Financial Factbook 2017

TOAGOSEI

Management's Discussion & Analysis

The financial section was translated into English based on some disclosed documents including the securities report of the Japanese version and is provided for information purpose only.

Overview of Fiscal 2017

During the reporting term (January 1 to December 31, 2017), the domestic economy moderately recovered, thanks mainly to favorable corporate earnings and improving employment and income conditions. As for the global economy, the economies of developed countries and regions such as the US and Europe progressed steadily and the economies of emerging countries saw signs of improvement such as advancing structural reforms in China.

In the overall surroundings of Toagosei Group (hereinafter "the Group"), demand for chemical products as a whole progressed favorably with backing mainly from the ongoing recovery trend in the Japanese economy and the effect of environmental regulations in China, though prices for crude oil and other natural resources rose from the last half of the year onward. Furthermore, demand for electronics and automotive-related products increased.

As a result, net sales in the reporting term increased by 6.9% year on year on a consolidated basis to ¥144,708 million, operating income increased by 8.1% to ¥17,453 million and ordinary profit increased by 9.2% to ¥18,492 million, while net income attributable to owners of parent decreased by 6.4% to ¥12,911 million, mainly due to a decrease in gain on sales of idle real estate.

The Company previously classified its businesses into four reportable segments, namely, Commodity Chemicals, Acrylic Products, Specialty Chemicals, and Plastics. Effective from the reporting term, reportable segments are reclassified into five segments, namely, Commodity Chemicals, Polymer & Oligomer, Adhesive Material, Performance Chemicals, and Plastics.

This reclassification reflects organizational reforms implemented on January 1, 2017 with a view to promoting the strategy set forth under Trajectory Toward Growth 2019, the medium-term management plan started from the reporting term.

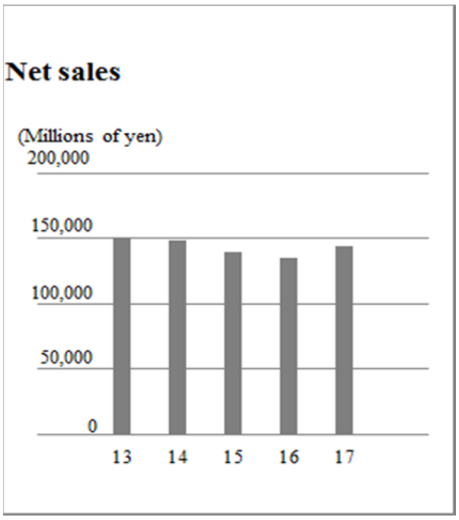
As a result of this reclassification, year-on-year comparison of performance was made using the figures for the previous term that were prepared using the classification method after the change.

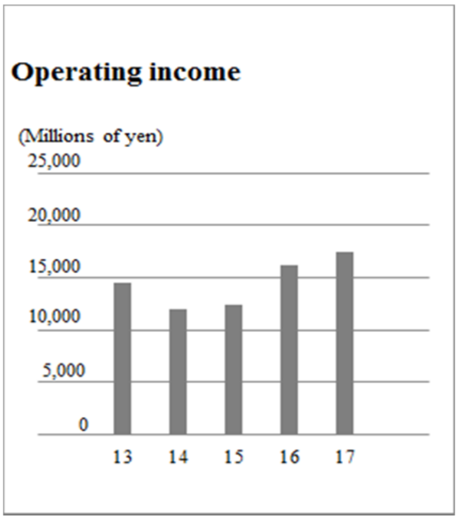
Sales by Segment

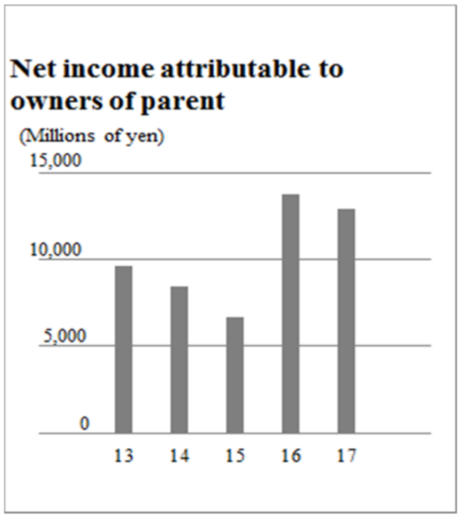
Commodity Chemicals

In Commodity Chemicals, sales of electrolytic products increased as the sales volume of caustic soda and inorganic chlorides progressed favorably and the sales prices of some products were optimized. Sales of acrylic monomer products increased, mainly due to increased sales volume and optimized sales prices. Sales of industrial gas increased, mainly due to an increase in sales volume buoyed by steady demand. As a result, sales in this segment increased by 9.8% year on year to ¥66,630 million.

In spite of the downward pressure on income associated with increasing raw material and fuel prices and rising fixed costs, segment income increased by 24.6% to ¥5,795 million, mainly thanks to increased sales and optimized sales prices of electrolytic products and acrylic monomer products.







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Polymer & Oligomer

Sales of acrylic polymers increased because of strong sales of high value-added products mainly used for automotive materials and cosmetic raw materials. Sales of acrylic oligomers increased because of strong sales of UV-curable products mainly used for coating film and electronics materials. Sales of polymer flocculants increased due to a sales volume increase outweighing a decline in sales prices. As a result, sales in this segment increased by 5.2% year on year to ¥28,096 million.

Segment income decreased by 3.6% to ¥4,429 million mainly due to decreasing profitability of polymer flocculants and rising fixed costs of acrylic polymers, despite increased income from acrylic oligomers.

Adhesive Material

Sales of instant glues increased due to strong sales to convenience stores and for industrial applications. Sales of functional adhesives increased due to expanded sales of reactive adhesives mainly used for high-performance information devices. As a result, sales in this segment increased by 3.1% year on year to ¥12,010 million.

Segment income decreased by 6.8% to ¥2,659 million because factors such as the increased advertising and promotional expenses for instant glues in Japan put downward pressure on profitability, though income from functional adhesives increased due to strong sales.

Performance Chemicals

Sales of high-purity inorganic chemicals increased due to expanded sales of high-purity products such as liquid hydrogen chloride on the back of vigorous demand for semiconductors. Sales of inorganic functional materials increased because sales of amenity products such as inorganic antimicrobial agents, deodorant, and anti-mold agents progressed steadily against the backdrop of growing interest in comfortable and hygienic life. As a result, sales in this segment increased by 16.2% year on year to ¥7,791 million.

Segment income surged by 34.4% to ¥2,397 million due to the contribution from increased sales of high-purity inorganic chemicals and inorganic functional materials.

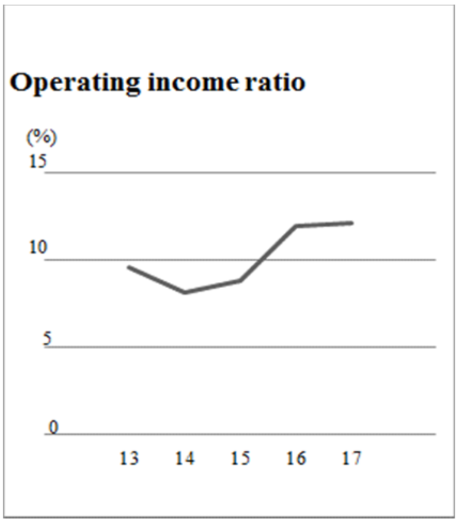
Plastics

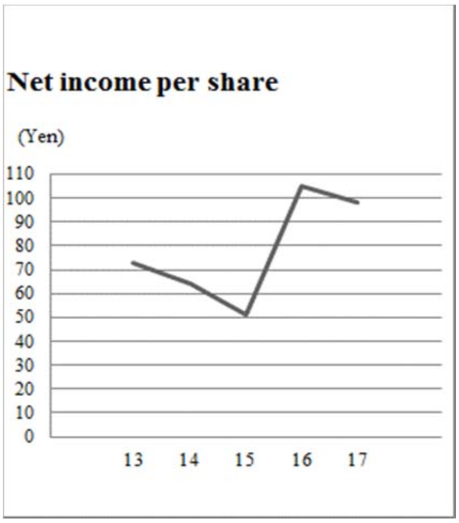
Sales of piping equipment increased thanks to an increase in sales volume, though sales prices remained weak. Sales of products for construction and civil engineering remained almost unchanged from the previous term. Nursing care product sales increased mainly due to the launch of new products. Sales of elastomer increased due to favorable sales of products for medical care and beverages. As a result, sales in this segment increased by 1.4% year on year to ¥26,828 million.

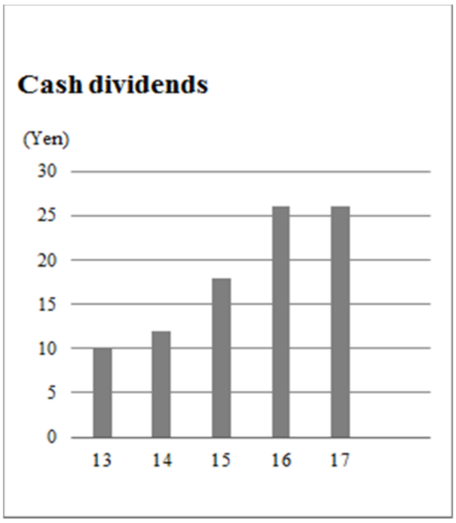
Segment income decreased by 4.5% to ¥1,946 million mainly due to the effect of a decline in the sales prices of piping equipment and an increase in the price of raw materials, though earnings from nursing care products and elastomer increased.

