435	-
	Bank of China	2020.08.20 ~ 2020.11.11	3M USD LIBOR + 0.90 ~ 1.00	66,436	-
General borrowings	China Merchants Bank	2020.11.04	3M USD LIBOR + 1.00	9,979	-
	City Bank	2020.08.06 ~ 2020.12.04	3M USD LIBOR + 1.00	22,536	22,341
	China Development Bank	-	-	-	558,527
				₩ <u>1,168,354</u>	<u>585,788</u>

SK HYNIX, INC. and Subsidiaries
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18. Borrowings, Continued

(3) Details of long-term borrowings as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	Financial institutions	Maturity date	Interest rate per annum in 2019 (%) ¹	2019	2018
Local currency borrowings:					
Funds for equipment	Korea Development Bank	2021.09.29 ~ 2022.04.07	2.02 ~ 2.50	₩ 500,000	500,000
	NongHyup Bank	2025.03.31 ~ 2026.03.31	1.00	1,248	1,248
	Shinhan Bank	2026.12.19	2.96	760	-
Finance lease liabilities ²	Hansu Technical Service Ltd.	-	-	-	66,757
	Veolia Water Industrial Development Co., Ltd.	-	-	-	1,400
				<u>502,008</u>	<u>569,405</u>
Foreign currency borrowings:					
General borrowings	The Export-Import Bank of Korea	2021.05.31	3M JPY LIBOR + 0.57	850,776	810,544
Funds for equipment	The Export-Import Bank of Korea	2020.10.27 ~ 2022.03.10	3M USD LIBOR + 1.03~1.40	607,845	978,233
Funds for equipment	The Export-Import Bank of Korea	2021.12.25 ~ 2021.12.27	3M USD LIBOR + 1.65	289,059	-
	Korea Development Bank	2020.06.30 ~ 2026.10.02	3M USD LIBOR + 0.95 ~ 1.1	622,318	181,692
	Woori Bank	2020.03.11	3M USD LIBOR + 0.98	43,417	125,787
	Hana Bank	-	-	-	44,724
	NongHyup Bank	-	-	-	22,362
	China Bank	2022.11.28	3M USD LIBOR + 1.70	124,873	7,484
Syndicated loan	Industrial & Commercial Bank of China and others	2024.04.24	3M USD LIBOR + 1.65	3,272,146	-
				<u>5,810,434</u>	<u>2,170,826</u>
				<u>6,312,442</u>	<u>2,740,231</u>
Less: Current portion ²				(1,259,593)	(578,665)
Less: Present value discount				(12,478)	-
				<u>₩ 5,040,371</u>	<u>2,161,566</u>

¹ As of December 31, 2019, the annual interest rates are as follows:

Type	Interest rate per annum as of December 31, 2019
3M USD LIBOR	1.91%
3M JPY LIBOR	-0.05%

² As of December 31, 2018, finance lease borrowings are subject to finance lease liabilities in accordance with K-IFRS No. 1017. As a result of the transition to K-IFRS No. 1116, lease liabilities are presented separately from borrowings in the consolidated statement of financial position as of December 31, 2019.

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18. Borrowings, Continued

(4) Details of debentures as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	Maturity date	Interest rate per annum in 2019 (%)	2019	2018
Unsecured notes in local currency:				
Unsecured corporate bonds 212th	2019.05.30	-	₩ -	450,000
Unsecured corporate bonds 214-1st	2020.08.26	2.27	210,000	210,000
Unsecured corporate bonds 214-2nd	2022.08.26	2.63	140,000	140,000
Unsecured corporate bonds 215-2nd	2020.11.25	2.56	100,000	100,000
Unsecured corporate bonds 215-3rd	2022.11.25	2.75	10,000	10,000
Unsecured corporate bonds 216-2nd	2021.02.19	2.22	180,000	180,000
Unsecured corporate bonds 216-3rd	2023.02.19	2.53	80,000	80,000
Unsecured corporate bonds 217-2nd	2021.05.27	2.30	150,000	150,000
Unsecured corporate bonds 218th	2023.03.14	3.01	300,000	300,000
Unsecured corporate bonds 219-1st	2023.08.27	2.48	250,000	250,000
Unsecured corporate bonds 219-2nd	2025.08.27	2.67	90,000	90,000
Unsecured corporate bonds 220-1st	2022.05.09	1.96	410,000	-
Unsecured corporate bonds 220-2nd	2024.05.09	1.99	200,000	-
Unsecured corporate bonds 220-3rd	2026.05.09	2.17	120,000	-
Unsecured corporate bonds 220-4rd	2029.05.09	2.54	250,000	-
			<u>2,490,000</u>	<u>1,960,000</u>
Unsecured notes in foreign currency:				
Unsecured global bonds 9th	2024.09.17	3.00	578,900	-
			<u>3,068,900</u>	<u>1,960,000</u>
Less: Discounts on debentures			(13,712)	(4,082)
Less: Current portion			(309,823)	(449,850)
			<u>₩ 2,745,365</u>	<u>1,506,068</u>

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19. Other Current and Non-current Liabilities

Details of other current and non-current liabilities as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Current		
Advance receipts	₩ 9,901	8,973
Unearned income	190	186
Withholdings	59,186	49,770
Deposits received	1,341	1,036
Contract liabilities	86,999	80,373
Others	5,380	7,500
	<u>162,997</u>	<u>147,838</u>
Non-current		
Other long-term employee benefits	82,873	74,403
Long-term advance receipts	4,900	4,900
	<u>87,773</u>	<u>79,303</u>
	₩ <u>250,770</u>	<u>227,141</u>

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20. Provisions

(1) Details of changes in provisions for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

in millions of won

	2019				
	Beginning balance	Increase	Utilization	Reversal	Ending Balance
Warranty	₩ 3,992	15,811	(15,722)	-	4,081
Legal claims	5,881	-	(5,881)	-	-
Emission allowances	46,335	-	(2,702)	(37,013)	6,620
	₩ 56,208	15,811	(24,305)	(37,013)	10,701

(In millions of won)

in millions of won

	2018			
	Beginning balance	Increase	Utilization	Ending Balance
Warranty	₩ 3,807	8,848	(8,663)	3,992
Legal claims	9,460	5,881	(9,460)	5,881
Emission allowances	37,412	8,923	-	46,335
	₩ 50,679	23,652	(18,123)	56,208

(2) Provisions for warranty

The Group estimates the expected warranty costs based on historical results and accrues provisions for warranty.

