



stocklight.com > [Stocks](#) > [United States](#)
[The Boeing](#) > [Annual Reports](#) > 2020 Annual Report



The Boeing Annual Report 2020

Form 10-K (NYSE:BA)

Published: January 31st, 2020

Brought to you by





The Boeing (BA) Historical Annual Reports 2003-2024

Year	Report	Size
2024	 The Boeing (BA) 10-K Annual Report - Jan 31st, 2024	909kb
2023	 The Boeing (BA) 10-K Annual Report - Jan 27th, 2023	925kb
2022	 The Boeing (BA) 10-K Annual Report - Jan 31st, 2022	192kb
2021	 The Boeing (BA) 10-K Annual Report - Feb 1st, 2021	191kb
2019	 The Boeing (BA) 10-K Annual Report - Feb 8th, 2019	217kb
2018	 The Boeing (BA) 10-K Annual Report - Feb 12th, 2018	217kb
2017	 The Boeing (BA) 10-K Annual Report - Feb 10th, 2017	173kb
2017	 The Boeing (BA) 10-K Annual Report - Feb 8th, 2017	193kb
2016	 The Boeing (BA) 10-K Annual Report - Feb 10th, 2016	1.2mb
2015	 The Boeing (BA) 10-K Annual Report - Feb 12th, 2015	190kb
2014	 The Boeing (BA) 10-K Annual Report - Feb 14th, 2014	191kb
2013	 The Boeing (BA) 10-K Annual Report - Feb 11th, 2013	193kb
2012	 The Boeing (BA) 10-K Annual Report - Feb 9th, 2012	737kb
2011	 The Boeing (BA) 10-K Annual Report - Feb 9th, 2011	736kb
2010	 The Boeing (BA) 10-K Annual Report - Feb 8th, 2010	736kb
2009	 The Boeing (BA) 10-K Annual Report - Feb 9th, 2009	719kb
2008	 The Boeing (BA) 10-K Annual Report - Feb 15th, 2008	779kb
2007	 The Boeing (BA) 10-K Annual Report - Feb 16th, 2007	786kb
2006	 The Boeing (BA) 10-K Annual Report - Feb 28th, 2006	857kb
2005	 The Boeing (BA) 10-K Annual Report - Feb 28th, 2005	951kb
2004	 The Boeing (BA) 10-K Annual Report - Mar 12th, 2004	163kb
2004	 The Boeing (BA) 10-K Annual Report - Mar 5th, 2004	746kb
2003	 The Boeing (BA) 10-K Annual Report - Feb 27th, 2003	586kb



UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2019
or

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

For the transition period from _____ to _____
Commission file number **1-442**

THE BOEING COMPANY

(Exact name of registrant as specified in its charter)

Delaware

91-0425694

(State or other jurisdiction of
incorporation or organization)

(I.R.S. Employer Identification No.)

100 N. Riverside Plaza, Chicago, IL

60606-1596

(Address of principal executive offices)

(Zip Code)

Registrant's telephone number, including area code (312)-544-2000

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

Common Stock, \$5.00 Par Value

BA

New York Stock Exchange

(Title of each class)

(Trading Symbol)

(Name of each exchange on which registered)

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. Yes ☒ No ☐
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer ☒

Accelerated filer ☐

Non-accelerated filer ☐

Smaller reporting company ☐

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of June 30, 2019, there were 562,702,606 common shares outstanding held by nonaffiliates of the registrant, and the aggregate market value of the common shares (based upon the closing price of these shares on the New York Stock Exchange) was approximately \$204.8 billion.

The number of shares of the registrant's common stock outstanding as of January 24, 2020 was 563,152,208.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates information by reference to the registrant's definitive proxy statement, to be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2019.

THE BOEING COMPANY
Index to the Form 10-K
For the Fiscal Year Ended December 31, 2019

<u>PART I</u>		<i>Page</i>
	<u>Item 1. Business</u>	<u>1</u>
	<u>Item 1A. Risk Factors</u>	<u>5</u>
	<u>Item 1B. Unresolved Staff Comments</u>	<u>15</u>
	<u>Item 2. Properties</u>	<u>15</u>
	<u>Item 3. Legal Proceedings</u>	<u>16</u>
	<u>Item 4. Mine Safety Disclosures</u>	<u>16</u>
<u>PART II</u>		
	<u>Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities</u>	<u>17</u>
	<u>Item 6. Selected Financial Data</u>	<u>18</u>
	<u>Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations</u>	<u>19</u>
	<u>Item 7A. Quantitative and Qualitative Disclosures About Market Risk</u>	<u>48</u>
	<u>Item 8. Financial Statements and Supplementary Data</u>	<u>50</u>
	<u>Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure</u>	<u>123</u>
	<u>Item 9A. Controls and Procedures</u>	<u>123</u>
	<u>Item 9B. Other Information</u>	<u>123</u>
<u>PART III</u>		
	<u>Item 10. Directors, Executive Officers and Corporate Governance</u>	<u>124</u>
	<u>Item 11. Executive Compensation</u>	<u>127</u>
	<u>Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters</u>	<u>128</u>
	<u>Item 13. Certain Relationships and Related Transactions, and Director Independence</u>	<u>128</u>
	<u>Item 14. Principal Accounting Fees and Services</u>	<u>128</u>
<u>PART IV</u>		
	<u>Item 15. Exhibits, Financial Statement Schedules</u>	<u>129</u>
	<u>Item 16. Form 10-K Summary</u>	<u>131</u>
	<u>Signatures</u>	<u>132</u>

PART I

Item 1. Business

The Boeing Company, together with its subsidiaries (herein referred to as “Boeing,” the “Company,” “we,” “us,” “our”), is one of the world's major aerospace firms.

We are organized based on the products and services we offer. We operate in four reportable segments:

- Commercial Airplanes (BCA);
- Defense, Space & Security (BDS);
- Global Services (BGS);
- Boeing Capital (BCC).

Commercial Airplanes Segment

This segment develops, produces and markets commercial jet aircraft and provides fleet support services, principally to the commercial airline industry worldwide. We are a leading producer of commercial aircraft and offer a family of commercial jetliners designed to meet a broad spectrum of global passenger and cargo requirements of airlines. This family of commercial jet aircraft in production includes the 737 narrow-body model and the 747, 767, 777 and 787 wide-body models. Development continues on the 777X program and certain 737 MAX derivatives.

Defense, Space & Security Segment

This segment engages in the research, development, production and modification of manned and unmanned military aircraft and weapons systems for strike, surveillance and mobility, including fighter and trainer aircraft; vertical lift, including rotorcraft and tilt-rotor aircraft; and commercial derivative aircraft, including anti-submarine and tanker aircraft. In addition, this segment engages in the research, development, production and modification of the following products and related services: strategic defense and intelligence systems, including strategic missile and defense systems, command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR), cyber and information solutions, and intelligence systems; satellite systems, including government and commercial satellites and space exploration.

BDS' primary customer is the United States Department of Defense (U.S. DoD). Revenues from the U.S. DoD, including foreign military sales through the U.S. government, accounted for approximately 84% of its 2019 revenues. Other significant BDS customers include the National Aeronautics and Space Administration (NASA) and customers in international defense, civil and commercial satellite markets.

This segment's primary products include the following fixed-wing military aircraft: F/A-18E/F Super Hornet, F-15 programs, P-8 programs, KC-46A Tanker, and T-7A Red Hawk. This segment produces rotorcraft and rotary-wing programs, such as CH-47 Chinook, AH-64 Apache, and V-22 Osprey. Unmanned vehicles include the MQ-25, QF-16, and Insitu's Scan Eagle aircraft. In addition, this segment's products include space and missile systems including: government and commercial satellites, NASA's Space Launch System (SLS), the International Space Station, Commercial Crew, missile defense and weapons programs, and Joint Direct Attack Munition, as well as the United Launch Alliance joint venture.

Global Services Segment

This segment provides services to our commercial and defense customers worldwide. BGS sustains aerospace platforms and systems with a full spectrum of products and services, including supply chain

and logistics management, engineering, maintenance and modifications, upgrades and conversions, spare parts, pilot and maintenance training systems and services, technical and maintenance documents, and data analytics and digital services.

Boeing Capital Segment

BCC seeks to ensure that Boeing customers have the financing they need to buy and take delivery of their Boeing product and manages overall financing exposure. BCC's portfolio consists of equipment under operating leases, sales-type/finance leases, notes and other receivables, assets held for sale or re-lease and investments.

Intellectual Property

We own numerous patents and have licenses for the use of patents owned by others, which relate to our products and their manufacture. In addition to owning a large portfolio of intellectual property, we also license intellectual property to and from third parties. For example, the U.S. government has licenses in our patents that are developed in performance of government contracts, and it may use or authorize others to use the inventions covered by such patents for government purposes. Unpatented research, development and engineering skills, as well as certain trademarks, trade secrets, and other intellectual property rights, also make an important contribution to our business. While our intellectual property rights in the aggregate are important to the operation of each of our businesses, we do not believe that our business would be materially affected by the expiration of any particular intellectual property right or termination of any particular intellectual property patent license agreement.

Employees

Total workforce level at December 31, 2019 was approximately 161,100. As of December 31, 2019, our principal collective bargaining agreements were with the following unions:

Union	Percent of our Employees Represented	Status of the Agreements with Major Union
The International Association of Machinists and Aerospace Workers (IAM)	22%	We have two major agreements; one expiring in June 2022 and one in September 2024.
The Society of Professional Engineering Employees in Aerospace (SPEEA)	11%	We have two major agreements expiring in October 2022.
The United Automobile, Aerospace and Agricultural Implement Workers of America (UAW)	1%	We have one major agreement expiring in October 2022.

Competition

The commercial jet aircraft market and the airline industry remain extremely competitive. We face aggressive international competitors who are intent on increasing their market share, such as Airbus and other entrants from Russia, China and Japan. We are focused on improving our processes and continuing cost reduction efforts. We intend to continue to compete with other airplane manufacturers by providing customers with greater value products.

BDS faces strong competition in all market segments, primarily from Lockheed Martin Corporation, Northrop Grumman Corporation, Raytheon Company, General Dynamics Corporation and SpaceX. Non-U.S.

companies such as BAE Systems and Airbus Group continue to build a strategic presence in the U.S. market by strengthening their North American operations and partnering with U.S. defense companies. In addition, certain competitors have occasionally formed teams with other competitors to address specific customer requirements. BDS expects the trend of strong competition to continue into 2020.

The commercial and defense services market is an extremely challenging landscape made up of many of the same strong U.S. and non-U.S. competitors facing BCA and BDS along with other competitors in those markets. BGS leverages our extensive services network offering products and services which span the life cycle of our defense and commercial airplane programs: training, fleet services and logistics, maintenance and engineering, modifications and upgrades - as well as the daily cycle of gate-to-gate operations. BGS expects the market to remain highly competitive in 2020, and intends to grow market share by leveraging a high level of customer satisfaction and productivity.

Regulatory Matters

Our businesses are heavily regulated in most of our markets. We deal with numerous U.S. government agencies and entities, including but not limited to all of the branches of the U.S. military, NASA, the Federal Aviation Administration (FAA) and the Department of Homeland Security. Similar government authorities exist in our non-U.S. markets.

Government Contracts. The U.S. government, and other governments, may terminate any of our government contracts at their convenience, as well as for default based on our failure to meet specified performance requirements. If any of our U.S. government contracts were to be terminated for convenience, we generally would be entitled to receive payment for work completed and allowable termination or cancellation costs. If any of our government contracts were to be terminated for default, generally the U.S. government would pay only for the work that has been accepted and could require us to pay the difference between the original contract price and the cost to re-procure the contract items, net of the work accepted from the original contract. The U.S. government can also hold us liable for damages resulting from the default.

Commercial Aircraft. In the U.S., our commercial aircraft products are required to comply with FAA regulations governing production and quality systems, airworthiness and installation approvals, repair procedures and continuing operational safety. Outside the U.S., similar requirements exist for airworthiness, installation and operational approvals. These requirements are generally administered by the national aviation authorities of each country and, in the case of Europe, coordinated by the European Joint Aviation Authorities.

Environmental. We are subject to various federal, state, local and non-U.S. laws and regulations relating to environmental protection, including the discharge, treatment, storage, disposal and remediation of hazardous substances and wastes. We continually assess our compliance status and management of environmental matters to ensure our operations are in compliance with all applicable environmental laws and regulations. Investigation, remediation, and operation and maintenance costs associated with environmental compliance and management of sites are a normal, recurring part of our operations. These costs often are allowable costs under our contracts with the U.S. government. It is reasonably possible that costs incurred to ensure continued environmental compliance could have a material impact on our results of operations, financial condition or cash flows if additional work requirements or more stringent clean-up standards are imposed by regulators, new areas of soil, air and groundwater contamination are discovered and/or expansions of work scope are prompted by the results of investigations.

A Potentially Responsible Party (PRP) has joint and several liability under existing U.S. environmental laws. Where we have been designated a PRP by the Environmental Protection Agency or a state environmental agency, we are potentially liable to the government or third parties for the full cost of remediating contamination at our facilities or former facilities or at third-party sites. If we were required to fully fund the remediation of a site for which we were originally assigned a partial share, the statutory

framework would allow us to pursue rights to contribution from other PRPs. For additional information relating to environmental contingencies, see Note 14 to our Consolidated Financial Statements.

Non-U.S. Sales. Our non-U.S. sales are subject to both U.S. and non-U.S. governmental regulations and procurement policies and practices, including regulations relating to import-export control, tariffs, investment, exchange controls, anti-corruption, and repatriation of earnings. Non-U.S. sales are also subject to varying currency, political and economic risks.

Raw Materials, Parts, and Subassemblies

We are highly dependent on the availability of essential materials, parts and subassemblies from our suppliers and subcontractors. The most important raw materials required for our aerospace products are aluminum (sheet, plate, forgings and extrusions), titanium (sheet, plate, forgings and extrusions) and composites (including carbon and boron). Although alternative sources generally exist for these raw materials, qualification of the sources could take a year or more. Many major components and product equipment items are procured or subcontracted on a sole-source basis with a number of companies.

Suppliers

We are dependent upon the ability of a large number of U.S. and non-U.S. suppliers and subcontractors to meet performance specifications, quality standards and delivery schedules at our anticipated costs. While we maintain an extensive qualification and performance surveillance system to control risk associated with such reliance on third parties, failure of suppliers or subcontractors to meet commitments could adversely affect production schedules and program/contract profitability, thereby jeopardizing our ability to fulfill commitments to our customers. We are also dependent on the availability of energy sources, such as electricity, at affordable prices.

Seasonality

No material portion of our business is considered to be seasonal.

Executive Officers of the Registrant

See “Item 10. Directors, Executive Officers and Corporate Governance” in Part III.

Other Information

Boeing was originally incorporated in the State of Washington in 1916 and reincorporated in Delaware in 1934. Our principal executive offices are located at 100 N. Riverside Plaza, Chicago, Illinois 60606 and our telephone number is (312) 544-2000.

General information about us can be found at www.boeing.com. The information contained on or connected to our website is not incorporated by reference into this Annual Report on Form 10-K and should not be considered part of this or any other report filed with the Securities and Exchange Commission (SEC). Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as any amendments to those reports, are available free of charge through our website as soon as reasonably practicable after we file them with, or furnish them to, the SEC. The SEC maintains a website at www.sec.gov that contains reports, proxy statements and other information regarding SEC registrants, including Boeing.

Forward-Looking Statements

This report, as well as our annual report to shareholders, quarterly reports, and other filings we make with the SEC, press and earnings releases and other written and oral communications, contain “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as “may,” “should,” “expects,” “intends,” “projects,” “plans,” “believes,” “estimates,” “targets,” “anticipates” and similar expressions generally identify these forward-looking statements. Examples of forward-looking statements include statements relating to our future financial condition and operating results, as well as any other statement that does not directly relate to any historical or current fact.

Forward-looking statements are based on expectations and assumptions that we believe to be reasonable when made, but that may not prove to be accurate. These statements are not guarantees and are subject to risks, uncertainties and changes in circumstances that are difficult to predict. Many factors, including those set forth in the “Risk Factors” section below and other important factors disclosed in this report and from time to time in our other filings with the SEC, could cause actual results to differ materially and adversely from these forward-looking statements. Any forward-looking statement speaks only as of the date on which it is made, and we assume no obligation to update or revise any forward-looking statement whether as a result of new information, future events or otherwise, except as required by law.

Item 1A. Risk Factors

An investment in our common stock or debt securities involves risks and uncertainties and our actual results and future trends may differ materially from our past or projected future performance. We urge investors to consider carefully the risk factors described below in evaluating the information contained in this report.

The 737 MAX fleet is currently grounded, and we have temporarily suspended production of the 737 MAX. We are subject to a number of risks and uncertainties related to the 737 MAX. These risks include uncertainties regarding the timing and conditions of 737 MAX regulatory approvals, delays in the resumption of production, lower than planned production rates and/or delivery rates, increased considerations to customers, increased supplier costs and supply chain health, changes to the assumptions and estimates made in our financial statements regarding the 737 program, and potential outcomes of various 737 MAX-related legal proceedings and government investigations.

On March 13, 2019, the Federal Aviation Administration (FAA) issued an order to suspend operations of all 737 MAX aircraft in the U.S. and by U.S. aircraft operators following two fatal 737 MAX accidents. Non-U.S. civil aviation authorities have issued directives to the same effect. Deliveries of the 737 MAX have been suspended until clearance is granted by the appropriate regulatory authorities. The grounding has reduced revenues, operating margins, and cash flows, and will continue to do so until production and deliveries resume and production rates return to pre-grounding levels. In connection with the effort to return the 737 MAX to service, we have developed software updates for the 737 MAX, together with an associated pilot training and supplementary education program. We continue to work with the FAA and other non-U.S. civil aviation authorities to complete remaining steps toward certification and readiness for return to service, including addressing their questions on the software updates and how pilots will interact with the airplane controls and displays in different flight scenarios. Any delays in certification and/or the resumption of deliveries or other liabilities associated with the accidents or grounding could have a material adverse effect on our financial position, results of operations, and/or cash flows. In addition, multiple legal actions have been filed against us related to the 737 MAX. We also are fully cooperating with U.S. government investigations related to the accidents and the 737 MAX, including investigations by the U.S. Department of Justice and the Securities and Exchange Commission. Any adverse results with respect to any such litigation or investigation could have a further material impact on our financial position, results of operations and/or cash flows.

During the second quarter of 2019, we announced plans to reduce the 737 production rate from 52 aircraft per month to 42 per month. During the fourth quarter of 2019, we announced plans to temporarily suspend 737 MAX production beginning in January 2020. Impacts related to the reduction in production rate followed by the production suspension have significantly increased costs to produce aircraft included in the current accounting quantity and will result in reduced 737 program and overall BCA segment operating margins when deliveries resume. We have also made significant assumptions regarding estimated costs expected to be incurred in 2020 and 2021 that should be included in program inventory and those estimated costs that will be expensed when incurred as abnormal production costs. If we are unable to return the 737 MAX aircraft to service in one or more jurisdictions or begin deliveries to customers on the schedule and/or at a pace consistent with our current expectations, we will incur significant additional costs and/or delay the resumption and subsequent ramp-up of 737 production. These delays would also result in significant additional disruption to the 737 production system once production resumes and would further delay efforts to restore and/or implement previously planned increases in the 737 production rate. Cash flows continue to be negatively impacted by delayed payments from customers, higher costs and inventory levels, and payments made to customers in connection with disruption to their operations. In addition, we have experienced claims and assertions from customers in connection with the grounding, and we recorded an earnings charge of \$8,259 million, net of insurance recoveries of \$500 million, in 2019, in connection with an estimate of potential concessions and other considerations to customers for disruptions related to the grounding and associated delivery delays.

Any further delays in regulatory approval of the 737 MAX, the resumption of 737 production and/or deliveries, further disruptions to suppliers and/or the long-term health of the production system, supplier claims or assertions, or changes to estimated concessions or other considerations we expect to provide to customers could have a material adverse effect on our financial position, results of operations, and/or cash flows. The FAA and other non-U.S. civil aviation authorities will determine the timing and conditions of return to service in each relevant jurisdiction. We have assumed that regulatory approval will enable 737 MAX deliveries to resume during mid-2020. This assumption reflects our best estimate at this time based on factors such as the estimated duration of regulatory approval and final pilot training requirements. In the event of unanticipated additional training requirements in one or more jurisdictions, delays in regulatory approval, and/or delays in our ability to resume deliveries, we may be required to take actions with longer-term impact, such as further changes to our production plans, employment reductions and/or the expenditure of significant resources to support our supply chain and/or customers.

We have made significant estimates with respect to the 737 program regarding the number of units to be produced, the period during which those units are likely to be produced, and the units' expected sales prices, production costs, program tooling and other non-recurring costs, and routine warranty costs. In addition to the estimated timing of the resumption of deliveries, we have made assumptions regarding outcomes of accident investigations and other government inquiries, timing of future 737 production rate increases, timing and sequence of future deliveries, supply chain health as we implement our production plans, as well as outcomes of negotiations with customers. Any changes in these estimates and/or assumptions with respect to the 737 program could have a material impact on our financial position, results of operations, and/or cash flows. For additional information, see our discussion under "Management's Discussion and Analysis-Critical Accounting Policies and Estimates-737 MAX Grounding" on page 45.

Our Commercial Airplanes and Global Services businesses depend heavily on commercial airlines, and are subject to unique risks.

Market conditions have a significant impact on demand for our commercial aircraft and related services. The commercial aircraft market is predominantly driven by long-term trends in airline passenger and cargo traffic. The principal factors underlying long-term traffic growth are sustained economic growth and political stability both in developed and emerging markets. Demand for our commercial aircraft is further influenced by airline profitability, availability of aircraft financing, world trade policies, government-to-government relations, technological advances, price and other competitive factors, fuel prices, terrorism, epidemics

and environmental regulations. Traditionally, the airline industry has been cyclical and very competitive and has experienced significant profit swings and constant challenges to be more cost competitive. Significant deterioration in the global economic environment, the airline industry generally, or the financial stability of one or more of our major customers could result in fewer new orders for aircraft or services, or could cause customers to seek to postpone or cancel contractual orders and/or payments to us, which could result in lower revenues, profitability and cash flows and a reduction in our contractual backlog. In addition, because our commercial aircraft backlog consists of aircraft scheduled for delivery over a period of several years, any of these macroeconomic, industry or customer impacts could unexpectedly affect deliveries over a long period.

We enter into firm fixed-price aircraft sales contracts with indexed price escalation clauses which could subject us to losses if we have cost overruns or if increases in our costs exceed the applicable escalation rate. Commercial aircraft sales contracts are often entered into years before the aircraft are delivered. In order to help account for economic fluctuations between the contract date and delivery date, aircraft pricing generally consists of a fixed amount as modified by price escalation formulas derived from labor, commodity and other price indices. Our revenue estimates are based on current expectations with respect to these escalation formulas, but the actual escalation amounts are outside of our control. Escalation factors can fluctuate significantly from period to period. Changes in escalation amounts can significantly impact revenues and operating margins in our Commercial Airplanes business.

We derive a significant portion of our revenues from a limited number of commercial airlines. We can make no assurance that any customer will exercise purchase options, fulfill existing purchase commitments or purchase additional products or services from us. In addition, fleet decisions, airline consolidations or financial challenges involving any of our major commercial airline customers could significantly reduce our revenues and limit our opportunity to generate profits from those customers.

Our Commercial Airplanes business depends on our ability to maintain a healthy production system, achieve planned production rate targets, successfully develop new aircraft or new derivative aircraft, and meet or exceed stringent performance and reliability standards.

The commercial aircraft business is extremely complex, involving extensive coordination and integration with U.S. and non-U.S. suppliers, highly-skilled labor from thousands of employees and other partners, and stringent regulatory requirements and performance and reliability standards. In addition, the introduction of new aircraft programs and/or derivatives, such as the 777X, involves increased risks associated with meeting development, testing, production, and certification schedules. The 737 program has also experienced significant disruption due to the grounding of the 737 MAX and associated suspension of 737 MAX production. As a result, our ability to deliver aircraft on time, satisfy regulatory and customer requirements, and achieve or maintain, as applicable, program profitability is subject to significant risks.

We must minimize disruption caused by production changes and achieve productivity improvements in order to meet customer demand and maintain our profitability. We have plans to adjust production rates on several of our commercial aircraft programs, as well as to resume 737 MAX production at low levels once timing and conditions of return to service are better understood. At the same time we are engaging in significant ongoing development, testing and production of the 777X aircraft. In addition, we continue to seek opportunities to reduce the costs of building our aircraft, including working with our suppliers to reduce supplier costs, identifying and implementing productivity improvements, and optimizing how we manage inventory. If production rate changes at any of our commercial aircraft assembly facilities are delayed or create significant disruption to our production system, or if our suppliers cannot timely deliver components to us at the cost and rates necessary to achieve our targets, we may be unable to meet delivery schedules and/or the financial performance of one or more of our programs may suffer.

Operational challenges impacting the production system for one or more of our commercial aircraft programs could result in production delays and/or failure to meet customer demand for new aircraft, either

of which would negatively impact our revenues and operating margins. Our commercial aircraft production system is extremely complex. Operational issues, including delays or defects in supplier components, failure to meet internal performance plans, or delays or failures to achieve required regulatory approval, such as the with the 737 MAX, could result in significant out-of-sequence work and increased production costs, as well as delayed deliveries to customers, impacts to aircraft performance and/or increased warranty or fleet support costs.

If our commercial airplanes fail to satisfy performance and reliability requirements, we could face additional costs and/or lower revenues. Developing and manufacturing commercial aircraft that meet or exceed our performance and reliability standards, as well as those of customers and regulatory agencies, can be costly and technologically challenging. These challenges are particularly significant with newer aircraft programs. Any failure of any Boeing aircraft to satisfy performance or reliability requirements could result in disruption to our operations, higher costs and/or lower revenues.

Changes in levels of U.S. government defense spending or overall acquisition priorities could negatively impact our financial position and results of operations.

We derive a substantial portion of our revenue from the U.S. government, primarily from defense related programs with the U.S. DoD. Levels of U.S. defense spending are very difficult to predict and may be impacted by numerous factors such as the evolving nature of the national security threat, U.S. foreign policy, the domestic political environment, macroeconomic conditions and the ability of the U.S. government to enact relevant legislation such as authorization and appropriations bills.

The Bipartisan Budget Act of 2019 raised preexisting spending limits on federal discretionary defense and non-defense spending for fiscal years 2020 and 2021 (FY20 and FY21), reducing budget uncertainty and the risk of sequestration. Although FY20 appropriations have been enacted and FY21 topline funding levels have been agreed to, the timeliness of FY21 and future appropriations for government departments and agencies remains a recurrent risk. A lapse in appropriations for government department or agencies would result in a full or partial government shutdown, which could impact the Company's operations. Alternatively, Congress may fund government departments and agencies with one or more Continuing Resolutions; however, this could restrict the execution of certain program activities and delay new programs or competitions. In addition, long-term uncertainty remains with respect to overall levels of defense spending beyond FY21 and it is likely that the U.S. government discretionary spending levels will continue to be subject to pressure.

In addition, there continues to be uncertainty with respect to future acquisition priorities and program-level appropriations for the U.S. DoD and other government agencies (including NASA), including tension between modernization and sustainment investments, within the overall budgetary framework described above. Future budget cuts or investment priority changes, including changes associated with the authorizations and appropriations process could result in reductions, cancellations, and/or delays of existing contracts or programs. Any of these impacts could have a material effect on the results of the Company's operations, financial position and/or cash flows.

In addition, as a result of the significant ongoing uncertainty with respect to both U.S. defense spending levels and the nature of the threat environment, we also expect the U.S. DoD to continue to emphasize affordability, innovation, cybersecurity, and delivery of technical data and software in its procurement processes. If we can no longer adjust successfully to these changing acquisition policies our revenues and market share could be impacted.

We conduct a significant portion of our business pursuant to U.S. government contracts, which are subject to unique risks.

In 2019, 39% of our revenues were earned pursuant to U.S. government contracts, which include foreign military sales (FMS) through the U.S. government. Business conducted pursuant to such contracts is subject to extensive procurement regulations and other unique risks.

Our sales to the U.S. government are subject to extensive procurement regulations, and changes to those regulations could increase our costs. New procurement regulations, or changes to existing requirements, could increase our compliance costs or otherwise have a material impact on the operating margins of our BDS and BGS businesses. These requirements may result in increased compliance costs, and we could be subject to additional costs in the form of withheld payments and/or reduced future business if we fail to comply with these requirements in the future. Compliance costs attributable to current and potential future procurement regulations such as these could negatively impact our financial condition and operating results.

The U.S. government may modify, curtail or terminate one or more of our contracts. The U.S. government contracting party may modify, curtail or terminate its contracts and subcontracts with us, without prior notice and either at its convenience or for default based on performance. In addition, funding pursuant to our U.S. government contracts may be reduced or withheld as part of the U.S. Congressional appropriations process due to fiscal constraints, changes in U.S. national security strategy and/or priorities or other reasons. Further uncertainty with respect to ongoing programs could also result in the event that the U.S. government finances its operations through temporary funding measures such as “continuing resolutions” rather than full-year appropriations. Any loss or anticipated loss or reduction of expected funding and/or modification, curtailment, or termination of one or more large programs could have a material adverse effect on our earnings, cash flow and/or financial position.

We are subject to U.S. government inquiries and investigations, including periodic audits of costs that we determine are reimbursable under U.S. government contracts. U.S. government agencies, including the Defense Contract Audit Agency and the Defense Contract Management Agency, routinely audit government contractors. These agencies review our performance under contracts, cost structure and compliance with applicable laws, regulations, and standards, as well as the adequacy of and our compliance with our internal control systems and policies. Any costs found to be misclassified or inaccurately allocated to a specific contract will be deemed non-reimbursable, and to the extent already reimbursed, must be refunded. Any inadequacies in our systems and policies could result in withholds on billed receivables, penalties and reduced future business. Furthermore, if any audit, inquiry or investigation uncovers improper or illegal activities, we could be subject to civil and criminal penalties and administrative sanctions, including termination of contracts, forfeiture of profits, suspension of payments, fines, and suspension or debarment from doing business with the U.S. government. We also could suffer reputational harm if allegations of impropriety were made against us, even if such allegations are later determined to be false.

We enter into fixed-price contracts which could subject us to losses if we have cost overruns.

Our BDS and BGS defense businesses generated approximately 70% and 73% of their 2019 revenues from fixed-price contracts. While fixed-price contracts enable us to benefit from performance improvements, cost reductions and efficiencies, they also subject us to the risk of reduced margins or incurring losses if we are unable to achieve estimated costs and revenues. If our estimated costs exceed our estimated price, we recognize reach-forward losses which can significantly affect our reported results. For example, in 2019, we recorded reach-forward losses of \$489 million on the Commercial Crew contract primarily reflecting higher estimated costs associated with spacecraft completion, certification and testing, and additional reach-forward losses of \$148 million on the KC-46A Tanker contract reflecting higher manufacturing costs. New programs could also have risk for reach-forward loss upon contract award and during the period of contract performance. For example, in 2018, in connection with winning the T-7A Red

Hawk and MQ-25 competitions, we recorded a loss of \$400 million associated with options for 346 T-7A Red Hawk aircraft and a loss of \$291 million related to the MQ-25 Engineering, Manufacturing and Development (EMD) contract. The long term nature of many of our contracts makes the process of estimating costs and revenues on fixed-price contracts inherently risky. Fixed-price contracts often contain price incentives and penalties tied to performance which can be difficult to estimate and have significant impacts on margins. In addition, some of our contracts have specific provisions relating to cost, schedule and performance.

Fixed-price development contracts are generally subject to more uncertainty than fixed-price production contracts. Many of these development programs have highly complex designs. In addition, technical or quality issues that arise during development could lead to schedule delays and higher costs to complete, which could result in a material charge or otherwise adversely affect our financial condition. Examples of significant BDS fixed-price development contracts include Commercial Crew, KC-46A Tanker, T-7A Red Hawk, VC-25B Presidential Aircraft, MQ-25, and commercial and military satellites.

We enter into cost-type contracts which also carry risks.

Our BDS and BGS defense businesses generated approximately 30% and 27% of their 2019 revenues from cost-type contracting arrangements. Some of these are development programs that have complex design and technical challenges. These cost-type programs typically have award or incentive fees that are subject to uncertainty and may be earned over extended periods. In these cases the associated financial risks are primarily in reduced fees, lower profit rates or program cancellation if cost, schedule or technical performance issues arise. Programs whose contracts are primarily cost-type include Ground-based Midcourse Defense (GMD), Proprietary and SLS programs.

We enter into contracts that include in-orbit incentive payments that subject us to risks.

Contracts in the commercial satellite industry and certain government satellite contracts include in-orbit incentive payments. These in-orbit payments may be paid over time after final satellite acceptance or paid in full prior to final satellite acceptance. In both cases, the in-orbit incentive payment is at risk if the satellite does not perform to specifications for up to 15 years after acceptance. The net present value of in-orbit incentive fees we ultimately expect to realize is recognized as revenue in the construction period. If the satellite fails to meet contractual performance criteria, customers will not be obligated to continue making in-orbit payments and/or we may be required to provide refunds to the customer and incur significant charges.

Our ability to deliver products and services that satisfy customer requirements is heavily dependent on the performance and financial stability of our subcontractors and suppliers, as well as on the availability of raw materials and other components.

We rely on other companies including U.S. and non-U.S. subcontractors and suppliers to provide and produce raw materials, integrated components and sub-assemblies, and production commodities and to perform some of the services that we provide to our customers. If one or more of our suppliers or subcontractors experiences financial difficulties, delivery delays or other performance problems, we may be unable to meet commitments to our customers or incur additional costs. In addition, if one or more of the raw materials on which we depend (such as aluminum, titanium or composites) becomes unavailable or is available only at very high prices, we may be unable to deliver one or more of our products in a timely fashion or at budgeted costs. In some instances, we depend upon a single source of supply. Any service disruption from one of these suppliers, either due to circumstances beyond the supplier's control, such as geo-political developments, or as a result of performance problems or financial difficulties, could have a material adverse effect on our ability to meet commitments to our customers or increase our operating costs.

We use estimates in accounting for many contracts and programs. Changes in our estimates could adversely affect our future financial results.

Contract and program accounting require judgment relative to assessing risks, estimating revenues and costs and making assumptions for schedule and technical issues. Due to the size and nature of many of our contracts and programs, the estimation of total revenues and cost at completion is complicated and subject to many variables. Assumptions have to be made regarding the length of time to complete the contract or program because costs also include expected increases in wages and employee benefits, material prices and allocated fixed costs. Incentives or penalties related to performance on contracts are considered in estimating sales and profit rates, and are recorded when there is sufficient information for us to assess anticipated performance. Supplier claims and assertions are also assessed and considered in estimating costs and profit rates. Estimates of award fees are also used in sales and profit rates based on actual and anticipated awards.

With respect to each of our commercial aircraft programs, inventoriable production costs (including overhead), program tooling and other non-recurring costs and routine warranty costs are accumulated and charged as cost of sales by program instead of by individual units or contracts. A program consists of the estimated number of units (accounting quantity) of a product to be produced in a continuing, long-term production effort for delivery under existing and anticipated contracts limited by the ability to make reasonably dependable estimates. To establish the relationship of sales to cost of sales, program accounting requires estimates of (a) the number of units to be produced and sold in a program, (b) the period over which the units can reasonably be expected to be produced and (c) the units' expected sales prices, production costs, program tooling and other non-recurring costs, and routine warranty costs for the total program. Several factors determine accounting quantity, including firm orders, letters of intent from prospective customers and market studies. Changes to customer or model mix, production costs and rates, learning curve, changes to price escalation indices, costs of derivative aircraft, supplier performance, customer and supplier negotiations/settlements, supplier claims and/or certification issues can impact these estimates. Any such change in estimates relating to program accounting may adversely affect future financial performance.

Because of the significance of the judgments and estimation processes described above, materially different sales and profit amounts could be recorded if we used different assumptions or if the underlying circumstances were to change. Changes in underlying assumptions, circumstances or estimates may adversely affect future period financial performance. For additional information on our accounting policies for recognizing sales and profits, see our discussion under "Management's Discussion and Analysis – Critical Accounting Policies – Contract Accounting/Program Accounting" on pages 44 – 45 and Note 1 to our Consolidated Financial Statements on pages 57 – 69 of this Form 10-K.

Competition within our markets and with respect to the products we sell may reduce our future contracts and sales.