Other Businesses

Sales for this segment, which comprises new product development operations, goods transportation services, and trading house operations, increased by 6.1% year on year to ¥3,350 million, and segment income totaled ¥218 million.







(Notes) 1. We have executed a two-for-one reverse stock split effective on July 1, 2015. Net income per share is calculated assuming that the two-for-one reverse stock split was executed at the beginning of fiscal 2012.
2. For fiscal 2015, the total annual dividend of ¥18 per share consists of an interim dividend of ¥6 per share and a term-end dividend of ¥12 per share. As we implemented a two-for-one reverse stock split effective on July 1, 2015, the interim dividend of ¥6 per share is an amount before the reverse stock split and the term-end dividend of ¥12 per share is an amount after the reverse stock split.

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Cash Flows

Net cash provided by operating activities decreased by ¥6,823 million year on year to ¥15,166 million due to increases in inventories and income taxes paid.

Net cash used in investing activities increased by ¥5,512 million to ¥23,186 million due to a decrease in proceeds from sales of property, plant and equipment.

Net cash used in financing activities increased by ¥108 million to ¥4,047 million due to increases in cash dividends to shareholders and cash dividends paid to non-controlling interests.

As a result, cash and cash equivalents at end of the year stood at ¥42,136 million, a decrease of ¥12,095 million from the previous term-end.

Business Performance Prospects for Fiscal 2018

For the current term ending December 31, 2018, we forecast net sales of ¥149.0 billion, operating income of ¥17.5 billion, and net income attributable to owners of parent of ¥13.0 billion.

Cash Flow Prospects for Fiscal 2018

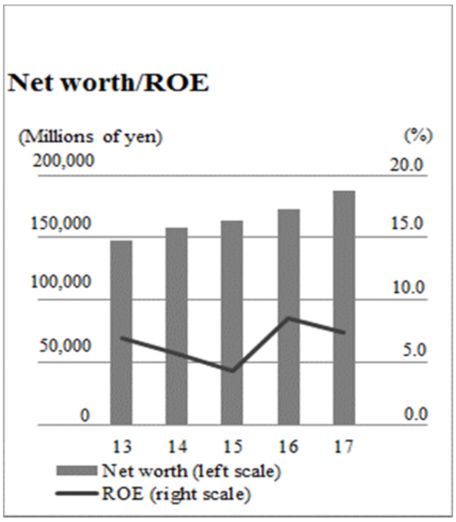
Net cash provided by operating activities is expected to be ¥20.0 billion due to an anticipated recording of income before income taxes at almost the same level reported in the previous term and an anticipated decrease in income taxes paid.

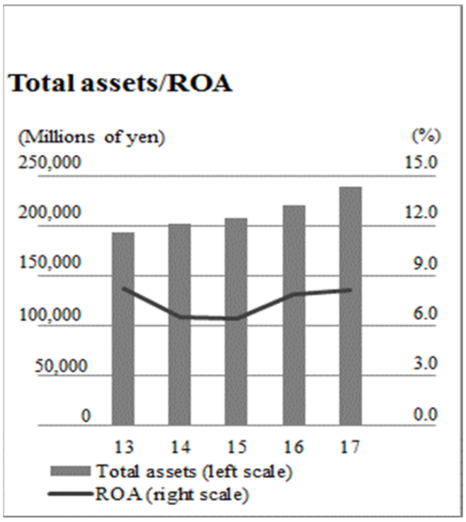
Net cash used in investing activities is expected to total ¥11.0 billion mainly due to purchases of property, plant and equipment.

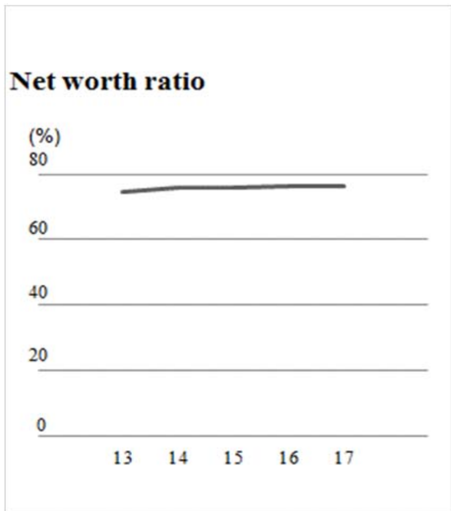
Net cash used in financing activities is expected to total ¥4.0 billion mainly due to dividend payments.

Basic Policy on Shareholder Returns and Dividends for Fiscal 2017 and 2018

Our basic shareholder return policy is to pay stable dividends of ¥20 per share annually, taking into account the performance for the fiscal year in question, the future outlook, and forecast performance figures. However, we also place importance on ensuring a sufficient amount of retained earnings to maintain a sound financial position. We must secure sufficient funding to finance R&D activities and capital investment needed to prepare us for an expected increase in competition.







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For fiscal 2017 ended December 31, 2017, we made a term-end dividend payment of ¥13 per share. As we have already paid an interim dividend of ¥13 per share, the total annual dividend will be ¥26 per share.

For the current term ending December 31, 2018, we are planning an interim dividend payment of ¥14 per share and a term-end payment of the same sum, for an annual dividend of ¥28 per share.

Business Risks

(1) Cost competition

The Group manufactures and sells many products that are difficult to differentiate from those of other companies in terms of their function and performance. Given the present trend of intensifying price competition, there is a possibility that the Group, despite its efforts to strengthen marketing activities and reduce costs, may not be able to maintain its competitive edge over rival companies that are able to sell products with the same qualities at lower prices. This could adversely affect the business performance and financial position of the Group.

(2) Changes in the price of crude oil and naphtha

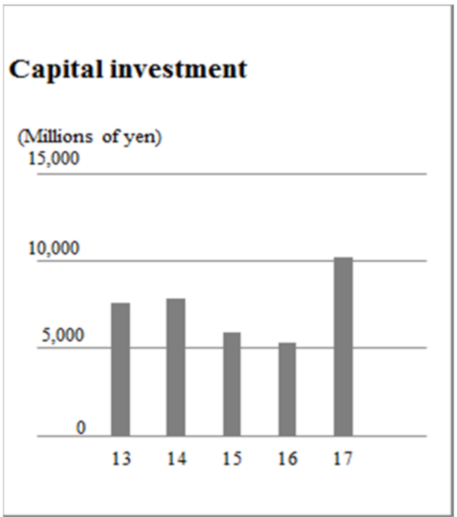
The purchase prices of the major raw materials of products manufactured and sold by the Group are affected by changes in crude oil and naphtha prices. Therefore, if the Group is unable to sufficiently raise its product prices, and/or if the Group is unable to rationalize its operations sufficiently to offset the rising prices of crude oil and naphtha, there is a possibility that the Group's business performance and financial position will be adversely affected.

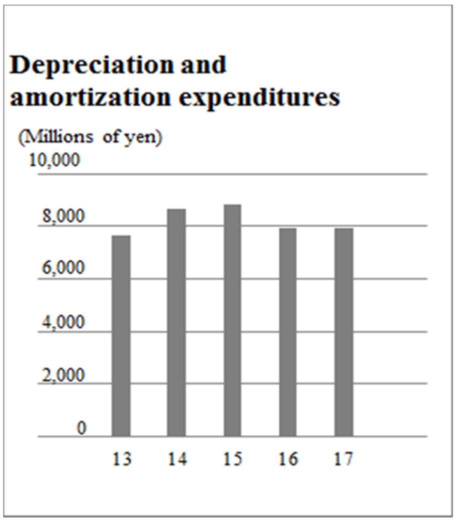
(3) Product liability

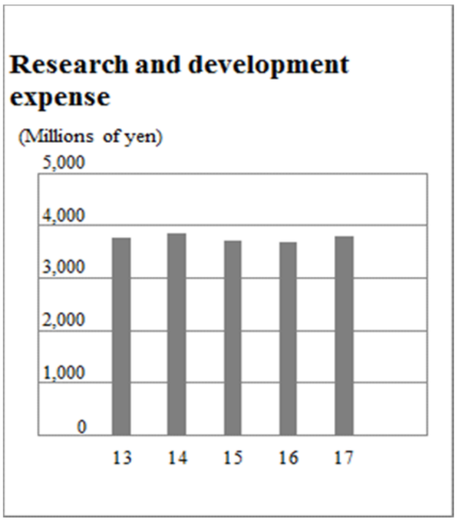
In spite of our efforts to ensure a high level of product quality, there is a possibility that a customer or other party may experience financial losses or other forms of damage as a result of an unexpected defect in products manufactured and sold by the Group. As not all losses incurred will be covered by product liability insurance, this factor may adversely affect the business performance and financial position of the Group.

(4) Impact of natural disasters

The production plants of the Group are located mostly in the Tokai Region of Japan, which is said to be particularly at risk of the occurrence of a major earthquake. If such an earthquake were to occur, substantial losses, including the suspension of operations, could result, and this would adversely affect the business performance and financial position of the Group.







Management’s Discussion & Analysis

(5) Major litigation

In the event of a major lawsuit being brought against the Group in the future, there is a possibility that this will adversely affect the Group’s business performance and financial position.

(6) Deferred tax assets

The deferred tax assets of the Group are based on an amount that is recorded after judging the potential for collection based on forecasts of future taxable income. If such forecasts deviate significantly from actual results, there is a possibility that this will adversely affect the business performance and financial position of the Group.