(3) Provisions for legal claims

The Group recognizes provisions for legal claims when the Group has a present legal or constructive obligation as a result of past events and an outflow of resources required to settle the obligation is probable and the amount can be reliably estimated.

(4) Provision for emission allowances

The Group recognizes estimated future payment for the number of emission certificates required to settle the Group's obligation exceeding the actual number of certificates on hand as emission allowances according to the *Act on Allocation and Trading of Greenhouse Gas Emission Permits*.

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21. Defined Benefit Liabilities

Under the defined benefit plan, the Group pays employee benefits to retired employees in the form of a lump sum based on their salaries and years of service at the time of their retirement. Accordingly, the Group is exposed to a variety of actuarial assumption risks such as risk associated with expected years of service, interest risk, and market (investment) risk.

(1) Details of defined benefit liabilities (assets) as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Present value of defined benefit obligations	₩ 1,936,868	1,609,055
Fair value of plan assets	(1,886,650)	(1,608,832)
Net defined benefit liabilities	₩ 50,218	223
Defined benefit liabilities	53,624	5,387
Defined benefit assets ¹	(3,406)	(5,164)

¹ The Parent Company and certain subsidiaries' fair value of plan assets in excess of the present value of defined benefit obligations amounted to ₩3,406 million and ₩5,164 million as of December 31, 2019 and 2018 are presented as defined benefit assets.

(2) Principal actuarial assumptions as of December 31, 2019 and 2018 are as follows:

	2019 (%)	2018 (%)
Discount rate for defined benefit obligations	1.92 ~ 3.47	2.64 ~ 3.78
Expected rate of salary increase	2.70 ~ 5.94	2.70 ~ 5.83

(3) Weighted average durations of defined benefit obligations as of December 31, 2019 and 2018 are 11.48 and 11.64 years, respectively.

(4) Changes in defined benefit obligations for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Beginning balance	₩ 1,609,055	1,330,559
Current service cost	220,870	179,689
Interest expense	59,683	56,465
Transfer from associates	2,408	1,077
Remeasurements:	97,434	73,727
Demographic assumption	67	3,138
Financial assumption	76,241	102,639
Adjustment based on experience	21,126	(32,050)
Benefits paid	(52,609)	(36,798)
Business combination	-	4,300
Effect of movements in exchange rates	27	36
Ending balance	₩ 1,936,868	1,609,055

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21. Defined Benefit Liabilities, Continued

(5) Changes in plan assets for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Beginning balance	₩ 1,608,832	1,337,848
Contributions	279,751	276,739
Interest income	59,554	56,651
Transfer from associates	3,430	1,837
Benefits paid	(38,008)	(34,768)
Business combination	-	3,009
Remeasurements	(26,909)	(32,484)
Ending balance	₩ 1,886,650	1,608,832

(6) The amounts recognized in profit or loss for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Current service cost	₩ 220,870	179,689
Net interest expense	129	(186)
	₩ 220,999	179,503

(7) The amounts in which defined benefit plan related expenses are included for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Cost of sales	₩ 120,736	101,944
Selling and administrative expenses	100,263	77,559
	₩ 220,999	179,503

(8) Details of plan assets as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Deposits	₩ 1,884,630	1,607,552
Others	2,020	1,280
	₩ 1,886,650	1,608,832

Actual return on plan assets for the years ended December 31, 2019 and 2018 amounted to ₩32,645 million and ₩24,167 million, respectively.

(9) As of December 31, 2019, the Group funded defined benefit obligations through insurance plans with Mirae Asset Life Insurance Co., Ltd. and other insurance companies. The Group's reasonable estimation of contribution to the plan assets for the year ending December 31, 2020 is ₩196,131 million under the assumption that the Group maintains the defined benefit plan.

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21. Defined Benefit Liabilities, Continued

(10) The sensitivity analysis of the defined benefit obligations as of December 31, 2019 to changes in the principal assumptions is as follows:

(In millions of won)

		Effects on defined benefit obligation	
		Increase of rate	Decrease of rate
Discount rate (if changed by 1%)	₩	(197,787)	233,001
Expected rate of salary increase (if changed by 1%)		231,698	(200,399)

The sensitivity analysis does not consider dispersion of all cash flows that are expected from the plan and provides approximate values of sensitivity for the assumptions used.

(11) Information about the maturity profile of the defined benefit obligation as of December 31, 2019 is as follows:

(In millions of won)

		Less than 1 year	2 - 5 years	6 - 10 years	More than 11 years	Total
Benefits paid	₩	59,918	348,940	623,402	1,854,515	2,886,775

Information about the maturity profile is based on the undiscounted and vested amount of defined benefit obligation as of December 31, 2019, and classified by employee's expected years of remaining services.

(12) The Group adopted defined contribution plan for retirement benefit for employees subject to peak wage system. Contributions to defined contribution plans amounting to ₩455 million (2018: ₩216 million) was expensed for the year ended December 31, 2019.

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22. Deferred Income Tax

(1) Changes in deferred income tax assets and liabilities for the years ended December 31, 2019 and 2018 without taking into consideration the offsetting of balances within the same tax authority, are as follows:

(In millions of won)

2019					
	January 1, 2019	Profit or loss	Equity	Foreign exchange differences	December 31, 2019
Inventories, net	₩ 102,812	73,691	-	240	176,743
Property, plant and equipment, net	140,762	71,659	-	(6,718)	205,703
Defined benefits liabilities, net	(609)	(25,776)	34,132	10	7,757
Short-term and long-term investment assets and others	(32,984)	5,429	-	-	(27,555)
Employee benefits	39,954	6,583	-	-	46,537
Provisions	19,169	(15,599)	-	19	3,589
Other assets and other liabilities	24,583	(12,872)	-	(82)	11,629
Accrued expenses	48,883	43,526	-	-	92,409
Others	56,653	(35,239)	-	(6,734)	14,680
Deferred tax assets for temporary differences, net	399,223	111,402	34,132	(13,265)	531,492
Tax credit carryforwards recognized	15,189	(9,542)	-	604	6,251
Tax loss carryforwards recognized	123,007	(10,023)	-	4,396	117,380
Deferred tax assets recognized, net	₩ 537,419	91,837	34,132	(8,265)	655,123

(In millions of won)