The markets in which we operate are highly competitive and one or more of our competitors may have more extensive or more specialized engineering, manufacturing and marketing capabilities than we do in some areas. In our Commercial Airplanes business, we anticipate increasing competition among non-U.S. aircraft manufacturers of commercial jet aircraft. In our BDS business, we anticipate that the effects of defense industry consolidation, fewer large and new programs and new priorities, including near and long-term cost competitiveness, of our U.S. DoD and non-U.S. customers will intensify competition for many of our BDS products. Our BGS segment faces competition from many of the same strong U.S. and non-U.S. competitors facing BCA and BDS. Furthermore, we are facing increased international competition and cross-border consolidation of competition. There can be no assurance that we will be able to compete successfully against our current or future competitors or that the competitive pressures we face will not result in reduced revenues and market share.

We derive a significant portion of our revenues from non-U.S. sales and are subject to the risks of doing business in other countries.

In 2019, non-U.S. customers, which includes FMS, accounted for approximately 55% of our revenues. We expect that non-U.S. sales will continue to account for a significant portion of our revenues for the foreseeable future. As a result, we are subject to risks of doing business internationally, including:

- changes in regulatory requirements;
- U.S. and non-U.S. government policies, including requirements to expend a portion of program funds locally and governmental industrial cooperation or participation requirements;
- fluctuations in international currency exchange rates;
- volatility in international political and economic environments and changes in non-U.S. national priorities and budgets, which can lead to delays or fluctuations in orders;
- the complexity and necessity of using non-U.S. representatives and consultants;
- the uncertainty of the ability of non-U.S. customers to finance purchases, including the availability of financing from the Export-Import Bank of the United States;
- uncertainties and restrictions concerning the availability of funding credit or guarantees;
- imposition of domestic and international taxes, export controls, tariffs, embargoes, sanctions and other trade restrictions;
- the difficulty of management and operation of an enterprise spread over many countries;
- compliance with a variety of non-U.S. laws, as well as U.S. laws affecting the activities of U.S. companies abroad; and
- unforeseen developments and conditions, including terrorism, war, epidemics and international tensions and conflicts.

While the impact of these factors is difficult to predict, any one or more of these factors could adversely affect our operations in the future.

Unauthorized access to our or our customers' information and systems could negatively impact our business.

We face certain security threats, including threats to the confidentiality, availability and integrity of our data and systems. We maintain an extensive network of technical security controls, policy enforcement mechanisms, monitoring systems and management oversight in order to address these threats. While these measures are designed to prevent, detect and respond to unauthorized activity in our systems, certain types of attacks, including cyber-attacks, could result in significant financial or information losses and/or reputational harm. In addition, we manage information and information technology systems for certain customers. Many of these customers face similar security threats. If we cannot prevent the unauthorized access, release and/or corruption of our customers' confidential, classified or personally identifiable information, our reputation could be damaged, and/or we could face financial losses.

The outcome of litigation and of government inquiries and investigations involving our business is unpredictable and an adverse decision in any such matter could have a material effect on our financial position and results of operations.

We are involved in a number of litigation matters. These matters may divert financial and management resources that would otherwise be used to benefit our operations. No assurances can be given that the results of these matters will be favorable to us. An adverse resolution of any of these lawsuits, or future lawsuits, could have a material impact on our financial position and results of operations. In addition, we

are subject to extensive regulation under the laws of the United States and its various states, as well as other jurisdictions in which we operate. As a result, we are sometimes subject to government inquiries and investigations of our business due, among other things, to our business relationships with the U.S. government, the heavily regulated nature of our industry, and in the case of environmental proceedings, our current or past ownership of certain property. Any such inquiry or investigation could potentially result in an adverse ruling against us, which could have a material impact on our financial position and results of operations.

A significant portion of our customer financing portfolio is concentrated among certain customers and in certain types of Boeing aircraft, which exposes us to concentration risks.

A significant portion of our customer financing portfolio is concentrated among certain customers and in distinct geographic regions. Our portfolio is also concentrated by varying degrees across Boeing aircraft product types, most notably 717 and 747-8 aircraft, and among customers that we believe have less than investment-grade credit. If one or more customers holding a significant portion of our portfolio assets experiences financial difficulties or otherwise defaults on or does not renew its leases with us at their expiration, and we are unable to redeploy the aircraft on reasonable terms, or if the types of aircraft that are concentrated in our portfolio suffer greater than expected declines in value, our earnings, cash flows and/or financial position could be materially adversely affected.

We may be unable to obtain debt to fund our operations and contractual commitments at competitive rates, on commercially reasonable terms or in sufficient amounts.

We depend, in part, upon the issuance of debt to fund our operations and contractual commitments. As of December 31, 2019 and 2018, our airplane financing commitments totaled \$13,377 and \$19,462. In addition, our debt balances increased significantly in 2019, and we expect further increases in 2020, in order to manage liquidity impacts related to the 737 MAX grounding. This has also resulted in downgrades to our credit ratings. If we require additional funding in order to fund outstanding financing commitments, address further 737 MAX impacts, or meet other business requirements, our market liquidity may not be sufficient. A number of factors could cause us to incur increased borrowing costs and to have greater difficulty accessing public and private markets for debt. These factors include disruptions or declines in the global capital markets and/or a decline in our financial performance, outlook or credit ratings, including impacts related to the 737 MAX grounding. The occurrence of any or all of these events may adversely affect our ability to fund our operations and contractual or financing commitments.

We may not realize the anticipated benefits of mergers, acquisitions, joint ventures/strategic alliances or divestitures.

As part of our business strategy, we may merge with or acquire businesses and/or form joint ventures and strategic alliances. For example, in 2018 we completed the acquisition of KLX Inc., a provider of aviation parts and services. Whether we realize the anticipated benefits from these acquisitions and related activities depends, in part, upon our ability to integrate the operations of the acquired business, the performance of the underlying product and service portfolio, and the performance of the management team and other personnel of the acquired operations. Accordingly, our financial results could be adversely affected by unanticipated performance issues, legacy liabilities, transaction-related charges, amortization of expenses related to intangibles, charges for impairment of long-term assets, credit guarantees, partner performance and indemnifications. Consolidations of joint ventures could also impact our reported results of operations or financial position. While we believe that we have established appropriate and adequate procedures and processes to mitigate these risks, there is no assurance that these transactions will be successful. We also may make strategic divestitures from time to time. These transactions may result in continued financial involvement in the divested businesses, such as through guarantees or other financial arrangements.

following the transaction. Nonperformance by those divested businesses could affect our future financial results through additional payment obligations, higher costs or asset write-downs.

Our insurance coverage may be inadequate to cover all significant risk exposures.

We are exposed to liabilities that are unique to the products and services we provide. We maintain insurance for certain risks and, in some circumstances, we may receive indemnification from the U.S. government. The amount of our insurance coverage may not cover all claims or liabilities and we may be forced to bear substantial costs. For example, liabilities arising from the use of certain of our products, such as aircraft technologies, missile systems, border security systems, anti-terrorism technologies, and/or air traffic management systems may not be insurable on commercially reasonable terms. While some of these products are shielded from liability within the U.S. under the SAFETY Act provisions of the 2002 Homeland Security Act, no such protection is available outside the U.S., potentially resulting in significant liabilities. The amount of insurance coverage we maintain may be inadequate to cover these or other claims or liabilities.

Business disruptions could seriously affect our future sales and financial condition or increase our costs and expenses.

Our business may be impacted by disruptions including threats to physical security, information technology or cyber-attacks or failures, damaging weather or other acts of nature and pandemics or other public health crises. Any of these disruptions could affect our internal operations or our ability to deliver products and services to our customers. Any significant production delays, or any destruction, manipulation or improper use of our data, information systems or networks could impact our sales, increase our expenses and/or have an adverse effect on the reputation of Boeing and of our products and services.

Some of our and our suppliers' workforces are represented by labor unions, which may lead to work stoppages.

Approximately 57,000 employees, which constitute 35% of our total workforce, were union represented as of December 31, 2019. We experienced a work stoppage in 2008 when a labor strike halted commercial aircraft and certain BDS program production. We may experience additional work stoppages in the future, which could adversely affect our business. We cannot predict how stable our relationships, currently with 11 U.S. labor organizations and 13 non-U.S. labor organizations, will be or whether we will be able to meet the unions' requirements without impacting our financial condition. The unions may also limit our flexibility in dealing with our workforce. Union actions at suppliers can also affect us. Work stoppages and instability in our union relationships could delay the production and/or development of our products, which could strain relationships with customers and cause a loss of revenues which would adversely affect our operations.

Substantial pension and other postretirement benefit obligations have a material impact on our earnings, shareholders' equity and cash flows from operations, and could have significant adverse impacts in future periods.

The majority of our employees have earned benefits under defined benefit pension plans. Potential pension contributions include both mandatory amounts required under the Employee Retirement Income Security Act and discretionary contributions to improve the plans' funded status. The extent of future contributions depends heavily on market factors such as the discount rate and the actual return on plan assets. We estimate future contributions to these plans using assumptions with respect to these and other items. Changes to those assumptions could have a significant effect on future contributions as well as on our annual pension costs and/or result in a significant change to shareholders' equity. For U.S. government contracts, we allocate pension costs to individual contracts based on U.S. Cost Accounting Standards

which can also affect contract profitability. We also provide other postretirement benefits to certain of our employees, consisting principally of health care coverage for eligible retirees and qualifying dependents. Our estimates of future costs associated with these benefits are also subject to assumptions, including estimates of the level of medical cost increases. For a discussion regarding how our financial statements can be affected by pension and other postretirement plan accounting policies, see "Management's Discussion and Analysis -Critical Accounting Policies-Pension Plans" on page 48 of this Form 10-K. Although Generally Accepted Accounting Principles in the United States of America (GAAP) expense and pension or other postretirement benefit contributions are not directly related, the key economic factors that affect GAAP expense would also likely affect the amount of cash or stock we would contribute to our plans.

Our operations expose us to the risk of material environmental liabilities.

We are subject to various U.S. federal, state, local and non-U.S. laws and regulations related to environmental protection, including the discharge, treatment, storage, disposal and remediation of hazardous substances and wastes. We could incur substantial costs, including cleanup costs, fines and civil or criminal sanctions, as well as third-party claims for property damage or personal injury, if we were to violate or become liable under environmental laws or regulations. In some cases, we may be subject to such costs due to environmental impacts attributable to our current or past manufacturing operations or the operations of companies we have acquired. In other cases, we may become subject to such costs due to an indemnification agreement between us and a third party relating to such environmental liabilities. In addition, new laws and regulations, more stringent enforcement of existing laws and regulations, the discovery of previously unknown contamination or the imposition of new remediation requirements could result in additional costs. For additional information relating to environmental contingencies, see Note 14 to our Consolidated Financial Statements.

Item 1B. Unresolved Staff Comments

Not applicable

Item 2. Properties

We occupied approximately 86 million square feet of floor space on December 31, 2019 for manufacturing, warehousing, engineering, administration and other productive uses, of which approximately 93% was located in the United States. The following table provides a summary of the floor space by business as of December 31, 2019:

<i>(Square feet in thousands)</i>	Owned	Leased	Government Owned ⁽¹⁾	Total
Commercial Airplanes	41,098	2,471		43,569
Defense, Space & Security	23,401	5,651		29,052
Global Services	686	7,596		8,282
Other ⁽²⁾	2,504	2,214	318	5,036
Total	67,689	17,932	318	85,939

⁽¹⁾ Excludes rent-free space furnished by U.S. government landlord of 49 square feet.

⁽²⁾ Other includes BCC, sites used for common internal services, and our Corporate Headquarters.

At December 31, 2019, we occupied in excess of 78.9 million square feet of floor space at the following major locations:

- Commercial Airplanes – Greater Seattle, WA; Greater Charleston, SC; Portland, OR; Greater Los Angeles, CA; Greater Salt Lake City, UT; Canada; and Australia
- Defense, Space & Security – Greater St. Louis, MO; Greater Los Angeles, CA; Greater Seattle, WA; Philadelphia, PA; Mesa, AZ; Huntsville, AL; Oklahoma City, OK; Heath, OH; Greater Washington, DC; Australia; and Houston, TX
- Global Services – San Antonio, TX; Greater Miami, FL; Dallas, TX; Jacksonville, FL; Germany; Greater Los Angeles, CA; Mesa, AZ; and Greater Denver, CO
- Other – Chicago, IL; Greater Seattle, WA; Greater Los Angeles, CA ; Greater Washington, DC; India; and Greater St. Louis, MO

Most runways and taxiways that we use are located on airport properties owned by others and are used jointly with others. Our rights to use such facilities are provided for under long-term leases with municipal, county or other government authorities. In addition, the U.S. government furnishes us certain office space, installations and equipment at U.S. government bases for use in connection with various contract activities.

We believe that our major properties are adequate for our present needs and, as supplemented by planned improvements and construction, expect them to remain adequate for the foreseeable future.

Item 3. Legal Proceedings

Currently, we are involved in a number of legal proceedings. For a discussion of contingencies related to legal proceedings, see Note 22 to our Consolidated Financial Statements, which is hereby incorporated by reference.

Item 4. Mine Safety Disclosures

Not applicable

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

The principal market for our common stock is the New York Stock Exchange where it trades under the symbol BA. As of January 24, 2020, there were 100,750 shareholders of record.

Issuer Purchases of Equity Securities

The following table provides information about purchases we made during the quarter ended December 31, 2019 of equity securities that are registered by us pursuant to Section 12 of the Exchange Act:

(Dollars in millions, except per share data)

	(a)	(b)	(c)	(d)
	Total Number of Shares Purchased ⁽¹⁾	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares That May Yet be Purchased Under the Plans or Programs ⁽²⁾
10/1/2019 thru 10/31/2019	3,521	\$365.32		\$17,349
11/1/2019 thru 11/30/2019	10,739	347.54		17,349
12/1/2019 thru 12/31/2019	5,459	346.06		17,349
Total	19,719	\$350.31	—	

⁽¹⁾ A total of 19,719 shares were transferred to us from employees in satisfaction of minimum tax withholding obligations associated with the vesting of restricted stock units during the period. We did not purchase any shares of our common stock in the open market pursuant to our repurchase program or in swap transactions.

⁽²⁾ On December 17, 2018, the Board approved a repurchase plan for up to \$20 billion of common stock. Share repurchases under this plan are currently suspended.

Item 6. Selected Financial Data

Five-Year Summary (Unaudited)

(Dollars in millions, except per share data)

	2019	2018	2017	2016	2015 ⁽²⁾
Revenues	\$76,559	\$101,127	\$94,005	\$93,496	\$96,114
Net (loss)/earnings	(\$636)	\$10,460	\$8,458	\$5,034	\$5,176
Basic (loss)/earnings per share	(\$1.12)	\$18.05	\$14.03	\$7.92	\$7.52
Diluted (loss)/earnings per share	(1.12)	17.85	13.85	7.83	7.44
Dividends declared per share ⁽¹⁾	8.22	7.19	5.97	4.69	3.82
Cash and cash equivalents	\$9,485	\$7,637	\$8,813	\$8,801	\$11,302
Short-term and other investments	545	927	1,179	1,228	750
Total assets	133,625	117,359	112,362	109,076	94,408
Total debt	27,302	13,847	11,117	9,952	9,964
Operating cash flow	(\$2,446)	\$15,322	\$13,346	\$10,496	\$9,363
Total backlog	\$463,403	\$490,481	\$474,640	\$473,492 ⁽²⁾	\$489,299
Year-end workforce	161,100	153,000	140,800	150,500	161,400

⁽¹⁾ Cash dividends have been paid on common stock every year since 1942.

⁽²⁾ Amounts prior to 2016, along with 2016 Backlog, do not reflect impact of the adoption of ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606); ASU No. 2017-07, Compensation - Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost; ASU 2016-18 Statement of Cash Flows (Topic 230) Restricted Cash; in the first quarter of 2018.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Consolidated Results of Operations and Financial Condition

Overview

We are a global market leader in the design, development, manufacture, sale, service and support of commercial jetliners, military aircraft, satellites, missile defense, human space flight and launch systems and services. We are one of the two major manufacturers of 100+ seat airplanes for the worldwide commercial airline industry and one of the largest defense contractors in the U.S. While our principal operations are in the U.S., we conduct operations in an expanding number of countries and rely on an extensive network of non-U.S. partners, key suppliers and subcontractors.

Our strategy is centered on successful execution in healthy core businesses – Commercial Airplanes (BCA), Defense, Space & Security (BDS), and Global Services (BGS) – supplemented and supported by Boeing Capital (BCC). Taken together, these core businesses have historically generated substantial earnings and cash flow that permit us to invest in new products and services. We focus on producing the products and providing the services that the market demands, and continue to find new ways to improve efficiency and quality to provide a fair return for our shareholders. BCA is committed to being the leader in commercial aviation by offering airplanes and services that deliver superior design, safety, efficiency and value to customers around the world. BDS integrates its resources in defense, intelligence, communications, security, space and services to deliver capability-driven solutions to customers at reduced costs. Our BDS strategy is to leverage our core businesses to capture key next-generation programs while expanding our presence in adjacent and international markets, underscored by an intense focus on growth and productivity. BGS provides support for commercial and defense through innovative, comprehensive, and cost-competitive product and service solutions. BCC facilitates, arranges, structures and provides selective financing solutions for our Boeing customers.

On March 13, 2019, the Federal Aviation Administration (FAA) issued an order to suspend operations of all 737 MAX aircraft in the U.S. and by U.S. aircraft operators following two fatal 737 MAX accidents. Non-U.S. civil aviation authorities have issued directives to the same effect. Deliveries of the 737 MAX have been suspended until clearance is granted by the appropriate regulatory authorities. The grounding is having a significant adverse impact on our operations and creates significant uncertainty. We are focused on safely returning the 737 MAX to service.

Consolidated Results of Operations

The following table summarizes key indicators of consolidated results of operations:

(Dollars in millions, except per share data)

Years ended December 31,	2019	2018	2017
Revenues	\$76,559	\$101,127	\$94,005
GAAP			
(Loss)/earnings from operations	(\$1,975)	\$11,987	\$10,344
Operating margins	(2.6)%	11.9%	11.0%
Effective income tax rate	71.8 %	9.9%	16.3%
Net (loss)/earnings	(\$636)	\$10,460	\$8,458
Diluted (loss)/earnings per share	(\$1.12)	\$17.85	\$13.85
Non-GAAP ⁽¹⁾			
Core operating (loss)/earnings	(\$3,390)	\$10,660	\$8,906
Core operating margins	(4.4%)	10.5%	9.5%
Core (loss)/earnings per share	(\$3.47)	\$16.01	\$12.33

⁽¹⁾ These measures exclude certain components of pension and other postretirement benefit expense. See page 42 - 43 for important information about these non-GAAP measures and reconciliations to the most comparable GAAP measures.

Revenues

The following table summarizes Revenues:

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Commercial Airplanes	\$32,255	\$57,499	\$54,612
Defense, Space & Security	26,227	26,392	23,938
Global Services	18,468	17,056	14,611
Boeing Capital	244	274	307
Unallocated items, eliminations and other	(635)	(94)	537
Total	\$76,559	\$101,127	\$94,005

Revenues decreased by \$24,568 million in 2019 compared with 2018 primarily due to lower revenues at BCA, partially offset by higher revenues at BGS. Lower BCA revenues are primarily driven by lower 737 MAX deliveries and a revenue reduction of \$8,259 million recorded in 2019 for estimated potential concessions and other considerations to customers for disruptions and associated delivery delays related to the 737 MAX grounding, net of insurance recoveries.

Revenues increased by \$7,122 million in 2018 compared with 2017 due to higher revenues at BCA, BDS, and BGS. BCA revenues increased by \$2,887 million due to higher 737 and 787 deliveries and favorable 737 and 787 model mix, which more than offset lower 777 and 747 deliveries. BDS revenues increased by \$2,454 million primarily due to non-US contract awards for fighters, higher weapons revenue, the final C-17 aircraft sale and higher satellites revenue. BGS revenues increased by \$2,445 million due to higher parts revenue, including the acquisition of KLX, Inc. (KLX) in the fourth quarter of 2018.

The changes in Unallocated items, eliminations and other in 2019, 2018 and 2017 primarily reflect the timing of eliminations for intercompany aircraft deliveries and the sale of aircraft previously leased to customers.

Earnings From Operations

The following table summarizes Earnings from operations:

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Commercial Airplanes	(\$6,657)	\$7,830	\$5,285
Defense, Space & Security	2,608	1,657	2,383
Global Services	2,697	2,536	2,251
Boeing Capital	28	79	114
Segment operating (loss)/profit	(1,324)	12,102	10,033
Pension FAS/CAS service cost adjustment	1,071	1,005	1,127
Postretirement FAS/CAS service cost adjustment	344	322	311
Unallocated items, eliminations and other	(2,066)	(1,442)	(1,127)
(Loss)/earnings from operations (GAAP)	(\$1,975)	\$11,987	\$10,344
FAS/CAS service cost adjustment *	(1,415)	(1,327)	(1,438)
Core operating (loss)/earnings (Non-GAAP) **	(\$3,390)	\$10,660	\$8,906

* The FAS/CAS service cost adjustment represents the difference between the FAS pension and postretirement service costs calculated under GAAP and costs allocated to the business segments.

** Core operating earnings is a Non-GAAP measure that excludes the FAS/CAS service cost adjustment. See page 42.

Loss from operations was \$1,975 million in 2019 compared with earnings from operations of \$11,987 million in 2018. The decrease of \$13,962 million is primarily due to a loss from operations at BCA of \$6,657 million in 2019 compared to earnings from operations of \$7,830 million in 2018, partially offset by higher earnings at BDS and BGS in 2019 compared with 2018. BCA decreased by \$14,487 million due to lower 737 deliveries and the earnings charge for the 737 MAX grounding of \$8,259 million, net of insurance recoveries. BDS earnings from operations increased by \$951 million primarily due to lower charges in 2019 for development programs. BGS earnings from operations increased by \$161 million primarily due to higher revenues, which was partially offset by less favorable performance and mix.

Earnings from operations increased by \$1,643 million in 2018 compared with 2017 primarily due to higher earnings at BCA and BGS, which more than offset the decrease at BDS and the change in Unallocated items, eliminations and other. BCA earnings from operations increased by \$2,545 million due to higher revenues and improved operating margins. The increase in operating margins is primarily due to higher 787 margins, improved cost performance and favorable delivery mix. BGS earnings from operations increased by \$285 million primarily due to higher revenues, partially offset by higher period costs. BDS earnings from operations decreased by \$726 million as earnings growth from higher revenues was more than offset by charges of \$691 million related to winning the T-7A Red Hawk and MQ-25 competitions, as well as higher KC-46A Tanker reach-forward losses.

During 2019, 2018 and 2017, we recorded reach-forward losses on the KC-46A Tanker program of \$148 million, \$736 million, and \$445 million, respectively.

Core operating earnings decreased by \$14,050 million in 2019 compared with 2018 primarily due to a loss from operations at BCA in 2019, partially offset by higher earnings at BDS and BGS.

Core operating earnings increased by \$1,754 million in 2018 compared with 2017 primarily due to higher earnings at BCA and BGS, partially offset by lower earnings at BDS and higher unallocated expenses.

Unallocated Items, Eliminations and Other The most significant items included in Unallocated items, eliminations and other are shown in the following table:

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Share-based plans	(\$65)	(\$76)	(\$77)
Deferred compensation	(174)	(19)	(240)
Amortization of previously capitalized interest	(89)	(92)	(96)
Research and development expense, net	(384)	(132)	42
Customer financing impairment	(250)		
Litigation	(109)	(148)	
Eliminations and other unallocated items	(995)	(975)	(756)
Unallocated items, eliminations and other	(\$2,066)	(\$1,442)	(\$1,127)

Deferred compensation expense increased by \$155 million in 2019 and decreased by \$221 million in 2018, primarily driven by changes in broad stock market conditions and our stock price.

Research and development expense increased by \$252 million in 2019 and increased by \$174 million in 2018 primarily due to spending by Boeing NeXt on product development.

In 2019, we recorded a \$250 million charge related to the impairment of lease incentives with one customer that experienced liquidity issues, and a \$109 million charge related to ongoing litigation associated with recoverable costs on U.S. government contracts. In 2018, we recorded a \$148 million charge related to the outcome of the Spirit litigation.

Eliminations and other unallocated expense increased by \$20 million in 2019 and \$219 million in 2018 primarily due to timing of expense allocations.

Net periodic pension benefit costs included in Earnings from operations were as follows:

(Dollars in millions)

	Pension		
Years ended December 31,	2019	2018	2017
Allocated to business segments	(\$1,384)	(\$1,318)	(\$1,637)
Pension FAS/CAS service cost adjustment	1,071	1,005	1,127
Net periodic benefit cost included in (Loss)/earnings from operations	(\$313)	(\$313)	(\$510)

The pension FAS/CAS service cost adjustment recognized in Earnings from operations in 2019, 2018, and 2017 was largely consistent across all periods. The net periodic benefit cost included in Earnings from operations in 2019 was consistent with 2018, as reductions in current year service cost were offset by higher amortization of prior year service costs. The decrease in net periodic benefit cost included in Earnings from operations in 2018 compared to 2017 was primarily due to a lower portion of service cost recognized in Earnings from operations.

For additional discussion related to Postretirement Plans, see Note 17 to our Consolidated Financial Statements.

Other Earnings Items

(Dollars in millions)

Years ended December 31,	2019	2018	2017
(Loss)/earnings from operations	(\$1,975)	\$11,987	\$10,344
Other income, net	438	92	123
Interest and debt expense	(722)	(475)	(360)
(Loss)/earnings before income taxes	(2,259)	11,604	10,107
Income tax benefit/(expense)	1,623	(1,144)	(1,649)
Net (loss)/earnings from continuing operations	(\$636)	\$10,460	\$8,458

Other income, net increased by \$346 million in 2019 primarily due to higher non-operating pension income. Other income, net decreased by \$31 million in 2018 primarily due to lower gains from foreign exchange, partially offset by higher interest income.

The non-operating pension income included in Other income, net was \$374 million in 2019, \$143 million in 2018, and \$117 million in 2017. The increased income in 2019 compared to 2018 was due to lower amortization of actuarial losses, partially offset by decreases in expected return on assets and increases in interest cost. The increase in 2018 compared to 2017 was due to decreases in interest cost and increases in estimated return on assets, partially offset by higher amortization of actuarial losses.

Interest and debt expense increased by \$247 million in 2019 and increased by \$115 million in 2018 as a result of higher debt balances.

For additional discussion related to Income Taxes, see Note 5 to our Consolidated Financial Statements.

Total Costs and Expenses ("Cost of Sales")

Cost of sales, for both products and services, consists primarily of raw materials, parts, sub-assemblies, labor, overhead and subcontracting costs. Our BCA segment predominantly uses program accounting to account for cost of sales. Under program accounting, cost of sales for each commercial airplane program equals the product of (i) revenue recognized in connection with customer deliveries and (ii) the estimated cost of sales percentage applicable to the total remaining program. For long-term contracts, the amount reported as cost of sales is recognized as incurred. Substantially all contracts at our BDS segment and certain contracts at our BGS segment are long-term contracts with the U.S. government and other customers that generally extend over several years. Costs on these contracts are recorded as incurred. Cost of sales for commercial spare parts is recorded at average cost.

The following table summarizes cost of sales:

(Dollars in millions)

Years ended December 31	2019	2018	Change	2018	2017	Change
Cost of sales	\$72,093	\$81,490	(\$9,397)	\$81,490	\$76,612	\$4,878
Cost of sales as a % of revenues	94.2%	80.6%	13.6%	80.6%	81.5%	(0.9)%

Cost of sales decreased by \$9,397 million in 2019 compared with 2018, primarily due to lower revenue and lower reach-forward losses. Cost of sales as a percentage of Revenues increased in 2019 primarily due to the 737 MAX grounding.

Cost of sales increased by \$4,878 million in 2018 compared with 2017, primarily due to higher revenue and higher reach-forward losses.

Research and Development The following table summarizes our Research and development expense:

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Commercial Airplanes	\$1,956	\$2,188	\$2,247
Defense, Space & Security	758	788	834
Global Services	121	161	140
Other	384	132	(42)
Total	\$3,219	\$3,269	\$3,179

Research and development expense decreased by \$50 million in 2019 compared with 2018 primarily due to lower spending on 777X and 737 MAX, partially offset by higher spending by BCA and Boeing NeXt on product development.

Research and development expense increased by \$90 million in 2018 compared with 2017 due to investment in product development, partially offset by lower spending on 777X and 787-10.

Backlog

Our backlog at December 31 was as follows:

(Dollars in millions)

Years ended December 31,	2019	2018
Commercial Airplanes	\$376,593	\$408,140
Defense, Space & Security	63,908	61,277
Global Services	22,902	21,064
Total Backlog	\$463,403	\$490,481
Contractual backlog	\$436,473	\$462,070
Unobligated backlog	26,930	\$28,411
Total Backlog	\$463,403	\$490,481

Contractual backlog of unfilled orders excludes purchase options, announced orders for which definitive contracts have not been executed, and unobligated U.S. and non-U.S. government contract funding. The decrease in contractual backlog during 2019 was primarily due to BCA deliveries in excess of new orders and a reduction in backlog related to orders from a customer that experienced liquidity issues, partially offset by BDS current year contract awards in excess of revenue recognized on contracts awarded in prior years

Unobligated backlog includes U.S. and non-U.S. government definitive contracts for which funding has not been authorized. The decrease in unobligated backlog in 2019 was primarily due to reclassifications to contractual backlog related to BDS and BGS contracts partially offset by contract awards.

Additional Considerations

Export-Import Bank of the United States Many of our non-U.S. customers finance purchases through the Export-Import Bank of the United States. The bank is authorized through December 31, 2026.

Global Trade We continually monitor the global trade environment for changes in tariffs, trade agreements, sanctions or other potential geopolitical economic developments that may impact the company.

Beginning in June 2018, the U.S. Government has imposed tariffs on steel and aluminum imports. In response to these tariffs, several major U.S. trading partners have imposed, or announced their intention to impose, tariffs on U.S. goods. In May 2019, the U.S. Government, Mexico and Canada reached an agreement to end the steel and aluminum tariffs between these countries. Passage of the U.S./Mexico/Canada Free Trade Agreement (USMCA) will also result in lower tariffs. We continue to monitor the potential for any extra costs that may result from the remaining global tariffs.

Since 2018, the U.S. and China imposed tariffs on approximately \$34 billion of each other's exports in July 2018. Certain aircraft parts and components that Boeing procures are subject to these tariffs. Subsequently, the U.S. imposed tariffs on an additional \$216 billion in Chinese goods, and China imposed tariffs on an additional \$76 billion worth of U.S. goods. The U.S. and China Phase I agreement in January 2020 is a positive development for overall trade with China. Negotiations to resolve remaining trade issues continue.

Overall global trade tensions and increased market uncertainty have resulted in fewer orders than anticipated for our commercial aircraft.

The U.S. Government continues to impose and/or consider imposing sanctions on certain businesses and individuals in Russia. Although our operations or sales in Russia have not been impacted to date, we continue to monitor additional sanctions that may be imposed by the U.S. Government and any responses from Russia that could affect our supply chain, business partners or customers.

Segment Results of Operations and Financial Condition

Commercial Airplanes

Business Environment and Trends

Airline Industry Environment Global economic growth, a primary driver for air travel, was 2.6% in 2019, slightly below the long-term average of approximately 3%. Passenger traffic is estimated to grow by 4% to 5% in 2019, close to the long-term average of approximately 5%. The grounding of the 737 MAX and suspension of 737 MAX deliveries has slowed growth at certain airlines. While growth was solid across most major world regions, there continues to be variation between regions and airline business models. Despite some moderation in the growth rates, airlines operating in Asia Pacific and Europe, as well as low-cost-carriers globally, are leading the 2019 growth in passenger traffic. Air cargo traffic growth is expected to contract this year due to weak global trade growth.

Airline financial performance also plays a role in the demand for new capacity. Airlines continue to focus on increasing revenue through alliances, partnerships, new marketing initiatives, and effective leveraging of ancillary services and related revenues. Airlines are also focusing on reducing costs and renewing fleets to leverage more efficient airplanes. Net profits in 2019 are expected to approximate \$26 billion.

The long-term outlook for the industry continues to remain positive due to the fundamental drivers of air travel demand: economic growth and the increasing propensity to travel due to increased trade, globalization, and improved airline services driven by liberalization of air traffic rights between countries. Our 20-year forecast projects a long-term average growth rate of 4.6% per year for passenger traffic and 4.2% for cargo traffic. Based on long-term global economic growth projections of 2.7% average annual GDP growth, we project a \$6.8 trillion market for approximately 44,000 new airplanes over the next 20 years. The industry remains vulnerable to exogenous developments including fuel price spikes, credit market shocks, acts of terrorism, natural disasters, conflicts, epidemics and increased global environmental regulations.

Industry Competitiveness The commercial jet airplane market and the airline industry remain extremely competitive. Market liberalization in Europe, the Middle East and Asia is enabling low-cost airlines to continue gaining market share. These airlines are increasing the pressure on airfares. This results in continued cost pressures for all airlines and price pressure on our products. Major productivity gains are essential to ensure a favorable market position at acceptable profit margins.

Continued access to global markets remains vital to our ability to fully realize our sales potential and long-term investment returns. Approximately 80% of Commercial Airplanes' total backlog, in dollar terms, is with non-U.S. airlines.

We face aggressive international competitors who are intent on increasing their market share. They offer competitive products and have access to most of the same customers and suppliers. The grounding of the 737 MAX and the associated suspension of 737 MAX deliveries have significantly reduced our market share with respect to deliveries of single aisle aircraft in 2019 and may provide competitors with an opportunity to obtain more orders and increase market share. We are continuing to monitor the impact of the 737 MAX grounding on our suppliers and working to ensure that our supply chain can support our production plans once production resumes. With government support, Airbus has historically invested heavily to create a family of products to compete with ours. After the acquisition of a majority share of Bombardier's C Series (now A220) in 2018, Airbus continues to expand in the 100-150 seat transcontinental market. Additionally, other competitors from Russia, China and Japan are developing commercial jet aircraft. Some of these competitors have historically enjoyed access to government-provided financial support, including "launch aid," which greatly reduces the cost and commercial risks associated with airplane development activities. This has enabled the development of airplanes without commercial viability; others to be brought to market more quickly than otherwise possible; and many offered for sale below market-based prices. Many competitors have continued to make improvements in efficiency, which may result in funding product development, gaining market share and improving earnings. This market environment has resulted in intense pressures on pricing and other competitive factors, and we expect these pressures to continue or intensify in the coming years.

We are focused on safely returning the 737 MAX to service, improving our products and services and continuing our cost-reduction efforts, which enhances our ability to compete. We are also focused on taking actions to ensure that Boeing is not harmed by unfair subsidization of competitors.

Results of Operations

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Revenues	\$32,255	\$57,499	\$54,612
% of total company revenues	42%	57%	58%
(Loss)/earnings from operations	(\$6,657)	\$7,830	\$5,285
Operating margins	(20.6)%	13.6%	9.7%
Research and development	\$1,956	\$2,188	\$2,247

Revenues

BCA revenues decreased by \$25,244 million in 2019 compared with 2018 driven by lower 737 MAX deliveries and a revenue reduction of \$8,259 million that was recorded in 2019 for estimated potential concessions and other considerations to customers for disruptions and associated delivery delays related to the 737 MAX grounding, net of \$500 million of insurance recoveries. BCA revenues increased by \$2,887 million in 2018 compared with 2017 primarily due to higher 737 and 787 deliveries and favorable 737 and 787 model mix, which more than offset lower 777 and 747 deliveries. The 737 MAX grounding will continue to have a significant impact on revenues until deliveries resume.

Commercial Airplanes deliveries as of December 31 were as follows:

	737 *	747 †	767 *	777 †	787	Total
2019						
Cumulative deliveries	7,439	1,555	1,176	1,627	939	
Deliveries	127 ⁽¹⁹⁾	7	43 ⁽²³⁾	45 ⁽²⁾	158	380
2018						
Cumulative deliveries	7,312	1,548	1,133	1,582	781	
Deliveries	580 ⁽¹⁸⁾	6	27 ⁽¹⁰⁾	48	145	806
2017						
Cumulative deliveries	6,732	1,542	1,106	1,534	636	
Deliveries	529 ⁽¹⁷⁾	14 ⁽¹⁾	10	74	136	763

* Intercompany deliveries identified by parentheses

† Aircraft accounted for as revenues by BCA and as operating leases in consolidation identified by parentheses

Loss/Earnings From Operations

BCA loss from operations was \$6,657 million in 2019 compared with earnings from operations of \$7,830 million in 2018. The decrease of \$14,487 million is primarily due to lower 737 deliveries and earnings charges related to the 737 MAX. The 737 MAX grounding and associated changes to our production rate will continue to adversely impact 737 program and overall BCA margins.