(7) Changes in foreign currency exchange rates

For the reporting period, overseas sales of the Group accounted for 16.7% of total sales. The Group includes eight overseas consolidated subsidiaries and one overseas affiliated company subject to the equity method. There is therefore a possibility of a change in exchange rates adversely affecting the business performance and financial position of the Group.

(8) Changes in interest rates

The Group has been raising funds for its business operations and there is a possibility that a change in interest rates will influence the business performance and financial position of the Group.

(9) Application of accounting for the impairment of fixed assets

In line with accounting law in Japan, the Group has applied impairment accounting for fixed assets. As a result, in the event of a significant future decline in market prices of land, and/or a deterioration in the Group’s operating environment, there is a possibility of the posting of a substantial impairment loss, which would adversely affect the Group’s business performance and financial position.

The Group is fully aware of the risks outlined above, and has measures in place to minimize their impact on operating results and financial position, at the Group and Group company level.

Estimates or projections included in this report are based on facts known to the Company’s management as of the time of writing, and actual results may therefore differ substantially from such statements.

1. [Consolidated Financial Statements and Others]

(1) [Consolidated Financial Statements]

i) [Consolidated Balance Sheets]

				(Millions of yen)
December 31,		2016		2017
Assets				
Current assets				
Cash and deposits		28,966		29,636
Notes and accounts receivable	*5	40,302	*5	42,583
Securities		44,000		47,000
Inventories	*1	14,162	*1	16,005
Deferred tax assets		956		770
Other current assets		756		1,313
Allowance for doubtful receivables		(33)		(35)
Total current assets		129,110		137,273
Fixed assets				
Property, plant and equipment				
Buildings and structures, net		18,572		18,579
Machinery, equipment and other, net		20,917		20,762
Tools, furniture and fixtures, net		1,884		1,770
Land		17,135		17,210
Leased assets, net		127		128
Construction in progress		1,314		4,211
Total property, plant and equipment	*3, *4	59,953	*3, *4	62,663
Intangible fixed assets		500		505
Investments and other assets				
Investment securities	*2	26,983	*2	35,238
Net defined benefit asset		1,229		1,934
Deferred tax assets		54		50
Other assets	*2	1,703	*2	1,687
Allowance for doubtful receivables		(15)		(15)
Total investments and other assets		29,955		38,896
Total fixed assets		90,409		102,064
Total assets		219,520		239,338

See accompanying notes to consolidated financial statements.

December 31,		2016		2017
				(Millions of yen)
Liabilities				
Current liabilities				
Notes and accounts payable	*5	13,729	*5	15,149
Short-term bank loans		2,502		6,503
Lease obligations		55		49
Accrued income taxes		4,142		2,124
Accrued bonuses for employees		18		17
Other current liabilities	*5	9,070	*5	13,188
Total current liabilities		29,519		37,032
Long-term liabilities				
Long-term debt		9,805		5,647
Lease obligations		81		88
Deferred tax liabilities		3,280		5,860
Net defined benefit liability		158		162
Other long-term liabilities		3,671		3,059
Total long-term liabilities		16,997		14,818
Total liabilities		46,517		51,850
Net Assets				
Shareholders' equity				
Common stock		20,886		20,886
Capital surplus		16,799		16,498
Retained earnings		120,999		130,488
Treasury stock		(278)		(289)
Total shareholders' equity		158,407		167,584
Accumulated other comprehensive income				
Unrealized holding gain on available-for-sale securities		7,955		13,082
Translation adjustments		1,922		1,884
Remeasurements of defined benefit plans		(296)		73
Total accumulated other comprehensive income		9,582		15,040
Non-controlling interests		5,012		4,862
Total net assets		173,003		187,487
Total liabilities and net assets		219,520		239,338

See accompanying notes to consolidated financial statements.

ii) [Consolidated Statements of Income and Consolidated Statements of Comprehensive Income]
[Consolidated Statements of Income]

(Millions of yen)

Years ended December 31,		2016		2017
Net sales		135,382		144,708
Cost of sales	*1	95,717	*1	102,106
Gross profit		39,665		42,601
Selling, general and administrative expenses				
Selling expenses	*2	14,528	*2	15,385
General and administrative expenses	*3, *4	8,989	*3, *4	9,762
Total selling, general and administrative expenses		23,517		25,148
Operating income		16,147		17,453
Non-operating income				
Interest income		60		77
Dividend income		760		740
Equity in earnings of affiliates		337		338
Rent income on non-current assets		92		134
Other		161		180
Total non-operating income		1,411		1,472
Non-operating expenses				
Interest expenses		101		96
Foreign currency exchange losses		95		38
Inactive facilities expenses		97		68
Environment readiness fee		205		154
Other		123		75
Total non-operating expenses		623		433
Ordinary profit		16,935		18,492
Extraordinary gains				
Gain on sales of non-current assets	*5	3,685	*5	369
Gain on sales of investment securities		619		446
Subsidy income		10		37
Total extraordinary gains		4,315		853
Extraordinary losses				
Loss on disposal of non-current assets	*6	535	*6	444
Impairment loss on property, plant and equipment	*7	19	*7	205
Total extraordinary losses		554		650
Income before income taxes		20,696		18,695
Income taxes -- Current		5,951		5,062
Income taxes -- Deferred		522		382
Total income taxes		6,473		5,445
Net income		14,223		13,250
Net income attributable to non-controlling interests		421		339
Net income attributable to owners of parent		13,801		12,911

See accompanying notes to consolidated financial statements.

[Consolidated Statements of Comprehensive Income]

(Millions of yen)

Years ended December 31,	2016		2017	
Net income		14,223		13,250
Other comprehensive income				
Unrealized holding gain on available-for-sale securities		58		5,130
Translation adjustments		(338)		(6)
Remeasurements of defined benefit plans, net of tax		(466)		369
Total other comprehensive income	*1	(746)	*1	5,494
Comprehensive income		13,476		18,744
Comprehensive income attributable to:				
Owners of the parent		13,116		18,369
Non-controlling interests		360		374

See accompanying notes to consolidated financial statements.

iii) [Consolidated Statements of Changes in Net Assets]

(Millions of yen)

Year ended December 31, 2016	Shareholders' equity: Common stock	Capital surplus	Retained earnings	Treasury stock	Total shareholders' equity
Balance at beginning of the year	20,886	16,799	110,489	(269)	147,905
Changes during the year:					
Cash dividends			(3,291)		(3,291)
Net income attributable to owners of parent			13,801		13,801
Purchase of treasury stock				(8)	(8)
Gain on sales of treasury stock		0		0	0
Change in ownership interest of parent due to transactions with non-controlling interests					—
Net changes in items other than shareholders' equity					
Total changes during the year	—	0	10,510	(8)	10,501
Balance at end of the year	20,886	16,799	120,999	(278)	158,407

Year ended December 31, 2016	Accumulated other comprehensive income: Unrealized holding gain on available-for-sale securities	Translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Non-controlling interests	Total net assets
Balance at beginning of the year	7,898	2,199	169	10,267	4,846	163,020
Changes during the year:						
Cash dividends						(3,291)
Net income attributable to owners of parent						13,801
Purchase of treasury stock						(8)
Gain on sales of treasury stock						0
Change in ownership interest of parent due to transactions with non-controlling interests						—
Net changes in items other than shareholders' equity	57	(276)	(466)	(685)	166	(518)
Total changes during the year	57	(276)	(466)	(685)	166	9,982
Balance at end of the year	7,955	1,922	(296)	9,582	5,012	173,003

See accompanying notes to consolidated financial statements.

(Millions of yen)

Year ended December 31, 2017	Shareholders' equity Common stock	Capital surplus	Retained earnings	Treasury stock	Total shareholders' equity
Balance at beginning of the year	20,886	16,799	120,999	(278)	158,407
Changes during the year:					
Cash dividends			(3,422)		(3,422)
Net income attributable to owners of parent			12,911		12,911
Purchase of treasury stock				(11)	(11)
Gain on sales of treasury stock		0		0	0
Change in ownership interest of parent due to transactions with non-controlling interests		(300)			(300)
Net changes in items other than shareholders' equity					
Total changes during the year	—	(300)	9,488	(11)	9,176
Balance at end of the year	20,886	16,498	130,488	(289)	167,584

Year ended December 31, 2017	Accumulated other comprehensive income Unrealized holding gain on available-for-sale securities	Translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Non-controlling interests	Total net assets
Balance at beginning of the year	7,955	1,922	(296)	9,582	5,012	173,003
Changes during the year:						
Cash dividends						(3,422)
Net income attributable to owners of parent						12,911
Purchase of treasury stock						(11)
Gain on sales of treasury stock						0
Change in ownership interest of parent due to transactions with non-controlling interests						(300)
Net changes in items other than shareholders' equity	5,127	(38)	369	5,458	(150)	5,308
Total changes during the year	5,127	(38)	369	5,458	(150)	14,484
Balance at end of the year	13,082	1,884	73	15,040	4,862	187,487

See accompanying notes to consolidated financial statements.

iv) [Consolidated Statements of Cash Flows]

		(Millions of yen)
Years ended December 31,	2016	2017
Operating activities		
Income before income taxes	20,696	18,695
Depreciation and amortization	7,965	7,944
Impairment losses on property, plant and equipment	19	205
Amortization of goodwill	9	—
Decrease in allowance for doubtful receivables	(3)	1
Increase (decrease) in other provisions	1	(1)
Increase in net defined benefit asset	(232)	(172)
Increase (decrease) in net defined benefit liability	(2)	4
Interest and dividend income	(820)	(818)
Interest expense	101	96
Foreign currency exchange gain	46	(17)
Gain on sales of investment securities	(619)	(446)
Equity in earnings of affiliates	(337)	(338)
Gain on sales of non-current assets	(3,685)	(369)
Subsidy income	(10)	(37)
Loss on disposal of non-current assets	535	444
Decrease (increase) in receivables	(1,652)	(2,282)
Decrease (increase) in inventories	1,784	(1,841)
Increase (decrease) in payables	596	1,416
Other, net	861	(1,105)
Subtotal	25,250	21,378
Interest and dividends received	1,087	1,253
Interest paid	(101)	(94)
Subsidy income received	90	37
Income taxes paid	(4,338)	(7,407)
Net cash provided by operating activities	21,989	15,166
Investing activities		
Increase in time deposits	(6,857)	(6,842)
Net decrease (increase) in securities	(9,000)	(9,000)
Purchases of investment securities	(10)	(1,016)
Proceeds from sales of investment securities	822	589
Purchases of property, plant and equipment	(6,348)	(6,388)
Proceeds from sales of property, plant and equipment	4,566	336
Other, net	(846)	(865)
Net cash used in investing activities	(17,673)	(23,186)

See accompanying notes to consolidated financial statements.