2018					
	January 1, 2018	Profit or loss	Equity	Foreign exchange differences	December 31, 2018
Inventories, net	₩ 47,169	55,513	-	130	102,812
Property, plant and equipment, net	236,870	(96,703)	-	594	140,761
Defined benefits liabilities, net	416	(30,020)	29,182	(187)	(609)
Short-term and long-term investment assets and others	43,191	(76,175)	-	-	(32,984)
Employee benefits	34,166	5,785	-	3	39,954
Provisions	18,268	794	-	108	19,170
Other assets and other liabilities	14,743	9,840	-	-	24,583
Accrued expenses	13,641	35,242	-	-	48,883
Others	47,832	17,408	-	(8,587)	56,653
Deferred tax assets for temporary differences, net	456,296	(78,316)	29,182	(7,939)	399,223
Tax credit carryforwards recognized	7,813	6,693	-	684	15,190
Tax loss carryforwards recognized	130,120	(14,286)	-	7,172	123,006
Deferred tax assets recognized, net	₩ 594,229	(85,909)	29,182	(83)	537,419

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22. Deferred Income Tax, Continued

(2) As of December 31, 2019 and 2018, the temporary differences that are not recognized as deferred tax assets (liabilities) are as follows:

(In millions of won)

		2019	2018
Investments in subsidiaries, associates, and joint ventures and others	₩	(344,446)	(5,139)
Deductible temporary differences and others		18,863	17,756

23. Derivative Financial Instruments

(1) Details of derivative financial instruments applying cash flow hedge accounting for the year ended December 31, 2019 is as follows:

(In millions of foreign currencies)

Hedged items			Hedging instruments		
Borrowing date	Financial instrument	Hedged risk	Type of contract	Financial institution	Contract period
2019.09.17	Foreign currency denominated bond with fixed rate (Par value: USD 500,000)	Foreign currency risk	Fixed-to-fixed cross currency swap	Kookmin Bank and other	2019.09.17~ 2024.09.17
2019.10.02	Foreign currency denominated borrowing for equipment with floating rate (Par value: USD 500,000)	Foreign currency and interest rate risk	Floating-to-fixed cross currency interest rate swap	Korea Development Bank	2019.10.02~ 2026.10.02

(2) The derivative financial instruments held by the Group are presented in non-current other financial liabilities in the consolidated financial statements of financial position and the details are as follows:

(In millions of won and millions of foreign currencies)

Type of contract	Hedged items		Cash flow hedge	Fair value
Fixed-to-fixed cross currency swap	Foreign currency denominated bond with fixed rate (Par value: USD 500,000)	₩	10,572	10,572
Floating-to-fixed cross currency interest rate swap	Foreign currency denominated borrowing for equipment with floating rate (Par value: USD 500,000)		4,960	4,960
		₩		<u>15,532</u>

As of December 31, 2019, changes of fair value of the derivative is recognized in other comprehensive income as all of designated hedging instruments are effective for foreign currency risk or foreign currency and interest rate risk.

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24. Capital Stock, Capital Surplus and Other Equity

(1) The Parent Company has 9,000,000,000 authorized shares and the face value per share is ₩5,000 as of December 31, 2019. The number of shares issued, common stock, capital surplus and other capital as of December 31, 2019 and 2018, are as follows:

(In millions of won, thousands of shares)

		2019	2018
Issued shares ¹		731,530	731,530
Capital stock:			
Common stock	₩	3,657,652	3,657,652
Capital surplus:			
Additional paid in capital		3,625,797	3,625,797
Others		517,939	517,939
		<u>4,143,736</u>	<u>4,143,736</u>
Other equity:			
Acquisition cost of treasury shares		(2,508,427)	(2,508,427)
Stock option		3,714	1,976
	₩	<u>(2,504,713)</u>	<u>(2,506,451)</u>
Number of treasury shares		44,001	44,001

¹ As of December 31, 2019, total number of shares is 728,002 thousand shares, which differs from total issued shares due to the effect of stock retirement.

(2) The number of outstanding shares, which deducted treasury shares held by the Parent Company from listed shares, is 684,002 thousands as of December 31, 2019 and 2018.

25. Accumulated Other Comprehensive Loss

(1) Details of accumulated other comprehensive loss as of December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Equity-accounted investees – share of other comprehensive income (loss)	₩	3,278	(18,166)
Foreign operations – foreign currency translation differences		(314,966)	(464,653)
Gain on valuation of derivatives		12,753	-
	₩	<u>(298,935)</u>	<u>(482,819)</u>

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25. Accumulated Other Comprehensive Loss, continued

(2) Changes in accumulated other comprehensive income (loss) for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019		
		Beginning balance	Change	Ending balance
Equity-accounted investees – share of other comprehensive income (loss)	₩	(18,166)	21,444	3,278
Foreign operations – foreign currency translation differences		(464,653)	149,687	(314,966)
Gain on valuation of derivatives		-	12,753	12,753
	₩	<u>(482,819)</u>	<u>183,884</u>	<u>(298,935)</u>

(In millions of won)

		2018			
		Beginning balance	Change	Effect of significant change in accounting policy¹	Ending balance
Equity-accounted investees – share of other comprehensive income (loss)	₩	(20,442)	2,276	-	(18,166)
Loss on valuation of long-term investment assets		(10,735)	-	10,735	-
Foreign operations – foreign currency translation differences		(471,087)	6,434	-	(464,653)
	₩	<u>(502,264)</u>	<u>8,710</u>	<u>10,735</u>	<u>(482,819)</u>

¹ Due to the application of K-IFRS No. 1109, available-for-sale financial assets for equity investments were reclassified to financial assets measured at fair value through profit or loss. As a result of this reclassification, as at January 1, 2018, other comprehensive loss of ₩10,735 million was reclassified to retained earnings.

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26. Retained Earnings and Dividends

(1) Details of retained earnings as of December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Legal reserve ¹	₩ 281,555	178,954
Discretionary reserve ²	235,506	235,506
Unappropriated retained earnings	42,413,614	41,619,141
	₩ <u>42,930,675</u>	<u>42,033,601</u>

¹ The Commercial Code of the Republic of Korea requires the Parent Company to appropriate for each financial year, 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 cash dividends payment, but may be transferred to capital stock or used to reduce accumulated deficit.

² Discretionary reserve is a reserve for technology development.