BCA earnings from operations increased by \$2,545 million in 2018 compared with 2017. The increase in operating earnings reflects higher revenues and improved operating margins. The increase in operating margins is primarily due to higher 787 margins, improved cost performance and favorable delivery mix.

Backlog

Our total backlog represents the estimated transaction prices on unsatisfied and partially satisfied performance obligations to our customers where we believe it is probable that we will collect the consideration due and where no contingencies remain before we and the customer are required to perform. Backlog does not include prospective orders where customer controlled contingencies remain, such as the customer receiving approval from its board of directors, shareholders or government or completing financing arrangements. All such contingencies must be satisfied or have expired prior to recording a new firm order even if satisfying such conditions is highly certain. Backlog excludes options and BCC orders. A number of our customers may have contractual remedies, including rights to reject individual airplane deliveries if the actual delivery date is significantly later than the contractual delivery date. We address customer claims and requests for other contractual relief as they arise. The value of orders in backlog is adjusted as changes to price and schedule are agreed to with customers and is reported in accordance with the requirements of ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606).

BCA total backlog of \$376,593 million at December 31, 2019 decreased from \$408,140 million at December 31, 2018, primarily due to deliveries in excess of new orders and a reduction in backlog related to orders from a customer that experienced liquidity issues. We are experiencing fewer new 737 MAX orders than we were receiving prior to the grounding. If 737 MAX aircraft remain grounded for an extended period of time, we may experience reductions to backlog and/or significant order cancellations. To date, the 737 MAX grounding has not resulted in significant order cancellations.

Accounting Quantity The accounting quantity is our estimate of the quantity of airplanes that will be produced for delivery under existing and anticipated contracts. The determination of the accounting quantity is limited by the ability to make reasonably dependable estimates of the revenue and cost of existing and anticipated contracts. It is a key determinant of the gross margins we recognize on sales of individual airplanes throughout a program's life. Estimation of each program's accounting quantity takes into account several factors that are indicative of the demand for that program, including firm orders, letters of intent from prospective customers and market studies. We review our program accounting quantities quarterly.

The accounting quantity for each program may include units that have been delivered, undelivered units under contract, and units anticipated to be under contract in the reasonable future (anticipated orders). In developing total program estimates, all of these items within the accounting quantity must be considered.

The following table provides details of the accounting quantities and firm orders by program as of December 31. Cumulative firm orders represent the cumulative number of commercial jet aircraft deliveries plus undelivered firm orders.

		Program								
		737	†	747*	767	777	†	777X	787	†
2019										
Program accounting quantities		10,400		1,574	1,195	1,690		**	1,600	
Undelivered units under firm orders		4,398		17	94	68		309	520	(29)
Cumulative firm orders		11,837		1,572	1,270	1,695		309	1,459	(29)
2018										
Program accounting quantities		10,400		1,574	1,195	1,680		**	1,600	
Undelivered units under firm orders		4,708	(75)	24	111	100	(2)	326	604	(30)
Cumulative firm orders		12,020		1,572	1,244	1,682		326	1,385	
2017										
Program accounting quantities		9,800		1,570	1,171	1,625		**	1,400	
Undelivered units under firm orders		4,613		12	98	97		326	640	
Cumulative firm orders		11,345		1,554	1,204	1,631		326	1,276	

† Aircraft ordered by BCC are identified in parentheses.

* At December 31, 2019, the 747 accounting quantity includes one already completed aircraft that has not been sold and is being remarketed.

** The accounting quantity for the 777X will be determined in the year of first airplane delivery.

Program Highlights

737 Program See the discussion of the 737 MAX Grounding and 737NG Structure (Pickle Fork) in Note 14 to our Consolidated Financial Statements .

747 Program We are currently producing at a rate of 0.5 aircraft per month. We believe that ending production of the 747 at the end of the current accounting quantity would not have a material impact on our financial position, results of operations or cash flows.

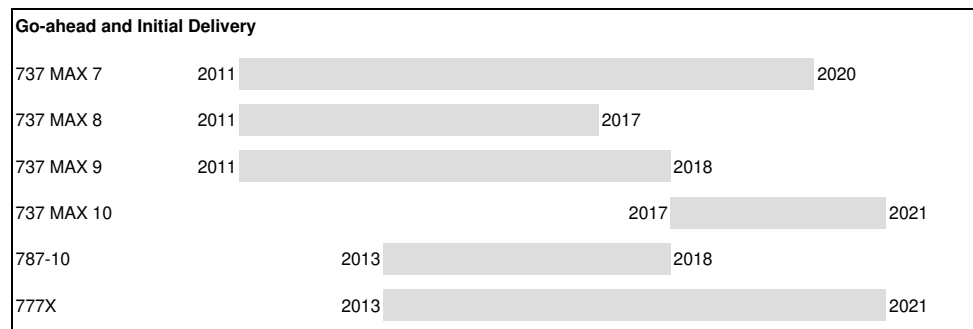
767 Program The 767 assembly line includes the commercial program and a derivative to support the tanker program. We are increasing our combined production rate from 2.5 to 3 per month in 2020.

777 Program The accounting quantity for the 777 program increased by 10 units during 2019 due to the program's normal progress of obtaining additional orders and delivering airplanes. In 2013, we launched the 777X, which features a new composite wing, new engines and folding wing-tips. We have experienced issues in engine design and development on the 777X. The first flight of the 777X was completed on January 25, 2020, and first delivery is targeted for 2021. The 777 and 777X programs have a combined production rate of 5 per month. We plan to produce more 777 models and fewer 777X models in the near term than previously planned. We expect to deliver at an average rate of 3 per month in 2020. The 777X will have a separate program accounting quantity, which will be determined in the year of first airplane delivery.

787 Program At the end of the first quarter of 2019, we increased the production rate from 12 per month to 14 per month. As a result of fewer orders than anticipated, we plan to reduce the 787 production rate to 12 per month in late 2020 and to 10 per month in early 2021. We plan to return to a production rate of 12 per month in 2023.

Fleet Support We provide the operators of our commercial airplanes with assistance and services to facilitate efficient and safe airplane operation. Collectively known as fleet support services, these activities and services begin prior to airplane delivery and continue throughout the operational life of the airplane. They include flight and maintenance training, field service support, engineering services, information services and systems and technical data and documents. The costs for fleet support are expensed as incurred and have historically been approximately 1% of total consolidated costs of products and services.

Program Development The following chart summarizes the time horizon between go-ahead and planned initial delivery for major Commercial Airplanes derivatives and programs.



Reflects models in development during 2019

We launched the 737 MAX 7, 8 and 9 in August 2011 and the 737 MAX 10 in June 2017. We launched the 787-10 in June 2013 and the 777X in November 2013.

Additional Considerations

The development and ongoing production of commercial aircraft is extremely complex, involving extensive coordination and integration with suppliers and highly-skilled labor from employees and other partners. Meeting or exceeding our performance and reliability standards, as well as those of customers and regulators, can be costly and technologically challenging. In addition, the introduction of new aircraft and derivatives, such as the 777X, involves increased risks associated with meeting development, production and certification schedules. As a result, our ability to deliver aircraft on time, satisfy performance and reliability standards and achieve or maintain, as applicable, program profitability is subject to significant risks. Factors that could result in lower margins (or a material charge if an airplane program has or is determined to have reach-forward losses) include the following: changes to the program accounting quantity, customer and model mix, production costs and rates, changes to price escalation factors due to changes in the inflation rate or other economic indicators, performance or reliability issues involving completed aircraft, capital expenditures and other costs associated with increasing or adding new production capacity, learning curve, additional change incorporation, achieving anticipated cost reductions, flight test and certification schedules, costs, schedule and demand for new airplanes and derivatives and status of customer claims, supplier claims or assertions and other contractual negotiations. While we believe the cost and revenue estimates incorporated in the consolidated financial statements are appropriate, the technical complexity of our airplane programs creates financial risk as additional completion costs may become necessary or scheduled delivery dates could be extended, which could trigger termination provisions, order cancellations or other financially significant exposure.

Defense, Space & Security

Business Environment and Trends

United States Government Defense Environment Overview

The Bipartisan Budget Act of 2019 raised the Budget Control Act limits on federal discretionary defense and non-defense spending for fiscal years 2020 and 2021 (FY20 and FY21), reducing budget uncertainty

and the risk of sequestration. The consolidated appropriations acts for FY20, enacted in December 2019, provided FY20 appropriations for government departments and agencies, including the United States Department of Defense (U.S. DoD), the National Aeronautics and Space Administration (NASA) and the Federal Aviation Administration (FAA).

The enacted FY20 appropriations included funding for Boeing's major programs, such as the F/A-18 Super Hornet, F-15EX, CH-47 Chinook, AH-64 Apache, V-22 Osprey, KC-46A Tanker, P-8 Poseidon and Space Launch System. However, there continues to be uncertainty with respect to future program-level appropriations for the U.S. DoD and other government agencies, including NASA. Future budget cuts or investment priority changes, including changes associated with the authorizations and appropriations process, could result in reductions, cancellations and/or delays of existing contracts or programs. Any of these impacts could have a material effect on our results of operations, financial position and/or cash flows.

Non-U.S. Defense Environment Overview The non-U.S. market continues to be driven by complex and evolving security challenges and the need to modernize aging equipment and inventories. BDS expects that it will continue to have a wide range of opportunities across Asia, Europe and the Middle East given the diverse regional threats. At the end of 2019, 29% of BDS backlog was attributable to non-U.S. customers.

Results of Operations

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Revenues	\$26,227	\$26,392	\$23,938
% of total company revenues	34%	26%	25%
Earnings from operations	\$2,608	\$1,657	\$2,383
Operating margins	9.9%	6.3%	10.0%

Since our operating cycle is long-term and involves many different types of development and production contracts with varying delivery and milestone schedules, the operating results of a particular year, or year-to-year comparisons of revenues, earnings and backlog may not be indicative of future operating results. In addition, depending on the customer and their funding sources, our orders might be structured as annual follow-on contracts, or as one large multi-year order or long-term award. As a result, period-to-period comparisons of backlog are not necessarily indicative of future workloads. The following discussions of comparative results among periods should be viewed in this context.

Deliveries of units for new-build production aircraft, including remanufactures and modifications were as follows:

Years ended December 31,	2019	2018	2017
F/A-18 Models	23	17	23
F-15 Models	11	10	16
C-17 Globemaster III	1		
CH-47 Chinook (New)	13	13	9
CH-47 Chinook (Renewed)	22	17	35
AH-64 Apache (New)	37		11
AH-64 Apache (Remanufactured)	74	23	57
KC-46 Tanker	28		
P-8 Models	18	16	19
C-40A	2		
Total	229	96	170

New-build satellite deliveries were as follows:

Years ended December 31,	2019	2018	2017
Commercial and civil satellites	2	1	3
Military satellites		1	1

Revenues

BDS revenues in 2019 decreased by \$165 million compared with 2018 due to timing associated with non-U.S. contract awards for fighters and the final C-17 sale in 2018, lower revenue related to charges on Commercial Crew, and lower volume from certain unmanned and vertical lift programs. These reductions were partially offset by increases from new programs, including E-7 early warning aircraft, VC-25B, T-7A Red Hawk, and MQ-25, as well as from satellites and weapons. The unfavorable impact of cumulative contract catch-up adjustments in 2019 was \$163 million higher than the comparable period in the prior year, reflecting unfavorable adjustments on the Commercial Crew contract and less favorable performance.

BDS revenues in 2018 increased by \$2,454 million compared with 2017 primarily due to non-US contract awards for fighters, higher weapons revenue, the final C-17 aircraft sale and higher satellites revenue. The unfavorable impact of cumulative contract catch-up adjustments in 2018 was \$359 million higher than the comparable period in the prior year, reflecting increased unfavorable adjustments on the KC-46A Tanker recorded in 2018.

Earnings From Operations

BDS earnings from operations in 2019 increased by \$951 million compared with 2018 primarily due to lower net charges on development programs. In 2019, BDS recorded charges of \$143 million compared with \$722 million in 2018 related to the KC-46A Tanker contract. Also during 2019, BDS recorded charges of \$489 million compared with \$57 million in 2018 related to the Commercial Crew contract. In 2018, we recorded charges of \$691 million related to losses on the T-7A Red Hawk and MQ-25 contracts. The unfavorable impact of cumulative contract catch-up adjustments in 2019 was \$62 million lower than the comparable period in the prior year, reflecting lower net unfavorable adjustments on development programs.

BDS earnings from operations in 2018 decreased by \$726 million compared with 2017 as earnings growth from higher revenues was more than offset by the higher charges on development programs in 2018. In

2017, BDS recorded charges of \$401 million related to the KC-46A Tanker contract. The unfavorable impact of cumulative contract catch-up adjustments in 2018 was \$412 million higher than the comparable period in the prior year, driven by higher charges on development programs in 2018.

BDS earnings from operations include equity earnings of \$128 million, \$147 million and \$183 million primarily from our ULA and non-U.S. joint ventures in 2019, 2018 and 2017, respectively.

Backlog

Total backlog of \$63,908 million at December 31, 2019 increased by 4% from \$61,277 million at December 31, 2018, primarily due to current year contract awards in many of our programs greater than revenue recognized. Significant orders included F/A-18 fighters, Space Launch System, P-8A Poseidon, KC-46A Tanker, and E-7 Airborne Early Warning & Control, partially offset by revenue recognized on contracts awarded in prior years.

Additional Considerations

Our BDS business includes a variety of development programs which have complex design and technical challenges. Many of these programs have cost-type contracting arrangements. In these cases, the associated financial risks are primarily in reduced fees, lower profit rates or program cancellation if cost, schedule or technical performance issues arise. Examples of these programs include Ground-based Midcourse Defense, Proprietary and Space Launch System programs.

Some of our development programs are contracted on a fixed-price basis and BDS customers are increasingly seeking fixed priced proposals for new programs. Examples of significant fixed-price development programs include Commercial Crew, KC-46A Tanker, T-7A Red Hawk, VC-25B Presidential Aircraft, MQ-25, and commercial and military satellites. New programs could also have risk for reach-forward loss upon contract award and during the period of contract performance. Many development programs have highly complex designs. As technical or quality issues arise during development, we may experience schedule delays and cost impacts, which could increase our estimated cost to perform the work or reduce our estimated price, either of which could result in a material charge or otherwise adversely affect our financial condition. These programs are ongoing, and while we believe the cost and fee estimates incorporated in the financial statements are appropriate, the technical complexity of these programs creates financial risk as additional completion costs may become necessary or scheduled delivery dates could be extended, which could trigger termination provisions, the loss of satellite in-orbit incentive payments, or other financially significant exposure. These programs have risk for reach-forward losses if our estimated costs exceed our estimated contract revenues.

KC-46A Tanker The KC-46A Tanker is a derivative of our 767 commercial aircraft. In 2011, we were awarded a contract from the U.S. Air Force (USAF) to design, develop, manufacture and deliver next generation aerial refueling tankers. The contract contains production options for both low rate initial production (LRIP) aircraft and full rate production aircraft. Since 2016, the USAF has authorized five LRIP lots for a total of 67 aircraft. The Engineering, Manufacturing and Development (EMD) contract and the five authorized LRIP lots are valued at approximately \$15 billion. If all options under the contract are exercised, we expect to deliver 179 aircraft for a total expected contract value of approximately \$30 billion. In January 2019, we delivered the first KC-46A to the USAF, and by December 2019, we had delivered a total of 28 aircraft.

During 2017, we recorded reach-forward losses of \$445 million related to this program, primarily reflecting higher estimated costs associated with certification and incorporating changes into LRIP aircraft. During 2018, we recorded additional reach-forward losses of \$736 million primarily reflecting higher estimated costs associated with certification, flight testing and change incorporation on aircraft, as well as higher than expected effort to meet customer requirements in order to support delivery of the initial aircraft. During 2019, we recorded additional reach-forward losses of \$148 million reflecting higher manufacturing costs.

As with any development program, this program remains subject to additional reach-forward losses and/or delivery delays if we experience further production, technical or quality issues.

Commercial Crew NASA has contracted us to design and build the CST-100 Starliner spacecraft to transport crews to the International Space Station. On December 20, 2019 the Starliner launched and successfully landed two days later completing an abbreviated uncrewed flight test that performed many mission objectives before returning to Earth as the first orbital land touchdown of a human-rated capsule in U.S. history. The flight test was abbreviated, however, because anomalies experienced during the mission prevented docking with the International Space Station. In the fourth quarter of 2019, we recorded an increase to the reach-forward loss of \$410 million, primarily to provision for another uncrewed mission. Root cause analysis is underway and NASA is evaluating the data received during the mission to determine if another uncrewed mission is required.

T-7A Red Hawk In September 2018, we were selected by the USAF to build the next generation training capability, known as T-7A Red Hawk (formerly T-X Trainer). The program includes aircraft and simulators as well as support and ground equipment. The contract is structured as an indefinite delivery/indefinite quantity fixed-price contract with a minimum of 206 aircraft and a maximum of 475 aircraft. The EMD contract is a fixed-price contract valued at \$813 million and includes five aircraft and seven simulators, with a period of performance that runs through 2022. The production and support contracts are structured as options that begin with authorization from fiscal year 2022 to 2034. In connection with winning this competition in 2018, we recorded a reach-forward loss of \$400 million associated with anticipated losses on the options for 346 aircraft that we believe are probable of being exercised. During 2019, we completed the aircraft's critical design review. We believe that our investment in this contract positions us for additional market opportunities for both trainer and light attack aircraft.

MQ-25 In August 2018, we were awarded an EMD contract to build the MQ-25 for the U.S. Navy. The EMD contract is a fixed-price contract that includes development and delivery of four aircraft and test articles at a contract price of \$805 million. In connection with winning this competition, we recognized a reach-forward loss of \$291 million. The period of performance runs from 2018 through 2024. In 2019, we conducted a successful first flight. The MQ-25 is the U.S. Navy's first operational carrier-based unmanned aircraft, and we believe that our investment in this contract positions us for long-term leadership in autonomy and artificial intelligence technologies along with additional market opportunities.

United Launch Alliance See the discussion of Indemnifications to ULA and Financing Commitments in Notes 7 and 15 to our Consolidated Financial Statements.

Sea Launch See the discussion of the Sea Launch receivables in Note 12 to our Consolidated Financial Statements.

Global Services

Business Environment and Trends

The aerospace markets we serve include parts distribution, logistics, and other inventory services; maintenance, engineering, and upgrades; training and professional services; and information services. We expect the market to grow by around 3.5% annually.

As the size of the worldwide commercial airline fleet continues to grow, so does demand for aftermarket services designed to increase efficiency and extend the economic lives of airplanes. Airlines are using data analytics to plan flight operations and predictive maintenance to improve their productivity and efficiency. Airlines continue to look for opportunities to reduce the size and cost of their spare parts inventory, frequently outsourcing spares management to third parties.

Government services market segments are growing on pace with related fleets, but vary based on the utilization and age of the aircraft. The U.S. government services market is the single largest individual market, comprising over 50 percent of the government services markets served. Over the next decade, we expect U.S. growth to remain flat and non-U.S. fleets, led by Middle East and Asia Pacific customers, to add rotorcraft and commercial derivative aircraft at the fastest rates. We expect less than 20 percent of the worldwide fleet of military aircraft to be retired and replaced over the next ten years, driving increased demand for services to maintain aging aircraft and enhance aircraft capability.

BGS' major customer, the U.S. government, remains subject to the spending limits and uncertainty described on page 30, which could restrict the execution of certain program activities and delay new programs or competitions.

Industry Competitiveness Aviation services is a competitive market with many domestic and international competitors. This market environment has resulted in intense pressures on pricing and we expect these pressures to continue or intensify in the coming years. Continued access to global markets remains vital to our ability to fully realize our sales growth potential and long-term investment returns.

Results of Operations

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Revenues	\$18,468	\$17,056	\$14,611
% of total company revenues	24%	17%	16%
Earnings from operations	\$2,697	\$2,536	\$2,251
Operating margins	14.6%	14.9%	15.4%

Revenues

BGS revenues in 2019 increased by \$1,412 million compared with 2018 due to the acquisition of KLX in the fourth quarter of 2018 and government services revenue, partially offset by lower commercial services revenue. The favorable impact of cumulative contract catch-up adjustments in 2019 was \$80 million higher than the comparable period in the prior year .

BGS revenues in 2018 increased by \$2,445 million compared with 2017 due to growth across our services portfolio, primarily driven by higher parts revenue, including the acquisition of KLX. The favorable impact of cumulative contract catch-up adjustments in 2018 was \$63 million lower than the comparable period in the prior year.

Earnings From Operations

BGS earnings from operations in 2019 increased by \$161 million compared with 2018. The increase in earnings from operations reflects higher revenues, which was partially offset by less favorable performance and mix. Earnings from operations for 2019 also includes a divestiture gain of \$395 million and a charge of \$293 million related to our decision in the fourth quarter to retire the Aviall brand and trade name. The favorable impact of cumulative contract catch-up adjustments in 2019 was \$21 million higher than the comparable period in the prior year .

BGS earnings from operations in 2018 increased by \$285 million compared with 2017 primarily due to higher revenues, partially offset by higher period costs. The favorable impact of cumulative contract catch-up adjustments in 2018 was \$25 million lower than the comparable period in the prior year .

Backlog

BGS total backlog of \$22,902 million at December 31, 2019 increased by 9% from \$21,064 million at December 31, 2018, primarily due to current year contract awards, partially offset by revenue recognized on contracts awarded in prior years.

Boeing Capital

Business Environment and Trends

BCC's gross customer financing and investment portfolio at December 31, 2019 totaled \$2,254 million. A substantial portion of BCC's portfolio is related to customers that we believe have less than investment-grade credit. BCC's portfolio is also concentrated by varying degrees across Boeing aircraft product types, most notably 717 and 747-8 aircraft.

BCC provided customer financing of \$419 million and \$601 million during 2019 and 2018. While we may be required to fund a number of new aircraft deliveries in 2020 and/or provide refinancing for existing bridge debt, we expect alternative financing will be available at reasonable prices from broad and globally diverse sources.

Aircraft values and lease rates are impacted by the number and type of aircraft that are currently out of service. Approximately 2,200 western-built commercial jet aircraft (8.5% of current world fleet) were parked at the end of 2019, including both in-production and out-of-production aircraft types. Of these parked aircraft, approximately 20% are not expected to return to service. At the end of 2018 and 2017, 6.7% and 8.3% of the western-built commercial jet aircraft were parked. Aircraft valuations could decline if significant numbers of additional aircraft, particularly types with relatively few operators, are placed out of service.

Results of Operations

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Revenues	\$244	\$274	\$307
Earnings from operations	\$28	\$79	\$114
Operating margins	11%	29%	37%

Revenues

BCC segment revenues consist principally of lease income from equipment under operating lease, interest income from financing receivables and notes, and other income. BCC's revenues in 2019 decreased by \$30 million compared with 2018 primarily due to lower gains on the sale of assets. BCC's revenues in 2018 decreased by \$33 million compared with 2017 primarily due to lower lease income driven by a smaller portfolio, partially offset by gains on asset sales.

Earnings From Operations

BCC's earnings from operations are presented net of interest expense, provision for (recovery of) losses, asset impairment expense, depreciation on leased equipment and other operating expenses. Earnings from operations in 2019 decreased by \$51 million primarily due to lower revenues and higher asset impairment expenses. Earnings from operations in 2018 decreased by \$35 million primarily due to lower revenues.

Financial Position

The following table presents selected financial data for BCC as of December 31:

<i>(Dollars in millions)</i>	2019	2018
Customer financing and investment portfolio, net	\$2,251	\$2,790
Other assets, primarily cash and short-term investments	535	717
Total assets	\$2,786	\$3,507
Other liabilities, primarily deferred income taxes	\$432	\$523
Debt, including intercompany loans	1,960	2,487
Equity	394	497
Total liabilities and equity	\$2,786	\$3,507
Debt-to-equity ratio	5.0-to-1	5.0-to-1

BCC's customer financing and investment portfolio at December 31, 2019 decreased from December 31, 2018, primarily due to \$720 million of note payoffs and portfolio run-off and \$250 million related to the impairment of lease incentives, partially offset by new volume.

BCC enters into certain transactions with Boeing, reflected in Unallocated items, eliminations and other, in the form of intercompany guarantees and other subsidies that mitigate the effects of certain credit quality or asset impairment issues on the BCC segment. The \$250 million impairment of lease incentives did not result in an earnings charge in the BCC segment because of an intercompany guarantee.

Leased aircraft with a carrying value of approximately \$58 million are scheduled to be returned off lease during 2020. We are seeking to remarket these aircraft or have the leases extended.

Liquidity and Capital Resources

Cash Flow Summary

<i>(Dollars in millions)</i>	2019	2018	2017
Years ended December 31,			
Net (loss)/earnings	(\$636)	\$10,460	\$8,458
Non-cash items	2,819	2,578	2,636
Changes in working capital	(4,629)	2,284	2,252
Net cash (used)/provided by operating activities	(2,446)	15,322	13,346
Net cash used by investing activities	(1,530)	(4,621)	(2,058)
Net cash provided/(used) by financing activities	5,739	(11,722)	(11,350)
Effect of exchange rate changes on cash and cash equivalents	(5)	(53)	80
Net increase/(decrease) in cash & cash equivalents, including restricted	1,758	(1,074)	18
Cash & cash equivalents, including restricted, at beginning of year	7,813	8,887	8,869
Cash & cash equivalents, including restricted, at end of year	\$9,571	\$7,813	\$8,887

Operating Activities Net cash used by operating activities was \$2.4 billion during 2019, compared with net cash provided by operating activities of \$15.3 billion during 2018 and \$13.3 billion in 2017. The decrease in operating cash flows in 2019 primarily reflects the impacts of the 737 MAX grounding that is resulting

in lower earnings, higher inventory and lower advances and progress payments. In addition, compensation payments to 737 MAX customers of \$1.2 billion for disruption to their operations also reduced 2019 cash from operating activities. Cash used to fund inventory was \$12.4 billion during 2019 as we continued to produce aircraft while deliveries were suspended. Cash provided by advances and progress billings was \$0.7 billion in 2019, as compared with \$2.6 billion in 2018. In December 2019, we announced plans to temporarily suspend production of the 737 MAX beginning in January 2020. This will enable us to prioritize the delivery of stored aircraft. Net cash from operating activities in future quarters is expected to continue to be adversely impacted by the 737 MAX grounding.

Discretionary contributions to our pension plans were insignificant in 2019 and 2018. During 2017, our discretionary contributions to our pension plans included 14.4 million shares of our common stock with an aggregate value of \$3.5 billion and \$0.5 billion in cash.

Investing Activities Cash used by investing activities during 2019, 2018 and 2017 was \$1.5 billion, \$4.6 billion and \$2.1 billion. The reduction in 2019 compared with 2018 is primarily due to acquisitions completed in the second half of 2018 and the timing of investments. Acquisitions net of cash acquired were \$0.5 billion in 2019, compared with \$3.2 billion in 2018, primarily related to the acquisition of KLX. Proceeds from dispositions was \$0.5 billion in 2019 as a result of the divestiture of two businesses. Capital expenditures totaled \$1.8 billion in 2019, relatively consistent with \$1.7 billion in 2018 and 2017. We expect capital expenditures in 2020 to be relatively consistent with 2019. Net proceeds from investments was \$0.1 billion in 2019, \$0.3 billion in 2018, and was insignificant in 2017.

Financing Activities Cash provided by financing activities was \$5.7 billion during 2019, compared with cash used by financing activities of \$11.7 billion in 2018. The increase of \$17.5 billion compared with 2018 primarily reflects higher net borrowings and lower share repurchases, partially offset by higher dividend payments in 2019. Cash used by financing activities was \$11.7 billion during 2018, an increase of \$0.4 billion compared with 2017, primarily due to higher dividend payments partially offset by higher net borrowings. Net borrowings were \$13.2 billion in 2019, \$1.4 billion in 2018 and \$1.1 billion in 2017.

At December 31, 2019 and 2018 the recorded balance of debt was \$27.3 billion and \$13.8 billion of which \$7.3 billion and \$3.2 billion was classified as short-term. At December 31, 2019 and 2018 this included \$2.0 billion and \$2.5 billion of debt attributable to BCC, of which \$0.5 billion and \$0.5 billion were classified as short-term.

During 2019 and 2018 we repurchased 6.9 million and 26.1 million shares totaling \$2.7 billion and \$9.0 billion through our open market share repurchase program. In 2019 and 2018, we had 0.6 million shares transferred to us from employees for tax withholdings. At December 31, 2019, the amount available under the share repurchase plan, announced on December 17, 2018, totaled \$17.3 billion. Share repurchases under this plan are currently suspended. We increased our quarterly dividend from \$1.71 to \$2.055 in December 2018, which resulted in \$684 million of higher dividend payments in 2019 compared with 2018.

Capital Resources We have substantial borrowing capacity. Any future borrowings may affect our credit ratings and are subject to various debt covenants as described below. We have a commercial paper program that serves as a source of short-term liquidity. At December 31, 2019, 2018, and 2017, commercial paper borrowings totaling \$6,109 million, \$1,895 million and \$600 million, respectively, which were supported by unused commitments under the revolving credit agreement. At December 31, 2019, we had \$9.6 billion of unused borrowing capacity on revolving credit line agreements. We anticipate that these credit lines will primarily serve as backup liquidity to support our general corporate borrowing needs.

Customer financing commitments totaled \$13.4 billion and \$19.5 billion at December 31, 2019 and 2018. The decrease primarily relates to financing commitment expirations and terminations. We anticipate that we will not be required to fund a significant portion of our financing commitments as we continue to work with third party financiers to provide alternative financing to customers. Historically, we have not been

required to fund significant amounts of outstanding commitments. However, there can be no assurances that we will not be required to fund greater amounts than historically required.

As previously announced, we plan to acquire an 80% ownership stake in a joint venture comprised of the commercial aircraft and services operations of Embraer for \$4.2 billion. We expect the transaction to close in the first half of 2020.

In the event we require additional funding to support strategic business opportunities, our commercial aircraft financing commitments, unfavorable resolution of litigation or other loss contingencies, or other business requirements, including impacts related to the 737 MAX grounding, we expect to meet increased funding requirements by issuing commercial paper or term debt. We believe our ability to access external capital resources should be sufficient to satisfy existing short-term and long-term commitments and plans, and also to provide adequate financial flexibility to take advantage of potential strategic business opportunities should they arise within the next year. However, there can be no assurance of the cost or availability of future borrowings under our commercial paper program or in the debt markets.

As of January 31, 2020, we have received commitments from a syndicate of banks sufficient for us to enter into a \$12 billion delayed draw two-year term loan credit facility. This facility may be increased at the Company's option if the facility is oversubscribed. The facility will enhance our liquidity and is expected to close in February 2020.

At December 31, 2019 and 2018, our pension plans were \$15.9 billion and \$15.3 billion underfunded as measured under GAAP. On an Employee Retirement Income Security Act (ERISA) basis our plans are more than 100% funded at December 31, 2019. We do not expect to make significant contributions to our pension plans in 2020. We may be required to make higher contributions to our pension plans in future years.

At December 31, 2019, we were in compliance with the covenants for our debt and credit facilities. The most restrictive covenants include a limitation on mortgage debt and sale and leaseback transactions as a percentage of consolidated net tangible assets (as defined in the credit agreements), and a limitation on consolidated debt as a percentage of total capital (as defined). When considering debt covenants, we continue to have substantial borrowing capacity.

Contractual Obligations

The following table summarizes our known obligations to make future payments pursuant to certain contracts as of December 31, 2019, and the estimated timing thereof.

<i>(Dollars in millions)</i>	Total	Less than 1 year	1-3 years	3-5 years	After 5 years
Long-term debt (including current portion)	\$27,476	\$7,306	\$2,698	\$1,780	\$15,692
Interest on debt	12,408	803	1,479	1,341	8,785
Pension and other postretirement cash requirements	9,717	621	1,307	3,719	4,070
Finance lease obligations	238	71	98	26	43
Operating lease obligations	1,574	287	429	249	609
Purchase obligations not recorded on the Consolidated Statements of Financial Position	115,411	52,685	33,550	19,246	9,930
Purchase obligations recorded on the Consolidated Statements of Financial Position	22,315	20,867	1,423	3	22
Acquisition not recorded on the Consolidated Statements of Financial Position ⁽²⁾	4,200	4,200			
Total contractual obligations ⁽¹⁾	\$193,339	\$86,840	\$40,984	\$26,364	\$39,151

⁽¹⁾ Excludes income tax matters. As of December 31, 2019, our net liability for income taxes payable, including uncertain tax positions of \$1,409 million, was \$1,262 million. Aside from \$670 million of income taxes payable expected to be paid in 2020, we are not able to reasonably estimate the timing of future cash flows related to the remaining net liability for income taxes payable. For further discussion of income taxes, see Note 5 to our Consolidated Financial Statements.

⁽²⁾ We plan to acquire an 80% ownership stake in a joint venture comprised of the commercial aircraft and services operations of Embraer. For additional information, see Note 2 to our Consolidated Financial Statements.

Pension and Other Postretirement Benefits Pension cash requirements are based on an estimate of our minimum funding requirements, pursuant to ERISA regulations, although we may make additional discretionary contributions. Estimates of other postretirement benefits are based on both our estimated future benefit payments and the estimated contributions to plans that are funded through trusts.

Purchase Obligations Purchase obligations represent contractual agreements to purchase goods or services that are legally binding; specify a fixed, minimum or range of quantities; specify a fixed, minimum, variable, or indexed price provision; and specify approximate timing of the transaction. Purchase obligations include amounts recorded as well as amounts that are not recorded on the Consolidated Statements of Financial Position.

Purchase Obligations Not Recorded on the Consolidated Statements of Financial Position Purchase obligations not recorded on the Consolidated Statements of Financial Position include agreements for inventory procurement, tooling costs, electricity and natural gas contracts, property, plant and equipment, customer financing equipment, and other miscellaneous production related obligations. The most significant obligation relates to inventory procurement contracts. We have entered into certain significant inventory procurement contracts that specify determinable prices and quantities, and long-term delivery timeframes. In addition, we purchase raw materials on behalf of our suppliers. These agreements require suppliers and vendors to be prepared to build and deliver items in sufficient time to meet our production schedules. The need for such arrangements with suppliers and vendors arises from the extended production planning horizon for many of our products. A significant portion of these inventory commitments is supported by firm contracts and/or has historically resulted in settlement through reimbursement from customers for penalty payments to the supplier should the customer not take delivery. These amounts are also included in our forecasts of costs for program and contract accounting. Some inventory procurement contracts may include escalation adjustments. In these limited cases, we have included our best estimate of the effect of the escalation adjustment in the amounts disclosed in the table above.

Purchase Obligations Recorded on the Consolidated Statements of Financial Position Purchase obligations recorded on the Consolidated Statements of Financial Position primarily include accounts payable and certain other current and long-term liabilities including accrued compensation.

Industrial Participation Agreements We have entered into various industrial participation agreements with certain customers outside of the U.S. to facilitate economic flow back and/or technology or skills transfer to their businesses or government agencies as the result of their procurement of goods and/or services from us. These commitments may be satisfied by our local operations there, placement of direct work or vendor orders for supplies, opportunities to bid on supply contracts, transfer of technology or other forms of assistance. However, in certain cases, our commitments may be satisfied through other parties (such as our vendors) who purchase supplies from our non-U.S. customers. In certain cases, penalties could be imposed if we do not meet our industrial participation commitments. During 2019, we incurred no such penalties. As of December 31, 2019, we have outstanding industrial participation agreements totaling \$24.8 billion that extend through 2034. Purchase order commitments associated with industrial participation agreements are included in purchase obligations in the table above. To be eligible for such a purchase order commitment from us, a non-U.S. supplier must have sufficient capability to meet our requirements and must be competitive in cost, quality and schedule.

Commercial Commitments

The following table summarizes our commercial commitments outstanding as of December 31, 2019.