(Millions of yen)

Years ended December 31,		2016		2017
Financing activities				
Repayment of long-term debt		(386)		(158)
Proceeds from sales of treasury stock		0		0
Purchases of treasury stock		(8)		(11)
Repayment of lease obligations		(66)		(59)
Cash dividends to shareholders		(3,284)		(3,421)
Cash dividends paid to non-controlling interests		(194)		(397)
Net cash used in financing activities		(3,939)		(4,047)
Effect of exchange rate changes on cash and cash equivalents		(122)		(27)
Net increase (decrease) in cash and cash equivalents		254		(12,095)
Cash and cash equivalents at beginning of the year		53,977		54,231
Cash and cash equivalents at end of the year	*1	54,231	*1	42,136

See accompanying notes to consolidated financial statements.

[Notes]

(Basis for Preparation of Consolidated Financial Statements)

1. Scope of consolidation

(1) Consolidated subsidiaries: 20
Consolidated subsidiaries are shown in "4. Information on Subsidiaries and Affiliates" under "I. Overview of the Company."

(2) Unconsolidated subsidiaries: 3
A major unconsolidated subsidiary is Toa Kenso Co., Ltd.
The unconsolidated subsidiaries have an immaterial effect on the Company's consolidated financial statements as a whole in terms of the sum of total assets, the sum of net sales, the sum of net income/loss, and the sum of retained earnings.

2. Application of equity method

(1) Unconsolidated subsidiaries and affiliates which are accounted for by the equity method
Affiliates: 1　　Partnership: 1
Chubu Liquid Oxygen Co., Ltd.
Elmer's & Toagosei Co.

(2) Unconsolidated subsidiaries and affiliates which are not accounted for by the equity method
Unconsolidated subsidiaries: 3
Affiliates: 10
Toyo Denka Kogyo Co., Ltd.

(3) Reason for exclusion from application of equity method accounting:
Because the effect of their net income/loss and retained earnings on the Company's consolidated financial statements is immaterial and they are not important as a whole in accounting terms.

3. Fiscal year-end of consolidated subsidiaries
The fiscal year-end of consolidated subsidiaries is the same as the Company's consolidated fiscal year-end.

4. Accounting policies

(1) Basis and method for valuation of major assets

1) Securities
Available-for-sale securities
Marketable securities classified as available-for-sale securities
Marketable securities classified as available-for-sale securities are carried at fair value determined based on the average of quoted prices (or their equivalent) in the one-month period prior to the balance sheet date with changes in unrealized holding gain or loss, net of the applicable income taxes, included directly in net assets.
Non-marketable securities classified as available-for-sale securities
Non-marketable securities classified as available-for-sale securities are carried at cost. Cost of securities sold is determined by the moving average method.

2) Derivative
Derivative financial instruments are carried at fair value.

3) Inventories
Inventories are stated at the lower of cost or net selling value, cost being determined by the moving average method. (The balance sheet amounts are written down if there is any decrease in profitability.)

(2) Depreciation and amortization of major depreciable and amortizable assets

1) Property, plant and equipment (excluding leased assets)
Depreciation of property, plant and equipment is calculated by the straight-line method based on the estimated useful lives of the respective assets and their residual value.
The useful lives for major property, plant and equipment are as follows:

Buildings and structures	2–75 years
Machinery, equipment and other	2–17 years
Tools, furniture and fixtures	2–20 years

2) Intangible fixed assets (excluding leased assets)
Amortization of intangible fixed assets, primarily consisting of software, is calculated by the straight-line method based on the estimated useful lives of the respective assets in this category (5 years for software).

3) Leased assets (leased assets relating to finance lease transactions that do not transfer ownership)
Depreciation of leased assets shall be calculated based on the assumption that the useful lives equal the lease term and the residual value is zero.

(3) Posting standards for providing major allowance

1) Allowance for doubtful receivables
The allowance for bad debts and doubtful receivables in respect of individual bad debts is provided in an amount sufficient to cover credit losses based on the collectability of individual receivables. The allowance for receivables other than those described above is based on past credit loss experience.

2) Accrued bonuses for employees
Accrued bonuses for employees are provided at the estimated amounts expected to be paid to employees for one consolidated subsidiary.

(4) Accounting methods relating to retirement benefits

1) Periodic allocation of estimated retirement benefits
In calculating retirement benefit obligation, the benefit formula basis is applied for allocation of projected retirement benefit to the periods until the end of the current fiscal year.

2) Amortization of actuarial gain or loss and prior service costs
Actuarial gain or loss of the Company is amortized in the year following the year in which the gain or loss is recognized by the straight-line method over the average remaining years of service of the eligible employees (primarily 10 years) when incurred in each fiscal year.
Prior service costs are expensed using the straight-line method over the average remaining years of service of the eligible employees (primarily 10 years) when incurred.

3) Adoption of the simplified method in SMEs
In calculating net defined benefit liability and retirement benefit expenses, some consolidated subsidiaries adopt the simplified method where the projected benefit obligation is an estimated amount of retirement benefits, assuming that all employees terminate their services on the balance sheet date for their own convenience.

(5) Foreign currency translation

Receivables and payables in foreign currencies are translated into yen at the rates of exchange in effect at the balance sheet date, and the resulting translation gain or loss is charged or credited to income.

Assets and liabilities of the foreign consolidated subsidiaries are translated at the same exchange rates. Revenue and expense accounts of the foreign consolidated subsidiaries are translated at periodical average rates during the fiscal year. The resulting translation gain or loss is included in "Translation adjustments" and "Non-controlling interests" under "Net assets."

(6) Method and period for amortization of goodwill

Goodwill is amortized over a five-year period after the accrual date, with the exception of minor amounts charged or credited to income.

(7) Scope of funds in the consolidated statements of cash flows

Funds (cash and cash equivalents) in the consolidated statements of cash flows comprise cash on hand, bank deposits available for withdrawal on demand and readily available short-term investments with maturities of three months or less, which are exposed to minor risk of fluctuation in value.

(8) Other important items concerning the preparation of consolidated financial statements

Consumption taxes and others

Consumption taxes are excluded from the transaction accounts.

(Additional information)

Application of the implementation guidance on recoverability of deferred tax assets

The "Implementation Guidance on Recoverability of Deferred Tax Assets" (ASBJ Guidance No. 26 issued on March 28, 2016) has been applied, effective from the current fiscal year.

(Notes to Consolidated Balance Sheets)

*1. Components of inventories:

(Millions of yen)

December 31,	2016	2017
Merchandise and finished products (including semi-finished products)	9,583	10,625
Work in process	348	504
Raw materials and supplies	4,230	4,875
Total	14,162	16,005

*2. Investments in unconsolidated subsidiaries and affiliates were as follows:

(Millions of yen)

December 31,	2016	2017
Investment securities (stocks)	2,219	2,242
Other (investments and other assets)	228	100

*3. Assets pledged as collateral:

December 31, 2016

Assets pledged as collateral		
Classification	Book value (Millions of yen)	Type of security interests
Buildings and structures	6,208	Plant foundation
Machinery, equipment and other	5,504	ditto
Tools, furniture and fixtures	575	ditto
Land	4,136	ditto
Total	16,425	

(Note) The assets described above are pledged as collateral, but there are no corresponding secured obligations.

December 31, 2017

Assets pledged as collateral		
Classification	Book value (Millions of yen)	Type of security interests
Buildings and structures	6,259	Plant foundation
Machinery, equipment and other	6,905	ditto
Tools, furniture and fixtures	676	ditto
Land	4,136	ditto
Total	17,977	

(Note) The assets described above are pledged as collateral, but there are no corresponding secured obligations.

*4. Accumulated depreciation of property, plant and equipment:

December 31,	2016	2017
	(Millions of yen)	
	182,103	184,284

*5. Notes matured at the balance sheet date and cash settlement payable as of the balance sheet date (method of cash settlement payable at due date with the same terms as notes) are treated as if they were settled on the maturity date. Because the balance sheet date of the current fiscal year fell on a holiday for financial institutions, the notes matured and cash settlement payable at the balance sheet date were excluded from the balance as of the end of the current fiscal year.