(2) Dividends of the Parent Company

(a) Details of dividends for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won and In thousands of shares)

	2019	2018
Type of dividends	Cash Dividends	Cash Dividends
Outstanding ordinary shares	684,002	684,002
Par value (in won)	₩ 5,000	5,000
Dividend rate	20%	30%
Total dividends	₩ <u>684,002</u>	<u>1,026,003</u>

(b) Dividend payout ratio for the years ended December 31, 2019 and 2018 is as follows:

(In millions of won)

	2019	2018
Dividends	₩ 684,002	1,026,003
Profit attributable to owners of the Parent Company	2,013,288	15,540,111
Dividend payout ratio	<u>33.97%</u>	<u>6.60%</u>

(c) Dividend yield ratio for the years ended December 31, 2019 and 2018 is as follows:

(In won)

	2019	2018
Dividends per share	₩ 1,000	1,500
Closing stock price	94,100	60,500
Dividend yield ratio	<u>1.06%</u>	<u>2.48%</u>

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27. Revenue

(1) Details of the Group's revenue for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Sale of goods	₩	26,922,416	40,388,846
Providing services		68,317	56,220
	₩	<u>26,990,733</u>	<u>40,445,066</u>

(2) Details of the Group's revenue by product and service types for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
DRAM	₩	20,292,687	32,370,936
NAND Flash		5,139,563	7,420,857
Others		1,558,483	653,273
	₩	<u>26,990,733</u>	<u>40,445,066</u>

(3) The Group's revenue information by region based on the location of selling entities for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

		2019	2018
Korea	₩	1,446,997	840,491
China		12,570,278	15,785,993
Taiwan		1,444,188	2,950,067
Asia (other than China and Taiwan)		2,301,314	4,609,601
U.S.A.		8,141,151	14,278,161
Europe		1,086,805	1,980,753
	₩	<u>26,990,733</u>	<u>40,445,066</u>

(4) Details of the Group's revenue by the timing of revenue recognition are as follows:

(In millions of won)

		2019	2018
Performance obligations satisfied at a point in time	₩	26,922,416	40,388,846
Performance obligations satisfied over time		68,317	56,220
	₩	<u>26,990,733</u>	<u>40,445,066</u>

27. Revenue, Continued

(5) Revenue recognition policies and performance obligations

Revenue is measured based on the promised consideration specified in a contract with a customer. The Group recognizes revenue when the Group transfers a promised good or service to a customer.

Revenue recognition policies regarding the nature and timing of performance obligation satisfaction in the contract are as follows:

	Nature and timing of performance obligation satisfaction	Revenue recognition policies
	Revenue is recognized when the customer obtains control of that asset, which is typically upon delivery or shipment depending on the terms of the contract.	Revenue is measured at the amount of consideration for the sale of goods, reflecting the expected amount of return estimated through historical information. The Group's right to recover products from customers and refund liability are recognized.
Sale of goods	When the good is defective, the customer is granted the right to return the defective goods in exchange for a functioning product or cash.	Refund liability is initially measured at the former carrying amount of the product less any expected costs to recover those products. Refund liability is included in other current liabilities (See note 19) and right to recover products from customers is included in other current assets (See note 10).The Group reviews its estimate of expected returns at the end of each reporting period and updates the amounts of the asset and liabilities accordingly.

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28. Selling and Administrative Expenses

Selling and administrative expenses for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Selling and administrative expenses:		
Salaries	₩ 516,226	564,923
Defined benefit plan	34,692	27,200
Employee benefits	141,104	115,892
Commission	460,644	369,307
Depreciation	206,429	130,229
Amortization	687,365	442,389
Freight and custody charge	40,222	27,412
Legal cost	31,679	34,032
Rental	6,933	13,301
Taxes and dues	54,525	31,785
Training	43,217	32,636
Advertising	92,792	92,025
Utilities	12,193	11,603
Supplies	99,029	103,384
Repair	29,546	24,938
Travel and transportation	16,731	15,483
Sales promotion	68,479	64,837
Sales repair	21,085	6,243
Others	34,206	28,859
	<u>2,597,097</u>	<u>2,136,478</u>
Research and development:		
Expenditure on research and development	3,188,531	2,894,954
Development cost capitalized	(332,888)	(610,954)
	<u>2,855,643</u>	<u>2,284,000</u>
	<u>₩ 5,452,740</u>	<u>4,420,478</u>

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29. Expenses by Nature

Nature of expenses for the years ended December 31, 2019 and 2018 is as follows:

(In millions of won)

	2019	2018
Changes in finished goods and work-in-process	₩ (523,777)	(1,473,125)
Raw materials, supplies and consumables	6,746,715	5,659,357
Employee benefit	3,411,234	3,669,809
Depreciation and others	8,493,295	6,309,070
Royalty	137,157	172,615
Commission	2,078,900	1,675,122
Utilities	1,355,547	1,131,394
Repair	1,071,976	1,023,685
Outsourcing	1,201,938	1,072,241
Others	305,030	361,148
Total ¹	₩ 24,278,015	19,601,316

¹ Total expenses consist of cost of sales and selling and administrative expenses.

30. Finance Income and Expenses

Finance income and expenses for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Finance income:		
Interest income	₩ 30,062	62,478
Dividend income	429	2,136
Foreign exchange differences ¹	1,143,099	1,386,287
Gain on valuation of short-term investment assets	5,811	16,740
Gain on valuation of long-term investment assets	8,237	182,641
Gain on disposal of short-term investment assets	58,784	36,349
Gain on disposal of long-term investment assets	1,218	5,504
	1,247,640	1,691,955
Finance expenses:		
Interest expenses	238,508	94,635
Foreign exchange differences ¹	1,034,104	1,046,217
Loss on disposal of long-term investment asset	786	-
Loss on valuation of long-term investment asset	241,471	1,282
	1,514,869	1,142,134
Net finance income (expenses)	₩ (267,229)	549,821

¹ Foreign exchange differences related to fair value of long-term investment assets amounting to ₩210,519 million and ₩87,246 million are included for the years ended December 31, 2019 and 2018, respectively.