<i>(Dollars in millions)</i>	Total Amounts Committed/Maximum Amount of Loss	Less than 1 year	1-3 years	4-5 years	After 5 years
Standby letters of credit and surety bonds	\$3,769	\$1,657	\$1,224	\$180	\$708
Commercial aircraft financing commitments	13,377	3,506	4,324	3,570	1,977
Total commercial commitments	\$17,146	\$5,163	\$5,548	\$3,750	\$2,685

Commercial aircraft financing commitments include commitments to provide financing related to aircraft on order, under option for deliveries or proposed as part of sales campaigns or refinancing with respect to delivered aircraft, based on estimated earliest potential funding dates. Based on historical experience, we anticipate that we will not be required to fund a significant portion of our financing commitments. However, there can be no assurances that we will not be required to fund greater amounts than historically required. See Note 14 to our Consolidated Financial Statements.

Contingent Obligations

We have significant contingent obligations that arise in the ordinary course of business, which include the following:

Legal Various legal proceedings, claims and investigations are pending against us. Legal contingencies are discussed in Note 22 to our Consolidated Financial Statements.

Environmental Remediation We are involved with various environmental remediation activities and have recorded a liability of \$570 million at December 31, 2019. For additional information, see Note 14 to our Consolidated Financial Statements.

Off-Balance Sheet Arrangements

We are a party to certain off-balance sheet arrangements including certain guarantees. For discussion of these arrangements, see Note 15 to our Consolidated Financial Statements.

Non-GAAP Measures

Core Operating Earnings, Core Operating Margin and Core Earnings Per Share

Our Consolidated Financial Statements are prepared in accordance with Generally Accepted Accounting Principles in the United States of America (GAAP) which we supplement with certain non-GAAP financial information. These non-GAAP measures should not be considered in isolation or as a substitute for the related GAAP measures, and other companies may define such measures differently. We encourage investors to review our financial statements and publicly-filed reports in their entirety and not to rely on any single financial measure. Core operating earnings, core operating margin and core earnings per share exclude the FAS/CAS service cost adjustment. The FAS/CAS service cost adjustment represents the difference between the FAS pension and postretirement service costs calculated under GAAP and costs allocated to the business segments. Core earnings per share excludes both the FAS/CAS service cost adjustment and non-operating pension and postretirement expenses. Non-operating pension and postretirement expenses represent the components of net periodic benefit costs other than service cost. Pension costs, comprising service and prior service costs computed in accordance with GAAP are allocated to BCA and certain BGS businesses supporting commercial customers. Pension costs allocated to BDS and BGS businesses supporting government customers are computed in accordance with U.S. Government Cost Accounting Standards (CAS), which employ different actuarial assumptions and accounting conventions than GAAP. CAS costs are allocable to government contracts. Other postretirement benefit costs are allocated to all business segments based on CAS, which is generally based on benefits paid.

The Pension FAS/CAS service cost adjustment recognized in (loss)/earnings from operations during 2019 was a benefit of \$1,071 million, largely consistent with a benefit of \$1,005 million in 2018 and \$1,127 million in 2017. The non-operating pension expense included in Other income, net was a benefit of \$374 million in 2019, \$143 million in 2018 and \$117 million in 2017. The benefits in 2019, 2018, and 2017 reflect expected returns in excess of interest cost and amortization of actuarial losses.

For further discussion of pension and other postretirement costs see the Management's Discussion and Analysis on page 22 of this Form 10-K and see Note 23 to our Consolidated Financial Statements. Management uses core operating earnings, core operating margin and core earnings per share for purposes of evaluating and forecasting underlying business performance. Management believes these core earnings measures provide investors additional insights into operational performance as unallocated

pension and other postretirement benefit cost, primarily represent costs driven by market factors and costs not allocable to U.S. government contracts.

Reconciliation of GAAP Measures to Non-GAAP Measures

The table below reconciles the non-GAAP financial measures of core operating earnings, core operating margin and core earnings per share with the most directly comparable GAAP financial measures of earnings from operations, operating margins and diluted earnings per share.

(Dollars in millions, except per share data)

Years ended December 31,	2019	2018	2017
Revenues	\$76,559	\$101,127	\$94,005
(Loss)/earnings from operations, as reported	(\$1,975)	\$11,987	\$10,344
Operating margins	(2.6)%	11.9%	11.0%
Pension FAS/CAS service cost adjustment ⁽¹⁾	(\$1,071)	(\$1,005)	(\$1,127)
Postretirement FAS/CAS service cost adjustment ⁽¹⁾	(\$344)	(\$322)	(\$311)
FAS/CAS service cost adjustment ⁽¹⁾	(\$1,415)	(\$1,327)	(\$1,438)
Core operating (loss)/earnings (non-GAAP)	(\$3,390)	\$10,660	\$8,906
Core operating margins (non-GAAP)	(4.4)%	10.5%	9.5%
Diluted (loss)/earnings per share, as reported	(\$1.12)	\$17.85	\$13.85
Pension FAS/CAS service cost adjustment ⁽¹⁾	(\$1.89)	(\$1.71)	(\$1.84)
Postretirement FAS/CAS service cost adjustment ⁽¹⁾	(\$0.61)	(\$0.55)	(\$0.51)
Non-operating pension expense ⁽²⁾	(\$0.66)	(\$0.24)	(\$0.19)
Non-operating postretirement expense ⁽²⁾	\$0.19	\$0.17	\$0.20
Provision for deferred income taxes on adjustments ⁽³⁾	\$0.62	\$0.49	\$0.82
Core (loss)/earnings per share (non-GAAP)	(\$3.47)	\$16.01	\$12.33
Weighted average diluted shares (in millions)	566.0	586.2	610.7

⁽¹⁾ FAS/CAS service cost adjustment represents the difference between the FAS pension and postretirement service costs calculated under GAAP and costs allocated to the business segments. This adjustment is excluded from Core operating (loss)/earnings (non-GAAP).

⁽²⁾ Non-operating pension and postretirement expenses represent the components of net periodic benefit costs other than service cost. These expenses are included in Other income, net and are excluded from Core (loss)/earnings per share (non-GAAP).

⁽³⁾ The income tax impact is calculated using the U.S. corporate statutory tax rate.

Critical Accounting Policies & Estimates

Accounting for long-term contracts

Substantially all contracts at BDS and certain contracts at BGS are long-term contracts. Our long-term contracts typically represent a single distinct performance obligation due to the highly interdependent and interrelated nature of the underlying goods and/or services and the significant service of integration that we provide.

Accounting for long-term contracts involves a judgmental process of estimating the total sales, costs, and profit for each performance obligation. Cost of sales is recognized as incurred and revenue is determined by adding a proportionate amount of the estimated profit to the amount reported as cost of sales.

Due to the size, duration and nature of many of our long-term contracts, the estimation of total sales and costs through completion is complicated and subject to many variables. Total sales estimates are based on negotiated contract prices and quantities, modified by our assumptions regarding contract options, change orders, incentive and award provisions associated with technical performance, and price adjustment clauses (such as inflation or index-based clauses). The majority of these long-term contracts are with the U.S. government where the price is generally based on estimated cost to produce the product or service plus profit. Federal Acquisition Regulations provide guidance on the types of cost that will be reimbursed in establishing contract price. Total cost estimates are largely based on negotiated or estimated purchase contract terms, historical performance trends, business base and other economic projections. Factors that influence these estimates include inflationary trends, technical and schedule risk, internal and subcontractor performance trends, business volume assumptions, asset utilization, and anticipated labor agreements.

Revenue and cost estimates for all significant long-term contract performance obligations are reviewed and reassessed quarterly. Changes in these estimates could result in recognition of cumulative catch-up adjustments to the performance obligation's inception to date revenues, cost of sales and profit, in the period in which such changes are made. Changes in revenue and cost estimates could also result in a reach-forward loss or an adjustment to a reach-forward loss, which would be recorded immediately in earnings. For the years ended December 31, 2019 and 2018 net unfavorable cumulative catch-up adjustments, including reach-forward losses, across all long-term contracts decreased Earnings from operations by \$111 million and \$190 million. For the year ended December 31, 2017, net favorable cumulative catch-up adjustments, including reach-forward losses, across all long-term contracts increased Earnings from operations by \$250 million.

Due to the significance of judgment in the estimation process described above, it is likely that materially different earnings could be recorded if we used different assumptions or if the underlying circumstances were to change. Changes in underlying assumptions/estimates, supplier performance, or circumstances may adversely or positively affect financial performance in future periods. If the combined gross margin for all long-term contract performance obligations for all of 2019 had been estimated to be higher or lower by 1%, it would have increased or decreased pre-tax income for the year by approximately \$330 million. In addition, a number of our fixed price development contracts are in a reach-forward loss position. Changes to estimated losses are recorded immediately in earnings.

Program Accounting

Program accounting requires the demonstrated ability to reliably estimate the relationship of sales to costs for the defined program accounting quantity. A program consists of the estimated number of units (accounting quantity) of a product to be produced in a continuing, long-term production effort for delivery under existing and anticipated contracts. The determination of the accounting quantity is limited by the ability to make reasonably dependable estimates of the revenue and cost of existing and anticipated contracts. For each program, the amount reported as cost of sales is determined by applying the estimated cost of sales percentage for the total remaining program to the amount of sales recognized for airplanes delivered and accepted by the customer.

Factors that must be estimated include program accounting quantity, sales price, labor and employee benefit costs, material costs, procured part costs, major component costs, overhead costs, program tooling and other non-recurring costs, and warranty costs. Estimation of the accounting quantity for each program takes into account several factors that are indicative of the demand for the particular program, such as firm orders, letters of intent from prospective customers, and market studies. Total estimated program sales are determined by estimating the model mix and sales price for all unsold units within the accounting quantity, added together with the sales prices for all undelivered units under contract. The sales prices for all undelivered units within the accounting quantity include an escalation adjustment for inflation that is updated quarterly. Cost estimates are based largely on negotiated and anticipated contracts with suppliers, historical performance trends, and business base and other economic projections. Factors that influence these estimates include production rates, internal and subcontractor performance trends, customer and/or supplier claims or assertions, asset utilization, anticipated labor agreements, and inflationary or deflationary trends.

To ensure reliability in our estimates, we employ a rigorous estimating process that is reviewed and updated on a quarterly basis. Changes in estimates are normally recognized on a prospective basis; however, when estimated costs to complete a program exceed estimated revenues from undelivered units in the accounting quantity, a loss provision is recorded in the current period for the estimated loss on all undelivered units in the accounting quantity.

The program method of accounting allocates tooling and other non-recurring and production costs over the accounting quantity for each program. Because of the higher unit production costs experienced at the beginning of a new program and substantial investment required for initial tooling and other non-recurring costs, new commercial aircraft programs, such as the 777X program, typically have lower initial margins than established programs. In addition, actual costs incurred for earlier units in excess of the estimated average cost of all units in the program accounting quantity are included within program inventory as deferred production costs. Deferred production, unamortized tooling and other non-recurring costs are expected to be fully recovered when all units in the accounting quantity are delivered as the expected unit cost for later deliveries is below the estimated average cost as learning curve and other improvements are realized.

Due to the significance of judgment in the estimation process described above, it is reasonably possible that changes in underlying circumstances or assumptions could have a material effect on program gross margins. If the combined gross margin percentages for our commercial airplane programs had been estimated to be 1% higher or lower it would have an approximately \$400 million impact on operating earnings for the year ended December 31, 2019.

737 MAX Grounding

On March 13, 2019, the Federal Aviation Administration (FAA) issued an order to suspend operations of all 737 MAX aircraft in the U.S. and by U.S. aircraft operators following two fatal 737 MAX accidents. Non-U.S. civil aviation authorities have issued directives to the same effect. The grounding is having a significant adverse impact on our operations and creates significant uncertainty.

Multiple legal actions have been filed against us as a result of the October 29, 2018 accident of Lion Air Flight 610 and the March 10, 2019 accident of Ethiopian Airlines Flight 302. Further, we are fully cooperating with all ongoing governmental and regulatory investigations and inquiries relating to the accidents and the 737 MAX, including investigations by the U.S. Department of Justice and the Securities and Exchange Commission. We cannot reasonably estimate a range of loss, if any, not covered by available insurance that may result given the ongoing status of these lawsuits, investigations, and inquiries. We have also experienced claims and/or assertions from customers and suppliers in connection with the grounding. As a result of the grounding, we reduced the 737 production rate from 52 per month to 42 per month in 2019 and in December 2019, we announced plans to temporarily suspend 737 production beginning in January 2020. We have concluded that the suspension of production and the gradual resumption of production at low production rates will result in abnormal production costs which will be expensed when incurred rather than inventoried. Prior to the grounding, we had planned to increase the production rate to 57 per month in 2019.

In the preparation of our financial statements, we have made assumptions regarding outcomes of accident investigations and other government inquiries, timing and conditions of return to service, the duration of the 737 MAX production suspension and timing of future 737 production rate increases, supplier readiness to support production rate changes, timing and sequence of future customer deliveries as well as outcomes of negotiations with customers impacted by the grounding. We have also made significant assumptions regarding estimated costs expected to be incurred in 2020 and 2021 that should be included in program inventory and those costs that should be expensed when incurred as abnormal production costs. While these assumptions reflect our best estimate at this time, they are highly uncertain and significantly affect the estimates inherent in our financial statements.

The FAA and other non-U.S. civil aviation authorities will determine the timing and conditions of the 737 MAX return to service in each relevant jurisdiction. We have assumed that regulatory approval of the 737 MAX will enable deliveries to resume during mid-2020. We have also assumed that, as a condition of return to service, regulators will require 737 MAX pilots to undergo computer and simulator training. We have assumed that we will resume 737 MAX aircraft production at low rates in 2020 as timing and conditions of return to service are better understood, and then we expect to gradually increase to previously planned production rates over the next few years. We are also assuming that 737 MAX airplanes produced during the grounding and included within inventory will be delivered over several quarters with the majority of them delivering during the first year after the resumption of deliveries. The cumulative impacts of changes to assumptions regarding timing of return to service and timing of planned production rates have increased the estimated costs to produce aircraft included in the current accounting quantity by approximately \$6.3 billion, which will be recorded in program inventory. In addition, the suspension of 737 MAX production and lower production rates is expected to result in approximately \$4.0 billion of abnormal production costs in 2020 and 2021 that will be expensed as incurred. The increases in the estimated costs accounted for as program inventory will reduce 737 program and overall BCA segment operating margins in future periods after deliveries resume. Production costs incurred while production is suspended and a portion of production costs incurred while we gradually increase production rates to a normal level will be expensed as incurred as abnormal costs and will not be included in program inventory. We may face additional costs, delays in regulatory approval of the 737 MAX and/or the resumption of deliveries, and/or further delays in planned production rate increases which may result in further increases in program costs and/or abnormal production costs.

We recorded an earnings charge and corresponding liability of \$6.1 billion, in the second quarter of 2019, in connection with an estimate of potential concessions and other considerations to customers for disruptions related to the 737 MAX grounding and associated delivery delays. The second quarter estimate of \$6.1 billion was updated in the third and fourth quarters of 2019. The remaining liability of \$7.4 billion at December 31, 2019 represents our current best estimate of future concessions and other considerations we expect to provide to customers. This estimate relies on the exercise of judgment by management and is significantly impacted by the assumptions described above, as well as the status of negotiations with

our customers. Any delays in our ability to resume deliveries, prolonged production suspension, further disruptions to our production system, supplier claims or assertions, or changes to estimated concessions and other considerations we expect to provide to customers could have a material adverse effect on our financial position, results of operations, and/or cash flows.

Goodwill and Indefinite-Lived Intangible Impairments

We test goodwill for impairment by performing a qualitative assessment or using a two-step impairment process. If we choose to perform a qualitative assessment, we evaluate economic, industry and company-specific factors as an initial step in assessing the fair value of operations. If we determine it is more likely than not that the carrying value of the net assets is more than the fair value of the related operations, the two-step impairment process is then performed; otherwise, no further testing is required. For operations where the two-step impairment process is used, we first compare the book value of net assets to the fair value of the related operations. If the fair value is determined to be less than book value, a second step is performed to compute the amount of the impairment. In this process, a fair value for goodwill is estimated, based in part on the fair value of the operations, and is compared to its carrying value. The shortfall of the fair value below carrying value represents the amount of goodwill impairment.

We estimate the fair values of the related operations using discounted cash flows. Forecasts of future cash flows are based on our best estimate of future sales and operating costs, based primarily on existing firm orders, expected future orders, contracts with suppliers, labor agreements and general market conditions. Changes in these forecasts could significantly change the amount of impairment recorded, if any.

The cash flow forecasts are adjusted by an appropriate discount rate derived from our market capitalization plus a suitable control premium at the date of evaluation. Therefore, changes in the stock price may also affect the amount of impairment recorded, if any.

We completed our assessment of goodwill as of April 1, 2019 and determined that there is no impairment of goodwill. As of December 31, 2019, we estimated that the fair value of each reporting unit significantly exceeded its corresponding carrying value. Changes in our forecasts, or decreases in the value of our common stock could cause book values of certain operations to exceed their fair values which may result in goodwill impairment charges in future periods.

As of December 31, 2018, we had \$490 million of indefinite-lived intangible assets related to the Jeppesen and Aviall brand and trade names acquired in business combinations. During 2019, we changed the name of the Aviall business to Boeing Distribution Inc. and, in the fourth quarter, decided to retire the Aviall brand and trade name. As a result we recorded an earnings charge of \$293 million to write-off the Aviall indefinite-lived intangible asset. Accordingly, as of December 31, 2019, we had an indefinite-lived intangible asset with a carrying value of \$197 million related to the Jeppesen brand and trade name.

We test these intangibles for impairment by comparing their carrying value to current projections of discounted cash flows attributable to the brand and trade names. Any excess carrying value over the amount of discounted cash flows represents the amount of the impairment. A 10% decrease in the discounted cash flows would not impact the carrying value of the Jeppesen indefinite-lived intangible asset.

Pension Plans

The majority of our employees have earned benefits under defined benefit pension plans. Nonunion and the majority of union employees that had participated in defined benefit pension plans transitioned to a company-funded defined contribution retirement savings plan in 2016. Additional union employees transitioned to company-funded defined contribution retirement savings plans effective January 1, 2019. Accounting rules require an annual measurement of our projected obligation and plan assets. These measurements are based upon several assumptions, including the discount rate and the expected long-term rate of asset return. Future changes in assumptions or differences between actual and expected outcomes can significantly affect our future annual expense, projected benefit obligation and Shareholders' equity.

The following table shows the sensitivity of our pension plan liability and net periodic cost to a 25 basis point change in the discount rate as of December 31, 2019.

<i>(Dollars in millions)</i>	Change in discount rate Increase 25 bps	Change in discount rate Decrease 25 bps
Pension plans		
Projected benefit obligation	(\$2,231)	\$2,778
Net periodic pension cost	(10)	20

Pension cost is also sensitive to changes in the expected long-term rate of asset return. A decrease or increase of 25 basis points in the expected long-term rate of asset return would have increased or decreased 2019 net periodic pension cost by \$149 million.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Interest Rate Risk

We have financial instruments that are subject to interest rate risk, principally fixed-rate debt obligations, and customer financing assets and liabilities. Historically, we have not experienced material gains or losses on our customer financing assets and liabilities due to interest rate changes. As of December 31, 2019, the impact over the next 12 months of a 100 basis point rise in interest rates to our pre-tax earnings would not be significant. The investors in our fixed-rate debt obligations do not generally have the right to demand we pay off these obligations prior to maturity. Therefore, exposure to interest rate risk is not believed to be material for our fixed-rate debt.

Foreign Currency Exchange Rate Risk

We are subject to foreign currency exchange rate risk relating to receipts from customers and payments to suppliers in foreign currencies. We use foreign currency forward contracts to hedge the price risk associated with firmly committed and forecasted foreign denominated payments and receipts related to our ongoing business. Foreign currency forward contracts are sensitive to changes in foreign currency exchange rates. At December 31, 2019, a 10% increase or decrease in the exchange rate in our portfolio of foreign currency contracts would have increased or decreased our unrealized losses by \$226 million. Consistent with the use of these contracts to neutralize the effect of exchange rate fluctuations, such unrealized losses or gains would be offset by corresponding gains or losses, respectively, in the remeasurement of the underlying transactions being hedged. When taken together, these forward currency contracts and the offsetting underlying commitments do not create material market risk.

Commodity Price Risk

We are subject to commodity price risk relating to commodity purchase contracts for items used in production that are subject to changes in the market price. We use commodity swaps to hedge against these potentially unfavorable price changes. Our commodity purchase contracts and derivatives are both sensitive to changes in the market price. At December 31, 2019, a 10% increase or decrease in the market price in our commodity derivatives would have increased or decreased our unrealized losses by \$63 million. Consistent with the use of these contracts to neutralize the effect of market price fluctuations, such unrealized losses or gains would be offset by corresponding gains or losses, respectively, in the remeasurement of the underlying transactions being hedged. When taken together, these commodity purchase contracts and the offsetting swaps do not create material market risk.

Item 8. Financial Statements and Supplementary Data

Index to the Consolidated Financial Statements

	<i>Page</i>
<u>Consolidated Statements of Operations</u>	<u>51</u>
<u>Consolidated Statements of Comprehensive Income</u>	<u>52</u>
<u>Consolidated Statements of Financial Position</u>	<u>53</u>
<u>Consolidated Statements of Cash Flows</u>	<u>54</u>
<u>Consolidated Statements of Equity</u>	<u>55</u>
<u>Summary of Business Segment Data</u>	<u>56</u>
<u>Note 1 - Summary of Significant Accounting Policies</u>	<u>57</u>
<u>Note 2 - Acquisitions and Joint Ventures</u>	<u>69</u>
<u>Note 3 - Goodwill and Acquired Intangibles</u>	<u>71</u>
<u>Note 4 - Earnings Per Share</u>	<u>72</u>
<u>Note 5 - Income Taxes</u>	<u>73</u>
<u>Note 6 - Accounts Receivable</u>	<u>76</u>
<u>Note 7 - Inventories</u>	<u>77</u>
<u>Note 8 - Contracts with Customers</u>	<u>78</u>
<u>Note 9 - Customer Financing</u>	<u>78</u>
<u>Note 10 - Property, Plant and Equipment</u>	<u>81</u>
<u>Note 11 - Investments</u>	<u>82</u>
<u>Note 12 - Other Assets</u>	<u>82</u>
<u>Note 13 - Leases</u>	<u>83</u>
<u>Note 14 - Liabilities, Commitments and Contingencies</u>	<u>84</u>
<u>Note 15 - Arrangements with Off-Balance Sheet Risk</u>	<u>89</u>
<u>Note 16 - Debt</u>	<u>90</u>
<u>Note 17 - Postretirement Plans</u>	<u>92</u>
<u>Note 18 - Share-Based Compensation and Other Compensation Arrangements</u>	<u>101</u>
<u>Note 19 - Shareholders' Equity</u>	<u>105</u>
<u>Note 20 - Derivative Financial Instruments</u>	<u>106</u>
<u>Note 21 - Fair Value Measurements</u>	<u>109</u>
<u>Note 22 - Legal Proceedings</u>	<u>111</u>
<u>Note 23 - Segment and Revenue Information</u>	<u>111</u>
<u>Note 24 - Quarterly Financial Data</u>	<u>117</u>
 <u>Reports of Independent Registered Public Accounting Firm</u>	 <u>118</u>

The Boeing Company and Subsidiaries
Consolidated Statements of Operations

(Dollars in millions, except per share data)

Years ended December 31,	2019	2018	2017
Sales of products	\$66,094	\$90,229	\$83,740
Sales of services	10,465	10,898	10,265
Total revenues	76,559	101,127	94,005
Cost of products	(62,877)	(72,922)	(68,879)
Cost of services	(9,154)	(8,499)	(7,663)
Boeing Capital interest expense	(62)	(69)	(70)
Total costs and expenses	(72,093)	(81,490)	(76,612)
	4,466	19,637	17,393
(Loss)/income from operating investments, net	(4)	111	204
General and administrative expense	(3,909)	(4,567)	(4,095)
Research and development expense, net	(3,219)	(3,269)	(3,179)
Gain on dispositions, net	691	75	21
(Loss)/earnings from operations	(1,975)	11,987	10,344
Other income, net	438	92	123
Interest and debt expense	(722)	(475)	(360)
(Loss)/earnings before income taxes	(2,259)	11,604	10,107
Income tax benefit/(expense)	1,623	(1,144)	(1,649)
Net (loss)/earnings	(\$636)	\$10,460	\$8,458
Basic (loss)/earnings per share	(\$1.12)	\$18.05	\$14.03
Diluted (loss)/earnings per share	(\$1.12)	\$17.85	\$13.85

See Notes to the Consolidated Financial Statements on pages 56 – 117.

The Boeing Company and Subsidiaries
Consolidated Statements of Comprehensive Income

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Net (loss)/earnings	(\$636)	\$10,460	\$8,458
Other comprehensive income/(loss), net of tax:			
Currency translation adjustments	(27)	(86)	128
Unrealized gain on certain investments, net of tax of \$0, (\$1) and (\$1)	1	2	1
Derivative instruments:			
Unrealized (loss)/gain arising during period, net of tax of \$13, \$40, and (\$66)	(48)	(146)	119
Reclassification adjustment for loss included in net earnings, net of tax of (\$7), (\$8), and (\$28)	26	30	52
Total derivative instruments, net of tax	(22)	(116)	171
Defined benefit pension plans & other postretirement benefits:			
Net actuarial (loss)/gain arising during the period, net of tax of \$405, (\$105), and \$248	(1,413)	384	(495)
Amortization of actuarial losses included in net periodic pension cost, net of tax of (\$133), (\$242), and (\$272)	464	878	542
Settlements and curtailments included in net income, net of tax of \$0, (\$2), and \$0		8	
Pension and postretirement benefit/(cost) related to our equity method investments, net of tax (\$5), (\$6), and \$5	17	22	(11)
Amortization of prior service credits included in net periodic pension cost, net of tax of \$25, \$39, and \$59	(89)	(143)	(117)
Prior service (credit)/cost arising during the period, net of tax of \$0, (\$94), and (\$14)	(1)	341	28
Total defined benefit pension plans & other postretirement benefits, net of tax	(1,022)	1,490	(53)
Other comprehensive (loss)/income, net of tax	(1,070)	1,290	247
Comprehensive loss related to noncontrolling interests	(41)	(21)	(2)
Comprehensive (loss)/income, net of tax	(\$1,747)	\$11,729	\$8,703

See Notes to the Consolidated Financial Statements on pages 56 – 117.

The Boeing Company and Subsidiaries
Consolidated Statements of Financial Position

(Dollars in millions, except per share data)

December 31,	2019	2018
Assets		
Cash and cash equivalents	\$9,485	\$7,637
Short-term and other investments	545	927
Accounts receivable, net	3,266	3,879
Unbilled receivables, net	9,043	10,025
Current portion of customer financing, net	162	460
Inventories	76,622	62,567
Other current assets	3,106	2,335
Total current assets	102,229	87,830
Customer financing, net	2,136	2,418
Property, plant and equipment, net	12,502	12,645
Goodwill	8,060	7,840
Acquired intangible assets, net	3,338	3,429
Deferred income taxes	683	284
Investments	1,092	1,087
Other assets, net of accumulated amortization of \$580 and \$503	3,585	1,826
Total assets	\$133,625	\$117,359
Liabilities and equity		
Accounts payable	\$15,553	\$12,916
Accrued liabilities	22,868	14,808
Advances and progress billings	51,551	50,676
Short-term debt and current portion of long-term debt	7,340	3,190
Total current liabilities	97,312	81,590
Deferred income taxes	413	1,736
Accrued retiree health care	4,540	4,584
Accrued pension plan liability, net	16,276	15,323
Other long-term liabilities	3,422	3,059
Long-term debt	19,962	10,657
Shareholders' equity:		
Common stock, par value \$5.00 – 1,200,000,000 shares authorized; 1,012,261,159 shares issued	5,061	5,061
Additional paid-in capital	6,745	6,768
Treasury stock, at cost	(54,914)	(52,348)
Retained earnings	50,644	55,941
Accumulated other comprehensive loss	(16,153)	(15,083)
Total shareholders' equity	(8,617)	339
Noncontrolling interests	317	71
Total equity	(8,300)	410
Total liabilities and equity	\$133,625	\$117,359

See Notes to the Consolidated Financial Statements on pages 56 – 117.

The Boeing Company and Subsidiaries
Consolidated Statements of Cash Flows

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Cash flows – operating activities:			
Net (loss)/earnings	(\$636)	\$10,460	\$8,458
Adjustments to reconcile net earnings to net cash provided by operating activities:			
Non-cash items –			
Share-based plans expense	212	202	202
Depreciation and amortization	2,271	2,114	2,047
Investment/asset impairment charges, net	443	93	113
Customer financing valuation adjustments	250	(3)	2
Gain on dispositions, net	(691)	(75)	(21)
Other charges and credits, net	334	247	293
Changes in assets and liabilities –			
Accounts receivable	603	(795)	(840)
Unbilled receivables	982	(1,826)	(1,600)
Advances and progress billings	737	2,636	4,700
Inventories	(12,391)	568	(1,403)
Other current assets	(682)	98	(19)
Accounts payable	1,600	2	130
Accrued liabilities	7,781	1,117	335
Income taxes receivable, payable and deferred	(2,476)	(180)	656
Other long-term liabilities	(621)	87	94
Pension and other postretirement plans	(777)	(153)	(582)
Customer financing, net	419	120	1,041
Other	196	610	(260)
Net cash (used)/provided by operating activities	(2,446)	15,322	13,346
Cash flows – investing activities:			
Property, plant and equipment additions	(1,834)	(1,722)	(1,739)
Property, plant and equipment reductions	334	120	92
Acquisitions, net of cash acquired	(455)	(3,230)	(324)
Proceeds from dispositions	464		
Contributions to investments	(1,658)	(2,607)	(3,569)
Proceeds from investments	1,759	2,898	3,607
Purchase of distribution rights	(127)	(69)	(131)
Other	(13)	(11)	6
Net cash used by investing activities	(1,530)	(4,621)	(2,058)
Cash flows – financing activities:			
New borrowings	25,389	8,548	2,077
Debt repayments	(12,171)	(7,183)	(953)
Contributions from noncontrolling interests	7	35	
Stock options exercised	58	81	311
Employee taxes on certain share-based payment arrangements	(248)	(257)	(132)
Common shares repurchased	(2,651)	(9,000)	(9,236)
Dividends paid	(4,630)	(3,946)	(3,417)
Other	(15)		
Net cash provided/(used) by financing activities	5,739	(11,722)	(11,350)
Effect of exchange rate changes on cash and cash equivalents	(5)	(53)	80
Net increase/(decrease) in cash & cash equivalents, including restricted	1,758	(1,074)	18
Cash & cash equivalents, including restricted, at beginning of year	7,813	8,887	8,869
Cash & cash equivalents, including restricted, at end of year	9,571	7,813	8,887
Less restricted cash & cash equivalents, included in Investments	86	176	74
Cash and cash equivalents at end of year	\$9,485	\$7,637	\$8,813

See Notes to the Consolidated Financial Statements on pages 56 – 117.

The Boeing Company and Subsidiaries
Consolidated Statements of Equity

	Boeing shareholders					Non-controlling Interest	Total
	Common Stock	Additional Paid-In Capital	Treasury Stock	Retained Earnings	Accumulated Other Comprehensive Loss		
<i>(Dollars in millions, except per share data)</i>							
Balance at January 1, 2017	\$5,061	\$4,762	(\$36,097)	\$41,754	(\$13,623)	\$60	\$1,917
Net earnings/(loss)				8,458		(2)	8,456
Impact of ASU 2018-02				2,997	(2,997)		—
Other comprehensive income, net of tax of (\$69)					247		247
Share-based compensation and related dividend equivalents		238		(35)			203
Treasury shares issued for stock options exercised, net		(88)	399				311
Treasury shares issued for other share-based plans, net		(190)	62				(128)
Treasury shares contributed to pension plans		2,082	1,418				3,500
Common shares repurchased			(9,236)				(9,236)
Cash dividends declared (\$5.97 per share)				(3,556)			(3,556)
Changes in noncontrolling interests						(1)	(1)
Balance at December 31, 2017	\$5,061	\$6,804	(\$43,454)	\$49,618	(\$16,373)	\$57	\$1,713
Net earnings/(loss)				10,460		(21)	10,439
Other comprehensive income, net of tax of (\$379)					1,290		1,290
Share-based compensation and related dividend equivalents		238		(36)			202
Treasury shares issued for stock options exercised, net		(45)	126				81
Treasury shares issued for other share-based plans, net		(229)	(20)				(249)
Common shares repurchased			(9,000)				(9,000)
Cash dividends declared (\$7.19 per share)				(4,101)			(4,101)
Changes in noncontrolling interests						35	35
Balance at December 31, 2018	\$5,061	\$6,768	(\$52,348)	\$55,941	(\$15,083)	\$71	\$410
Net earnings/(loss)				(636)		(41)	(677)
Other comprehensive income, net of tax of \$298					(1,070)		(1,070)
Share-based compensation and related dividend equivalents		245		(33)			212
Treasury shares issued for stock options exercised, net		(47)	104				57
Treasury shares issued for other share-based plans, net		(221)	(19)				(240)
Common shares repurchased			(2,651)				(2,651)
Cash dividends declared (\$8.22 per share)				(4,628)			(4,628)
Changes in noncontrolling interests						287	287
Balance at December 31, 2019	\$5,061	\$6,745	(\$54,914)	\$50,644	(\$16,153)	\$317	(\$8,300)

See Notes to the Consolidated Financial Statements on pages 56 – 117.

The Boeing Company and Subsidiaries
Notes to the Consolidated Financial Statements
Summary of Business Segment Data

(Dollars in millions)

Years ended December 31,	2019	2018	2017
Revenues:			
Commercial Airplanes	\$32,255	\$57,499	\$54,612
Defense, Space & Security	26,227	26,392	23,938
Global Services	18,468	17,056	14,611
Boeing Capital	244	274	307
Unallocated items, eliminations and other	(635)	(94)	537
Total revenues	\$76,559	\$101,127	\$94,005
(Loss)/earnings from operations:			
Commercial Airplanes	(\$6,657)	\$7,830	\$5,285
Defense, Space & Security	2,608	1,657	2,383
Global Services	2,697	2,536	2,251
Boeing Capital	28	79	114
Segment operating (loss)/profit	(1,324)	12,102	10,033
Unallocated items, eliminations and other	(2,066)	(1,442)	(1,127)
FAS/CAS service cost adjustment	1,415	1,327	1,438
(Loss)/earnings from operations	(1,975)	11,987	10,344
Other income, net	438	92	123
Interest and debt expense	(722)	(475)	(360)
(Loss)/earnings before income taxes	(2,259)	11,604	10,107
Income tax benefit/(expense)	1,623	(1,144)	(1,649)
Net (loss)/earnings	(\$636)	\$10,460	\$8,458

This information is an integral part of the Notes to the Consolidated Financial Statements. See Note 23 for further segment results.

The Boeing Company and Subsidiaries
Notes to the Consolidated Financial Statements
Years ended December 31, 2019, 2018 and 2017
(Dollars in millions, except per share data)

Note 1 – Summary of Significant Accounting Policies

Principles of Consolidation and Basis of Presentation

The Consolidated Financial Statements included in this report have been prepared by management of The Boeing Company (herein referred to as “Boeing,” the “Company,” “we,” “us,” or “our”). These statements include the accounts of all majority-owned subsidiaries and variable interest entities that are required to be consolidated. All significant intercompany accounts and transactions have been eliminated. As described in Note 23, we operate in four reportable segments: Commercial Airplanes (BCA); Defense, Space & Security (BDS), Global Services (BGS), and Boeing Capital (BCC). Effective at the beginning of 2019, all revenues and costs associated with military derivative aircraft production are reported in the BDS segment. Amounts in prior periods have been reclassified to conform to the current year presentation.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles (GAAP) requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Operating Cycle

For classification of certain current assets and liabilities, we use the duration of the related contract or program as our operating cycle, which is generally longer than one year.

Standards Issued and Implemented

In the first quarter of 2019, we adopted Accounting Standards Update (ASU) 2016-02, Leases (Topic 842) and recognized on our Consolidated Statement of Financial Position \$1,064 of lease liabilities with corresponding right-of-use assets for operating leases. Our accounting for finance leases and lessor contracts remains substantially unchanged. The standard has no impact to cash provided or used by operating, investing, or financing activities on our Consolidated Statements of Cash Flows. As permitted under the standard, we elected prospective application of the new guidance and prior periods continue to be presented in accordance with Topic 840. We also elected the package of practical expedients, which among other things, does not require reassessment of lease classification. See Note 9 and 13 for additional disclosures.

In the first quarter of 2019, we adopted ASU 2017-12, Derivatives and Hedging (Topic 815), using the modified retrospective method. The standard refines and simplifies hedge accounting requirements for both financial and commodity risks. The impact of the adoption was not material. See Note 20 for additional disclosures.