(Millions of yen)

December 31,	2016	2017
Notes and accounts receivable	4,264	4,723
Notes and accounts payable	1,587	2,068
Other (Current liabilities)	379	616

6. Contingent liabilities and secured liabilities:

(Millions of yen)

December 31,		2016	2017
Employees	Guarantees against loans from financial institutions	234	241
Hokuriku Liquid Oxygen Co., Ltd.	ditto	1	—
Total		235	241

(Notes to Consolidated Statements of Income)

*1. Inventories as at the fiscal year-end represent the book value written-down due to a decrease in profitability. The following losses on devaluation of inventories were included in cost of sales (the amount stated is the amount after offset by reversal):

Years ended December 31,	2016	2017
	(Millions of yen)	
	(318)	19

*2. Major items of selling expenses:

(Millions of yen)

Years ended December 31,	2016	2017
Transportation expenses	7,708	8,077
Salaries	1,920	2,034
Bonuses	772	834
Retirement benefit expenses	139	158
Depreciation and amortization	134	149

*3. Major items of general and administrative expenses:

(Millions of yen)

Years ended December 31,	2016	2017
Salaries	2,279	2,333
Bonuses	1,078	1,150
Retirement benefit expenses	231	245
Depreciation and amortization	732	694
Amortization of goodwill	9	—

*4. Research and development cost included in general and administrative expenses and manufacturing cost:

(Millions of yen)

Years ended December 31,	2016	2017
	3,690	3,795

*5. Components of gain on sales of non-current assets:

(Millions of yen)

Years ended December 31,	2016	2017
Land	3,685	369

*6. Components of loss on disposal of non-current assets:

(Millions of yen)

Years ended December 31,	2016	2017
Machinery, equipment and other	55	16
Disposal costs	432	356
Buildings and structures, etc.	47	71

*7. Impairment loss:

Year ended December 31, 2016

The Company and its consolidated subsidiaries have recognized impairment losses on the following classes of assets:

Location	Major use	Category	Impairment loss (Millions of yen)
Tsukuba city, Ibaraki	Idle assets	Land and buildings	19

(Outline and grouping method)

The Company and its consolidated subsidiaries have grouped business-use assets according to the minimum independent cash-flow-generating unit and have grouped idle assets according to their respective units.

Because the Company sold the idle assets (land and buildings, etc.) that had not been utilized for business purposes, the Company wrote down the book values of the idle assets to their sales values. Accordingly, ¥19 million of impairment losses were recognized in the statement of income.

(Components of impairment loss)

The impairment losses consisted of ¥19 million for land and buildings.

(Calculation of recoverable amounts, etc.)

The recoverable amounts applicable to the assets for which impairment losses were recognized for the corresponding year ended December 31, 2016 were calculated using the sales value.

Year ended December 31, 2017

The Company and its consolidated subsidiaries have recognized impairment losses on the following classes of assets:

Location	Major use	Category	Impairment loss (Millions of yen)
Takaoka city, Toyama	Idle assets	Buildings	122
Takaishi city, Osaka	Facilities for manufacturing ethylene carbonate	Machinery, etc.	46
Minato-ku, Nagoya city	Facilities for manufacturing ethylene carbonate	Machinery, etc.	36
Total			205

(Outline and grouping method)

The Company and its consolidated subsidiaries have grouped business-use assets according to the minimum independent cash-flow-generating unit and have grouped idle assets according to their respective units.

The Company wrote down the book values of business-use assets that experienced drops in profitability to their respective recoverable amounts. In addition, the Company wrote down the book values of idle assets that the Company does not plan to use for specific purposes in the future to their respective recoverable amounts. Accordingly, ¥205 million of impairment losses were recognized in the statement of income.

(Components of impairment loss)

The impairment losses consisted of ¥123 million for buildings, ¥76 million for machinery, and ¥6 million for other.

(Calculation of recoverable amounts, etc.)

For business-use assets, the recoverable amounts applicable to assets for which impairment losses were recognized for the corresponding year ended December 31, 2017 were measured using the utility value, which was calculated by discounting future cash flows at 8.1%. For idle assets, the recoverable amounts were calculated using the net sales value based on real estate appraisal.

(Notes to Consolidated Statements of Comprehensive Income)

*1. Reclassification adjustment and tax effect of other comprehensive income:

Years ended December 31,	2016 (Millions of yen)	2017
Unrealized holding gain on available-for-sale securities		
Amount arising during the fiscal year	440	7,819
Reclassification adjustment	(619)	(446)
Amount before tax effect	(178)	7,373
Tax effect	236	(2,242)
Unrealized holding gain on available-for-sale securities	58	5,130
Translation adjustments		
Amount arising during the fiscal year	(338)	(6)
Amount before tax effect	(338)	(6)
Tax effect	—	—
Translation adjustments	(338)	(6)
Remeasurements of defined benefit plans, net of tax		
Amount arising during the fiscal year	(759)	385
Reclassification adjustment	83	146
Amount before tax effect	(676)	532
Tax effect	210	(162)
Remeasurements of defined benefit plans, net of tax	(466)	369
Total other comprehensive income	(746)	5,494

(Notes to Consolidated Statements of Changes in Net Assets)

Year ended December 31, 2016

1. Matters related to the type and total number of issued shares and the type and total number of shares of treasury stock:

(Thousands of shares)

Type of shares	Number of shares at beginning of the year	Increase in the number of shares in the year	Decrease in the number of shares in the year	Number of shares at end of the year
Issued shares				
Common stock	131,996	—	—	131,996
Total	131,996	—	—	131,996
Treasury stock				
Common stock (Notes 1, 2)	345	8	0	353
Total	345	8	0	353

(Notes) 1. The increase in the number of treasury stock (common stock) is due to purchase of less-than-one-unit shares.
2. The decrease in the number of treasury stock (common stock) is due to sales of less-than-one-unit shares.

2. Matters related to dividends

(1) Amount of dividends paid

Resolution	Type of shares	Gross amount (Millions of yen)	Dividend per share (Yen)	Record date	Effective date
March 30, 2016 103rd Annual Shareholders' Meeting	Common stock	1,579	12.00	December 31, 2015	March 31, 2016
July 29, 2016 Board of Directors	Common stock	1,711	13.00	June 30, 2016	September 6, 2016

(2) Dividends whose record date was in the year ended December 31, 2016 but whose effective date is in the year ending December 31, 2017

Resolution	Type of shares	Gross amount (Millions of yen)	Source of dividends	Dividend per share (Yen)	Record date	Effective date
March 30, 2017 104th Annual Shareholders' Meeting	Common stock	1,711	Retained earnings	13.00	December 31, 2016	March 31, 2017

Year ended December 31, 2017

1. Matters related to the type and total number of issued shares and the type and total number of shares of treasury stock:

(Thousands of shares)

Type of shares	Number of shares at beginning of the year	Increase in the number of shares in the year	Decrease in the number of shares in the year	Number of shares at end of the year
Issued shares				
Common stock	131,996	—	—	131,996
Total	131,996	—	—	131,996
Treasury stock				
Common stock (Notes 1, 2)	353	8	0	361
Total	353	8	0	361

(Notes) 1. The increase in the number of treasury stock (common stock) is due to purchase of less-than-one-unit shares.

2. The decrease in the number of treasury stock (common stock) is due to sales of less-than-one-unit shares.

2. Matters related to dividends

(1) Amount of dividends paid

Resolution	Type of shares	Gross amount (Millions of yen)	Dividend per share (Yen)	Record date	Effective date
March 30, 2017 104th Annual Shareholders' Meeting	Common stock	1,711	13.00	December 31, 2016	March 31, 2017
July 28, 2017 Board of Directors	Common stock	1,711	13.00	June 30, 2017	September 6, 2017

(2) Dividends whose record date was in the year ended December 31, 2017 but whose effective date is in the year ending December 31, 2018

Resolution	Type of shares	Gross amount (Millions of yen)	Source of dividends	Dividend per share (Yen)	Record date	Effective date
March 29, 2018 105th Annual Shareholders' Meeting	Common stock	1,711	Retained earnings	13.00	December 31, 2017	March 30, 2018

(Notes to Consolidated Statements of Cash Flows)

*1. Reconciliation of the balance of cash and cash equivalents in the consolidated statement of cash flows to cash and deposits included in the consolidated balance sheet:

Years ended December 31,	2016	2017
	(Millions of yen)	
Cash and deposits	28,966	29,636
Securities	44,000	47,000
Time deposits with terms in excess of 3 months	(9,734)	(16,499)
Negotiable certificate of deposit with terms in excess of 3 months	(9,000)	(18,000)
Cash and cash equivalents	54,231	42,136

(Lease Transactions)

1. Finance leases (lessee)

Finance lease transactions that do not transfer ownership

1) Leased assets

Property, plant and equipment

Consists of buildings and structures, machinery, equipment and other, and tools, furniture and fixtures

Intangible fixed assets

Software

2) Depreciation of leased assets

As described in "4. Accounting policies (2) Depreciation and amortization of major depreciable and amortizable assets."

2. Operating leases

Future minimum lease payments under noncancelable operating leases:

(Millions of yen)

December 31,	2016	2017
Due within one year	20	20
Due after one year	4	3
Total	25	24

(Impairment loss)

No impairment loss is allocated to leased assets.