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31. Other Income and Expenses

(1) Other income for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Gain on disposal of property, plant and equipment	₩ 26,158	39,403
Others	62,021	73,407
	₩ 88,179	112,810

(2) Other expenses for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Loss on disposal of property, plant and equipment	₩ 11,531	59,738
Loss on disposal of intangible assets	7,668	5,545
Loss on disposal of trade receivables	8,564	9,031
Loss on impairment of intangible assets	71	4,483
Donation	59,522	62,041
Others	26,219	37,520
	₩ 113,575	178,358

32. Income Tax Expense

(1) Income tax expense for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Current tax:		
Current tax on profits for the year	₩ 603,692	5,728,798
Adjustments for the current tax liabilities attributable to prior year, but recognized in current year	(85,520)	(13,661)
	518,172	5,715,137
Deferred tax:		
Changes in net deferred tax assets	(91,837)	85,909
Income tax expense	₩ 426,335	5,801,046

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32. Income Tax Expense, continued

(2) The relationship between tax expense and accounting profit for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Profit before income tax	₩ 2,442,726	21,341,030
Tax calculated at domestic tax rates applicable to profits in the respective countries	661,387	5,858,421
Tax effects of:		
Tax-exempt income	(36,618)	(39,732)
Non-deductible expenses	11,694	10,008
Change in unrecognized deferred tax assets	(93,041)	88,614
Tax credits	(102,755)	(173,826)
Adjustments for the current tax liabilities attributable to prior year, but recognized in current year	(85,520)	(13,661)
Others	71,188	71,222
Income tax expense	₩ 426,335	5,801,046

(3) Income taxes recognized in other comprehensive income (loss) for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Remeasurements of defined benefit liabilities	₩ 34,132	29,182
Gain on valuation of derivatives	(4,837)	-
	₩ 29,295	29,182

33. Earnings per Share

Basic earnings per share is calculated by dividing the profit attributable to ordinary shareholders of the Parent Company by the weighted average number of outstanding ordinary shares during the years.

(1) Basic earnings per share for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won, except for shares and per share information)

	2019	2018
Profit attributable to ordinary shareholders of the Parent Company	₩ 2,013,288	15,540,111
Weighted average number of outstanding ordinary shares ¹	684,001,795	698,278,083
Basic earnings per share (in won)	₩ 2,943	22,255

¹ Weighted average number of outstanding ordinary shares is calculated as follows:

(In shares)

	2019	2018
Outstanding ordinary shares	728,002,365	728,002,365
Acquisition of treasury shares	(44,000,570)	(29,724,282)
Weighted average number of outstanding ordinary shares	684,001,795	698,278,083

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33. Earnings per Share, continued

(2) Diluted earnings per share for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won, except for shares and per share information)

	2019	2018
Profit attributable to ordinary shareholders of the Parent Company	₩ 2,013,288	15,540,111
Weighted average number of diluted outstanding ordinary shares ¹	684,089,944	698,364,251
Diluted earnings per share (in won)	₩ 2,943	22,252

¹ Weighted average number of diluted ordinary shares outstanding is calculated as follows:

(In shares)

	2019	2018
Weighted average number of outstanding ordinary shares	684,001,795	698,278,083
Stock options	88,149	86,168
Weighted average number of diluted outstanding ordinary shares	684,089,944	698,364,251

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34. Transactions with Related Parties and Others

(1) Details of related parties as of December 31, 2019 are as follows:

Type	Name of related parties
Associates	Stratio, Inc., SK China Company Limited, Gemini Partners Pte. Ltd., TCL Fund, SK South East Asia Investment Pte. Ltd., Hushan Xinju (Chengdu) Venture Investment Center (Smartsources), WooYoung Farm Co., Ltd.
Joint ventures	HITECH Semiconductor (Wuxi) Co., Ltd., Hystars Semiconductor (Wuxi) Co., Ltd.
Other related parties	SK Telecom Co., Ltd., which has significant influence over the Group, SK Holdings Co., Ltd., which has control over SK Telecom Co., Ltd., and their subsidiaries

(2) Significant transactions for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	Company	2019			
		Operating revenue and others	Operating expense and others	Asset acquisition	Dividend income
Associate	SK China Company Limited	₩ 15	10,954	-	-
Joint ventures	HITECH Semiconductor (Wuxi) Co., Ltd.	4,362	656,911	1,616	14,458
	Hystars Semiconductor (Wuxi) Co., Ltd.	238	-	-	-
Other related parties	SK Telecom Co., Ltd. ¹	167,878	242,559	10,699	-
	SK Holdings Co., Ltd. ²	25,912	265,496	259,280	-
	ESSENCE Limited	708,497	-	-	-
	SK Engineering & Construction Co., Ltd.	60,886	1,249	1,851,230	-
	SK Energy Co., Ltd.	62,220	73,717	-	-
	SK Networks Co., Ltd.	12,704	12,698	-	-
	SKC solmics Co., Ltd.	676	82,814	1,067	-
	Chungcheong energy service Co., Ltd.	215	27,215	-	-
	SK Materials Co., Ltd.	4,118	79,000	-	-
	SK Siltron Co., Ltd.	32,411	397,327	-	-
	SK Airgas Co., Ltd.	106	72,675	-	-
	Others	163,648	484,678	68,445	-
		₩ 1,243,886	2,407,293	2,192,337	14,458

¹ Operating expense and others include dividend payments of ₩219,200 million.

² For the year ended December 31, 2019, royalty paid for the use of the SK brand amounted to ₩82,629 million.

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34. Transactions with Related Parties and Others, Continued

(2) Significant transactions for the years ended December 31, 2019 and 2018 are as follows, Continued:

(In millions of won)

		2018			
	Company	Operating revenue and others	Operating expense and others	Asset acquisition	Dividend income
Associate	SK China Company Limited	₩ -	9,699	-	-
Joint ventures	HITECH Semiconductor (Wuxi) Co., Ltd.	3,442	621,986	1,901	13,120
	Hystars Semiconductor (Wuxi) Co., Ltd.	162	-	-	-
	SK Telecom Co., Ltd. ¹	313	162,342	46,122	-
Other related parties	SK Holdings Co., Ltd. ²	1,465	231,180	539,447	-
	ESSENCE Limited	917,320	-	-	-
	SK Engineering & Construction Co., Ltd.	4,038	25,882	2,484,366	-
	SK Energy Co., Ltd.	4,040	71,059	-	-
	SK Networks Co., Ltd.	-	7,190	10,600	-
	SKC Solmics Co., Ltd.	-	21,724	1,439	-
	Chungcheong energy service Co., Ltd.	-	19,112	203	-
	SK Materials Co., Ltd.	-	68,957	-	-
	SK Siltron Co., Ltd.	4,392	338,741	-	-
	SK Airgas Co., Ltd.	2	37,610	259	-
	Others	459	321,325	68,205	-
	Other				
	Happynarae Co., Ltd. ³	39	576,043	68,630	-
		₩ 935,672	2,512,850	3,221,172	13,120

¹ Operating expense and others include dividend payments of ₩146,100 million.