Revenue and Related Cost Recognition

Commercial aircraft contracts The majority of our BCA segment revenue is derived from commercial aircraft contracts. For each contract, we determine the transaction price based on the consideration expected to be received. We allocate the transaction price to each commercial aircraft performance obligation based on relative standalone selling prices adjusted by an escalation formula as specified in the customer agreement. Revenue is recognized for each commercial aircraft performance obligation at the point in time when the aircraft is completed and accepted by the customer. We use program accounting to determine the amount reported as cost of sales.

In certain situations, where an aircraft is still in our possession, and title and risk of loss has passed to the customer (known as a bill-and-hold arrangement), revenue will be recognized when all specific requirements for transfer of control under a bill-and-hold arrangement have been met.

Payments for commercial aircraft sales are received in accordance with the customer agreement, which generally includes a deposit upon order and additional payments in accordance with a payment schedule, with the balance being due immediately prior to or at aircraft delivery. Advances and progress billings (contract liabilities) are normal and customary for commercial aircraft contracts and not considered a significant financing component as they are intended to protect us from the other party failing to adequately complete some or all of its obligations under the contract.

Long-term contracts Substantially all contracts at BDS and certain contracts at BGS are long-term contracts with the U.S. government and other customers that generally extend over several years. Products sales under long-term contracts primarily include fighter jets, rotorcraft, cybersecurity products, surveillance suites, advanced weapons, missile defense, military derivative aircraft, satellite systems, and modification of commercial passenger aircraft to cargo freighters. Services sales under long-term contracts primarily include support and maintenance agreements associated with our commercial and defense products and space travel on Commercial Crew.

For each long-term contract, we determine the transaction price based on the consideration expected to be received. We allocate the transaction price to each distinct performance obligation to deliver a good or service, or a collection of goods and/or services, based on the relative standalone selling prices. A long-term contract will typically represent a single distinct performance obligation due to the highly interdependent and interrelated nature of the underlying goods and/or services and the significant service of integration that we provide. While the scope and price on certain long-term contracts may be modified over their life, the transaction price is based on current rights and obligations under the contract and does not include potential modifications until they are agreed upon with the customer. When applicable, a cumulative adjustment or separate recognition for the additional scope and price may result. Long-term contracts can be negotiated with a fixed price or a price in which we are reimbursed for costs incurred plus an agreed upon profit. The Federal Acquisition Regulations provide guidance on the types of cost that will be reimbursed in establishing the price for contracts with the U.S. government. Certain long-term contracts include in the transaction price variable consideration, such as incentive and award fees, if specified targets are achieved. The amount included in the transaction price represents the expected value, based on a weighted probability, or the most likely amount.

Long-term contract revenue is recognized over the contract term (over time) as the work progresses, either as products are produced or as services are rendered. We generally recognize revenue over time as we perform on long-term contracts because of continuous transfer of control to the customer. For U.S. government contracts, this continuous transfer of control to the customer is supported by clauses in the contract that allow the customer to unilaterally terminate the contract for convenience, pay us for costs incurred plus a reasonable profit and take control of any work in process. Similarly, for non-U.S. government contracts, the customer typically controls the work in process as evidenced either by contractual termination

clauses or by our rights to payment of the transaction price associated with work performed to date on products or services that do not have an alternative use to the Company.

The accounting for long-term contracts involves a judgmental process of estimating total sales, costs and profit for each performance obligation. Cost of sales is recognized as incurred. The amount reported as revenues is determined by adding a proportionate amount of the estimated profit to the amount reported as cost of sales. Recognizing revenue as costs are incurred provides an objective measure of progress on the long-term contract and thereby best depicts the extent of transfer of control to the customer.

Changes in estimated revenues, cost of sales and the related effect on operating income are recognized using a cumulative catch-up adjustment which recognizes in the current period the cumulative effect of the changes on current and prior periods based on a long-term contract's percentage-of-completion. When the current estimates of total sales and costs for a long-term contract indicate a loss, a provision for the entire reach-forward loss on the long-term contract is recognized.

Net cumulative catch-up adjustments to prior years' revenue and earnings, including certain reach-forward losses, across all long-term contracts were as follows:

	2019	2018	2017
Increase to Revenue	\$54	\$137	\$559
(Decrease)/increase to (Loss)/earnings from Operations	(\$111)	(\$190)	\$250
(Decrease)/increase to Diluted EPS	(\$0.06)	(\$0.29)	\$0.34

Significant adjustments during the three years ended December 31, 2019 included reach-forward losses of \$148, \$736 and \$445 on KC-46A Tanker recorded during 2019, 2018, and 2017, as well as reach-forward losses on Commercial Crew of \$489 during 2019.

Due to the significance of judgment in the estimation process, changes in underlying assumptions/estimates, supplier performance, or circumstances may adversely or positively affect financial performance in future periods.

Payments under long-term contracts may be received before or after revenue is recognized. The U.S. government customer typically withholds payment of a small portion of the contract price until contract completion. Therefore, long-term contracts typically generate Unbilled receivables (contract assets) but may generate Advances and progress billings (contract liabilities). Long-term contract Unbilled receivables and Advances and progress billings are not considered a significant financing component because they are intended to protect either the customer or the Company in the event that some or all of the obligations under the contract are not completed.

Commercial spare parts contracts Certain contracts at our BGS segment include sales of commercial spare parts. For each contract, we determine the transaction price based on the consideration expected to be received. The spare parts have discrete unit prices that represent fair value. We generally consider each spare part to be a separate performance obligation. Revenue is recognized for each commercial spare part performance obligation at the point in time of delivery to the customer. We may provide our customers with a right to return a commercial spare part where a customer may receive a full or partial refund, a credit applied to amounts owed, a different product in exchange, or any combination of these items. We consider the potential for customer returns in the estimated transaction price. The amount reported as cost of sales is recorded at average cost. Payments for commercial spare parts sales are typically received shortly after delivery.

Other service revenue contracts Certain contracts at our BGS segment are for sales of services to commercial customers including maintenance, training, data analytics and information-based services. We recognize revenue for these service performance obligations over time as the services are rendered.

The method of measuring progress (such as straight-line or billable amount) varies depending upon which method best depicts the transfer of control to the customer based on the type of service performed. Cost of sales is recorded as incurred.

Concession Sharing Arrangements We account for sales concessions to our customers in consideration of their purchase of products and services as a reduction of the transaction price and the revenue that is recognized for the related performance obligations. The sales concessions incurred may be partially reimbursed by certain suppliers in accordance with concession sharing arrangements. We record these reimbursements, which are presumed to represent reductions in the price of the vendor's products or services, as a reduction in Cost of products.

Unbilled Receivables and Advances and Progress Billings Unbilled receivables (contract assets) arise when the Company recognizes revenue for amounts which cannot yet be billed under terms of the contract with the customer. Advances and progress billings (contract liabilities) arise when the Company receives payments from customers in advance of recognizing revenue. The amount of Unbilled receivables or Advances and progress billings is determined for each contract.

Financial Services Revenue We record financial services revenue associated with sales-type/finance leases, operating leases, and notes receivable.

Lease and financing revenue arrangements are included in Sales of services on the Consolidated Statements of Operations. For sales-type/finance leases, we record financing receivables at lease inception. A financing receivable is recorded at the aggregate of future minimum lease payments, estimated residual value of the leased equipment, and deferred incremental direct costs less unearned income. Income is recognized over the life of the lease to approximate a level rate of return on the net investment. Income recognition is generally suspended for financing receivables at the date full recovery of income and principal becomes not probable. Income is recognized when financing receivables become contractually current and performance is demonstrated by the customer. Residual values, which are reviewed periodically, represent the estimated amount we expect to receive at lease termination from the disposition of the leased equipment. Actual residual values realized could differ from these estimates. Declines in estimated residual value that are deemed other-than-temporary are recognized in the period in which the declines occur.

For operating leases, revenue on leased aircraft and equipment is recorded on a straight-line basis over the term of the lease. Operating lease assets, included in Customer financing, are recorded at cost and depreciated over the period that we project we will hold the asset to an estimated residual value, using the straight-line method. We periodically review our estimates of residual value and recognize forecasted changes by prospectively adjusting depreciation expense.

For notes receivable, notes are recorded net of any unamortized discounts and deferred incremental direct costs. Interest income and amortization of any discounts are recorded ratably over the related term of the note.

Reinsurance Revenue Our wholly-owned insurance subsidiary, Astro Ltd., participates in a reinsurance pool for workers' compensation. The member agreements and practices of the reinsurance pool minimize any participating members' individual risk. Reinsurance revenues were \$151, \$145 and \$141 during 2019, 2018 and 2017, respectively. Reinsurance costs related to premiums and claims paid to the reinsurance pool were \$150, \$136 and \$144 during 2019, 2018 and 2017, respectively. Revenues and costs are presented net in Cost of sales in the Consolidated Statements of Operations.

Fleet Support

We provide assistance and support to facilitate efficient and safe aircraft operation to the operators of all our commercial airplane models. Collectively known as fleet support, these activities and support services

include flight and maintenance training, field service support, engineering support, and technical data and documents. Fleet support activity begins prior to aircraft delivery as the customer receives training, manuals, and technical consulting support. This activity continues throughout the aircraft's operational life. Services provided after delivery include field service support, consulting on maintenance, repair, and operational issues brought forth by the customer or regulators, updating manuals and engineering data, and the issuance of service bulletins that impact the entire model's fleet. Field service support involves our personnel located at customer facilities providing and coordinating fleet support activities and requests. The costs for fleet support are expensed as incurred as Cost of services.

Research and Development

Research and development includes costs incurred for experimentation, design, and testing, as well as bid and proposal efforts related to government products and services which are expensed as incurred unless the costs are related to certain contractual arrangements with customers. Costs that are incurred pursuant to such contractual arrangements are recorded over the period that revenue is recognized, consistent with our contract accounting policy. We have certain research and development arrangements that meet the requirement for best efforts research and development accounting. Accordingly, the amounts funded by the customer are recognized as an offset to our research and development expense rather than as contract revenues. Research and development expense included bid and proposal costs of \$214, \$234 and \$288 in 2019, 2018 and 2017, respectively.

Share-Based Compensation

We provide various forms of share-based compensation to our employees. For awards settled in shares, we measure compensation expense based on the grant-date fair value net of estimated forfeitures. For awards settled in cash, or that may be settled in cash, we measure compensation expense based on the fair value at each reporting date net of estimated forfeitures. The expense is recognized over the requisite service period, which is generally the vesting period of the award.

Income Taxes

Provisions for U.S. federal, state and local, and non-U.S. income taxes are calculated on reported (Loss)/earnings before income taxes based on current tax law and also include, in the current period, the cumulative effect of any changes in tax rates from those used previously in determining deferred tax assets and liabilities. Such provisions differ from the amounts currently receivable or payable because certain items of income and expense are recognized in different time periods for financial reporting purposes than for income tax purposes. Significant judgment is required in determining income tax provisions and evaluating tax positions.

The accounting for uncertainty in income taxes requires a more-likely-than-not threshold for financial statement recognition and measurement of tax positions taken or expected to be taken in a tax return. We record a liability for the difference between the benefit recognized and measured for financial statement purposes and the tax position taken or expected to be taken on our tax return. To the extent that our assessment of such tax positions changes, the change in estimate is recorded in the period in which the determination is made. Tax-related interest and penalties are classified as a component of Income tax benefit/(expense).

Postretirement Plans

The majority of our employees have earned benefits under defined benefit pension plans. Nonunion and the majority of union employees that had participated in defined benefit pension plans transitioned to a company-funded defined contribution retirement savings plan in 2016. We also provide postretirement

benefit plans other than pensions, consisting principally of health care coverage to eligible retirees and qualifying dependents. Benefits under the pension and other postretirement benefit plans are generally based on age at retirement and years of service and, for some pension plans, benefits are also based on the employee's annual earnings. The net periodic cost of our pension and other postretirement plans is determined using the projected unit credit method and several actuarial assumptions, the most significant of which are the discount rate, the long-term rate of asset return, and medical trend (rate of growth for medical costs). A portion of the service cost component of net periodic pension and other postretirement income or expense is not recognized in net earnings in the year incurred because it is allocated to production as product costs, and reflected in inventory at the end of a reporting period. Actuarial gains and losses, which occur when actual experience differs from actuarial assumptions, are reflected in Shareholders' equity (net of taxes). If actuarial gains and losses exceed ten percent of the greater of plan assets or plan liabilities we amortize them over the average expected future lifetime of participants. The funded status of our pension and postretirement plans is reflected on the Consolidated Statements of Financial Position.

Postemployment Plans

We record a liability for postemployment benefits, such as severance or job training, when payment is probable, the amount is reasonably estimable, and the obligation relates to rights that have vested or accumulated.

Environmental Remediation

We are subject to federal and state requirements for protection of the environment, including those for discharge of hazardous materials and remediation of contaminated sites. We routinely assess, based on in-depth studies, expert analyses and legal reviews, our contingencies, obligations, and commitments for remediation of contaminated sites, including assessments of ranges and probabilities of recoveries from other responsible parties and/or insurance carriers. Our policy is to accrue and charge to current expense identified exposures related to environmental remediation sites when it is probable that a liability has been incurred and the amount can be reasonably estimated. The amount of the liability is based on our best estimate or the low end of a range of reasonably possible exposure for investigation, cleanup, and monitoring costs to be incurred. Estimated remediation costs are not discounted to present value as the timing of payments cannot be reasonably estimated. We may be able to recover a portion of the remediation costs from insurers or other third parties. Such recoveries are recorded when realization of the claim for recovery is deemed probable.

Cash and Cash Equivalents

Cash and cash equivalents consist of highly liquid instruments, such as commercial paper, time deposits, and other money market instruments, which have original maturities of three months or less. We aggregate our cash balances by bank where conditions for right of set-off are met, and reclassify any negative balances, consisting mainly of uncleared checks, to Accounts payable. Negative balances reclassified to Accounts payable were \$101 and \$127 at December 31, 2019 and 2018.

Inventories

Inventoried costs on commercial aircraft programs and long-term contracts include direct engineering, production and tooling and other non-recurring costs, and applicable overhead, which includes fringe benefits, production related indirect and plant management salaries and plant services, not in excess of estimated net realizable value. To the extent a material amount of such costs are related to an abnormal event or are fixed costs not appropriately attributable to our programs or contracts, they are expensed in the current period rather than inventoried. Inventoried costs include amounts relating to programs and contracts with long-term production cycles, a portion of which is not expected to be realized within one

year. Included in inventory for federal government contracts is an allocation of allowable costs related to manufacturing process reengineering.

Commercial aircraft programs inventory includes deferred production costs and supplier advances. Deferred production costs represent actual costs incurred for production of early units that exceed the estimated average cost of all units in the program accounting quantity. Higher production costs are experienced at the beginning of a new or derivative airplane program. Units produced early in a program require substantially more effort (labor and other resources) than units produced later in a program because of volume efficiencies and the effects of learning. We expect that these deferred costs will be fully recovered when all units included in the accounting quantity are delivered as the expected unit cost for later deliveries is below the estimated average cost of all units in the program. Supplier advances represent payments for parts we have contracted to receive from suppliers in the future. As parts are received, supplier advances are amortized to work in process.

The determination of net realizable value of long-term contract costs is based upon quarterly reviews that estimate costs to be incurred to complete all contract requirements. When actual contract costs and the estimate to complete exceed total estimated contract revenues, a loss provision is recorded. The determination of net realizable value of commercial aircraft program costs is based upon quarterly program reviews that estimate revenue and cost to be incurred to complete the program accounting quantity. When estimated costs to complete exceed estimated program revenues to go, a program loss provision is recorded in the current period for the estimated loss on all undelivered units in the accounting quantity.

Used aircraft purchased by the Commercial Airplanes segment and general stock materials are stated at cost not in excess of net realizable value. See 'Aircraft Valuation' within this Note for a discussion of our valuation of used aircraft. Spare parts inventory is stated at lower of average unit cost or net realizable value. We review our commercial spare parts and general stock materials quarterly to identify impaired inventory, including excess or obsolete inventory, based on historical sales trends, expected production usage, and the size and age of the aircraft fleet using the part. Impaired inventories are charged to Cost of products in the period the impairment occurs.

Included in inventory for commercial aircraft programs are amounts paid or credited in cash, or other consideration to certain airline customers, that are referred to as early issue sales consideration. Early issue sales consideration is recognized as a reduction to revenue when the delivery of the aircraft under contract occurs. If an airline customer does not perform and take delivery of the contracted aircraft, we believe that we would have the ability to recover amounts paid. However, to the extent early issue sales consideration exceeds advances and is not considered to be otherwise recoverable, it would be written off in the current period.

Precontract Costs

We may, from time to time, incur costs in excess of the amounts required for existing contracts. If we determine the costs are probable of recovery from future orders, then we capitalize the precontract costs we incur, excluding start-up costs which are expensed as incurred. Capitalized precontract costs are included in Inventories in the accompanying Consolidated Statements of Financial Position. Should future orders not materialize or we determine the costs are no longer probable of recovery, the capitalized costs would be written off.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost, including applicable construction-period interest, less accumulated depreciation and are depreciated principally over the following estimated useful lives: new buildings and land improvements, from 10 to 40 years; and new machinery and equipment, from 4 to 20 years. The principal methods of depreciation are as follows: buildings and land improvements, 150%

declining balance; and machinery and equipment, sum-of-the-years' digits. Capitalized internal use software is included in Other assets and amortized using the straight line method over 5 years. Capitalized software as a service is included in Other assets and amortized using the straight line method over the term of the hosting arrangement which is typically no greater than 10 years. We periodically evaluate the appropriateness of remaining depreciable lives assigned to long-lived assets, including assets that may be subject to a management plan for disposition.

Long-lived assets held for sale are stated at the lower of cost or fair value less cost to sell. Long-lived assets held for use are subject to an impairment assessment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. If the carrying value is no longer recoverable based upon the undiscounted future cash flows of the asset, the amount of the impairment is the difference between the carrying amount and the fair value of the asset.

Leases We determine if an arrangement is, or contains, a lease at the inception date. Operating leases are included in Other assets, with the related liabilities included in Accrued liabilities and Other long-term liabilities. Assets under finance leases, which primarily represent computer equipment, are included in Property, plant and equipment, net, with the related liabilities included in Short-term debt and current portion of long-term debt and Long-term debt on the Consolidated Statements of Financial Position.

Operating lease assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease assets and liabilities are recognized at the lease commencement date based on the estimated present value of lease payments over the lease term. We use our estimated incremental borrowing rate in determining the present value of lease payments. Variable components of the lease payments such as fair market value adjustments, utilities, and maintenance costs are expensed as incurred and not included in determining the present value. Our lease terms include options to extend or terminate the lease when it is reasonably certain that we will exercise that option. Lease expense is recognized on a straight-line basis over the lease term.

We have lease agreements with lease and non-lease components which are accounted for as a single lease component.

Asset Retirement Obligations

We record all known asset retirement obligations for which the liability's fair value can be reasonably estimated, including certain asbestos removal, asset decommissioning and contractual lease restoration obligations. Recorded amounts are not material.

We also have known conditional asset retirement obligations, such as certain asbestos remediation and asset decommissioning activities to be performed in the future, that are not reasonably estimable due to insufficient information about the timing and method of settlement of the obligation. Accordingly, these obligations have not been recorded in the Consolidated Financial Statements. A liability for these obligations will be recorded in the period when sufficient information regarding timing and method of settlement becomes available to make a reasonable estimate of the liability's fair value. In addition, there may be conditional asset retirement obligations that we have not yet discovered (e.g. asbestos may exist in certain buildings but we have not become aware of it through the normal course of business), and therefore, these obligations also have not been included in the Consolidated Financial Statements.

Goodwill and Other Acquired Intangibles

Goodwill and other acquired intangible assets with indefinite lives are not amortized, but are tested for impairment annually and when an event occurs or circumstances change such that it is more likely than not that an impairment may exist. Our annual testing date is April 1.

We test goodwill for impairment by performing a qualitative assessment or using a two-step impairment process. If we choose to perform a qualitative assessment and determine it is more likely than not that the carrying value of the net assets is more than the fair value of the related operations, the two-step impairment process is then performed; otherwise, no further testing is required. For operations where the two-step impairment process is used, we first compare the carrying value of net assets to the fair value of the related operations. If the fair value is determined to be less than carrying value, a second step is performed to compute the amount of the impairment. In this process, a fair value for goodwill is estimated, based in part on the fair value of the operations, and is compared to its carrying value. The shortfall of the fair value below carrying value represents the amount of goodwill impairment.

Indefinite-lived intangibles consist of brand and trade names acquired in business combinations. We test these intangibles for impairment by comparing their carrying value to current projections of discounted cash flows attributable to the brand and trade names. Any excess carrying value over the amount of discounted cash flows represents the amount of the impairment.

Our finite-lived acquired intangible assets are amortized on a straight-line basis over their estimated useful lives as follows: developed technology, from 2 to 14 years; product know-how, from 6 to 30 years; customer base, from 3 to 17 years; distribution rights, from 3 to 27 years; and other, from 1 to 32 years. We evaluate the potential impairment of finite-lived acquired intangible assets whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. If the carrying value is no longer recoverable based upon the undiscounted future cash flows of the asset, the amount of the impairment is the difference between the carrying amount and the fair value of the asset.

Investments

Time deposits are held-to-maturity investments that are carried at cost.

Available-for-sale debt securities include commercial paper, U.S. government agency securities, and corporate debt securities. Available-for-sale debt securities are recorded at fair value, and unrealized gains and losses are recorded, net of tax, as a component of accumulated other comprehensive income. Realized gains and losses on available-for-sale debt securities are recognized based on the specific identification method. Available-for-sale debt securities are assessed for impairment quarterly.

The equity method of accounting is used to account for investments for which we have the ability to exercise significant influence, but not control, over an investee. Significant influence is generally deemed to exist if we have an ownership interest in the voting stock of an investee of between 20% and 50%. The cumulative earnings approach is used for cash flow classification of distributions received from equity method investments.

Other Equity investments are recorded at fair value, with gains and losses recorded through net earnings. Equity investments without readily determinable fair value are measured at cost, less impairments, plus or minus observable price changes. Equity investments without readily determinable fair value are assessed for impairment quarterly.

We classify investment income and loss on our Consolidated Statements of Operations based on whether the investment is operating or non-operating in nature. Operating investments align strategically and are integrated with our operations. Earnings from operating investments, including our share of income or loss from equity method investments, dividend income from other equity investments, and any impairments or gain/loss on the disposition of these investments, are recorded in Income from operating investments, net. Non-operating investments are those we hold for non-strategic purposes. Earnings from non-operating investments, including interest and dividends on marketable securities, and any impairments or gain/loss on the disposition of these investments are recorded in Other income/(loss), net.

Derivatives

All derivative instruments are recognized in the financial statements and measured at fair value regardless of the purpose or intent of holding them. We use derivative instruments to principally manage a variety of market risks. For derivatives designated as hedges of the exposure to changes in fair value of the recognized asset or liability or a firm commitment (referred to as fair value hedges), the gain or loss is recognized in earnings in the period of change together with the offsetting loss or gain on the hedged item attributable to the risk being hedged. The effect of that accounting is to include in earnings the extent to which the hedge is not effective in achieving offsetting changes in fair value. For our cash flow hedges, the derivative's gain or loss is initially reported in comprehensive income and is subsequently reclassified into earnings in the same period or periods during which the hedged forecasted transaction affects earnings. We have agreements to purchase and sell aluminum to address long-term strategic sourcing objectives and international business requirements. These agreements are derivatives for accounting purposes but are not designated for hedge accounting treatment. We also hold certain derivative instruments for economic purposes that are not designated for hedge accounting treatment. For these aluminum agreements and for other derivative instruments not designated for hedge accounting treatment, the changes in their fair value are recorded in earnings immediately.

Aircraft Valuation

Used aircraft under trade-in commitments and aircraft under repurchase commitments In conjunction with signing a definitive agreement for the sale of new aircraft (Sale Aircraft), we have entered into trade-in commitments with certain customers that give them the right to trade in used aircraft at a specified price upon the purchase of Sale Aircraft. Additionally, we have entered into contingent repurchase commitments with certain customers wherein we agree to repurchase the Sale Aircraft at a specified price, generally 10 to 15 years after delivery of the Sale Aircraft. Our repurchase of the Sale Aircraft is contingent upon a future, mutually acceptable agreement for the sale of additional new aircraft. If we execute an agreement for the sale of additional new aircraft, and if the customer exercises its right to sell the Sale Aircraft to us, a contingent repurchase commitment would become a trade-in commitment. Our historical experience is that contingent repurchase commitments infrequently become trade-in commitments.

Exposure related to trade-in commitments may take the form of:

- (1) adjustments to revenue for the difference between the contractual trade-in price in the definitive agreement and our best estimate of the fair value of the trade-in aircraft as of the date of such agreement, which would be recognized upon delivery of the Sale Aircraft, and/or
- (2) charges to cost of products for adverse changes in the fair value of trade-in aircraft that occur subsequent to signing of a definitive agreement for Sale Aircraft but prior to the purchase of the used trade-in aircraft. Estimates based on current aircraft values would be included in Accrued liabilities.

The fair value of trade-in aircraft is determined using aircraft-specific data such as model, age and condition, market conditions for specific aircraft and similar models, and multiple valuation sources. This process uses our assessment of the market for each trade-in aircraft, which in most instances begins years before the return of the aircraft. There are several possible markets in which we continually pursue opportunities to place used aircraft. These markets include, but are not limited to, the resale market, which could potentially include the cost of long-term storage; the leasing market, with the potential for refurbishment costs to meet the leasing customer's requirements; or the scrap market. Trade-in aircraft valuation varies significantly depending on which market we determine is most likely for each aircraft. On a quarterly basis, we update our valuation analysis based on the actual activities associated with placing each aircraft into a market or using current published third-party aircraft valuations based on the type and age of the aircraft, adjusted for individual attributes and known conditions.

Used aircraft acquired by the Commercial Airplanes segment are included in Inventories at the lower of cost or net realizable value as it is our intent to sell these assets. To mitigate costs and enhance marketability, aircraft may be placed on operating lease. While on operating lease, the assets are included in Customer financing.

Customer financing Customer financing includes operating lease equipment, notes receivable, and sales-type/finance leases. Sales-type/finance leases are treated as receivables, and allowances for losses are established as necessary.

We assess the fair value of the assets we own, including equipment under operating leases, assets held for sale or re-lease, and collateral underlying receivables, to determine if their fair values are less than the related assets' carrying values. Differences between carrying values and fair values of sales-type/finance leases and notes and other receivables, as determined by collateral value, are considered in determining the allowance for losses on receivables.

We use a median calculated from published collateral values from multiple third-party aircraft value publications based on the type and age of the aircraft to determine the fair value of aircraft. Under certain circumstances, we apply judgment based on the attributes of the specific aircraft or equipment, usually when the features or use of the aircraft vary significantly from the more generic aircraft attributes covered by outside publications.

Impairment review for assets under operating leases and held for sale or re-lease We evaluate for impairment assets under operating lease or assets held for sale or re-lease when events or changes in circumstances indicate that the expected undiscounted cash flow from the asset may be less than the carrying value. We use various assumptions when determining the expected undiscounted cash flow, including our intentions for how long we will hold an asset subject to operating lease before it is sold, the expected future lease rates, lease terms, residual value of the asset, periods in which the asset may be held in preparation for a follow-on lease, maintenance costs, remarketing costs and the remaining economic life of the asset. We record assets held for sale at the lower of carrying value or fair value less costs to sell.

When we determine that impairment is indicated for an asset, the amount of impairment expense recorded is the excess of the carrying value over the fair value of the asset.

Allowance for losses on customer financing receivables We record the potential impairment of customer financing receivables in a valuation account, the balance of which is an accounting estimate of probable but unconfirmed losses. The allowance for losses on receivables relates to two components of receivables: (a) receivables that are evaluated individually for impairment and (b) all other receivables.

We determine a receivable is impaired when, based on current information and events, it is probable that we will be unable to collect amounts due according to the original contractual terms of the receivable agreement, without regard to any subsequent restructurings. Factors considered in assessing collectability include, but are not limited to, a customer's extended delinquency, requests for restructuring and filings for bankruptcy. We determine a specific impairment allowance based on the difference between the carrying value of the receivable and the estimated fair value of the related collateral we would expect to realize.

We review the adequacy of the allowance attributable to the remaining receivables (after excluding receivables subject to a specific impairment allowance) by assessing both the collateral exposure and the applicable cumulative default rate. Collateral exposure for a particular receivable is the excess of the carrying value of the receivable over the fair value of the related collateral. A receivable with an estimated fair value in excess of the carrying value is considered to have no collateral exposure. The applicable cumulative default rate is determined using two components: customer credit ratings and weighted average remaining contract term. Internally assigned credit ratings, our credit quality indicator, are determined for

each customer in the portfolio. Those ratings are updated based upon public information and information obtained directly from our customers.

We have entered into agreements with certain customers that would entitle us to look beyond the specific collateral underlying the receivable for purposes of determining the collateral exposure as described above. Should the proceeds from the sale of the underlying collateral asset resulting from a default condition be insufficient to cover the carrying value of our receivable (creating a shortfall condition), these agreements would, for example, permit us to take the actions necessary to sell or retain certain other assets in which the customer has an equity interest and use the proceeds to cover the shortfall.

Each quarter we review customer credit ratings, published historical credit default rates for different rating categories, and multiple third-party aircraft value publications as a basis to validate the reasonableness of the allowance for losses on receivables. There can be no assurance that actual results will not differ from estimates or that the consideration of these factors in the future will not result in an increase or decrease to the allowance for losses on receivables.

Warranties

In conjunction with certain product sales, we provide warranties that cover factors such as non-conformance to specifications and defects in material and design. The majority of our warranties are issued by our Commercial Airplanes segment. Generally, aircraft sales are accompanied by a 3 to 4-year standard warranty for systems, accessories, equipment, parts, and software manufactured by us or manufactured to certain standards under our authorization. These warranties are included in the programs' estimate at completion. On occasion we have made commitments beyond the standard warranty obligation to correct fleet-wide major issues of a particular model, resulting in additional accrued warranty expense. Warranties issued by our BDS segment principally relate to sales of military aircraft and weapons systems. These sales are generally accompanied by a six month to two-year warranty period and cover systems, accessories, equipment, parts, and software manufactured by us to certain contractual specifications. Estimated costs related to standard warranties are recorded in the period in which the related product delivery occurs. The warranty liability recorded at each balance sheet date reflects the estimated number of months of warranty coverage outstanding for products delivered times the average of historical monthly warranty payments, as well as additional amounts for certain major warranty issues that exceed a normal claims level. Estimated costs of these additional warranty issues are considered changes to the initial liability estimate.

We provide guarantees to certain commercial airplane customers which include compensation provisions for failure to meet specified aircraft performance targets. We account for these performance guarantees as warranties. The estimated liability for these warranties is based on known and anticipated operational characteristics and forecasted customer operation of the aircraft relative to contractually specified performance targets, and anticipated settlements when contractual remedies are not specified. Estimated payments are recorded as a reduction of revenue at delivery of the related aircraft. We have agreements that require certain suppliers to compensate us for amounts paid to customers for failure of supplied equipment to meet specified performance targets. Claims against suppliers under these agreements are included in Inventories and recorded as a reduction in Cost of products at delivery of the related aircraft. These performance warranties and claims against suppliers are included in the programs' estimate at completion.

Supplier Penalties

We record an accrual for supplier penalties when an event occurs that makes it probable that a supplier penalty will be incurred and the amount is reasonably estimable. Until an event occurs, we fully anticipate accepting all products procured under production-related contracts.

Guarantees

We record a liability in Accrued liabilities for the fair value of guarantees that are issued or modified after December 31, 2002. For credit guarantees, the liability is equal to the present value of the expected loss. We determine the expected loss by multiplying the creditor's default rate by the guarantee amount reduced by the expected recovery, if applicable, for each future period the credit guarantee will be outstanding. If at inception of a guarantee, we determine there is a probable related contingent loss, we will recognize a liability for the greater of (a) the fair value of the guarantee as described above or (b) the probable contingent loss amount.

Standards Issued and Not Yet Implemented

In June 2016, the Financial Accounting Standards Board issued ASU 2016-13, Financial Instruments - Credit Losses (Topic 326). The new standard is effective for reporting periods beginning after December 15, 2019. The standard replaces the incurred loss impairment methodology under current GAAP with a methodology that reflects expected credit losses and requires the use of a forward-looking expected credit loss model for accounts receivables, loans, and other financial instruments. The standard requires a modified retrospective approach through a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective. We plan to adopt the new credit loss standard effective January 1, 2020. We do not expect the new credit loss standard to have a material effect on our financial position, results of operations or cash flows.

Note 2 – Acquisitions and Joint Ventures

Strategic Partnership with Embraer

During the first quarter of 2019, we entered into definitive transaction documents with respect to a strategic partnership with Embraer S.A. (Embraer). The partnership contemplates that the parties enter into a joint venture comprising the commercial aircraft and services operations of Embraer, in which Boeing will acquire an 80 percent ownership stake for \$4,200, as well as a joint venture to promote and develop new markets for the multi-mission, medium airlift C-390 Millennium, in which Boeing will hold a 49 percent ownership stake.

Embraer shareholders approved the transaction, which remains subject to regulatory approvals and other customary closing conditions. We are actively engaged with the European Commission and have obtained unconditional clearance to close in all other required jurisdictions, including the United States, China, and Japan. In Brazil, the Administrative Council for Economic Defense (CADE)'s General-Superintendence (SG) has provided unconditional approval; the decision will become final in mid-February unless a review is requested by CADE Commissioners. We continue to be engaged with the European Commission as it progresses its Phase II investigation of the transaction. Pending timely resolution of the remaining regulatory approvals, the transaction is expected to close in the first half of 2020. If the transaction is not completed due to failure to obtain antitrust approvals, we would be required to pay a termination fee of \$100.

KLX Inc.

On October 9, 2018, we acquired all the outstanding shares of KLX Inc. (KLX). KLX is a global provider of aviation parts and services in the aerospace industry. Its capabilities include distribution and supply chain services. The KLX acquisition is intended to accelerate growth in our services business by allowing Boeing to offer commercial, defense, business and general aviation customers a broader range of offerings. The results of KLX's operations have been included in our Global Services segment from the acquisition date. KLX's revenues and earnings from operations from October 9, 2018 through December 31, 2018 were \$356 and \$50.

The final allocation of the purchase price was as follows:

Cash and cash equivalents	\$225
Accounts receivable	260
Inventories	1,298
Other current assets	43
Property, plant & equipment	36
Goodwill	2,056
Intangible assets	963
Other assets	78
Current liabilities	(350)
Other long-term liabilities	(113)
Long-term debt	(1,210)
Total net assets acquired	\$3,286

The goodwill has been allocated to the Global Services and Commercial Airplanes segments based on revenue synergies expected to be realized from the integration of KLX's products and services and expected cost synergies primarily resulting from the consolidation of procurement spending and functional support. Approximately \$533 of the acquired goodwill and intangible assets is deductible for tax purposes. The acquired intangible assets primarily relate to customer and supplier relationships and have a weighted-average useful life of 17.5 years.

Note 3 – Goodwill and Acquired Intangibles

Changes in the carrying amount of goodwill for the years ended December 31, 2019 and 2018 were as follows:

	Commercial Airplanes	Defense, Space & Security	Global Services	Other	Total
Balance at January 1, 2018	\$992	\$3,074	\$1,493		\$5,559
KLX acquisition	249		1,861		2,110
Other acquisitions		180	3		183
Goodwill adjustments			(12)		(12)
Balance at December 31, 2018	\$1,241	\$3,254	\$3,345		\$7,840
KLX acquisition adjustments			(51)		(51)
Acquisitions	72		188	\$62	322
Dispositions			(49)		(49)
Goodwill adjustments		(10)	8		(2)
Balance at December 31, 2019	\$1,313	\$3,244	\$3,441	\$62	\$8,060

As of December 31, 2019 and 2018, we had indefinite-lived intangible assets with carrying amounts of \$197 and \$490 relating to trade names. During 2019, we recorded an impairment of \$293 within Cost of Sales, as a result of our decision to retire the Aviall brand and trade name. As of December 31, 2019, we had indefinite-lived intangible assets with a carrying amount of \$202 related to in process research and development.