(Financial Instruments)

1. Matters related to the status of financial instruments

(1) Policies on financial instruments

When managing surplus funds, the Group limits the application of such funds to highly secure financial assets, mainly short-term bank deposits, and it procures funds mainly through bank borrowings. Derivative transactions are used to hedge interest fluctuation risk present in borrowings, but are not used for speculative or trading purposes.

(2) Description of financial instruments and associated risks

Notes and accounts receivable, which represent trade receivables, are exposed to client-based credit risk. Furthermore, foreign currency denominated trade receivables are also subject to exchange rate fluctuation risks. In order to counter such risk, foreign currency borrowings are used when necessary as a means of hedging the net position of foreign currency denominated trade payables. Securities and investment securities are primarily negotiable certificate of deposits, held-to-maturity securities and shares related to businesses, and are thus exposed to risk stemming from fluctuations in market value.

Notes and accounts payable, which represent trade payables, are due within one year. A portion of these are foreign currency denominated items related to payment for raw material imports, which are subject to exchange rate fluctuation risk. These are constantly maintained within the balance of receivables denominated in the same foreign currencies. Borrowings are used to procure funds necessary for operational transactions and capital expenditures. A portion of these borrowings bearing variable interest rates are exposed to interest rate fluctuation risk. Derivative transactions (interest rate swap transactions) are used as a means of hedging.

(3) Risk management systems related to financial instruments

1) Management of credit risk (risk associated with non-performance of a contract by a business partner etc.)

The departments in charge of Company operations regularly monitor the trade receivable status of all business partners in accordance with the Regulations on Selling in order to identify business partner-based credit risk associated with the deterioration of financial circumstances or other causes at an early stage and reduce it. In case of the consolidated subsidiaries, their divisions or accounting departments also manage the financial and credit status of their business partners pursuant to their own regulations. Derivative transactions are entered into only with highly rated financial institutions.

The maximum credit risk value as of the date of closing of consolidated accounts for the current term is expressed by the value of financial assets in the consolidated balance sheet which are subject to credit risk.

2) Management of market risk (risk associated with exchange rate and interest rate fluctuations)

When necessary, the Company uses borrowings denominated in foreign currencies to hedge its foreign currency denominated trade receivables and trade payables. Interest rate swaps are used to reduce risk associated with fluctuations in interest expenses related to borrowings.

The Company regularly confirms the fair value of securities and investment securities and the financial condition of the issuers (its business partners) and continually reviews its shareholdings with a view to maintaining and strengthening comprehensive relations with its business partners and in consideration of the economic rationality of holding their shares.

Derivative transactions are executed and managed in accordance with internal regulations that stipulate transaction authority.

3) Management of liquidity risk associated with procuring funds (the risk of being unable to execute a payment on the due date)

The Company and its consolidated subsidiaries have formulated cash flow management plans and manage liquidity risk by, for example, keeping a certain amount of cash reserves on hand.

(4) Supplementary information regarding the fair value of financial instruments

The fair value of financial instruments consists of their market price-based value, and, if a market price is not available, their logically calculated value. Variable factors are incorporated into the calculations of the fair value, and different fair values are possible depending on the differing assumptions used.

2. Fair value of financial instruments

The fair value and carrying value of financial instruments and the difference between both values are shown below. Financial instruments whose fair value is extremely difficult to determine, are not included in the table below. (Please refer to Note 2.)

(Millions of yen)

December 31, 2016	Carrying value	Fair value	Difference
(1) Cash and deposits	28,966	28,966	—
(2) Notes and accounts receivable	40,302	40,302	—
(3) Securities and investment securities:			
Available-for-sale securities	68,002	68,002	—
Total assets	137,271	137,271	—
(1) Notes and accounts payable	13,729	13,729	—
(2) Short-term bank loans	2,502	2,502	—
(3) Long-term debt	9,805	9,955	150
Total liabilities	26,037	26,188	150

(Millions of yen)

December 31, 2017	Carrying value	Fair value	Difference
(1) Cash and deposits	29,636	29,636	—
(2) Notes and accounts receivable	42,583	42,583	—
(3) Securities and investment securities:			
Available-for-sale securities	79,280	79,280	—
Total assets	151,500	151,500	—
(1) Notes and accounts payable	15,149	15,149	—
(2) Short-term bank loans	6,503	6,503	—
(3) Long-term debt	5,647	5,750	103
Total liabilities	27,299	27,402	103

(Note 1)
Valuation method of financial instruments and matters related to securities

Assets

(1) Cash and cash equivalents, and (2) Notes and accounts receivable

As all of these are settled within a short span of time, the fair value is virtually identical to the carrying value. Therefore, the carrying value is used.

(3) Securities and investment securities

In the case of the fair value of securities and investment securities, shares are stated at the exchange-listed price and securities are stated at the exchange-listed price or the price quoted by the correspondent financial institution. In the case of those available-for-sale securities which are settled within a short span of time, the fair value is virtually identical to the carrying value. Therefore, the carrying value is used. With regard to notes to securities by purpose of holding, please refer to the note entitled “Securities.”

Liabilities

(1) Notes and accounts payable, and (2) Short-term bank loans

As all of these are settled within a short span of time, the fair value is virtually identical to the carrying value. Therefore, the carrying value is used.

(3) Long-term debt

The fair value of long-term debt is calculated as the present value by discounting the total principal and interest on the borrowings by the interest rate which would be assumed if new, similar borrowings were made.

(Note 2)
Financial instruments whose fair value is extremely difficult to determine:

(Millions of yen)

December 31,	2016	2017
Investments in subsidiaries and affiliates		
Investments in unconsolidated subsidiaries and affiliates	2,219	2,242
Available-for-sale securities:		
Unlisted securities	761	715
Total	2,981	2,958

It is extremely difficult to determine the fair value of these items, as they do not have market prices and future cash flow cannot be estimated. Therefore, they are not included in “Assets: (3) Securities and investment securities.”

(Note 3)
The redemption schedule for monetary claims, held-to-maturity securities and available-for-sale securities with maturities subsequent to the consolidated balance sheet date:

(Millions of yen)

December 31, 2016	1 year or less	Over 1 year to 5 years	Over 5 years to 10 years	Over 10 years
Cash equivalents	28,960	—	—	—
Notes and accounts receivable	40,302	—	—	—
Securities and investment securities:				
Available-for-sale securities with maturities (negotiable certificate of deposit)	44,000	—	—	—
Total	113,263	—	—	—

(Millions of yen)

December 31, 2017	1 year or less	Over 1 year to 5 years	Over 5 years to 10 years	Over 10 years
Cash equivalents	29,630	—	—	—
Notes and accounts receivable	42,583	—	—	—
Securities and investment securities:				
Available-for-sale securities with maturities (negotiable certificate of deposit)	47,000	—	—	—
Total	119,213	—	—	—

(Note 4)
The repayment schedule for long-term debt, lease obligations, and other interest-bearing debt subsequent to the consolidated balance sheet date:

(Millions of yen)

December 31, 2016	1 year or less	Over 1 year to 2 years	Over 2 years to 3 years	Over 3 years to 4 years	Over 4 years to 5 years	Over 5 years
Short-term bank loans	2,344	—	—	—	—	—
Long-term debt	158	4,158	158	158	4,558	773
Lease obligations	55	34	23	14	6	2
Total	2,558	4,192	181	172	4,564	775

(Millions of yen)

December 31, 2017	1 year or less	Over 1 year to 2 years	Over 2 years to 3 years	Over 3 years to 4 years	Over 4 years to 5 years	Over 5 years
Short-term bank loans	2,345	—	—	—	—	—
Long-term debt	4,158	158	158	4,558	143	630
Lease obligations	49	37	28	15	4	1
Total	6,552	195	186	4,573	147	631

(Securities)
1. Marketable securities classified as available-for-sale securities:

(Millions of yen)

December 31, 2016	Type	Carrying value	Acquisition cost	Unrealized gain (loss)
Securities whose carrying value exceeds their acquisition cost	(1) Stock	22,329	11,022	11,307
Securities whose acquisition cost exceeds their carrying value	(1) Stock	1,672	1,709	(37)
	(2) Other	44,000	44,000	—
	Subtotal	45,672	45,709	(37)
Total		68,002	56,732	11,270

(Millions of yen)

December 31, 2017	Type	Carrying value	Acquisition cost	Unrealized gain (loss)
Securities whose carrying value exceeds their acquisition cost	(1) Stock	31,652	12,941	18,710
Securities whose acquisition cost exceeds their carrying value	(1) Stock	627	695	(67)
	(2) Other	47,000	47,000	—
	Subtotal	47,627	47,695	(67)
Total		79,280	60,637	18,643

2. Marketable securities classified as available-for-sale securities sold during the fiscal year ended:

December 31, 2016 (Millions of yen)

Classification	Sales amount	Total gain on sales	Total loss on sales
Stock	822	619	—

December 31, 2017 (Millions of yen)

Classification	Sales amount	Total gain on sales	Total loss on sales
Stock	589	446	—

3. Other securities for which impairment loss was recognized:
No impairment loss on investment securities was recognized for the current fiscal year.
In the accounting for impairment, an impairment loss is recognized for all securities of which the fair values as of the consolidated balance sheet date decline more than 50% from the acquisition cost, and at an amount deemed necessary for securities of which the fair values as of the same date decline between 30% and 50% in consideration of recoverability and other factors.