² For the year ended December 31, 2018, royalty paid for the use of the SK brand amounted to ₩61,955 million.

³ The amounts represent the transactions prior to the date of acquisition of Happynarae Co., Ltd.

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34. Transactions with Related Parties and Others, Continued

(3) The balances of significant transactions as of December 31, 2019 and 2018 are as follows:

(In millions of won)		2019	
	Company	Trade receivables and others	Other payables and others
Associate	SK China Company Limited	₩ 1	10,883
Joint ventures	HITECH Semiconductor (Wuxi) Co., Ltd.	357	395,529
	Hystars Semiconductor (Wuxi) Co., Ltd.	-	-
Other related parties	SK Telecom Co., Ltd.	9,334	7,342
	SK Holdings Co., Ltd.	3,668	151,940
	ESSEN CORE Limited	37,823	-
	SK Engineering & Construction Co., Ltd.	6,012	855,621
	SK Energy Co., Ltd.	3,207	24,203
	SK Networks Co., Ltd.	897	7,243
	SKC solmics Co., Ltd.	55	17,463
	Chungcheong energy service Co., Ltd.	13	3,599
	SK Materials Co., Ltd.	360	7,681
	SK Siltron Co., Ltd. ¹	99,203	36,395
	SK Airgas Co., Ltd.	43	277,059
	Others	20,486	102,535
		₩ 181,459	1,897,493

¹ Trade receivable and others include ₩96,216 million advance paid for the purchase of wafers (See note 35-(9)).

(In millions of won)		2018	
	Company	Trade receivables and others	Other payables and others
Associates	SK China Company Limited	₩ 1	9,060
Joint venture	HITECH Semiconductor (Wuxi) Co., Ltd.	33	102,932
	Hystars Semiconductor (Wuxi) Co., Ltd.	19	-
Other related parties	SK Telecom Co., Ltd.	3,339	15,489
	SK Holdings Co., Ltd.	1,876	144,225
	ESSEN CORE Limited	71,673	-
	SK Engineering & Construction Co., Ltd.	12,910	744,935
	SK Energy Co., Ltd.	5,350	9,005
	SK Networks Co., Ltd.	790	1,452
	SKC Solmics Co., Ltd.	57	8,113
	Chungcheong energy service Co., Ltd.	4	3,644
	SK Materials Co., Ltd.	443	18,214
	SK Siltron Co., Ltd.	156,023	37,070
	SK Airgas Co., Ltd.	4	24,027
	Others	14,914	96,928
		₩ 267,436	1,215,094

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34. Transactions with Related Parties and Others, Continued

(4) Key management compensation

The Group considers registered directors who have authority and responsibility for planning, directing and controlling the activities of the Group as key management. The compensation paid to key management for employee services for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

Details		2019	2018
Salaries	₩	3,849	2,999
Defined benefit plan related expenses		406	351
Share-based payment		954	51
	₩	5,209	3,401

(5) The significant transactions between the Group and the companies that are in the same conglomerate group according to 'Fair Trade Law' as of December 31, 2019 and 2018 are as follows. These entities are not related parties according to K-IFRS No. 1024, 'Related Party Disclosures'.

(In millions of won)

		2019			
		Operating revenue and others	Operating expense and others	Asset acquisition	Dividend income
Company					
Companies in the Conglomerate	SK Chemicals Co., Ltd.	₩ 8,676	1,507	-	-
	SK Bioscience Co., Ltd.	4,216	281	-	-
	AnTS Co., Ltd.	9	8,411	-	-
	Others	3,934	102	-	-
		₩ 16,835	10,301	-	-

(In millions of won)

		2018			
		Operating revenue and others	Operating expense and others	Asset acquisition	Dividend income
Company					
Companies in the Conglomerate	SK Chemicals Co., Ltd.	₩ -	1,216	-	-
	SK Bioscience Co., Ltd.	-	125	-	-
		₩ -	1,341	-	-

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34. Transactions with Related Parties and Others, Continued

(6) The balances of significant transactions between the Group and the companies that are in the same conglomerate group designated by 'Fair Trade Law'. The details of the balances as of December 31, 2019 and 2018 are as follows. These entities are not related parties according to K-IFRS No. 1024, 'Related Party Disclosures'.

(In millions of won)

		2019	
		Trade receivables and others	Other payables and others
Company			
Companies in the Conglomerate	SK Chemicals Co., Ltd.	₩ 886	114
	SK Bioscience Co., Ltd.	177	20
	AnTS Co., Ltd.	1	942
	Others	645	-
		₩ 1,709	1,076

(In millions of won)

		2018	
		Trade receivables and others	Other payables and others
Company			
Companies in the Conglomerate	SK Discovery Co., Ltd.	₩ 5	-
	SK Chemicals Co., Ltd.	1,253	331
	SK Bioscience Co., Ltd.	884	13
		₩ 2,142	344

- (7) The Group provides payment guarantee amounting to RMB 702 million for Hystars Semiconductor (Wuxi) Co., Ltd., a joint venture of the Group. (See note 35-(7))
- (8) The Group's establishments of subsidiaries during the year ended December 31, 2019 are presented in note 1 and the Group's acquisitions and additional contributions to associates during the year ended December 31, 2019 are presented in note 11.

35. Commitments and Contingencies

(1) The details of litigations and claims of the Group as of December 31, 2019 are as follows:

(a) Lawsuit from Netlist, Inc.

Netlist, Inc. filed lawsuits against the Parent Company, and its subsidiaries, SK hynix America Inc. and SK hynix memory solutions America Inc. alleging infringement of multiple patents to the U.S. District Court for the Central District of California, on August 31, 2016 and June 14, 2017, to the U.S. International Trade Commission ("ITC") on September 1, 2016 and October 31, 2017.

Meanwhile, the lawsuit filed to the U.S. ITC on September 1, 2016 was provisionally concluded on January 16, 2018 that the Parent Company and its subsidiaries, SK hynix America Inc. and SK hynix memory solutions America Inc., did not infringe the patents of Netlist, Inc. Against the conclusion, Netlist, Inc. filed a petition on March 26, 2018. As the U.S. Federal Court of Appeals rejected Netlist, Inc.'s appeal on December 12, 2019, the ruling that the Parent Company and its subsidiaries, SK hynix America Inc. and SK hynix memory solutions America Inc., did not infringe the patent was finalized.