The gross carrying amounts and accumulated amortization of our acquired finite-lived intangible assets were as follows at December 31:

	2019		2018	
	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Distribution rights	\$2,989	\$1,262	\$2,879	\$1,101
Product know-how	553	354	536	324
Customer base	1,364	599	1,284	523
Developed technology	653	485	595	439
Other	280	200	218	186
Total	\$5,839	\$2,900	\$5,512	\$2,573

Amortization expense for acquired finite-lived intangible assets for the years ended December 31, 2019 and 2018 was \$331 and \$272. Estimated amortization expense for the five succeeding years is as follows:

	2020	2021	2022	2023	2024
Estimated amortization expense	\$320	\$298	\$287	\$259	\$248

During 2019 and 2018, we acquired \$563 and \$1,133 of finite-lived intangible assets, of which \$30 and \$0 related to non-cash investing and financing transactions.

Note 4 – Earnings Per Share

Basic and diluted earnings per share are computed using the two-class method, which is an earnings allocation method that determines earnings per share for common shares and participating securities. The undistributed earnings are allocated between common shares and participating securities as if all earnings had been distributed during the period. Participating securities and common shares have equal rights to undistributed earnings.

Basic earnings per share is calculated by taking net earnings, less earnings available to participating securities, divided by the basic weighted average common shares outstanding.

Diluted earnings per share is calculated by taking net earnings, less earnings available to participating securities, divided by the diluted weighted average common shares outstanding.

The elements used in the computation of basic and diluted earnings per share were as follows:

(In millions - except per share amounts)

Years ended December 31,	2019	2018	2017
Net (loss)/earnings	(\$636)	\$10,460	\$8,458
Less: earnings available to participating securities		7	6
Net (loss)/earnings available to common shareholders	(\$636)	\$10,453	\$8,452
Basic			
Basic weighted average shares outstanding	566.0	579.9	603.2
Less: participating securities	0.6	0.7	0.7
Basic weighted average common shares outstanding	565.4	579.2	602.5
Diluted			
Basic weighted average shares outstanding	566.0	579.9	603.2
Dilutive potential common shares ⁽¹⁾		6.3	7.5
Diluted weighted average shares outstanding	566.0	586.2	610.7
Less: participating securities	0.6	0.7	0.7
Diluted weighted average common shares outstanding	565.4	585.5	610.0
Net (loss)/earnings per share:			
Basic	(\$1.12)	\$18.05	\$14.03
Diluted	(1.12)	17.85	13.85

⁽¹⁾ Diluted (loss)/earnings per share includes any dilutive impact of stock options, restricted stock units, performance-based restricted stock units and performance awards.

As a result of incurring a net loss for the year ended December 31, 2019, potential common shares of 4.1 million were excluded from diluted loss per share because the effect would have been antidilutive. In addition, the following table includes the number of shares that may be dilutive potential common shares in the future. These shares were not included in the computation of diluted (loss)/earnings per share because the effect was either antidilutive or the performance condition was not met.

(Shares in millions)

Years ended December 31,	2019	2018	2017
Performance awards	2.8	2.5	4.1
Performance-based restricted stock units	0.6	0.3	0.5

Note 5 – Income Taxes

The components of earnings before income taxes were:

Years ended December 31,	2019	2018	2017
U.S.	(\$2,792)	\$11,166	\$9,660
Non-U.S.	533	438	447
Total	(\$2,259)	\$11,604	\$10,107

Income tax (benefit)/expense consisted of the following:

Years ended December 31,	2019	2018	2017
Current tax (benefit)/expense			
U.S. federal	(\$308)	\$1,873	\$1,276
Non-U.S.	169	169	149
U.S. state	(161)	97	23
Total current	(300)	2,139	1,448
Deferred tax (benefit)/expense			
U.S. federal	(953)	(996)	204
Non-U.S.	(3)	(4)	3
U.S. state	(367)	5	(6)
Total deferred	(1,323)	(995)	201
Total income tax (benefit)/expense	(\$1,623)	\$1,144	\$1,649

Net income tax payments were \$837, \$1,326 and \$896 in 2019, 2018 and 2017, respectively.

The following is a reconciliation of the U.S. federal statutory tax to actual income tax expense:

Years ended December 31,	2019		2018		2017	
	Amount	Rate	Amount	Rate	Amount	Rate
U.S. federal statutory tax	(\$474)	21.0 %	\$2,437	21.0 %	\$3,537	35.0 %
Research and development credits	(382)	16.9	(207)	(1.8)	(162)	(1.6)
Audit settlements ⁽¹⁾	(371)	16.4	(412)	(3.6)		
Foreign derived intangible income ⁽²⁾	(229)	10.1	(549)	(4.7)		
Excess tax benefits ⁽³⁾	(180)	8.0	(181)	(1.6)	(207)	(2.1)
Other provision adjustments	66	(3.0)	91	1.0	26	0.3
Tax deductible dividends	(53)	2.4	(48)	(0.4)	(68)	(0.7)
Tax on non-US activities	43	(1.9)	40	0.3	(95)	(0.9)
State income tax provision, net of effects on U.S. federal tax	(43)	1.9	84	0.7	17	0.2
Impact of Tax Cuts and Jobs Act ⁽⁴⁾			(111)	(1.0)	(1,271)	(12.6)
U.S. manufacturing activity tax benefit					(128)	(1.3)
Income tax (benefit)/expense	(\$1,623)	71.8 %	\$1,144	9.9 %	\$1,649	16.3 %

⁽¹⁾ In the fourth quarter of 2019, we recorded a tax benefit of \$371 related to the settlement of state tax audits spanning 15 tax years. In the third quarter of 2018, we recorded a tax benefit of \$412 related to the settlement of the 2013-2014 federal tax audit.

⁽²⁾ On December 22, 2017, the Tax Cuts and Jobs Act (TCJA) was enacted. The TCJA revised the U.S. corporate income tax by, among other things, lowering the rate from 35% to 21% effective January 1, 2018, implementing a territorial tax system and imposing a one-time tax on deemed repatriated earnings of non-U.S. subsidiaries. The TCJA also enacted provisions which effectively apply a lower U.S. tax rate to intangible income derived from serving non-U.S. markets. In 2019 and 2018, we recorded tax benefits related to foreign derived intangible income of \$229 and \$549.

⁽³⁾ In 2019, 2018 and 2017, we recorded excess tax benefits related to employee share-based payments of \$180, \$181 and \$207, respectively.

⁽⁴⁾ In accordance with U.S. Securities and Exchange Commission Staff Accounting Bulletin No. 118 (SAB 118), in the fourth quarter of 2017, we recorded provisional tax benefits of \$1,430 related to the remeasurement of our net U.S. deferred tax liabilities to reflect the reduction in the corporate tax rate and a provisional tax expense of \$159 related to tax on non-U.S. activities resulting from the TCJA. During the fourth quarter of 2018 and in accordance with SAB 118, the Company completed its accounting for the provisional amounts recognized at December 31, 2017 and recorded an incremental benefit related to refinements to these provisional amounts which was not significant.

Significant components of our deferred tax assets/(liabilities) at December 31 were as follows:

	2019	2018
Inventory and long-term contract methods of income recognition	(\$6,048)	(\$5,422)
Pension benefits	3,495	3,344
737 MAX customer concessions and other considerations	1,626	
Fixed assets, intangibles and goodwill (net of valuation allowance of \$16 and \$16)	(1,560)	(1,616)
Retiree health care benefits	1,120	1,124
Other employee benefits	849	873
Accrued expenses and reserves	627	411
Net operating loss, credit and capital loss carryovers (net of valuation allowance of \$102 and \$77) ⁽¹⁾	595	258
Customer and commercial financing	(268)	(309)
Other	(166)	(115)
Net deferred tax assets/(liabilities) ⁽²⁾	\$270	(\$1,452)

⁽¹⁾ Of the deferred tax asset for net operating loss and credit carryovers, \$251 expires on or before December 31, 2039 and \$344 may be carried over indefinitely.

⁽²⁾ Included in the net deferred tax assets/(liabilities) as of December 31, 2019 and 2018 are deferred tax assets in the amounts of \$4,589 and \$4,275 related to Accumulated other comprehensive loss.

Net deferred tax assets/(liabilities) at December 31 were as follows:

	2019	2018
Deferred tax assets	\$10,722	\$8,835
Deferred tax liabilities	(10,334)	(10,194)
Valuation allowance	(118)	(93)
Net deferred tax assets/(liabilities)	\$270	(\$1,452)

The deferred tax assets are reduced by a valuation allowance if, based upon available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The TCJA one-time repatriation tax and Global Intangible Low Tax Income liabilities effectively taxed the undistributed earnings previously deferred from U.S. income taxes. We have not provided for foreign withholding tax on the undistributed earnings from our non-U.S. subsidiaries because such earnings are considered to be indefinitely reinvested. If such earnings were to be distributed, any foreign withholding tax would not be significant.

As of December 31, 2019 and 2018, the amounts accrued for the payment of income tax-related interest and penalties included in the Consolidated Statements of Financial Position were not significant. The amounts of interest included in the Consolidated Statements of Operations were not significant for the years ended December 31, 2019, 2018 and 2017.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

	2019	2018	2017
Unrecognized tax benefits – January 1	\$2,412	\$1,736	\$1,557
Gross increases – tax positions in prior periods	100	87	3
Gross decreases – tax positions in prior periods	(1,418)	(410)	(44)
Gross increases – current-period tax positions	344	1,208	220
Gross decreases – current period tax positions	(1)		
Settlements	39	(206)	
Statute Lapse		(3)	
Unrecognized tax benefits – December 31	\$1,476	\$2,412	\$1,736

As of December 31, 2019, 2018 and 2017, the total amount of unrecognized tax benefits was \$1,476, \$2,412 and \$1,736, respectively, of which \$1,287, \$1,405 and \$1,568 would affect the effective tax rate, if recognized. As of December 31, 2019, these amounts are primarily associated with the amount of research tax credits claimed, uncertainties in the TCJA, tax basis adjustments and the U.S. manufacturing activity tax benefit.

Federal income tax audits have been settled for all years prior to 2015. The Internal Revenue Service (IRS) began the 2015-2017 federal tax audit in the first quarter of 2019. We are also subject to examination in major state and international jurisdictions for the 2007-2018 tax years. We believe appropriate provisions for all outstanding tax issues have been made for all jurisdictions and all open years.

Audit outcomes and the timing of audit settlements are subject to significant uncertainty. It is reasonably possible that within the next 12 months unrecognized tax benefits related to federal matters under audit may decrease by up to \$710 based on current estimates.

Note 6 – Accounts Receivable, net

Accounts receivable at December 31 consisted of the following:

	2019	2018
U.S. government contracts ⁽¹⁾	\$1,121	\$1,877
Commercial Airplanes	29	51
Global Services ⁽²⁾	1,967	1,783
Defense, Space, & Security ⁽²⁾	220	222
Other	2	3
Less valuation allowance	(73)	(57)
Total	\$3,266	\$3,879

⁽¹⁾ Includes foreign military sales through the U.S. government

⁽²⁾ Excludes U.S. government contracts

Accounts receivable expected to be collected after one year are not material.

Note 7 – Inventories

Inventories at December 31 consisted of the following:

	2019	2018
Long-term contracts in progress	\$1,187	\$2,129
Commercial aircraft programs	66,016	52,753
Commercial spare parts, used aircraft, general stock materials and other	9,419	7,685
Total	\$76,622	\$62,567

Long-Term Contracts in Progress

Long-term contracts in progress includes Delta launch program inventory that is being sold at cost to United Launch Alliance (ULA) under an inventory supply agreement that terminates on March 31, 2021. The inventory balance was \$176 and \$227 at December 31, 2019 and 2018. See indemnifications to ULA in Note 15.

Included in inventories are capitalized precontract costs of \$711 at December 31, 2019, primarily related to the KC-46A Tanker and Commercial Crew, and \$644 at December 31, 2018 primarily related to KC-46A Tanker. See Note 14.

Commercial Aircraft Programs

At December 31, 2019 and 2018, commercial aircraft programs inventory included the following amounts related to the 737 program: \$1,313 and \$463 of deferred production costs and \$521 and \$471 of unamortized tooling and other non-recurring costs. At December 31, 2019, \$1,829 of 737 deferred production costs, unamortized tooling and other non-recurring costs are expected to be recovered from units included in the program accounting quantity that have firm orders and \$5 is expected to be recovered from units included in the program accounting quantity that represent expected future orders.

At December 31, 2019 and 2018, commercial aircraft programs inventory included the following amounts related to the 777X program: \$5,628 and \$3,067 of work in process and \$2,914 and \$2,512 of unamortized tooling and other non-recurring costs.

At December 31, 2019 and 2018, commercial aircraft programs inventory included the following amounts related to the 787 program: \$24,772 and \$27,852 of work in process (including deferred production costs of \$18,716 and \$22,967), \$2,202 and \$2,453 of supplier advances, and \$2,092 and \$2,638 of unamortized tooling and other non-recurring costs. At December 31, 2019, \$14,386 of 787 deferred production costs, unamortized tooling and other non-recurring costs are expected to be recovered from units included in the program accounting quantity that have firm orders and \$6,422 is expected to be recovered from units included in the program accounting quantity that represent expected future orders.

Commercial aircraft programs inventory included amounts credited in cash or other consideration (early issue sales consideration) to airline customers totaling \$2,863 and \$2,844 at December 31, 2019 and 2018.

Note 8 – Contracts with Customers

Unbilled receivables decreased from \$10,025 at December 31, 2018 to \$9,043 at December 31, 2019, primarily driven by timing of billings at BDS and BGS.

Advances and progress billings increased from \$50,676 at December 31, 2018 to \$51,551 at December 31, 2019, primarily driven by advances on orders received in excess of revenue recognized at BDS, BGS, and BCA.

Revenues recognized for the years ended December 31, 2019 and 2018 from amounts recorded as Advances and progress billings at the beginning of each year were \$16,778 and \$24,737.

Certain commercial airplane customers are experiencing liquidity issues and seeking additional capital. Should these customers fail to address their liquidity issues, accounts receivable, unbilled receivables and certain inventory could become impaired. In addition we would have to remove contracts related to these customers from backlog and remarket any undelivered aircraft.

The following table summarizes our contract assets under long-term contracts that were unbillable or related to outstanding claims as of December 31:

	Unbilled		Claims	
	2019	2018	2019	2018
Current	\$6,931	\$7,178	\$9	\$1
Expected to be collected after one year	2,112	2,847	14	2
Total	\$9,043	\$10,025	\$23	\$3

Unbilled receivables related to commercial customer incentives expected to be collected after one year were \$211 and \$150 at December 31, 2019 and 2018. Unbilled receivables related to claims are items that we believe are earned, but are subject to uncertainty concerning their determination or ultimate realization.

Note 9 – Customer Financing

Customer financing primarily relates to our BCC segment. Customer financing consisted of the following at December 31:

	2019	2018
Financing receivables:		
Investment in sales-type/finance leases	\$1,029	\$1,125
Notes	443	730
Total financing receivables	1,472	1,855
Operating lease equipment, at cost, less accumulated depreciation of \$235 and \$203	834	782
Operating lease incentive		250
Gross customer financing	2,306	2,887
Less allowance for losses on receivables	(8)	(9)
Total	\$2,298	\$2,878

The components of investment in sales-type/finance leases at December 31 were as follows:

	2019	2018
Minimum lease payments receivable	\$799	\$908
Estimated residual value of leased assets	393	425
Unearned income	(163)	(208)
Total	\$1,029	\$1,125

Operating lease equipment primarily includes large commercial jet aircraft.

Financing receivable balances evaluated for impairment at December 31 were as follows:

	2019	2018
Individually evaluated for impairment	\$400	\$409
Collectively evaluated for impairment	1,072	1,446
Total financing receivables	\$1,472	\$1,855

We determine a receivable is impaired when, based on current information and events, it is probable that we will be unable to collect amounts due according to the original contractual terms. At December 31, 2019 and 2018, we individually evaluated for impairment customer financing receivables of \$400 and \$409, of which \$388 and \$398 were determined to be impaired. We recorded no allowance for losses on these impaired receivables as the collateral values exceeded the carrying values of the receivables.

Income recognition is generally suspended for financing receivables at the date full recovery of income and principal becomes not probable. Income is recognized when financing receivables become contractually current and performance is demonstrated by the customer. The average recorded investment in impaired financing receivables for the year ended December 31, 2019 was \$392, and the related interest income was insignificant.

The change in the allowance for losses on financing receivables for the years ended December 31, 2019, 2018 and 2017, consisted of the following:

	2019	2018	2017
Beginning balance - January 1	(\$9)	(\$12)	(\$10)
Customer financing valuation benefit/(cost)	1	3	(2)
Ending balance - December 31	(\$8)	(\$9)	(\$12)
Collectively evaluated for impairment	(\$8)	(\$9)	(\$12)

The adequacy of the allowance for losses is assessed quarterly. Three primary factors influencing the level of our allowance for losses on customer financing receivables are customer credit ratings, default rates and collateral values. We assign internal credit ratings for all customers and determine the creditworthiness of each customer based upon publicly available information and information obtained directly from our customers. Our rating categories are comparable to those used by the major credit rating agencies.

Our financing receivable balances at December 31 by internal credit rating category are shown below:

Rating categories	2019	2018
BBB	\$573	\$883
BB	385	430
B	122	135
CCC	392	407
Total carrying value of financing receivables	\$1,472	\$1,855

At December 31, 2019, our allowance related to receivables with ratings of B, BB and BBB. We applied default rates that averaged 22.1%, 5.3% and 0.6%, respectively, to the exposure associated with those receivables.

Customer Financing Exposure

Customer financing is collateralized by security in the related asset. The value of the collateral is closely tied to commercial airline performance and overall market conditions and may be subject to reduced valuation with market decline. Declines in collateral values could result in asset impairments, reduced finance lease income, and an increase in the allowance for losses. Our customer financing collateral is concentrated in 747-8 and out-of-production aircraft. Generally, out-of-production aircraft have experienced greater collateral value declines than in-production aircraft.

The majority of customer financing carrying values are concentrated in the following aircraft models at December 31:

	2019	2018
717 Aircraft (\$124 and \$204 accounted for as operating leases)	\$736	\$918
747-8 Aircraft (\$130 and \$132 accounted for as operating leases)	475	477
737 Aircraft (\$240 and \$263 Accounted for as operating leases)	263	290
777 Aircraft (\$236 and \$60 accounted for as operating leases)	240	68
MD-80 Aircraft (Accounted for as sales-type finance leases)	186	204
757 Aircraft (\$22 and \$24 accounted for as operating leases)	182	200
747-400 Aircraft (\$31 and \$45 Accounted for as operating leases)	90	116

As part of selected lease transactions, Boeing may provide incentives to commercial customers. At December 31, 2018, Customer Financing included \$250 of lease incentives with one customer that experienced liquidity issues. In the first quarter of 2019, we concluded that these lease incentives were impaired and recorded a charge of \$250.

Charges related to customer financing asset impairment for the years ended December 31 were as follows:

	2019	2018	2017
Boeing Capital	\$53	\$1	\$13
Other Boeing	217	38	30
Total	\$270	\$39	\$43

Lease income recorded in Revenue on the Consolidated Statements of Operations for the year ended December 31, 2019 included \$62 from sales-type/finance leases and \$139 from operating leases, of which \$8 related to variable operating lease payments.

As of December 31, 2019, undiscounted cash flows for notes receivable, sales-type/finance and operating leases over the next five years and thereafter are as follows:

	Notes receivable	Sales- type/finance leases	Operating leases
Year 1	\$382	\$191	\$130
Year 2	7	141	103
Year 3	37	127	89
Year 4	17	118	74
Year 5		98	58
Thereafter		124	41
Total lease receipts	443	799	495
Less imputed interest		(163)	
Estimated unguaranteed residual values		393	
Total	\$443	\$1,029	\$495

At December 31, 2019 and December 31, 2018 unguaranteed residual values were \$393 and \$425. Guaranteed residual values at December 31, 2019 were not significant.

Note 10 – Property, Plant and Equipment

Property, plant and equipment at December 31 consisted of the following:

	2019	2018
Land	\$527	\$546
Buildings and land improvements	14,288	14,109
Machinery and equipment	15,723	15,221
Construction in progress	1,306	1,337
Gross property, plant and equipment	31,844	31,213
Less accumulated depreciation	(19,342)	(18,568)
Total	\$12,502	\$12,645

Depreciation expense was \$1,567, \$1,556 and \$1,548 for the years ended December 31, 2019, 2018 and 2017, respectively. Interest capitalized during the years ended December 31, 2019, 2018 and 2017 totaled \$83, \$81 and \$110, respectively.

During 2019 and 2018, we acquired \$128 and \$78 of property, plant and equipment through non-cash investing and financing transactions. Accounts payable related to purchases of property, plant and equipment were \$256 and \$338 for the years ended December 31, 2019 and 2018.

Note 11 – Investments

Our investments, which are recorded in Short-term and other investments or Investments, consisted of the following at December 31:

	2019	2018
Equity method investments ⁽¹⁾	\$1,031	\$1,048
Time deposits	50	255
Available for sale debt instruments	405	491
Equity and other investments	65	44
Restricted cash & cash equivalents ⁽²⁾	86	176
Total	\$1,637	\$2,014

⁽¹⁾ Dividends received were \$164 and \$325 during 2019 and 2018. Retained earnings at December 31, 2019 include undistributed earnings from our equity method investments of \$156.

⁽²⁾ Reflects amounts restricted in support of our workers' compensation programs, employee benefit programs, and insurance premiums.

Equity Method Investments

Our equity method investments consisted of the following as of December 31:

	Segment	Ownership Percentages	Investment Balance	
			2019	2018
United Launch Alliance	BDS	50%	\$771	\$768
Other	BCA, BDS, BGS and Other		260	280
Total equity method investments			\$1,031	\$1,048

Note 12 – Other Assets

Sea Launch

At December 31, 2019 and 2018, Other assets included \$244 of receivables related to our former investment in the Sea Launch venture which became payable by certain Sea Launch partners following Sea Launch's bankruptcy filing in June 2009. The net amounts owed to Boeing by each of the partners are as follows: S.P. Koroley Rocket and Space Corporation Energia of Russia (RSC Energia) – \$111, PO Yuzhnoye Mashinostroitelny Zavod of Ukraine – \$89 and KB Yuzhnoye of Ukraine – \$44.

In 2013, we filed an action in the United States District Court for the Central District of California seeking reimbursement from the other Sea Launch partners. In 2016, the United States District Court for the Central District of California issued a judgment in favor of Boeing. Later that year, we reached an agreement which we believe will enable us to recover the outstanding receivable balance from RSC Energia over the next several years. In the fourth quarter of 2019, the U.S. Court of Appeals for the Ninth Circuit affirmed the decision of the U.S. District Court. We continue to pursue collection efforts against the former Ukrainian partners in connection with the court judgment. We continue to believe the partners have the financial wherewithal to pay and intend to pursue vigorously all of our rights and remedies. In the event we are unable to secure reimbursement from RSC Energia and the Ukrainian Sea Launch partners, we could incur additional charges.

Note 13 – Leases

Our operating lease assets primarily represent manufacturing and research and development facilities, warehouses, and offices. Total operating lease expense was \$326 for the year ended December 31, 2019, of which \$55 was attributable to variable lease expenses.

For the year ended December 31, 2019, cash payments against operating lease liabilities totaled \$277 and non-cash transactions totaled \$371 to recognize operating assets and liabilities for new leases.

Supplemental Consolidated Statement of Financial Position information related to leases was as follows:

	December 31 2019
Operating leases:	
Operating lease right-of-use assets	\$1,182
Current portion of lease liabilities	252
Non-current portion of lease liabilities	978
Total operating lease liabilities	\$1,230
Weighted average remaining lease term (years)	9
Weighted average discount rate	3.35%

Maturities of operating lease liabilities for the next five years are as follows:

	Operating leases
2020	\$287
2021	235
2022	194
2023	151
2024	98
Thereafter	609
Total lease payments	1,574
Less imputed interest	(344)
Total	\$1,230

As of December 31, 2019, we have entered into an operating lease that has not yet commenced of \$160, primarily related to research and development and manufacturing facilities. This lease will commence in 2020 with a lease term of 15 years.

Payments due under operating leases net of sublease amounts and non-cancellable future rentals under ASC 840 as of December 31, 2018 were as follows:

	Operating leases
2019	\$272
2020	232
2021	194
2022	165
2023	126
Thereafter	849
Total lease payments	\$1,838

Note 14 – Liabilities, Commitments and Contingencies

Accrued Liabilities

Accrued liabilities at December 31 consisted of the following:

	2019	2018
Accrued compensation and employee benefit costs	\$5,582	\$6,841
737 MAX customer concessions and other considerations	7,389	
Environmental	570	555
Product warranties	1,267	1,127
Forward loss recognition	1,681	1,488
Dividends payable	1,159	1,160
Income taxes payable	670	485
Other	4,550	3,152
Total	\$22,868	\$14,808

737 MAX Grounding

On March 13, 2019, the Federal Aviation Administration (FAA) issued an order to suspend operations of all 737 MAX aircraft in the U.S. and by U.S. aircraft operators following two fatal 737 MAX accidents. Non-U.S. civil aviation authorities have issued directives to the same effect. Deliveries of the 737 MAX have been suspended until clearance is granted by the appropriate regulatory authorities. In addition, multiple legal actions have been filed against us as a result of the accidents. We also are fully cooperating with U.S. government investigations related to the accidents and the 737 MAX program, including investigations by the U.S. Department of Justice and the Securities and Exchange Commission. We cannot reasonably estimate a range of loss, if any, not covered by available insurance that may result given the ongoing status of these law suits, investigations and inquiries.

We have developed software and pilot training updates for the 737 MAX and continue to work with the FAA and non-U.S. civil aviation authorities to complete remaining steps toward certification and readiness for return to service including addressing their questions on the software updates and how pilots will interact with the airplane controls and displays in different flight scenarios. We have assumed that computer and simulator training will be required and as a result, we have provisioned for certain training costs.

Prior to the grounding, the 737 production rate was 52 per month and we had planned to increase the rate to 57 per month during 2019. Beginning in the second quarter of 2019, we reduced the production rate to 42 per month. We have continued to produce at a rate of 42 per month through December 2019, which has resulted in approximately 400 airplanes in inventory as of December 31, 2019. In December 2019, we announced the temporary suspension of 737 MAX production beginning in January 2020 due to a number of factors, including the 737 MAX grounding continuing longer than expected, our decision to prioritize delivery of stored aircraft, and uncertainty about the timing and conditions of return to service and global training approvals. We have assumed that we will resume 737 MAX aircraft production at low rates in 2020 as timing and conditions of return to service are better understood, and then we expect to gradually increase to previously planned production rates over the next few years. We have assumed that regulatory approval will enable 737 MAX deliveries to resume during mid-2020. The cumulative impacts of changes to assumptions regarding timing of return to service and timing of planned production rates and deliveries have increased the estimated costs to produce and deliver aircraft included in the current accounting quantity by approximately \$6,300, which will be recorded in program inventory. This will result in lower 737 program margins in future periods after deliveries resume. In addition, the suspension of 737 MAX production and abnormally low production rates once production resumes will result in approximately \$4,000 of abnormal production costs during 2020 and 2021 that will be expensed as incurred.

We are working with our customers to minimize the impact to their operations from grounded and undelivered aircraft. During the second quarter of 2019, we recorded an earnings charge (reduction in revenue) and a corresponding liability of \$6,110 in connection with estimated potential concessions and other considerations to customers for disruptions related to the 737 MAX grounding and associated delivery delays. We have insurance coverage for up to \$500 of costs arising due to grounded aircraft and have received \$500 from our insurance carriers, which partially offset the earnings charges. We continue to reassess the liability for estimated potential concessions and other considerations to customers on a quarterly basis, and in the third and fourth quarters of 2019, we recorded additional charges totaling \$2,649. This reassessment includes updating estimates to reflect revised return to service and updated delivery and production rate assumptions, as well as latest information based on engagements with 737 MAX customers. The liability represents our current best estimate of future concessions and other considerations to customers, and is necessarily based on a series of assumptions.

The following table summarizes changes in the 737 MAX customer concessions and other considerations liability during 2019.

	2019
Beginning balance – January 1	
Initial liability recorded in the second quarter of 2019	\$6,110
Reductions for payments made	(1,237)
Reductions for concessions and other in-kind considerations	(133)
Changes in estimates	2,649
Ending balance – December 31	\$7,389

We have also recorded additional expenses of \$328 as a result of the 737 MAX grounding. These expenses include costs related to storage, pilot training and software updates.

The FAA and other non-U.S. civil aviation authorities will determine the timing and conditions of return to service. Our assumptions reflect our current best estimate, but actual timing and conditions of return to service and resumption of deliveries could differ from this estimate, the effect of which could be material. We are unable at this time to reasonably estimate potential future additional financial impacts or a range of loss, if any, due to continued uncertainties related to the timing and conditions of return to service, future changes to the production rate, supply chain impacts or the results of negotiations with particular customers. Any such impacts, including any changes in our estimates, could have a material adverse effect on our

financial position, results of operations, and/or cash flows. For example, we expect that, in the event that we are unable to resume aircraft deliveries consistent with our assumptions, the continued absence of revenue, earnings, and cash flows associated with 737 MAX deliveries would continue to have the most material impact on our operating results. In the event that future production rate increases occur at a slower rate or take longer than we are currently assuming we expect that the growth in inventory and other cash flow impacts associated with production would decrease. However, while any prolonged production suspension or delays in planned production rate increases could mitigate the impact on our liquidity it could significantly increase the overall expected costs to produce aircraft included in the accounting quantity, which would reduce 737 program margins and/or increase abnormal production costs in the future.

737NG Structure (Pickle Fork)

During the third quarter of 2019, we detected cracks in the "pickle forks," a component of the structure connecting the wings to the fuselages, of three 737-800NGs we were converting into freighters. We notified the FAA, which issued a directive requiring that 737NG airplanes with over 30,000 flight cycles be inspected for this condition by October 10, 2019, and that airplanes with over 22,600 flight cycles be inspected over the next 1,000 flight cycles. To date, all airplanes with over 30,000 flight cycles and approximately half of the airplanes with over 22,600 flights cycles have been inspected and this condition has been found on a small percentage of aircraft, and those aircraft will be repaired. A small percentage of airplanes with fewer than 22,600 flight cycles have also been inspected. We have estimated the number of aircraft that will have to be repaired in the future and provisioned for the estimated costs of completing the repairs. We recognized charges of \$135 in 2019 for current and projected future aircraft repairs. However, we cannot estimate a range of reasonably possible losses, if any, in excess of amounts recognized due to the ongoing nature of the inspections and repairs and pending the completion of investigations into the cause of the condition.

Environmental

The following table summarizes environmental remediation activity during the years ended December 31, 2019 and 2018.

	2019	2018
Beginning balance – January 1	\$555	\$524
Reductions for payments made	(47)	(37)
Changes in estimates	62	68
Ending balance – December 31	\$570	\$555

The liabilities recorded represent our best estimate or the low end of a range of reasonably possible costs expected to be incurred to remediate sites, including operation and maintenance over periods of up to 30 years. It is reasonably possible that we may incur charges that exceed these recorded amounts because of regulatory agency orders and directives, changes in laws and/or regulations, higher than expected costs and/or the discovery of new or additional contamination. As part of our estimating process, we develop a range of reasonably possible alternate scenarios that includes the high end of a range of reasonably possible cost estimates for all remediation sites for which we have sufficient information based on our experience and existing laws and regulations. There are some potential remediation obligations where the costs of remediation cannot be reasonably estimated. At December 31, 2019 and 2018, the high end of the estimated range of reasonably possible remediation costs exceeded our recorded liabilities by \$1,077 and \$796.

Product Warranties

The following table summarizes product warranty activity recorded during the years ended December 31, 2019 and 2018.

	2019	2018
Beginning balance – January 1	\$1,127	\$1,211
Additions for current year deliveries	188	232
Reductions for payments made	(249)	(193)
Changes in estimates	201	(123)
Ending balance – December 31	\$1,267	\$1,127

Commercial Aircraft Commitments

In conjunction with signing definitive agreements for the sale of new aircraft (Sale Aircraft), we have entered into trade-in commitments with certain customers that give them the right to trade in used aircraft at a specified price upon the purchase of Sale Aircraft. The probability that trade-in commitments will be exercised is determined by using both quantitative information from valuation sources and qualitative information from other sources. The probability of exercise is assessed quarterly, or as events trigger a change, and takes into consideration the current economic and airline industry environments. Trade-in commitments, which can be terminated by mutual consent with the customer, may be exercised only during the period specified in the agreement, and require advance notice by the customer.

Trade-in commitment agreements at December 31, 2019 have expiration dates from 2020 through 2026. At December 31, 2019 and 2018, total contractual trade-in commitments were \$1,407 and \$1,519. As of December 31, 2019 and 2018, we estimated that it was probable we would be obligated to perform on certain of these commitments with net amounts payable to customers totaling \$711 and \$522 and the fair value of the related trade-in aircraft was \$678 and \$485.

Financing Commitments

Financing commitments related to aircraft on order, including options and those proposed in sales campaigns, and refinancing of delivered aircraft, totaled \$13,377 and \$19,462 as of December 31, 2019 and 2018. The estimated earliest potential funding dates for these commitments as of December 31, 2019 are as follows:

	Total
2020	\$3,506
2021	2,981
2022	1,343
2023	2,163
2024	1,407
Thereafter	1,977
	\$13,377

As of December 31, 2019, all of these financing commitments relate to customers we believe have less than investment-grade credit. We have concluded that no reserve for future potential losses is required for these financing commitments based upon the terms, such as collateralization and interest rates, under which funding would be provided.

Funding Commitments

We have commitments to make additional capital contributions of \$246 to joint ventures over the next eight years.

Standby Letters of Credit and Surety Bonds

We have entered into standby letters of credit and surety bonds with financial institutions primarily relating to the guarantee of our future performance on certain contracts. Contingent liabilities on outstanding letters of credit agreements and surety bonds aggregated approximately \$3,769 and \$3,761 as of December 31, 2019 and 2018.

Company Owned Life Insurance

McDonnell Douglas Corporation insured its executives with Company Owned Life Insurance (COLI), which are life insurance policies with a cash surrender value. Although we do not use COLI currently, these obligations from the merger with McDonnell Douglas are still a commitment at this time. We have loans in place to cover costs paid or incurred to carry the underlying life insurance policies. As of December 31, 2019 and 2018, the cash surrender value was \$448 and \$466 and the total loans were \$431 and \$447. As we have the right to offset the loans against the cash surrender value of the policies, we present the net asset in Other assets on the Consolidated Statements of Financial Position as of December 31, 2019 and 2018.

United States Government Defense Environment Overview

The Bipartisan Budget Act of 2019 raised the Budget Control Act limits on federal discretionary defense and non-defense spending for fiscal years 2020 and 2021 (FY20 and FY21), reducing budget uncertainty and the risk of sequestration. The consolidated appropriations acts for FY20, enacted in December 2019, provided FY20 appropriations for government departments and agencies, including the United States Department of Defense (U.S. DoD), the National Aeronautics and Space Administration (NASA) and the FAA.

The enacted FY20 appropriations included funding for Boeing's major programs, such as the F/A-18 Super Hornet, F-15EX, CH-47 Chinook, AH-64 Apache, V-22 Osprey, KC-46A Tanker, P-8 Poseidon and Space Launch System. However, there continues to be uncertainty with respect to future program-level appropriations for the U.S. DoD and other government agencies, including NASA. Future budget cuts or investment priority changes, including changes associated with the authorizations and appropriations process, could result in reductions, cancellations and/or delays of existing contracts or programs. Any of these impacts could have a material effect on our results of operations, financial position and/or cash flows.

BDS Fixed-Price Development Contracts

Fixed-price development work is inherently uncertain and subject to significant variability in estimates of the cost and time required to complete the work. BDS fixed-price contracts with significant development work include Commercial Crew, KC-46A Tanker, T-7A Red Hawk (formerly T-X Trainer), VC-25B Presidential Aircraft, MQ-25, and commercial and military satellites. The operational and technical complexities of these contracts create financial risk, which could trigger termination provisions, order cancellations or other financially significant exposure. Changes to cost and revenue estimates could result in lower margins or material charges for reach-forward losses. For example, we have recorded reach-forward losses of \$148 on KC-46A Tanker and \$489 on Commercial Crew in 2019. Moreover, our fixed-price development programs remain subject to additional reach-forward losses if we experience further production, technical or quality issues, schedule delays, or increased costs.