(Retirement Benefit Plans)

1. Outline of adopted retirement benefit plans for employees
The Company and its consolidated subsidiaries adopt a defined benefit plan and a defined contribution plan, either funded or unfunded, to provide for retirement benefits for employees.
Under defined benefit corporate pension plans (all the plans are funded), a lump-sum or annuity is paid based on accumulated points according to a qualification grade.
Under defined contribution pension plans, a premium calculated by the qualification grade is expensed when contributed.
Under retirement lump-sum payment plans (consisting of funded plans and unfunded plans), salaries and lump-sum payments based on length of service are paid as retirement benefits.
In addition, under the retirement lump-sum payment plans adopted by some of the consolidated subsidiaries, net defined benefit liability and retirement benefit expenses are calculated in accordance with the simplified plan.

2. Defined benefit plan
(1) Reconciliation of opening and closing balance of retirement benefit obligation (excluding plans using the simplified method)

(Millions of yen)

Years ended December 31,	2016	2017
Balance of retirement benefit obligation at beginning of year	10,164	11,266
Service cost	491	543
Interest cost	58	—
Actuarial gain or loss	761	4
Retirement benefits paid	(211)	(448)
Balance of retirement benefit obligation at end of year	11,266	11,365

(2) Reconciliation of opening and closing balance of plan assets (excluding plans using the simplified method)

(Millions of yen)

Years ended December 31,	2016	2017
Balance of plan assets at beginning of year	11,837	12,495
Expected return on plan assets	118	124
Actuarial gain or loss	2	390
Contribution from employer	748	737
Retirement benefits paid	(211)	(448)
Balance of plan assets at end of year	12,495	13,300

(3) Reconciliation of opening and closing balance of net defined benefit liability under the plans using the simplified method

(Millions of yen)

Years ended December 31,	2016	2017
Balance of net defined benefit liability at beginning of year	160	158
Retirement benefit expenses	12	14
Retirement benefits paid	(10)	(7)
Contribution to plan	(4)	(2)
Other	(1)	0
Balance of net defined benefit liability at end of year	158	162

(4) Reconciliation of the ending balance of retirement benefit obligations and plan assets and the net defined benefit liability and the net defined benefit asset included in the consolidated balance sheets

(Millions of yen)

December 31,	2016	2017
Funded retirement benefit obligations	11,484	11,576
Plan assets	(12,608)	(13,404)
	(1,124)	(1,828)
Unfunded projected benefit obligations	52	56
Net amount of relevant liabilities and assets on the consolidated balance sheets	(1,071)	(1,772)
Net defined benefit liability	158	162
Net defined benefit asset	(1,229)	(1,934)
Net amount of relevant liabilities and assets on the consolidated balance sheets	(1,071)	(1,772)

(Note) Includes the plans using the simplified method.

(5) Retirement benefit expenses and components thereof

(Millions of yen)

Years ended December 31,	2016	2017
Service cost	491	543
Interest cost	58	—
Expected return on plan assets	(118)	(124)
Amortization of actuarial gain or loss	136	199
Amortization of prior service cost	(53)	(53)
Retirement benefit expenses calculated using the simplified method	12	14
Retirement benefit expenses related to the defined benefit plan	528	579

(6) Remeasurements of defined benefit plans, net of tax

The components of items (before tax) reported under remeasurements of the defined benefit plans, net of tax were as follows:

(Millions of yen)

Years ended December 31,	2016	2017
Prior service cost	(53)	(53)
Actuarial gain or loss	(623)	585
Total	(676)	532

(7) Remeasurements of defined benefit plans

The components of items (before tax) reported under remeasurements of the defined benefit plans were as follows:

(Millions of yen)

December 31,	2016	2017
Unrecognized prior service cost	(572)	(519)
Unrecognized actuarial gain or loss	998	413
Total	426	(105)

(8) Matters regarding plan assets

1) Major components of the plan assets

The percentages of the major asset types accounting for the total plan assets were as follows:

December 31,	2016	2017
Bonds	37.3%	37.5%
Stocks	19.5	19.8
General accounts of life insurance companies	38.4	37.4
Other	4.8	5.3
Total	100.0	100.0

2) Method for setting the long-term rate of the expected return on plan assets

To determine the long-term rate of the expected return on plan assets, we take into account the current and projected distribution of plan assets and the current and anticipated long-term yield rates of the various assets that constitute the plan assets.

(9) Matters regarding the assumptions for actuarial calculations

Key assumptions for actuarial calculations (representing weighted averages)

Years ended December 31,	2016	2017
Discount rate	0.0%	0.0%
Long-term rate of the expected return on plan assets	1.0	1.0

3. Defined contribution plan

The amounts required to be contributed by the Company and consolidated subsidiaries are ¥298 million for the previous fiscal year and ¥297 million for the current fiscal year.

(Stock Options, etc.)

Not applicable.

(Tax Effect Accounting)

1. Significant components of deferred tax assets and liabilities:

(Millions of yen)

December 31,	2016	2017
Deferred tax assets		
Elimination of unrealized profit	1,429	1,417
Accrued costs of removing facilities	682	618
Depreciation	556	531
Impairment loss on property, plant and equipment	551	408
Net operating loss carry forwards	394	353
Loss on valuation of investment securities	324	323
Accrued enterprise tax	299	146
Valuation loss on inventories	81	90
Net defined benefit liability	48	49
Loss on valuation of golf club membership	41	41
Other	453	343
Gross deferred tax assets	4,862	4,325
Valuation allowance	(1,850)	(1,729)
Total deferred tax assets	3,012	2,596
Deferred tax liabilities		
Unrealized holding gain on available-for-sale securities	(3,308)	(5,550)
Reserve for reduction entry	(1,042)	(958)
Net defined benefit asset	(374)	(589)
Securities returned from retirement benefit trust	(221)	(221)
Undistributed earnings of overseas partnerships	(316)	(214)
Reserve for special account for reduction entry	—	(78)
Other	(19)	(23)
Total deferred tax liabilities	(5,282)	(7,635)
Net deferred tax assets (liability)	(2,270)	(5,039)

2. Major reasons for which the effective tax rates reflected in the consolidated statements of income differ from the statutory tax rates:

December 31,	2016	2017
Statutory tax rate	32.88%	30.70%
Effect of:		
Permanent difference – entertainment expenses	0.21	0.22
Permanent difference – dividend income	(0.41)	(0.32)
Inhabitants' per capita taxes	0.36	0.41
Amortization of goodwill	0.01	—
Equity in earnings of affiliates	(0.54)	(0.56)
Valuation allowance	0.20	(0.00)
Different tax rates applied to income of foreign consolidated subsidiaries	0.04	(0.36)
Tax deduction of experiment and research expenses	(1.04)	(1.19)
Other, net	(0.43)	0.22
Effective tax rates.	31.28	29.13

(Asset Retirement Obligations)
Not applicable.

(Rental properties, etc.)
Disclosure on rental properties, etc. is not required because rental properties, etc. are not significant in the Group.

(Segment Information, etc.)
[Segment Information]
1. Outline of Reportable Segments
(1) Methods for Determining Reportable Segments

The reportable segments of the Company and its consolidated subsidiaries are defined as operating segments for which discrete financial information is available and reviewed by the Board of Directors regularly in order to make decisions about resources to be allocated to individual segments and assess performance.

Group operating divisions are organized based on products and services and the operating divisions are responsible for comprehensive domestic and overseas comprehensive plans as to the products and services. The five reportable segments of the Company are “Commodity Chemicals,” “Polymer & Oligomer,” “Adhesive Material,” “Performance Chemicals,” and “Plastics” based on similarity of economic characteristics, and nature of products and services.

(2) Major products attributable to each reportable segment

Reportable segment	Major products
Commodity Chemicals	Caustic soda, caustic potash, sodium hypochlorite and other electrolytic products, sulfuric acid, industrial gases, acrylic acids, acrylate esters and other acrylic monomers
Polymer & Oligomer	Acrylic polymers, polymer flocculants, UV-Curable Resins and other acrylic oligomers, etc.
Adhesive Material	Instant glues, functional adhesives, etc.
Performance Chemicals	High purity inorganic chemicals, inorganic functional materials, etc.
Plastics	Piping equipment products, products for construction and civil engineering, nursing care products, elastomer, etc.

(3) Changes in reportable segments, etc.

The Company previously classified its businesses into four reportable segments, namely, Commodity Chemicals, Acrylic Products, Specialty Chemicals, and Plastics. Effective from the reporting term, reportable segments are reclassified into five segments, namely, Commodity Chemicals, Polymer & Oligomer, Adhesive Material, Performance Chemicals, and Plastics. This reclassification reflects organizational reforms implemented on January 1, 2017 with a view to promoting the strategy set forth under Trajectory Toward Growth 2019, the medium-term management plan started from the reporting term. This reclassification has also been arranged to appropriately show the actual condition of the Group’s business administration.

Segment information for the previous fiscal year has been prepared in accordance with the classification of reportable segments after the change.

2. Method of calculating net sales, income and loss, assets, liabilities and others

The accounting method applied to the reportable segments is the same as described in “Basis for Preparation of Consolidated Financial Statements.”

Segment income of the reportable segments is based on operating income.

Intersegment sales or transfer amounts are determined chiefly on the basis of market prices.