Regarding the lawsuit filed to the U.S. ITC on October 31, 2017, the U.S. ITC issued an initial determination on October 21, 2019, finding the Parent Company and its subsidiaries, SK hynix America Inc. and SK hynix memory solutions America Inc., violated one patent of Netlist, Inc. A decision on whether to have a rehearing the tentative decision will be made. As of December 31, 2019, the final result cannot be predicted.

Meanwhile, Netlist, Inc. filed a lawsuit against the Parent Company for infringement of one German patent to the District Court of Munich on July 11, 2017. The District Court of Munich rendered its decision finding no infringement by the Parent Company on January 31, 2019. Netlist, Inc. filed a notice of appeal against the decision to the Higher Regional Court of Munich on March 5, 2019 but withdrew the notice of appeal on June 11, 2019, thus the non-infringement decision of the District Court of Munich became the final and conclusive ruling.

(b) Price-fixing class-action lawsuits in North America

On April 27, 2018, a purported class-action lawsuit was filed against the Parent Company and its subsidiary, SK hynix America Inc. in the U.S. District Court for the Northern District of California asserting claims based on alleged price-fixing of DRAM products during the period from June 1, 2016 to February 1, 2018. Similar lawsuits were subsequently filed in federal court in the U.S., as well as in Canadian courts in British Columbia, Quebec and Ontario. As of December 31, 2019, the lawsuits filed have not been finalized and the Group is unable to predict the outcome of these matters and therefore cannot reliably estimate the range of possible loss.

(c) The antitrust investigation in China

The State Administration for Market Regulation of China initiated to investigate the violation of the antitrust law regarding on primary DRAM businesses' sales in China in May 2018. The investigation is ongoing. As of December 31, 2019, the Group is unable to predict the outcome of these matters and therefore cannot reliably estimate the range of possible loss.

(d) Other patent infringement claims and litigation

In addition to the above litigations, the Group has responded to various disputes related to intellectual property rights and has recognized a liability when it represents a present obligation as a result of past event and it is probable that an outflow of resources will arise and a loss can be reliably estimated.

(2) Technology and patent license agreements

The Group has entered into a number of patent license agreements with several companies. The related royalties are paid on a lump-sum or running basis in accordance with the respective agreements. The lump-sum royalties are expensed over the contract period using the straight-line method.

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35. Commitments and Contingencies, continued

(3) Contract for supply of industrial water

The Group has entered into a new contract with Veolia Water Industrial Development Co., Ltd. ("Veolia") under which the Group purchases industrial water from Veolia during the period of June 2018 through May 2023. According to the contract, the Group is obligated to pay base service charges, which are predetermined and additional service charges which are variable according to the volume of water used.

(4) Post- process service contract with HITECH Semiconductor (Wuxi) Co., Ltd. ("HITECH")

The Group has entered into an agreement with HITECH to be provided with post-process service by HITECH. The conditions of the service provided includes package, package test, modules and others. According to the agreement, the Group is liable to guarantee a certain level of margin to HITECH.

(5) Assets provided as collateral

Details of assets provided as collateral as of December 31, 2019 are as follows:

(In millions of won and millions of foreign currencies)

Category	Book value		Pledged amount			Remark
	Currency	Amount	Currency	Amount in USD	Amount in KRW	
Land and buildings	KRW	55,479	USD	53	61,587	Borrowings for equipment and others
			KRW	-	5,864	
Machinery	KRW	5,375,555	USD	6,258	7,245,003	
			KRW	-	600,000	
			USD	6,311	7,306,590	
	KRW	<u>5,431,034</u>	KRW	<u>-</u>	<u>605,864</u>	

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35. Commitments and Contingencies, continued

(6) Financing agreements

Details of credit lines with financial institutions as of December 31, 2019 are as follows:

(In millions of won and millions of foreign currencies)

	Financial Institution	Commitment	Currency	Amount
The Parent Company	Hana Bank and others	Import finance including usance Comprehensive limit contract for import and export including usance	USD	275
			USD	1,060
		Commitment as form of issuance for commercial paper	KRW	400,000
		Overdrafts with banks	KRW	20,000
		Accounts receivable factoring contracts which have no right to recourse	KRW	140,000
SK hynix Semiconductor (China) Ltd.	Agricultural Bank of China and others	Import finance including usance	RMB	2,300
SK hynix America Inc. and other sales entities	Citibank and others	Accounts receivable factoring contracts which have no right to recourse	USD	4,447
			USD	757
		Import finance including bills bought	USD	45
Domestic subsidiaries	Hana Bank and others	Finance secured by accounts receivables	KRW	53,820
		Agent agreement for payment of goods received	KRW	12,500

(7) Details of guarantees provided to others as of December 31, 2019 are as follows:

(In millions of U.S. dollars)

	Currency	Amount	Remark
Taiwan Semiconductor Manufacturing Company, Limited. ¹	USD	60	Guarantees for supply agreement
Wuxi Xinfu Group Co., Ltd. ²	RMB	702	Guarantees for borrowing

¹ The Group received a deposit of ~~₩~~1,000 million as collateral from ADTechnology Inc. regarding payment guarantee for Taiwan Semiconductor Manufacturing Company, Limited.

² The Group provides payment guarantee to Wuxi Xinfu Group Co., Ltd. for borrowings and accrued interests of Hystars Semiconductor (Wuxi) Co., Ltd., a joint venture of the Group.

(8) Capital commitments

The Group's commitments in relation to capital expenditures on property, plant and equipment as of December 31, 2019 are ~~₩~~232,387 million (as of December 31, 2018: ~~₩~~1,857,092 million).

35. Commitments and Contingencies, continued

(9) Long-term purchase agreement for raw materials

The Group has entered into a procurement agreement with SK Siltron Co., Ltd. from 2019 to 2023 for a stable supply of wafer with an advanced payment of ₩150,000 million during the year ended December 31, 2017. The advanced payment used in connection with the purchase of wafer during 2019 is ₩53,784 million, and the balance of the advance payment as of December 31, 2019 is ₩96,216 million. Meanwhile, SK Siltron Co., Ltd. has committed to providing a certain portion of its investment assets as collateral to secure the advanced payment.

(10) Investment in KIOXIA Holdings Corporation ("KIOXIA")

In regards to the Group's interests in KIOXIA through its investments in BCPE Pangea Intermediate holdings Cayman, L.P. and BCPE Pangea Cayman2 Limited, equity shares in KIOXIA owned, directly or indirectly, by the Group are limited to a certain percentage during certain periods after the date of acquisition. In addition, during the same periods, the Group does not have the right in appointing KIOXIA's directors and is unable to exercise significant influence over decision-making for KIOXIA's operation and management.