KC-46A Tanker

In 2011, we were awarded a contract from the U.S. Air Force (USAF) to design, develop, manufacture and deliver four next generation aerial refueling tankers. This EMD contract is a fixed-price incentive fee contract and involves highly complex designs and systems integration. Since 2016, the USAF has authorized five low rate initial production (LRIP) lots for a total of 67 aircraft. The EMD contract and authorized LRIP lots are valued at approximately \$15 billion.

At December 31, 2019, we had approximately \$331 of capitalized precontract costs and \$225 of potential termination liabilities to suppliers.

Recoverable Costs on Government Contracts

Our final incurred costs for each year are subject to audit and review for allowability by the U.S. government, which can result in payment demands related to costs they believe should be disallowed. We work with the U.S. government to assess the merits of claims and where appropriate reserve for amounts disputed. If we are unable to satisfactorily resolve disputed costs, we could be required to record an earnings charge and/or provide refunds to the U.S. government.

Note 15 – Arrangements with Off-Balance Sheet Risk

We enter into arrangements with off-balance sheet risk in the normal course of business, primarily in the form of guarantees.

The following table provides quantitative data regarding our third party guarantees. The maximum potential payments represent a “worst-case scenario,” and do not necessarily reflect amounts that we expect to pay. Estimated proceeds from collateral and recourse represent the anticipated values of assets we could liquidate or receive from other parties to offset our payments under guarantees. The carrying amount of liabilities represents the amount included in Accrued liabilities.

	Maximum Potential Payments		Estimated Proceeds from Collateral/ Recourse		Carrying Amount of Liabilities	
December 31,	2019	2018	2019	2018	2019	2018
Contingent repurchase commitments	\$1,570	\$1,685	\$1,570	\$1,685		
Indemnifications to ULA:						
Contributed Delta inventory	30	52				
Inventory supply agreement	34	85				
Questioned costs	317	317			\$48	
Credit guarantees	92	106	36	51	16	\$16

Contingent Repurchase Commitments The repurchase price specified in contingent repurchase commitments is generally lower than the expected fair value at the specified repurchase date. Estimated proceeds from collateral/recourse in the table above represent the lower of the contracted repurchase price or the expected fair value of each aircraft at the specified repurchase date.

Indemnifications to ULA In 2006, we agreed to indemnify ULA through December 31, 2020 against potential non-recoverability and non-allowability of \$1,360 of Boeing Delta launch program inventory included in contributed assets plus \$1,860 of inventory subject to an inventory supply agreement which ends on March 31, 2021. See Note 7. ULA has yet to consume \$30 of contributed inventory.

In June 2011, the Defense Contract Management Agency (DCMA) notified ULA that it had determined that \$271 of deferred support costs are not recoverable under government contracts. In December 2011, the DCMA notified ULA of the potential non-recoverability of an additional \$114 of deferred production costs. ULA and Boeing believe that all costs are recoverable and in November 2011, ULA filed a certified claim with the USAF for collection of deferred support and production costs. The USAF issued a final decision denying ULA's certified claim in May 2012. In 2012, Boeing and ULA, through its subsidiary United Launch Services, filed a suit in the Court of Federal Claims seeking recovery of the deferred support and production costs from the U.S. government, which subsequently asserted a counterclaim for credits that it alleges were offset by deferred support cost invoices. We believe that the U.S. government's counterclaim is without merit. The discovery phase of the litigation completed in 2017. The parties have since agreed to engage in alternative dispute resolution, and the court has stayed the litigation pending that process. If, contrary to our belief, it is determined that some or all of the deferred support or production costs are not recoverable, we could be required to record pre-tax losses up to \$269 and make indemnification payments to ULA for up to \$317 of the costs questioned by the DCMA.

Other Indemnifications In conjunction with our sales of Electron Dynamic Devices, Inc. and Rocketdyne Propulsion and Power businesses and our BCA facilities in Wichita, Kansas and Tulsa and McAlester, Oklahoma, we agreed to indemnify, for an indefinite period, the buyers for costs relating to pre-closing environmental conditions and certain other items. We are unable to assess the potential number of future claims that may be asserted under these indemnifications, nor the amounts thereof (if any). As a result, we cannot estimate the maximum potential amount of future payments under these indemnities and therefore, no liability has been recorded. To the extent that claims have been made under these indemnities and/or are probable and reasonably estimable, liabilities associated with these indemnities are included in the environmental liability disclosure in Note 14.

Credit Guarantees We have issued credit guarantees where we are obligated to make payments to a guaranteed party in the event that the original lessee or debtor does not make payments or perform certain specified services. Generally, these guarantees have been extended on behalf of guaranteed parties with less than investment-grade credit and are collateralized by certain assets. Current outstanding credit guarantees expire through 2036.

Industrial Revenue Bonds

Industrial Revenue Bonds (IRB) issued by St. Louis County were used to finance the purchase and/or construction of real and personal property at our St. Louis site. Tax benefits associated with IRBs include a twelve-year property tax abatement and sales tax exemption from St. Louis County. We record these properties on our Consolidated Statements of Financial Position. We have also purchased the IRBs and therefore are the bondholders as well as the borrower/lessee of the properties purchased with the IRB proceeds. The liabilities and IRB assets are equal and are reported net in the Consolidated Statements of Financial Position.

As of December 31, 2019 and 2018, the assets and liabilities associated with the IRBs were \$271.

Note 16 – Debt

In the first quarter of 2019, we issued \$1,500 of fixed rate senior notes consisting of \$400 due March 1, 2024 that bear an annual interest rate of 2.8%, \$400 due March 1, 2029 that bear an annual interest rate of 3.2%, \$400 due March 1, 2039 that bear an annual interest rate of 3.5%, and \$300 due March 1, 2059 that bear an annual interest rate of 3.825%. The notes are unsecured senior obligations and rank equally in right of payment with our existing and future unsecured and unsubordinated indebtedness. The net proceeds of the issuance totaled \$1,451, after deducting underwriting discounts, commissions and offering expenses.

In the second quarter of 2019, we issued \$3,500 of fixed rate senior notes consisting of \$600 due May 1, 2022 that bear an annual interest rate of 2.7%, \$650 due May 1, 2026 that bear an annual interest rate of 3.1%, \$600 due March 1, 2029 that bear an annual interest rate of 3.2%, \$850 due May 1, 2034 that bear an annual interest rate of 3.6%, and \$800 due May 1, 2049 that bear an annual interest rate of 3.9%. The notes are unsecured senior obligations and rank equally in right of payment with our existing and future unsecured and unsubordinated indebtedness. The net proceeds of the issuance totaled \$3,454, after deducting underwriting discounts, commissions and offering expenses.

In the third quarter of 2019, we issued \$5,500 of fixed rate senior notes consisting of \$750 due August 1, 2021 that bear an annual interest rate of 2.3%, \$1,000 due February 1, 2027 that bear an annual interest rate of 2.7%, \$750 due February 1, 2030 that bear an annual interest rate of 2.95%, \$750 due February 1, 2035 that bear an annual interest rate of 3.25%, \$1,250 due February 1, 2050 that bear an annual interest rate of 3.75%, and \$1,000 due August 1, 2059 that bear an annual interest rate of 3.95%. The notes are unsecured senior obligations and rank equally in right of payment with our existing and future unsecured and unsubordinated indebtedness. The net proceeds of the issuance totaled \$5,442, after deducting underwriting discounts, commissions and offering expenses.

Interest incurred, including amounts capitalized, was \$867, \$624 and \$541 for the years ended December 31, 2019, 2018 and 2017, respectively. Interest expense recorded by BCC is reflected as Boeing Capital interest expense on our Consolidated Statements of Operations. Total Company interest payments were \$973, \$616 and \$527 for the years ended December 31, 2019, 2018 and 2017, respectively.

We have \$9,600 currently available under credit line agreements, of which \$3,200 is a 364-day revolving credit facility expiring in October 2020, \$3,200 expires in October 2022, and \$3,200 expires in October 2024. The 364-day credit facility has a one-year term out option which allows us to extend the maturity of any borrowings one year beyond the aforementioned expiration date. We continue to be in full compliance with all covenants contained in our debt or credit facility agreements.

Short-term debt and current portion of long-term debt at December 31 consisted of the following:

	2019	2018
Unsecured debt securities	\$1,099	\$1,151
Non-recourse debt and notes	21	25
Finance lease obligations	71	57
Commercial paper	6,109	1,895
Other notes	40	62
Total	\$7,340	\$3,190

Debt at December 31 consisted of the following:

	2019	2018
Unsecured debt securities		
1.65% - 4.88% due through 2059	\$17,404	\$7,538
5.80% - 6.88% due through 2043	1,740	2,388
7.25% - 8.75% due through 2043	1,639	1,638
Commercial paper	6,109	1,895
Non-recourse debt and notes		
6.98% notes due through 2021	37	62
Finance lease obligations due through 2044	229	156
Other notes	144	170
Total debt	\$27,302	\$13,847

At December 31, 2019 and 2018, commercial paper borrowings totaling \$6,109 and \$1,895, with a weighted-average interest rate of 2.2% and 2.5%, were supported by unused commitments under the revolving credit agreement.

Total debt at December 31 is attributable to:

	2019	2018
BCC	\$1,960	\$2,487
Other Boeing	25,342	11,360
Total debt	\$27,302	\$13,847

At December 31, 2019, \$37 of debt (non-recourse debt) was collateralized by customer financing assets totaling \$186.

Scheduled principal payments for debt and minimum finance lease obligations for the next five years are as follows:

	2020	2021	2022	2023	2024
Debt	\$7,306	\$1,484	\$1,214	\$780	\$1,000
Minimum finance lease obligations	\$71	\$56	\$42	\$20	\$6

Note 17 – Postretirement Plans

The majority of our employees have earned benefits under defined benefit pension plans. Nonunion and the majority of union employees that had participated in defined benefit pension plans transitioned to a company-funded defined contribution retirement savings plan in 2016. Additional union employees transitioned to company-funded defined contribution retirement savings plans effective January 1, 2019.

We fund our major pension plans through trusts. Pension assets are placed in trust solely for the benefit of the plans' participants, and are structured to maintain liquidity that is sufficient to pay benefit obligations as well as to keep pace over the long-term with the growth of obligations for future benefit payments.

We also have other postretirement benefits (OPB) other than pensions which consist principally of health care coverage for eligible retirees and qualifying dependents, and to a lesser extent, life insurance to certain groups of retirees. Retiree health care is provided principally until age 65 for approximately two-thirds of those participants who are eligible for health care coverage. Certain employee groups, including

employees covered by most United Auto Workers bargaining agreements, are provided lifetime health care coverage. The funded status of the plans is measured as the difference between the plan assets at fair value and the projected benefit obligation (PBO). We have recognized the aggregate of all overfunded plans in Other assets, and the aggregate of all underfunded plans in either Accrued retiree health care or Accrued pension plan liability, net. The portion of the amount by which the actuarial present value of benefits included in the PBO exceeds the fair value of plan assets, payable in the next 12 months, is reflected in Accrued liabilities.

The components of net periodic benefit (income)/cost were as follows:

Years ended December 31,	Pension			Other Postretirement Benefits		
	2019	2018	2017	2019	2018	2017
Service cost	\$2	\$430	\$402	\$77	\$94	\$106
Interest cost	2,925	2,781	2,991	196	194	229
Expected return on plan assets	(3,863)	(4,009)	(3,847)	(8)	(8)	(7)
Amortization of prior service credits	(79)	(56)	(39)	(35)	(126)	(137)
Recognized net actuarial loss/(gain)	643	1,130	804	(46)	(10)	10
Settlement/curtailment/other losses		44	1			
Net periodic benefit (income)/cost	(\$372)	\$320	\$312	\$184	\$144	\$201
Net periodic benefit cost included in (Loss)/earnings from operations	\$313	\$313	\$510	\$88	\$84	\$107
Net periodic benefit (income)/cost included in Other income, net	(374)	(143)	(117)	107	101	123
Net periodic benefit (income)/cost included in (Loss)/earnings before income taxes	(\$61)	\$170	\$393	\$195	\$185	\$230

The following tables show changes in the benefit obligation, plan assets and funded status of both pensions and OPB for the years ended December 31, 2019 and 2018. Benefit obligation balances presented below reflect the PBO for our pension plans, and accumulated postretirement benefit obligations (APBO) for our OPB plans.

	Pension		Other Postretirement Benefits	
	2019	2018	2019	2018
Change in benefit obligation				
Beginning balance	\$71,424	\$80,393	\$5,114	\$6,085
Service cost	2	430	77	94
Interest cost	2,925	2,781	196	194
Amendments		(377)	1	(58)
Actuarial (gain)/loss	8,695	(6,352)	127	(732)
Settlement/curtailment/other	(756)	(730)		
Gross benefits paid	(4,658)	(4,700)	(474)	(487)
Subsidies			36	24
Exchange rate adjustment	13	(21)	3	(6)
Ending balance	\$77,645	\$71,424	\$5,080	\$5,114
Change in plan assets				
Beginning balance at fair value	\$56,102	\$64,011	\$132	\$143
Actual return on plan assets	10,851	(2,585)	26	(3)
Company contribution	16	16	1	2
Plan participants' contributions			6	7
Settlement payments	(756)	(764)		
Benefits paid	(4,514)	(4,557)	(16)	(17)
Exchange rate adjustment	12	(19)		
Ending balance at fair value	\$61,711	\$56,102	\$149	\$132
Amounts recognized in statement of financial position at December 31 consist of:				
Other assets	\$484	\$138		
Other accrued liabilities	(142)	(137)	(\$391)	(\$398)
Accrued retiree health care			(4,540)	(4,584)
Accrued pension plan liability, net	(16,276)	(15,323)		
Net amount recognized	(\$15,934)	(\$15,322)	(\$4,931)	(\$4,982)

Amounts recognized in Accumulated other comprehensive loss at December 31 were as follows:

	Pension		Other Postretirement Benefits	
	2019	2018	2019	2018
Net actuarial loss/(gain)	\$23,124	\$22,061	(\$625)	(\$783)
Prior service credits	(1,467)	(1,546)	(122)	(158)
Total recognized in Accumulated other comprehensive loss	\$21,657	\$20,515	(\$747)	(\$941)

The accumulated benefit obligation (ABO) for all pension plans was \$75,787 and \$69,376 at December 31, 2019 and 2018. Key information for our plans with ABO and PBO in excess of plan assets as of December 31 was as follows:

	2019	2018
Accumulated benefit obligation	\$70,466	\$66,306
Fair value of plan assets	55,907	52,894

	2019	2018
Projected benefit obligation	\$72,325	\$68,354
Fair value of plan assets	55,907	52,894

Assumptions

The following assumptions, which are the weighted average for all plans, are used to calculate the benefit obligation at December 31 of each year and the net periodic benefit cost for the subsequent year.

December 31,	2019	2018	2017
Discount rate:			
Pension	3.30%	4.20%	3.60%
Other postretirement benefits	3.00%	4.00%	3.30%
Expected return on plan assets	6.80%	6.80%	6.80%
Rate of compensation increase	4.30%	5.30%	5.30%
Interest crediting rates for cash balance plans	5.15%	5.15%	5.15%

The discount rate for each plan is determined based on the plans' expected future benefit payments using a yield curve developed from high quality bonds that are rated as Aa or better by at least half of the four rating agencies utilized as of the measurement date. The yield curve is fitted to yields developed from bonds at various maturity points. Bonds with the ten percent highest and the ten percent lowest yields are omitted. The present value of each plan's benefits is calculated by applying the discount rates to projected benefit cash flows.

The pension fund's expected return on plan assets assumption is derived from a review of actual historical returns achieved by the pension trust and anticipated future long-term performance of individual asset classes. While consideration is given to recent trust performance and historical returns, the assumption represents a long-term, prospective return. The expected return on plan assets component of the net periodic benefit cost for the upcoming plan year is determined based on the expected return on plan assets assumption and the market-related value of plan assets (MRVA). Since our adoption of the accounting standard for pensions in 1987, we have determined the MRVA based on a five-year moving average of plan assets. As of December 31, 2019, the MRVA was approximately \$3,674 less than the fair market value of assets.

Assumed health care cost trend rates were as follows:

December 31,	2019	2018	2017
Health care cost trend rate assumed next year	5.00%	5.50%	6.00%
Ultimate trend rate	4.50%	4.50%	4.50%
Year that trend reached ultimate rate	2021	2021	2021

Plan Assets

Investment Strategy The overall objective of our pension assets is to earn a rate of return over time to satisfy the benefit obligations of the pension plans and to maintain sufficient liquidity to pay benefits and address other cash requirements of the pension fund. Specific investment objectives for our long-term investment strategy include reducing the volatility of pension assets relative to pension liabilities, achieving a competitive total investment return, achieving diversification between and within asset classes and managing other risks. Investment objectives for each asset class are determined based on specific risks and investment opportunities identified.

We periodically update our long-term, strategic asset allocations. We use various analytics to determine the optimal asset mix and consider plan liability characteristics, liquidity characteristics, funding requirements, expected rates of return and the distribution of returns. We identify investment benchmarks to evaluate performance for the asset classes in the strategic asset allocation that are market-based and investable where possible. Actual allocations to each asset class vary from target allocations due to periodic investment strategy changes, market value fluctuations, the length of time it takes to fully implement investment allocation positions, and the timing of benefit payments and contributions. Short-term investments and exchange-traded derivatives are used to rebalance the actual asset allocation to the target asset allocation. The asset allocation is monitored and rebalanced periodically. The actual and target allocations by asset class for the pension assets at December 31 were as follows:

Asset Class	Actual Allocations		Target Allocations	
	2019	2018	2019	2018
Fixed income	49%	48%	47%	47%
Global equity	29	28	29	29
Private equity	5	5	5	5
Real estate and real assets	8	9	9	9
Hedge funds	9	10	10	10
Total	100%	100%	100%	100%

Fixed income securities are invested primarily in a diversified portfolio of long duration instruments. Global equity securities are invested in a diversified portfolio of U.S. and non-U.S. companies, across various industries and market capitalizations.

Private equity investment vehicles are primarily limited partnerships (LPs) that mainly invest in U.S. and non-U.S. leveraged buyout, venture capital and special situation strategies. Real estate and real assets include global private investments that may be held through an investment in a limited partnership (LP) or other fund structures and publicly traded investments (such as Real Estate Investment Trusts (REITs) in the case of real estate). Real estate includes, but is not limited to, investments in office, retail, apartment and industrial properties. Real assets include, but are not limited to, investments in natural resources (such as energy, farmland and timber), commodities and infrastructure.

Hedge fund investments seek to capitalize on inefficiencies identified across and within different asset classes or markets. Hedge fund strategy types include, but are not limited to directional, event driven, relative value, long-short and multi-strategy.

Investment managers are retained for explicit investment roles specified by contractual investment guidelines. Certain investment managers are authorized to use derivatives, such as equity or bond futures, swaps, options and currency futures or forwards. Derivatives are used to achieve the desired market exposure of a security or an index, transfer value-added performance between asset classes, achieve the desired currency exposure, adjust portfolio duration or rebalance the total portfolio to the target asset allocation.

As a percentage of total pension assets, derivative net notional amounts were 4.3% and 4.4% for fixed income, including to-be-announced mortgage-backed securities and treasury forwards, and 3.6% and 5.5% for global equity and commodities at December 31, 2019 and 2018.

Risk Management In managing the pension assets, we review and manage risk associated with funded status risk, interest rate risk, market risk, counterparty risk, liquidity risk and operational risk. Liability matching and asset class diversification are central to our risk management approach and are integral to the overall investment strategy. Further, asset classes are constructed to achieve diversification by investment strategy, by investment manager, by industry or sector and by holding. Investment manager guidelines for publicly traded assets are specified and are monitored regularly through the custodian. Credit parameters for counterparties have been established for managers permitted to trade over-the-counter derivatives. Valuation is governed through several types of procedures, including reviews of manager valuation policies, custodian valuation processes, pricing vendor practices, pricing reconciliation, and periodic, security-specific valuation testing.

Fair Value Measurements The following table presents our plan assets using the fair value hierarchy as of December 31, 2019 and 2018. The fair value hierarchy has three levels based on the reliability of the inputs used to determine fair value. Level 1 refers to fair values determined based on quoted prices in active markets for identical assets. Level 2 refers to fair values estimated using significant other observable inputs, and Level 3 includes fair values estimated using significant unobservable inputs.

	December 31, 2019				December 31, 2018			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Fixed income securities:								
Corporate	\$19,341		\$19,336	\$5	\$17,481		\$17,479	\$2
U.S. government and agencies	5,759		5,759		5,589		5,589	
Mortgage backed and asset backed	1,181		720	461	722		410	312
Municipal	1,317		1,317		1,255		1,255	
Sovereign	1,076		1,076		967		967	
Other	55	\$7	48		106	\$53	53	
Derivatives:								
Assets								
Liabilities	(143)		(143)		(51)		(51)	
Cash equivalents and other short-term investments	769		769		1,068		1,068	
Equity securities:								
U.S. common and preferred stock	4,866	4,866			3,744	3,744		
Non-U.S. common and preferred stock	5,529	5,527		2	4,850	4,846	4	
Derivatives:								
Assets	6		6		3		3	
Liabilities	(5)		(5)		(9)		(9)	
Real estate and real assets:								
Real estate	454	454			422	422		
Real assets	810	649	157	4	659	311	344	4
Derivatives:								
Assets	5	1	4		4		4	
Liabilities	(2)		(2)		(17)	(1)	(16)	
Total	\$41,018	\$11,504	\$29,042	\$472	\$36,793	\$9,375	\$27,100	\$318
Fixed income common/collective/pooled funds								
	\$959				\$938			
Fixed income other	512				442			
Equity common/collective pooled funds	6,301				5,264			
Private equity	3,184				2,934			
Real estate and real assets	3,605				3,792			
Hedge funds	5,688				5,484			
Total investments measured at NAV as a practical expedient	\$20,249				\$18,854			
Cash	\$207				\$205			
Receivables	383				404			
Payables	(146)				(154)			
Total	\$61,711				\$56,102			

Fixed income securities are primarily valued upon a market approach, using matrix pricing and considering a security's relationship to other securities for which quoted prices in an active market may be available, or an income approach, converting future cash flows to a single present value amount. Inputs used in developing fair value estimates include reported trades, broker quotes, benchmark yields, and base spreads.

Common/collective/pooled funds are typically common or collective trusts valued at their net asset values (NAVs) that are calculated by the investment manager or sponsor of the fund and have daily or monthly liquidity. Derivatives included in the table above are over-the-counter and are primarily valued using an income approach with inputs that include benchmark yields, swap curves, cash flow analysis, rating agency data and interdealer broker rates. Exchange-traded derivative positions are reported in accordance with changes in daily variation margin which is settled daily and therefore reflected in the payables and receivables portion of the table.

Cash equivalents and other short-term investments (which are used to pay benefits) are held in a separate account which consists of a commingled fund (with daily liquidity) and separately held short-term securities and cash equivalents. All of the investments in this cash vehicle are valued daily using a market approach with inputs that include quoted market prices for similar instruments. In the event a market price is not available for instruments with an original maturity of one year or less, amortized cost is used as a proxy for fair value. Common and preferred stock equity securities are primarily valued using a market approach based on the quoted market prices of identical instruments.

Private equity and private debt NAV valuations are based on the valuation of the underlying investments, which include inputs such as cost, operating results, discounted future cash flows and market based comparable data. For those investments reported on a one-quarter lagged basis (primarily LPs) we use NAVs, adjusted for subsequent cash flows and significant events.

Real estate and real asset NAV valuations are based on valuation of the underlying investments, which include inputs such as cost, discounted future cash flows, independent appraisals and market based comparable data. For those investments reported on a one-quarter lagged basis (primarily LPs) NAVs are adjusted for subsequent cash flows and significant events. Publicly traded REITs and infrastructure stocks are valued using a market approach based on quoted market prices of identical instruments. Exchange-traded commodities futures positions are reported in accordance with changes in daily variation margin which is settled daily and therefore reflected in the payables and receivables portion of the table.

Hedge fund NAVs are generally based on the valuation of the underlying investments. This is primarily done by applying a market or income valuation methodology depending on the specific type of security or instrument held.

Investments in private equity, private debt, real estate, real assets, and hedge funds are primarily calculated and reported by the General Partner (GP), fund manager or third party administrator. Additionally, some investments in fixed income and equity are made via commingled vehicles and are valued in a similar fashion. Pension assets invested in commingled and limited partnership structures rely on the NAV of these investments as the practical expedient for the valuations.

The following tables present a reconciliation of Level 3 assets held during the years ended December 31, 2019 and 2018. Transfers into and out of Level 3 are reported at the beginning-of-year values.

	January 1 2019 Balance	Net Realized and Unrealized Gains/(Losses)	Net Purchases, Issuances and Settlements	Net Transfers Into/(Out of) Level 3	December 31 2019 Balance
Fixed income securities:					
Corporate	\$2		\$3		\$5
Mortgage backed and asset backed	312	\$11	137	\$1	461
Equity securities:					
Non-U.S. common and preferred stock			1	1	2
Real assets	4				4
Total	\$318	\$11	\$141	\$2	\$472

	January 1 2018 Balance	Net Realized and Unrealized Gains/(Losses)	Net Purchases, Issuances and Settlements	Net Transfers Into/(Out of) Level 3	December 31 2018 Balance
Fixed income securities:					
Corporate	\$2				\$2
Mortgage backed and asset backed	310	(\$3)	\$3	\$2	312
Real assets	3			1	4
Total	\$315	(\$3)	\$3	\$3	\$318

The changes in unrealized gains/(losses) for Level 3 mortgage backed and asset backed fixed income securities still held at December 31, 2019 and 2018 were a gain of \$10 and a loss of \$4. The changes in unrealized losses for Level 3 non-U.S. common and preferred stock equity securities still held at December 31, 2019 and 2018 were \$1 and \$0.

OPB Plan Assets The majority of OPB plan assets are invested in a balanced index fund which is comprised of approximately 60% equities and 40% debt securities. The index fund is valued using a market approach based on the quoted market price of an identical instrument (Level 1). The expected rate of return on these assets does not have a material effect on the net periodic benefit cost.

Cash Flows

Contributions Required pension contributions under the Employee Retirement Income Security Act (ERISA), as well as rules governing funding of our non-US pension plans, are not expected to be significant in 2020. We do not expect to make discretionary contributions to our pension plans in 2020.

Estimated Future Benefit Payments The table below reflects the total pension benefits expected to be paid from the plans or from our assets, including both our share of the benefit cost and the participants' share of the cost, which is funded by participant contributions. OPB payments reflect our portion only.

Year(s)	2020	2021	2022	2023	2024	2025-2029
Pensions	\$4,838	\$4,808	\$4,744	\$4,650	\$4,608	\$21,757
Other postretirement benefits:						
Gross benefits paid	479	470	462	450	435	1,867
Subsidies	(18)	(18)	(18)	(18)	(18)	(93)
Net other postretirement benefits	\$461	\$452	\$444	\$432	\$417	\$1,774

Termination Provisions

Certain of the pension plans provide that, in the event there is a change in control of the Company which is not approved by the Board of Directors and the plans are terminated within five years thereafter, the assets in the plan first will be used to provide the level of retirement benefits required by ERISA, and then any surplus will be used to fund a trust to continue present and future payments under the postretirement medical and life insurance benefits in our group insurance benefit programs.

Should we terminate certain pension plans under conditions in which the plan's assets exceed that plan's obligations, the U.S. government will be entitled to a fair allocation of any of the plan's assets based on plan contributions that were reimbursed under U.S. government contracts.

Defined Contribution Plans

We provide certain defined contribution plans to all eligible employees. The principal plans are the Company-sponsored 401(k) plans. The expense for these defined contribution plans was \$1,533, \$1,480 and \$1,522 in 2019, 2018 and 2017, respectively.

Note 18 – Share-Based Compensation and Other Compensation Arrangements

Share-Based Compensation

Our 2003 Incentive Stock Plan, as amended and restated, permits awards of incentive and non-qualified stock options, stock appreciation rights, restricted stock or units, performance shares, performance restricted stock or units, performance units and other stock and cash-based awards to our employees, officers, directors, consultants, and independent contractors. The aggregate number of shares of our stock authorized for issuance under the plan is 87,000,000.

Shares issued as a result of stock option exercises or conversion of stock unit awards will be funded out of treasury shares, except to the extent there are insufficient treasury shares, in which case new shares will be issued. We believe we currently have adequate treasury shares to satisfy these issuances during 2020.

Share-based plans expense is primarily included in General and administrative expense since it is incentive compensation issued primarily to our executives. The share-based plans expense and related income tax benefit were as follows:

Years ended December 31,	2019	2018	2017
Restricted stock units and other awards	\$217	\$213	\$212
Income tax benefit	\$47	\$46	\$46

Stock Options

We discontinued granting options in 2014, replacing them with performance-based restricted stock units. Options granted through January 2014 had an exercise price equal to the fair market value of our stock on the date of grant and expire ten years after the date of grant. The stock options vested over a period of three years and were fully vested as of December 31, 2017.

Stock option activity for the year ended December 31, 2019 is as follows:

	Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value
Number of shares under option:				
Outstanding at beginning of year	3,252,083	\$72.47		
Exercised	(870,821)	66.16		
Expired	(5,679)	69.23		
Outstanding at end of year	2,375,583	\$74.79	2.44	\$596
Exercisable at end of year	2,375,583	\$74.79	2.44	\$596

The total intrinsic value of options exercised during the years ended December 31, 2019, 2018 and 2017 was \$279, \$320 and \$491, with a related tax benefit of \$61, \$70 and \$175, respectively. No options vested during the years ended December 31, 2019, 2018 and 2017.

Restricted Stock Units

In February 2019, 2018 and 2017, we granted to our executives 233,582, 260,730 and 523,835 restricted stock units (RSUs) as part of our long-term incentive program with grant date fair values of \$428.22, \$361.13 and \$178.72 per unit, respectively. The RSUs granted under this program will vest and settle in common stock (on a one-for-one basis) on the third anniversary of the grant date. If an executive terminates employment because of retirement, involuntary layoff, disability, or death, the employee (or beneficiary) will receive a proration of stock units based on active employment during the three-year service period. In all other cases, the RSUs will not vest and all rights to the stock units will terminate. In addition to RSUs awarded under our long-term incentive program, we grant RSUs to certain executives and employees to encourage retention or to reward various achievements. These RSUs are labeled other RSUs in the table below. The fair values of all RSUs are estimated using the average of the high and low stock prices on the date of grant.

RSU activity for the year ended December 31, 2019 was as follows:

	Long-Term Incentive Program	Other
Number of units:		
Outstanding at beginning of year	1,322,251	984,235
Granted	259,791	247,673
Dividends	22,571	20,576
Forfeited	(73,591)	(121,344)
Distributed	(625,997)	(222,819)
Outstanding at end of year	905,025	908,321
Unrecognized compensation cost	\$102	\$132
Weighted average remaining contractual life (years)	1.8	2.6

The number of vested but undistributed RSUs at December 31, 2019 was not significant.

Performance-Based Restricted Stock Units

Performance-Based Restricted Stock Units (PBRsUs) are stock units that pay out based on the Company's total shareholder return as compared to a group of peer companies over a three-year period. The award payout can range from 0% to 200% of the initial PBRsU grant. PBRsUs granted in February 2017 and 2016 will not exceed 400% of the initial value (excluding dividend equivalent credits). The PBRsUs granted under this program will vest at the payout amount and settle in common stock (on a one-for-one basis) on the third anniversary of the grant date. If an executive terminates employment because of retirement, involuntary layoff, disability, or death, the employee (or beneficiary) remains eligible under the award and, if the award is earned, will receive a proration of stock units based on active employment during the three-year service period. In all other cases, the PBRsUs will not vest and all rights to the stock units will terminate.

In February 2019, 2018 and 2017, we granted to our executives 214,651, 241,284 and 492,273 PBRsUs as part of our long-term incentive program. Compensation expense for the award is recognized over the three-year performance period based upon the grant date fair value. The grant date fair values were estimated using a Monte-Carlo simulation model with the assumptions presented below. The model includes no expected dividend yield as the units earn dividend equivalents.

Grant Year	Grant Date	Performance Period	Expected Volatility	Risk Free Interest Rate	Grant Date Fair Value
2019	2/25/2019	3 years	23.88%	2.46%	\$466.04
2018	2/26/2018	3 years	22.11%	2.36%	390.27
2017	2/27/2017	3 years	21.37%	1.46%	190.17

PBRSU activity for the year ended December 31, 2019 was as follows:

	Long-Term Incentive Program
Number of units:	
Outstanding at beginning of year	1,268,667
Granted	214,651
Performance based adjustment ⁽¹⁾	115,613
Dividends	65,042
Forfeited	(60,755)
Distributed	(777,092)
Outstanding at end of year	826,126
Unrecognized compensation cost	\$91
Weighted average remaining contractual life (years)	1.8

⁽¹⁾ Represents net incremental number of units issued at vesting based on TSR for units granted in 2016

Other Compensation Arrangements

Performance Awards

Performance Awards are cash units that pay out based on the achievement of long-term financial goals at the end of a three-year period. Each unit has an initial value of \$100 dollars. The amount payable at the end of the three-year performance period may be anywhere from \$0 to \$200 dollars per unit, depending on the Company's performance against plan for a three-year period. The Compensation Committee has the discretion to pay these awards in cash, stock, or a combination of both after the three-year performance period. Compensation expense, based on the estimated performance payout, is recognized ratably over the performance period.

During 2019, 2018 and 2017, we granted Performance Awards to our executives as part of our long-term incentive program with the payout based on the achievement of financial goals for each three-year period following the grant date. The minimum payout amount is \$0 and the maximum amount we could be required to pay out for the 2019, 2018 and 2017 Performance Awards is \$392, \$355 and \$325, respectively.

Deferred Compensation

The Company has deferred compensation plans which permit employees to defer a portion of their salary, bonus, certain other incentive awards, and retirement contributions. Participants can diversify these amounts among 22 investment funds including a Boeing stock unit account.

Total expense related to deferred compensation was \$174, \$19 and \$240 in 2019, 2018 and 2017, respectively. As of December 31, 2019 and 2018, the deferred compensation liability which is being marked to market was \$1,779 and \$1,572.

Note 19 – Shareholders' Equity

On December 17, 2018, the Board approved a repurchase plan for up to \$20,000 of common stock. Share repurchases under this plan are currently suspended. The program will expire when we have used all authorized funds or is otherwise terminated.

As of December 31, 2019 and 2018, there were 1,200,000,000 shares of common stock and 20,000,000 shares of preferred stock authorized. No preferred stock has been issued.

Changes in Share Balances

The following table shows changes in each class of shares:

	Common Stock	Treasury Stock
Balance at January 1, 2017	1,012,261,159	395,109,568
Issued		(20,746,426)
Acquired		46,859,184
Balance at December 31, 2017	1,012,261,159	421,222,326
Issued		(3,409,330)
Acquired		26,806,974
Balance at December 31, 2018	1,012,261,159	444,619,970
Issued		(2,797,002)
Acquired		7,529,437
Balance at December 31, 2019	1,012,261,159	449,352,405

Accumulated Other Comprehensive Loss

Changes in Accumulated other comprehensive loss (AOCI) by component for the years ended December 31, 2019, 2018 and 2017 were as follows:

	Currency Translation Adjustments	Unrealized Gains and Losses on Certain Investments	Unrealized Gains and Losses on Derivative Instruments	Defined Benefit Pension Plans & Other Postretirement Benefits	Total ⁽¹⁾
Balance at January 1, 2017	(\$143)	(\$2)	(\$127)	(\$13,351)	(\$13,623)
Other comprehensive (loss)/income before reclassifications	128	1	119	(478)	(230)
Amounts reclassified from AOCI			52	425 ⁽²⁾	477
Net current period Other comprehensive (loss)/income	128	1	171	(53)	247
Impact of ASU 2018-02		(1)	10	(3,006)	(2,997)
Balance at December 31, 2017	(\$15)	(\$2)	\$54	(\$16,410)	(\$16,373)
Other comprehensive income/(loss) before reclassifications	(86)	2	(146)	747	517
Amounts reclassified from AOCI			30	743 ⁽²⁾	773
Net current period Other comprehensive income/(loss)	(86)	2	(116)	1,490	1,290
Balance at December 31, 2018	(\$101)	\$—	(\$62)	(\$14,920)	(\$15,083)
Other comprehensive (loss)/income before reclassifications	(27)	1	(48)	(1,397)	(1,471)
Amounts reclassified from AOCI			26	375 ⁽²⁾	401
Net current period Other comprehensive (loss)/income	(27)	1	(22)	(1,022)	(1,070)
Balance at December 31, 2019	(\$128)	\$1	(\$84)	(\$15,942)	(\$16,153)

⁽¹⁾ Net of tax.