3. Information about the amounts of net sales, profit (loss), assets and other items for each reportable segment

(Millions of yen)

Year ended December 31, 2016	Reportable segments						Others (Note 1)	Total	Adjustments (Note 2)	Consolidated (Note 3)
	Commodity Chemicals	Polymer & Oligomer	Adhesive Material	Performance Chemicals	Plastics	Total				
Sales										
Sales to third parties	60,707	26,715	11,648	6,706	26,447	132,225	3,156	135,382	—	135,382
Intersegment sales	3,090	1,351	499	231	0	5,172	7,074	12,247	(12,247)	—
Net sales	63,798	28,066	12,147	6,937	26,448	137,398	10,231	147,630	(12,247)	135,382
Segment income	4,652	4,595	2,852	1,784	2,038	15,923	209	16,132	14	16,147
Segment assets	56,984	21,814	11,832	6,327	43,241	140,201	1,828	142,029	77,491	219,520
Other items										
Depreciation	4,485	836	400	458	1,114	7,296	90	7,386	578	7,965
Amortization of goodwill	—	—	9	—	—	9	—	9	—	9
Investment in associates accounted for using equity method	688	—	228	—	—	917	—	917	—	917
Increase in tangible and intangible fixed assets	1,515	1,425	247	844	946	4,980	17	4,997	361	5,359

(Notes)
1. The Others segment includes business operations relative to research and development, transportation and trading firm business.
2. “Adjustments” were as follows:
   (1) The adjustments to segment income include intersegment eliminations.
   (2) The adjustments to segment assets include corporate assets of ¥109,753 million that are not allocated to any reportable segments, and intersegment eliminations.
   (3) The adjustments to depreciation include mainly corporate expenses that are not allocated to any reportable segments.
   (4) The adjustments to increase in tangible and intangible fixed assets include mainly capital investment in corporate assets that are not allocated to any reportable segments.
3. Segment income is reconciled with operating income on the consolidated statements of income.
4. Depreciation in the table above includes amortization of long-term prepaid expense.

(Millions of yen)

Year ended December 31, 2017	Reportable segments						Others (Note 1)	Total	Adjustments (Note 2)	Consolidated (Note 3)
	Commodity Chemicals	Polymer & Oligomer	Adhesive Material	Performance Chemicals	Plastics	Total				
Sales										
Sales to third parties	66,630	28,096	12,010	7,791	26,828	141,358	3,350	144,708	—	144,708
Intersegment sales	3,223	1,339	478	42	19	5,104	7,115	12,219	(12,219)	—
Net sales	69,853	29,436	12,489	7,834	26,848	146,462	10,465	156,927	(12,219)	144,708
Segment income	5,795	4,429	2,659	2,397	1,946	17,228	218	17,446	6	17,453
Segment assets	59,442	24,057	12,007	6,773	43,842	146,124	1,511	147,636	91,702	239,338
Other items										
Depreciation	4,421	912	413	456	1,093	7,297	70	7,367	577	7,944
Amortization of goodwill	—	—	—	—	—	—	—	—	—	—
Investment in associates accounted for using equity method	712	—	100	—	—	812	—	812	—	812
Increase in tangible and intangible fixed assets	3,389	3,123	408	395	2,481	9,798	80	9,879	342	10,221

(Notes)
1. The Others segment includes business operations relative to research and development, transportation and trading firm business.
2. "Adjustments" were as follows:
   (1) The adjustments to segment income include intersegment eliminations.
   (2) The adjustments to segment assets include corporate assets of ¥122,981 million that are not allocated to any reportable segments, and intersegment eliminations.
   (3) The adjustments to depreciation include mainly corporate expenses that are not allocated to any reportable segments.
   (4) The adjustments to increase in tangible and intangible fixed assets include mainly capital investment in corporate assets that are not allocated to any reportable segments.
3. Segment income is reconciled with operating income on the consolidated statements of income.
4. Depreciation in the table above includes amortization of long-term prepaid expense.

[Related Information]

Year ended December 31, 2016
1. Information related to geographic region
(1) Net sales

(Millions of yen)

Japan	Asia	North America	Other	Total
113,720	16,248	2,878	2,535	135,382

(Note) Net sales are classified into countries and regions based on geographic location of the customer.

(2) Information related to property, plant and equipment
This information is not required to be disclosed because the amount of property, plant and equipment in Japan exceeded 90% of the amount on the consolidated balance sheet.

2. Information on major customer
This information is not required to be disclosed because net sales to any particular customer are less than 10% of the net sales on the consolidated statements of income.

Year ended December 31, 2017
1. Information related to geographic region
(1) Net sales

(Millions of yen)

Japan	Asia	North America	Other	Total
120,472	18,277	3,057	2,900	144,708

(Note) Net sales are classified into countries and regions based on geographic location of the customer.

(2) Information related to property, plant and equipment
This information is not required to be disclosed because the amount of property, plant and equipment in Japan exceeded 90% of the amount on the consolidated balance sheet.

2. Information on major customer
This information is not required to be disclosed because net sales to any particular customer are less than 10% of the net sales on the consolidated statements of income.

[Impairment loss on non-current assets by reportable segment]

Year ended December 31, 2016 (Millions of yen)

Commodity Chemicals	Polymer & Oligomer	Adhesive Material	Performance Chemicals	Plastics	Others	Adjustment	Total
—	—	—	—	—	—	19	19

(Note) ¥19 million of adjustment of impairment loss was recorded for land and buildings of idle assets.

Year ended December 31, 2017 (Millions of yen)

Commodity Chemicals	Polymer & Oligomer	Adhesive Material	Performance Chemicals	Plastics	Others	Adjustment	Total
82	—	—	—	—	—	122	205

(Note) ¥122 million of adjustment of impairment loss was recorded for buildings of idle assets.

[Balance of goodwill by reportable segment]

Year ended December 31, 2016 (Millions of yen)

Commodity Chemicals	Polymer & Oligomer	Adhesive Material	Performance Chemicals	Plastics	Others	Adjustment	Total
—	—	—	—	—	—	—	—

(Note) The amounts of amortization of goodwill are not required to be disclosed because the relevant amounts are disclosed in “Segment Information.”

Year ended December 31, 2017
Not applicable.

[Gain on negative goodwill by reportable segment]
Not applicable.

[Related party information]
Not applicable.

(Per Share Information)

Years ended December 31,	2016	2017 (Yen)
Net assets per share	1,276.10	1,387.36
Net income per share	104.83	98.08

(Notes)

1. Diluted net income per share is not disclosed because no potential shares exist.
2. The basis for calculation of "net income per share" is as follows:

Years ended December 31,	2016	2017
Net income per share		
Net income attributable to owners of parent (Millions of yen)	13,801	12,911
Amounts not belonging to shareholders of common stock (Millions of yen)	—	—
Net income attributable to owners of parent relating to common stock (Millions of yen)	13,801	12,911
Average number of common shares during the fiscal year (Thousands of shares)	131,647	131,639

3. The basis for calculation of "net assets per share" is as follows:

December 31,	2016	2017
Total amount of net assets (Millions of yen)	173,003	187,487
Amount deducted from the total amount of net assets (Millions of yen)	5,012	4,862
(including non-controlling interests)	(5,012)	(4,862)
Amount of net assets at the end of the fiscal year attributable to common stock (Millions of yen)	167,990	182,624
Number of common shares used for calculating net assets per share (Thousands of shares)	131,643	131,634

(Subsequent Events)
Not applicable.

v) [Supplementary Financial Schedules]

[Schedule of bonds and debentures]
Not applicable.

[Schedule of borrowings, etc.]

Classification	Beginning balance (Millions of yen)	Ending balance (Millions of yen)	Average interest rate (%)	Due date of repayment
Short-term bank loans	2,344	2,345	0.478	—
Long-term debt scheduled to be repaid within one year	158	4,158	0.640	—
Lease obligations scheduled to be repaid within one year	55	49	—	—
Long-term debt (excluding debt scheduled to be repaid within one year)	9,805	5,647	0.776	From 2019 to 2027
Lease obligations (excluding obligations scheduled to be repaid within one year)	81	88	—	From 2019 to 2025
Other interest-bearing debt	—	—	—	—
Total	12,445	12,287	—	—

(Notes)
1. “Average interest rate” presents the weighted average interest rate against the term-end balance of borrowings.
2. “Average interest rate” for lease obligations is not required to be disclosed because lease obligations are stated in the consolidated balance sheets in the amount before deducting the amount equivalent to related interest expenses, which are included in the total lease payments.
3. The projected repayment amounts of long-term debt and lease obligations (excluding debt and obligations scheduled to be repaid within one year) within five years after the consolidated balance sheet date are as follows.

(Millions of yen)

	Over 1 year to 2 years	Over 2 years to 3 years	Over 3 years to 4 years	Over 4 years to 5 years
Long-term debt	158	158	4,558	143
Lease obligations	37	28	15	4

[Schedule of asset retirement obligations]
Not applicable.

(2) [Other]

Quarterly data for the current fiscal year ended December 31, 2017

Cumulative periods	First quarter (From January 1 to March 31, 2017)	Second quarter (From January 1 to June 30, 2017)	Third quarter (From January 1 to September 30, 2017)	Current fiscal year (From January 1 to December 31, 2017)
Net sales (Millions of yen)	35,198	70,743	106,580	144,708
Income before income taxes (Millions of yen)	5,221	9,609	14,346	18,695
Net income attributable to owners of parent (Millions of yen)	3,546	6,584	9,862	12,911
Net income per share (Yen)	26.94	50.02	74.92	98.08

Accounting period	First quarter (From January 1 to March 31, 2017)	Second quarter (From April 1 to June 30, 2017)	Third quarter (From July 1 to September 30, 2017)	Fourth quarter (From October 1 to December 31, 2017)
Net income per share (Yen)	26.94	23.08	24.90	23.16