SK HYNIX, INC. and Subsidiaries
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36. Statements of Cash Flows

(1) Reconciliations between profit for the year and net cash inflow from operating activities for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Profit for the year	₩ 2,016,391	15,539,984
Adjustment		
Income tax expense	426,335	5,801,046
Defined benefit plan	220,999	179,503
Depreciation	7,511,794	5,904,156
Depreciation of investment property	37	84
Amortization	795,169	524,095
Depreciation of right-of-use assets	246,396	-
Share-based compensation expenses	1,738	1,163
Loss on disposal of property, plant and equipment	11,531	59,738
Loss on disposal of intangible assets	7,668	5,545
Loss on impairment of intangible assets	71	4,483
Loss on valuation of long-term investment asset	241,471	1,282
Impairment loss on associate investment	1,695	1,695
Interest expense	238,508	94,635
Loss on foreign currency translation	241,358	181,210
Loss on disposal of trade receivables	8,564	9,031
Gain on equity method investments, net	(24,328)	(14,702)
Gain on disposal of property, plant and equipment	(26,158)	(39,403)
Gain on disposal of short-term investment assets	(58,784)	(36,349)
Gain on valuation of short-term investment assets	(5,811)	(16,740)
Gain on disposal of long-term investment assets	(1,218)	(5,504)
Gain on valuation of long-term investment assets	(8,237)	(182,461)
Interest income	(30,062)	(62,478)
Gain on foreign currency translation	(263,012)	(126,094)
Others, net	99	(1,984)
Changes in operating assets and liabilities		
Decrease (increase) in trade receivables	2,214,776	(547,255)
Decrease in loans and other receivables	41,676	38,102
Increase in inventories	(851,735)	(1,782,384)
Decrease (increase) in other assets	114,792	(98,632)
Increase (decrease) in trade payables	(278,529)	58,773
Decrease in other payables	(16,623)	(16,161)
Increase (decrease) in other non-trade payables	(645,164)	542,437
Decrease in provisions	(42,787)	(25,183)
Increase in other liabilities	17,605	118,986
Payment of defined benefit liabilities	(4,120)	(8,862)
Contributions to plan assets	(279,751)	(276,739)
Cash generated from operating activities	₩ <u>11,822,354</u>	<u>25,825,017</u>

SK HYNIX, INC. and Subsidiaries
Notes to the Consolidated Financial Statements
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36. Statements of Cash Flows, Continued

(2) Details of significant financing and investing transactions, except for reclassifications between long-term and short-term balances, without inflows and outflows of cash for the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Increase in other payables related to acquisition of property, plant and equipment	₩ -	954,918
Transfer of investment property to property, plant and equipment	1,105	984

(3) Changes in liabilities arising from financing activities during the years ended December 31, 2019 and 2018 are as follows:

(In millions of won)

	2019	2018
Beginning balance	5,281,937	4,171,270
Adjustments on initial application of K-IFRS No.1116 ¹	1,123,422	-
Beginning balance after adjustments	₩ 6,405,359	4,171,270
Cash flows from financing activities		
Proceeds from borrowings	9,833,882	3,125,721
Repayments of borrowings	(4,585,425)	(2,078,522)
Payments of lease liabilities	(323,953)	-
Increase of lease liabilities	280,009	-
Foreign currency differences	90,513	61,857
Present value discount (interest expense)	27,576	1,611
Interest paid	(3,625)	-
Ending balance	₩ 11,724,336	5,281,937

¹ Lease liabilities are recognized upon adoption of K-IFRS No. 1116 as of January 1, 2019.

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37. Share-based payment

(1) The Parent Company accounts for share-based payment in which the Parent Company has a choice of either cash-settled payment or equity-settled payment in accordance with its substance. The details of share options as of December 31, 2019 are as follows:

(In shares)

	Total numbers of share option granted	Exercised	Forfeited or Cancelled	Outstanding at December 31, 2019
1st	99,600	-	-	99,600
2nd	99,600	-	-	99,600
3rd	99,600	-	-	99,600
4th	7,747	-	-	7,747
5th	7,223	-	-	7,223
6th	8,171	-	-	8,171
7th	61,487	-	-	61,487
8th	61,487	-	-	61,487
9th	61,487	-	-	61,487
	<u>506,402</u>	<u>-</u>	<u>-</u>	<u>506,402</u>

	Grant date	Service Period for Vesting	Exercisable Period	Exercise price
1st	March 24, 2017	March 24, 2017 - March 24, 2019	March 25, 2019 - March 24, 2022	₩ 48,400
2nd	March 24, 2017	March 24, 2017 - March 24, 2020	March 25, 2020 - March 24, 2023	52,280
3rd	March 24, 2017	March 24, 2017 - March 24, 2021	March 25, 2021 - March 24, 2024	56,460
4th	January 1, 2018	January 1, 2018 - December 31, 2019	January 1, 2020 - December 31, 2022	77,440
5th	March 28, 2018	March 28, 2018 - March 28, 2020	March 29, 2020 - March 28, 2023	83,060
6th	Feb 28, 2019	February 28, 2019 - February 28, 2021	March 1, 2021 - February 29, 2024	73,430
7th	March 22, 2019	March 22, 2019 - March 22, 2021	March 23, 2021 - March 22, 2024	71,560
8th	March 22, 2019	March 22, 2019 - March 22, 2022	March 23, 2022 - March 22, 2025	77,290
9th	March 22, 2019	March 22, 2019 - March 22, 2023	March 23, 2023 - March 22, 2026	83,470

(2) Measurement of fair value

The compensation cost is calculated by applying a binomial option-pricing model in estimating the fair value of the option at grant date. The inputs used are as follows:

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Expected volatility	23.23%	23.23%	23.23%	22.50%	25.30%	25.60%	26.20%	26.20%	26.20%
Estimated fair value of share options	₩ 10,026	9,613	9,296	16,687	18,362	16,505	17,744	16,888	16,093
Dividend yield ratio	1.20%	1.20%	1.20%	0.78%	1.23%	2.04%	1.98%	1.98%	1.98%
Risk free rate	1.86%	1.95%	2.07%	2.38%	2.46%	1.89%	1.82%	1.88%	1.91%

(3) The compensation expense for the year ended December 31, 2019 was ₩1,738 million (2018: ₩1,163 million).