⁽²⁾ Primarily relates to amortization of actuarial losses for the years ended December 31, 2019, 2018, and 2017 totaling \$464, \$878, and \$542 (net of tax of (\$133), (\$242), and (\$272)), respectively. These are included in the net periodic pension cost. See Note 17.

Note 20 – Derivative Financial Instruments

Disclosures reflect the adoption of ASU 2017-12, *Derivatives and Hedging (Topic 815)*, in the first quarter of 2019. Prior period amounts have not been restated.

Cash Flow Hedges

Our cash flow hedges include foreign currency forward contracts, commodity swaps and commodity purchase contracts. We use foreign currency forward contracts to manage currency risk associated with certain transactions, specifically forecasted sales and purchases made in foreign currencies. Our foreign currency contracts hedge forecasted transactions through 2025. We use commodity derivatives, such as fixed-price purchase commitments and swaps to hedge against potentially unfavorable price changes for items used in production. Our commodity contracts hedge forecasted transactions through 2023.

Fair Value Hedges

Interest rate swaps under which we agree to pay variable rates of interest are designated as fair value hedges of fixed-rate debt. The net change in fair value of the derivatives and the hedged items is reported in Boeing Capital interest expense. As of December 31, 2019, there are no fair value hedges reported on the Consolidated Statements of Financial Position.

Derivative Instruments Not Receiving Hedge Accounting Treatment

We have entered into agreements to purchase and sell aluminum to address long-term strategic sourcing objectives and non-U.S. business requirements. These agreements are derivative instruments for accounting purposes. The quantities of aluminum in these agreements offset and are priced at prevailing market prices. We also hold certain foreign currency forward contracts which do not qualify for hedge accounting treatment.

Notional Amounts and Fair Values

The notional amounts and fair values of derivative instruments in the Consolidated Statements of Financial Position as of December 31 were as follows:

	Notional amounts ⁽¹⁾		Other assets		Accrued liabilities	
	2019	2018	2019	2018	2019	2018
Derivatives designated as hedging instruments:						
Foreign exchange contracts	\$2,590	\$3,407	\$29	\$32	(\$60)	(\$132)
Interest rate contracts		125				
Commodity contracts	645	57	4	9	(72)	(2)
Derivatives not receiving hedge accounting treatment:						
Foreign exchange contracts	285	414	1	11	(6)	(2)
Commodity contracts	1,644	478				
Total derivatives	\$5,164	\$4,481	34	52	(138)	(136)
Netting arrangements			(20)	(24)	20	24
Net recorded balance			\$14	\$28	(\$118)	(\$112)

⁽¹⁾ Notional amounts represent the gross contract/notional amount of the derivatives outstanding.

Gains/(losses) associated with our hedging transactions and forward points recognized in Other comprehensive income are presented in the following table:

Years ended December 31,	2019	2018
Recognized in Other comprehensive income, net of taxes:		
Foreign exchange contracts	\$15	(\$156)
Commodity contracts	(63)	10

Gains/(losses) associated with our hedging transactions and forward points reclassified from AOCI to earnings are presented in the following table:

Years ended December 31,	2019	2018
Foreign exchange contracts		
Revenues		
Costs and expenses	(\$26)	(\$30)
General and administrative	(9)	(12)
Commodity contracts		
Revenues		
Costs and expenses	\$1	\$2
General and administrative expense	1	2

Gains/(losses) related to undesignated derivatives on foreign exchange cash flow hedging transactions recognized in Other income, net were insignificant for the years ended December 31, 2019 and 2018. Forward points related to foreign exchange cash flow hedging transactions recognized in Other income, net was a gain of \$1 for the year ended December 31, 2018.

Based on our portfolio of cash flow hedges, we expect to reclassify losses of \$8 (pre-tax) out of Accumulated other comprehensive loss into earnings during the next 12 months.

We have derivative instruments with credit-risk-related contingent features. For foreign exchange contracts with original maturities of at least five years, our derivative counterparties could require settlement if we default on our five-year credit facility. For certain commodity contracts, our counterparties could require collateral posted in an amount determined by our credit ratings. The fair value of foreign exchange and commodity contracts that have credit-risk-related contingent features that are in a net liability position at December 31, 2019 was \$19. At December 31, 2019, there was no collateral posted related to our derivatives.

Note 21 – Fair Value Measurements

The fair value hierarchy has three levels based on the reliability of the inputs used to determine fair value. Level 1 refers to fair values determined based on quoted prices in active markets for identical assets. Level 2 refers to fair values estimated using significant other observable inputs, and Level 3 includes fair values estimated using significant unobservable inputs. The following table presents our assets and liabilities that are measured at fair value on a recurring basis and are categorized using the fair value hierarchy.

	December 31, 2019			December 31, 2018		
	Total	Level 1	Level 2	Total	Level 1	Level 2
Assets						
Money market funds	\$2,562	\$2,562		\$1,737	\$1,737	
Available-for-sale debt investments:						
Commercial paper	108		\$108	78		\$78
Corporate notes	242		242	420		420
U.S. government agencies	55	55				
Other equity investments	33	33		12	12	
Derivatives	14		14	28		\$28
Total assets	\$3,014	\$2,650	\$364	\$2,275	\$1,749	\$526
Liabilities						
Derivatives	(\$118)		(\$118)	(\$112)		(\$112)
Total liabilities	(\$118)		(\$118)	(\$112)		(\$112)

Money market funds, available-for-sale debt investments and equity securities are valued using a market approach based on the quoted market prices or broker/dealer quotes of identical or comparable instruments.

Derivatives include foreign currency, commodity and interest rate contracts. Our foreign currency forward contracts are valued using an income approach based on the present value of the forward rate less the contract rate multiplied by the notional amount. Commodity derivatives are valued using an income approach based on the present value of the commodity index prices less the contract rate multiplied by the notional amount. The fair value of our interest rate swaps is derived from a discounted cash flow analysis based on the terms of the contract and the interest rate curve.

Certain assets have been measured at fair value on a nonrecurring basis using significant unobservable inputs (Level 3). The following table presents the nonrecurring losses recognized for the years ended December 31 due to long-lived asset impairment, and the fair value and asset classification of the related assets as of the impairment date:

	2019		2018	
	Fair Value	Total Losses	Fair Value	Total Losses
Investments	\$27	(\$109)		(\$50)
Customer financing assets	111	(20)	\$101	(39)
Other assets and Acquired intangible assets	4	(310)		
Property, plant and equipment	41	(4)	44	(4)
Total	\$183	(\$443)	\$145	(\$93)

Investments, Acquired intangible assets and Property, plant and equipment were primarily valued using an income approach based on the discounted cash flows associated with the underlying assets. The fair value of the impaired customer financing assets includes operating lease equipment and investments in sales type-leases/finance leases, and is derived by calculating a median collateral value from a consistent group of third party aircraft value publications. The values provided by the third party aircraft publications are derived from their knowledge of market trades and other market factors. Management reviews the publications quarterly to assess the continued appropriateness and consistency with market trends. Under certain circumstances, we adjust values based on the attributes and condition of the specific aircraft or equipment, usually when the features or use of the aircraft vary significantly from the more generic aircraft attributes covered by third party publications, or on the expected net sales price for the aircraft.

For Level 3 assets that were measured at fair value on a nonrecurring basis during the year ended December 31, 2019, the following table presents the fair value of those assets as of the measurement date, valuation techniques and related unobservable inputs of those assets.

	Fair Value	Valuation Technique(s)	Unobservable Input	Range Median or Average
Customer financing assets	\$111	Market approach	Aircraft value publications Aircraft condition adjustments	\$98 - \$158 ⁽¹⁾ Median \$123 (\$13) - \$1 ⁽²⁾ Net (\$12)

⁽¹⁾ The range represents the sum of the highest and lowest values for all aircraft subject to fair value measurement, according to the third party aircraft valuation publications that we use in our valuation process.

⁽²⁾ The negative amount represents the sum, for all aircraft subject to fair value measurement, of all downward adjustments based on consideration of individual aircraft attributes and condition. The positive amount represents the sum of all such upward adjustments.

Fair Value Disclosures

The fair values and related carrying values of financial instruments that are not required to be remeasured at fair value on the Consolidated Statements of Financial Position at December 31 were as follows:

December 31, 2019					
	Carrying Amount	Total Fair Value	Level 1	Level 2	Level 3
Assets					
Notes receivable, net	\$443	\$444		\$444	
Liabilities					
Debt, excluding finance lease obligations and commercial paper	(20,964)	(23,119)		(23,081)	(\$38)
December 31, 2018					
	Carrying Amount	Total Fair Value	Level 1	Level 2	Level 3
Assets					
Notes receivable, net	\$730	\$735		\$735	
Liabilities					
Debt, excluding finance lease obligations and commercial paper	(11,796)	(12,746)		(12,682)	(\$64)

The fair values of notes receivable are estimated with discounted cash flow analysis using interest rates currently offered on loans with similar terms to borrowers of similar credit quality. The fair value of our debt that is traded in the secondary market is classified as Level 2 and is based on current market yields. For our debt that is not traded in the secondary market, the fair value is classified as Level 2 and is based on our indicative borrowing cost derived from dealer quotes or discounted cash flows. The fair values of our debt classified as Level 3 are based on discounted cash flow models using the implied yield from similar securities. With regard to other financial instruments with off-balance sheet risk, it is not practicable to estimate the fair value of our indemnifications and financing commitments because the amount and timing of those arrangements are uncertain. Items not included in the above disclosures include cash, restricted cash, time deposits and other deposits, commercial paper, money market funds, Accounts receivable, Unbilled receivables, Other current assets, Accounts payable and long-term payables. The carrying values of those items, as reflected in the Consolidated Statements of Financial Position, approximate their fair value at December 31, 2019 and 2018. The fair value of assets and liabilities whose carrying value approximates fair value is determined using Level 2 inputs, with the exception of cash (Level 1).

Note 22 – Legal Proceedings

Various legal proceedings, claims and investigations related to products, contracts, employment and other matters are pending against us.

In addition, we are subject to various U.S. government inquiries and investigations from which civil, criminal or administrative proceedings could result or have resulted in the past. Such proceedings involve or could involve claims by the government for fines, penalties, compensatory and treble damages, restitution and/or forfeitures. Under government regulations, a company, or one or more of its operating divisions or subdivisions, can also be suspended or debarred from government contracts, or lose its export privileges, based on the results of investigations. We believe, based upon current information, that the outcome of any such legal proceeding, claim, or government dispute and investigation will not have a material effect on our financial position, results of operations, or cash flows. Where it is reasonably possible that we will incur losses in excess of recorded amounts in connection with any of the matters set forth below, we will disclose either the amount or range of reasonably possible losses in excess of such amounts or, where no such amount or range can be reasonably estimated, the reasons why no such estimate can be made.

Multiple legal actions have been filed against us as a result of the October 29, 2018 accident of Lion Air Flight 610 and the March 10, 2019 accident of Ethiopian Airlines Flight 302. Further, we are subject to ongoing governmental and regulatory investigations and inquiries relating to the accidents and the 737 MAX, including investigations by the U.S. Department of Justice and the Securities and Exchange Commission. We cannot reasonably estimate a range of loss, if any, not covered by available insurance that may result given the ongoing status of these lawsuits, investigations, and inquiries.

Note 23 – Segment and Revenue Information

Effective at the beginning of 2019, all revenues and costs associated with military derivative aircraft production are reported in the BDS segment. Revenues and costs associated with military derivative aircraft production were previously reported in the BCA and BDS segments. Business segment data for 2018 and 2017 reflects the realignment for military derivative aircraft, as well as the realignment of certain programs from BDS to BGS.

Our primary profitability measurements to review a segment's operating results are Earnings from operations and operating margins. We operate in four reportable segments: BCA, BDS, BGS, and BCC. All other activities fall within Unallocated items, eliminations and other. See page 56 for the Summary of Business Segment Data, which is an integral part of this note.

BCA develops, produces and markets commercial jet aircraft principally to the commercial airline industry worldwide. Revenue on commercial aircraft contracts is recognized at the point in time when an aircraft is completed and accepted by the customer.

BDS engages in the research, development, production and modification of the following products and related services: manned and unmanned military aircraft and weapons systems, surveillance and engagement, strategic defense and intelligence systems, satellite systems and space exploration. BDS revenue is generally recognized over the contract term (over time) as costs are incurred.

BGS provides parts, maintenance, modifications, logistics support, training, data analytics and information-based services to commercial and government customers worldwide. BGS segment revenue and costs include certain services provided to other segments. Revenue on commercial spare parts contracts is recognized at the point in time when a spare part is delivered to the customer. Revenue on other contracts is generally recognized over the contract term (over time) as costs are incurred.

BCC facilitates, arranges, structures and provides selective financing solutions for our Boeing customers.

While our principal operations are in the United States, Canada and Australia, some key suppliers and subcontractors are located in Europe and Japan. Revenues, including foreign military sales, are reported by customer location and consist of the following:

Years ended December 31,	2019	2018	2017
Asia, other than China	\$10,662	\$12,141	\$9,195
Europe	10,366	12,976	11,240
Middle East	9,272	9,745	11,433
China	5,684	13,764	11,932
Canada	2,019	2,583	2,212
Oceania	2,006	2,298	1,931
Africa	1,113	1,486	815
Latin America, Caribbean and other	1,015	1,458	1,541
Total non-U.S. revenues	42,137	56,451	50,299
United States	42,681	44,676	43,706
Estimated potential concessions and other considerations to 737 MAX customers, net ⁽¹⁾	(8,259)		
Total revenues	\$76,559	\$101,127	\$94,005

⁽¹⁾ Net of insurance recoveries

Revenues from the U.S. government (including foreign military sales through the U.S. government), primarily recorded at BDS and BGS, represented 39%, 31%, and 31% of consolidated revenues for 2019, 2018, and 2017, respectively. Approximately 4% of operating assets were located outside the United States as of December 31, 2019 and 2018.

The following tables present BCA, BDS and BGS revenues from contracts with customers disaggregated in a number of ways, such as geographic location, contract type and the method of revenue recognition. We believe these best depict how the nature, amount, timing and uncertainty of our revenues and cash flows are affected by economic factors.

BCA revenues by customer location consist of the following:

Years ended December 31,	2019	2018	2017
Revenue from contracts with customers:			
Asia, other than China	\$7,395	\$8,274	\$6,482
Europe	5,829	9,719	8,478
Middle East	5,761	5,876	8,927
China	5,051	13,068	10,982
Other	3,450	5,185	4,365
Total non-U.S. revenues	27,486	42,122	39,234
United States	12,676	15,347	15,182
Estimated potential concessions and other considerations to 737 MAX customers, net ⁽¹⁾	(8,259)		
Total revenues from contracts with customers	31,903	57,469	54,416
Intersegment revenues, eliminated on consolidation	352	30	196
Total segment revenues	\$32,255	\$57,499	\$54,612
<hr/>			
Revenue recognized on fixed-price contracts	100%	100%	100%
Revenue recognized at a point in time	100%	100%	100%

⁽¹⁾ Net of insurance recoveries

BDS revenues on contracts with customers, based on the customer's location, consist of the following:

Years ended December 31,	2019	2018	2017
Revenue from contracts with customers:			
U.S. customers	\$19,573	\$19,576	\$18,984
Non-U.S. customers ⁽¹⁾	6,654	6,816	4,954
Total segment revenue from contracts with customers	\$26,227	\$26,392	\$23,938
<hr/>			
Revenue recognized over time	98%	98%	97%
Revenue recognized on fixed-price contracts	70%	70%	69%
Revenue from the U.S. government ⁽¹⁾	89%	88%	89%

⁽¹⁾ Includes revenues earned from foreign military sales through the U.S. government.

BGS revenues consist of the following:

Years ended December 31,	2019	2018	2017
Revenue from contracts with customers:			
Commercial	\$10,167	\$9,227	\$7,622
Government	8,107	7,658	6,940
Total revenues from contracts with customers	18,274	16,885	14,562
Intersegment revenues eliminated on consolidation	194	171	49
Total segment revenues	\$18,468	\$17,056	\$14,611
Revenue recognized at a point in time	55%	54%	50%
Revenue recognized on fixed-price contracts	90%	90%	89%
Revenue from the U.S. government ⁽¹⁾	34%	36%	39%

⁽¹⁾ Includes revenues earned from foreign military sales through the U.S. government.

Earnings in Equity Method Investments

We recorded Earnings from operations associated with our equity method investments of \$90, \$167 and \$233, primarily in our BDS segment, for the years ended December 31, 2019, 2018 and 2017, respectively.

Backlog

Our total backlog represents the estimated transaction prices on performance obligations to our customers for which work remains to be performed. Backlog is converted into revenue in future periods as work is performed, primarily based on the cost incurred or at delivery and acceptance of products, depending on the applicable accounting method.

Our backlog at December 31, 2019 was \$463,403. We expect approximately 17% to be converted to revenue through 2020 and approximately 63% through 2023, with the remainder thereafter.

Unallocated Items, Eliminations and other

Unallocated items, eliminations and other include common internal services that support Boeing's global business operations, intercompany guarantees provided to BCC and eliminations of certain sales between segments. Such sales include airplanes accounted for as operating leases and considered transferred to the BCC segment. We generally allocate costs to business segments based on the U.S. federal cost accounting standards. Components of Unallocated items, eliminations and other are shown in the following table.

Years ended December 31,	2019	2018	2017
Share-based plans	(\$65)	(\$76)	(\$77)
Deferred compensation	(174)	(19)	(240)
Amortization of previously capitalized interest	(89)	(92)	(96)
Research and development expense, net	(384)	(132)	42
Customer financing impairment	(250)		
Litigation	(109)	(148)	
Eliminations and other unallocated items	(995)	(975)	(756)
Unallocated items, eliminations and other	(\$2,066)	(\$1,442)	(\$1,127)
Pension FAS/CAS service cost adjustment	\$1,071	\$1,005	\$1,127
Postretirement FAS/CAS service cost adjustment	344	322	311
FAS/CAS service cost adjustment	\$1,415	\$1,327	\$1,438

Pension and Other Postretirement Benefit Expense

Pension costs, comprising GAAP service and prior service costs, are allocated to BCA and the commercial operations at BGS. Pension costs are allocated to BDS and BGS businesses supporting government customers using U.S. Government Cost Accounting Standards (CAS), which employ different actuarial assumptions and accounting conventions than GAAP. These costs are allocable to government contracts. Other postretirement benefit costs are allocated to business segments based on CAS, which is generally based on benefits paid. FAS/CAS service cost adjustment represents the difference between the FAS pension and postretirement service costs calculated under GAAP and costs allocated to the business segments. Non-operating pension and postretirement expenses represent the components of net periodic benefit costs other than service cost. These expenses are included in Other income, net.

Effective in 2019, certain centrally managed assets that were previously recorded in the BCA, BDS and BGS segments have been realigned to Unallocated items, eliminations and other. Business segment data in the following tables for 2019, 2018 and 2017 reflects the realignment of these assets.

Assets

Segment assets are summarized in the table below.

December 31,	2019	2018
Commercial Airplanes	\$73,995	\$61,116
Defense, Space & Security	15,977	18,023
Global Services	18,605	17,856
Boeing Capital	2,269	2,809
Unallocated items, eliminations and other	22,779	17,555
Total	\$133,625	\$117,359

Assets included in Unallocated items, eliminations and other primarily consist of Cash and cash equivalents, Short-term and other investments, deferred tax assets, capitalized interest, and assets managed centrally on behalf of the four principle business segments and intercompany eliminations.

Capital Expenditures

Years ended December 31,	2019	2018	2017
Commercial Airplanes	\$433	\$604	\$636
Defense, Space & Security	202	208	210
Global Services	218	231	180
Unallocated items, eliminations and other	981	679	713
Total	\$1,834	\$1,722	\$1,739

Capital expenditures for Unallocated items, eliminations and other relate primarily to assets managed centrally on behalf of the four principal business segments.

Depreciation and Amortization

Years ended December 31,	2019	2018	2017
Commercial Airplanes	\$580	\$565	\$521
Defense, Space & Security	274	290	252
Global Services	424	348	322
Boeing Capital Corporation	64	58	70
Centrally Managed Assets ⁽¹⁾	929	853	882
Total	\$2,271	\$2,114	\$2,047

⁽¹⁾ Amounts shown in the table represent depreciation and amortization expense recorded by the individual business segments. Depreciation and amortization for centrally managed assets are included in segment operating earnings based on usage and occupancy. In 2019, \$717 was included in the primary business segments, of which \$407, \$257, and \$53 was included in BCA, BDS and BGS, respectively. In 2018, \$692 was included in the primary business segments, of which \$417, \$213, and \$62 was included in BCA, BDS and BGS, respectively. In 2017, \$730 was included in the primary business segments, of which \$427, \$243, and \$60 was included in BCA, BDS and BGS, respectively.

Note 24 – Quarterly Financial Data (Unaudited)

	2019				2018			
	4th	3rd	2nd	1st	4th	3rd	2nd	1st
Total revenues	\$17,911	\$19,980	\$15,751	\$22,917	\$28,341	\$25,146	\$24,258	\$23,382
Total costs and expenses	(18,708)	(16,930)	(17,810)	(18,645)	(22,090)	(21,040)	(19,536)	(18,824)
(Loss)/earnings from operations	(2,204)	1,259	(3,380)	2,350	4,175	2,227	2,710	2,875
Net (loss)/earnings	(1,010)	1,167	(2,942)	2,149	3,424	2,363	2,196	2,477
Basic (loss)/earnings per share	(1.79)	2.07	(5.21)	3.79	6.00	4.11	3.77	4.19
Diluted (loss)/earnings per share	(1.79)	2.05	(5.21)	3.75	5.93	4.07	3.73	4.15

Gross profit is calculated as Total revenues minus Total costs and expenses. Total costs and expenses includes Cost of products, Cost of services and Boeing Capital interest expense.

During the first quarter of 2019, we concluded that lease incentives granted to a customer that experienced liquidity issues were impaired and recorded a charge of \$250. During the first quarter of 2018, we recorded a reach-forward loss on KC-46A Tanker of \$81.

During the second quarter of 2019, we recorded a reduction to revenue of \$5,610, related to estimated potential concessions and other considerations to customers for disruptions and associated delivery delays related to the 737 MAX grounding, net of insurance recoveries. Additionally, we recorded a charge of \$109 related to ongoing litigation associated with recoverable costs on U.S. government contracts. During the second quarter of 2018, we recorded a charge of \$148 related to the outcome of the Spirit litigation and a reach-forward loss on KC-46A Tanker of \$426.

During the third quarter of 2018, we recorded a tax benefit of \$412 related to the settlement of the 2013-2014 federal tax audit. Additionally, we recorded reach-forward losses on KC-46A Tanker of \$179, on T-7A Red Hawk of \$400, and on MQ-25 of \$291.

During the fourth quarter of 2019, we recorded an additional reduction to revenue of \$2,619 for estimated potential concessions and other considerations to customers and associated delivery delays related to the 737 MAX grounding. During the fourth quarter of 2019, we recorded a divestiture gain of \$395 and a tax benefit of \$371 related to the settlement of state tax audits spanning 15 tax years. Additionally, we recorded an impairment of \$293 as a result of our decision to retire the Aviall brand and trade name, and reach-forward losses on Commercial Crew of \$410 and on KC-46A Tanker of \$108. During the fourth quarter of 2018, we recorded a reach-forward loss on KC-46A Tanker of \$50.

We increased our quarterly dividend from \$1.71 to \$2.055 in December 2018.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of The Boeing Company

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of financial position of The Boeing Company and subsidiaries (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive income, equity, and cash flows, for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

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

Basis for Opinion

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

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

Critical Audit Matters

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

Cost Estimates for Fixed-Price Development Contracts - Refer to Notes 1 and 14 to the financial statements

Critical Audit Matter Description

As more fully described in Notes 1 and 14 to the consolidated financial statements, the Company recognizes revenue over time for long-term contracts as goods are produced or services are rendered. The Company uses costs incurred as the method for determining progress, and revenue is recognized based on costs incurred to date plus an estimate of margin at completion. The process of estimating margin at completion involves estimating the costs to complete production of goods or rendering of services and comparing those costs to the estimated final revenue amount. Fixed-price development contracts are inherently uncertain in that revenue is fixed while the estimates of costs required to complete these contracts are subject to significant variability. Due to the technical performance requirements in many of these contracts, changes to cost estimates could occur, resulting in lower margins or material reach-forward losses.

Given the complexity of certain of the Company's fixed-price development contracts, including the KC-46A Tanker, Commercial Crew, United States Air Force VC-25B Presidential Aircraft, MQ-25 Stingray, and T-7A Red Hawk contracts, the limited amount of historical data available in certain instances and significant judgments necessary to estimate future costs at completion, auditing these estimates involved extensive audit effort and a high degree of auditor judgment and required audit professionals with industry and quantitative analytics experience.

How the Critical Audit Matter Was Addressed in the Audit

Our auditing procedures related to the cost estimates for fixed-price development contracts included the following, among others:

- We evaluated the appropriateness and consistency of management's methods and assumptions in developing its estimates.
- We performed inquiries of the Company's project managers and others directly involved with the contracts and observed the work site to evaluate project status and project challenges which may affect total estimated costs to complete.
- We tested the accuracy and completeness of the data used in developing the estimates. We developed independent expectations of likely outcomes using, in part, the program's data and compared our expectations to management's estimates.
- We tested the effectiveness of controls including those over the data used in developing the estimates, the mathematical extrapolation of such data, and management's judgment regarding the range of possible outcomes relating to the specific estimates.
- We performed retrospective reviews, comparing actual performance to estimated performance, when evaluating the thoroughness and precision of management's estimation process.

Program Accounting Estimates for New Programs - Refer to Notes 1 and 7 to the financial statements

Critical Audit Matter Description

The introduction of new aircraft programs involves increased risk associated with meeting development, certification and production schedules. The Company uses program accounting in order to compute cost of sales and margin for each commercial airplane sold. The use of program accounting requires estimating and demonstrating customer demand for the number of units included in the program (program accounting quantity) and estimating the sales and costs over the expected life of each program. In particular, estimating the initial program accounting quantity and revenue for unsold units within the program accounting quantity involves measurement uncertainty resulting in a range of possible outcomes. Changes to revenue or

program accounting quantity estimates could occur, resulting in lower margins or material reach-forward losses. Auditing the estimated market demand and revenue for unsold units for the 777X program involved extensive audit effort and required professionals with industry and quantitative analytics experience given the high degree of complexity and subjectivity related to management's estimates.

How the Critical Audit Matter Was Addressed in the Audit

Our auditing procedures related to estimated market demand and revenue for unsold units for the 777X included the following, among others:

- We inquired of the Company's management, including individuals responsible for sales and pricing, to evaluate the status of current sales campaigns, short and long-term market demand, and overall program status.
- We evaluated the appropriateness and consistency of management's methods and assumptions used in developing its estimates related to the initial program accounting quantity and revenue for unsold units.
- We evaluated management's ability to estimate program revenue by comparison to historical estimates and actual results on similar programs.
- We developed independent expectations of likely outcomes using, in part, the program's data and compared our expectations to management's estimates.
- We tested the effectiveness of controls including those over the data used in developing the estimates, the mathematical extrapolation of such data, and management's judgment regarding the range of possible outcomes relating to the specific estimates.

Liabilities related to the 737 MAX Grounding - Refer to Notes 14 and 22 to the financial statements

Critical Audit Matter Description

On March 13, 2019, the Federal Aviation Administration (FAA) issued an order to suspend operations of all 737 MAX aircraft in the U.S. and by U.S. aircraft operators following two fatal accidents of 737 MAX aircraft. Non-U.S. civil aviation authorities have issued directives to the same effect (the "737 MAX Grounding"). In addition, multiple legal actions have been filed against the Company following the fatal accidents and various governmental and regulatory investigations and inquiries continue relating to the accidents and the 737 MAX aircraft.

During 2019, the Company recorded a liability in connection with estimated payments, concessions and other in-kind consideration it intends to provide to customers for disruptions related to the 737 MAX Grounding and associated delivery delays. This liability totaled \$7.4 billion at December 31, 2019 and is reflected in the financial statements in Accrued liabilities. This represents the Company's best estimate of future concessions and other consideration to its customers, and is necessarily based on individual negotiations with customers and a series of assumptions, including the timing and conditions of the 737 MAX's return to service in various jurisdictions and the timing of future production rate increases. Because the timing and conditions of the 737 MAX return to service in various jurisdictions will be determined by civil aviation authorities and is outside of the Company's control, the assumptions underlying the liability require a high degree of auditor judgment.

Significant judgment is involved in management's ability to assess and reasonably estimate potential additional financial statement effects or a range of loss, if any, resulting from the outcome of 737 MAX-related litigation and the results of the various governmental and regulatory investigations and inquiries related to the 737 MAX.

The subjectivity of the liability associated with providing consideration to customers resulting from the 737 MAX Grounding and the complexity of assessing the outcome of the ongoing litigation and investigations related to the 737 MAX required a high degree of auditor judgment and increased audit effort.

How the Critical Audit Matter Was Addressed in the Audit

Our auditing procedures associated with liabilities related to the 737 MAX grounding included the following, among others:

- We inquired of management to understand developments with the 737 MAX Grounding, including the status of regulatory approval for return to service in various jurisdictions and the status of consideration discussions with individual customers.
- We obtained written representations from management concerning its intent to provide consideration to customers and the extent of that consideration.
- We tested the effectiveness of controls related to nonrecurring items and loss contingencies associated with litigation, claims and assessments.
- We evaluated the significant assumptions used by management to estimate the liability for customer consideration, including the timing and conditions of 737 MAX return to service, and, where possible, we corroborated the assumptions with management outside of the accounting and finance organizations.
- We reviewed the terms of customer contracts and correspondence with customers concerning potential consideration as a result of the 737 MAX Grounding.
- We inquired of internal and external legal counsel to understand developments related to contractual obligations to customers, litigation and other claims relating to the 737 MAX Grounding and progression in potential settlement discussions.
- We read minutes of meetings of the Board of Directors and its committees for evidence of unrecorded loss contingencies.
- We evaluated the Company's disclosures for consistency with our knowledge of matters related to the 737 MAX Grounding.

/s/ Deloitte & Touche LLP

Chicago, Illinois
January 31, 2020

We have served as the Company's auditor since at least 1934; however, an earlier year could not be reliably determined.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of The Boeing Company

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of The Boeing Company and subsidiaries (the "Company") as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2019 of the Company, and our report dated January 31, 2020 expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ Deloitte & Touche LLP

Chicago, Illinois

January 31, 2020

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

(a) Evaluation of Disclosure Controls and Procedures.

Our Chief Executive Officer and Chief Financial Officer have evaluated our disclosure controls and procedures as of December 31, 2019 and have concluded that these disclosure controls and procedures are effective to ensure that information required to be disclosed by us in the reports that we file or submit under the Securities Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and is accumulated and communicated to our management, including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

(b) Management's Report on Internal Control Over Financial Reporting.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f). Our management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation under the framework in Internal Control – Integrated Framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

Our internal control over financial reporting as of December 31, 2019, has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which is included in Item 8 of this report and is incorporated by reference herein.

(c) Changes in Internal Controls Over Financial Reporting.

There were no changes in our internal control over financial reporting that occurred during the fourth quarter of 2019 that have materially affected or are reasonably likely to materially affect our internal control over financial reporting.

Item 9B. Other Information

None.

Part III

Item 10. Directors, Executive Officers and Corporate Governance

Our executive officers and their ages as of January 31, 2020, are as follows:

Name	Age	Principal Occupation or Employment/Other Business Affiliations
Bertrand-Marc Allen	46	Senior Vice President and President, Embraer Partnership and Group Operations since April 2019. Mr. Allen previously served as Senior Vice President and President, Boeing International from February 2015 to April 2019; President of Boeing Capital Corporation from March 2014 to February 2015; Corporate Vice President, Boeing International and Chairman and President of Boeing (China) Co., Ltd. from March 2011 to March 2014; and Vice President, Global Law Affairs from May 2007 to March 2011.
Michael A. Arthur	69	Senior Vice President and President, Boeing International since April 2019. Mr. Arthur previously served as President of Boeing Europe from March 2016 to April 2019 and as Managing Director of Boeing United Kingdom and Ireland from September 2014 to April 2019.
David L. Calhoun	62	President and Chief Executive Officer since January 2020 and a member of the Board of Directors since June 2009. Previously, Mr. Calhoun served as Senior Managing Director & Head of Private Equity Portfolio Operations at The Blackstone Group from January 2014 to January 2020. Prior to that, Mr. Calhoun served as Chairman of the Board of Nielsen Holdings plc from January 2014 to January 2016, as Chief Executive Officer of Nielsen Holdings plc from May 2010 to January 2014, and as Chairman of the Executive Board and Chief Executive Officer of The Nielsen Company B.V. from August 2006 to January 2014. Prior to joining Nielsen, he served as Vice Chairman of General Electric Company and President and Chief Executive Officer of GE Infrastructure. During his 26-year tenure at GE, he ran multiple business units including GE Transportation, GE Aircraft Engines, GE Employers Reinsurance Corporation, GE Lighting and GE Transportation Systems. Mr. Calhoun also serves on the board of Caterpillar Inc.
Heidi B. Capozzi	50	Senior Vice President, Human Resources since March 2016. Ms. Capozzi previously served as Vice President of Leadership Development, Talent Management and Organization Effectiveness from April 2013 to March 2016; Director of Human Resources for the Airplane Programs division of Commercial Airplanes from April 2011 to April 2013; and Director of Human Resources for the Surveillance and Engagement division of Boeing Military Aircraft from May 2009 to April 2011.
Leanne G. Caret	53	Executive Vice President, President and Chief Executive Officer, Boeing Defense, Space & Security since March 2016. Ms. Caret joined Boeing in 1988, and her previous positions include President of Global Services & Support from February 2015 to March 2016; Chief Financial Officer and Vice President, Finance, for BDS from March 2014 to February 2015; Vice President and General Manager, Vertical Lift from November 2012 to February 2014; and Vice President and Program Manager, Chinook from November 2009 to October 2012.

Name	Age	Principal Occupation or Employment/Other Business Affiliations
Theodore Colbert III	46	Executive Vice President, President and Chief Executive Officer, Boeing Global Services since October 2019. Mr. Colbert previously served as Chief Information Officer and Senior Vice President, Information Technology & Data Analytics from April 2016 to October 2019; Chief Information Officer and Vice President of Information Technology from November 2013 to April 2016; Vice President of Information Technology Infrastructure from December 2011 to November 2013; and Vice President of IT Business Systems from September 2010 to December 2011.
Stanley A. Deal	55	Executive Vice President, President and Chief Executive Officer, Boeing Commercial Airplanes since October 2019. Mr. Deal joined Boeing in 1986, and his previous positions include Executive Vice President, President and Chief Executive Officer, Boeing Global Services from November 2016 to October 2019; Senior Vice President of Commercial Aviation Services from March 2014 to November 2016; Vice President and General Manager of Supply Chain Management and Operations for Commercial Airplanes from September 2011 to February 2014; Vice President of Supplier Management from February 2010 to August 2011; and Vice President of Asia Pacific Sales from December 2006 to January 2010.
Brett C. Gerry	48	Senior Vice President and General Counsel since May 2019. Mr. Gerry previously served as President of Boeing Japan from February 2016 to May 2019; Vice President and General Counsel, Boeing Commercial Airplanes from March 2009 to March 2016; and Chief Counsel, Network and Space Systems from September 2008 to March 2009.
Niel L. Golightly	61	Senior Vice President, Communications since January 2020. Prior to joining Boeing, Mr. Golightly served as Chief Communications Officer and a member of the Global Executive Council for Fiat Chrysler Automobiles from December 2018 until December 2019. Prior to that, he held a number of positions at Royal Dutch Shell plc, including Vice President, Energy Transition Strategy, Shell Oil Company from December 2016 to December 2018, Vice President, External Relations, Americas from November 2011 to December 2016 and Vice President, Global Downstream Communications and Sustainability from July 2006 to November 2011. From 1994 to 2006, Mr. Golightly held a number of positions at Ford Motor Company, including Director of Sustainable Business Strategies. He began his career in the U.S. Navy as a fighter pilot and later as a Pentagon speechwriter for the Secretary of the Navy and the Chairman of the Joint Chiefs of Staff.
Gregory L. Hyslop	61	Chief Engineer and Senior Vice President, Engineering, Test and Technology since August 2019. Mr. Hyslop's previous positions include Chief Technology Officer and Senior Vice President, Boeing Engineering, Test & Technology from July 2016 to August 2019; Senior Vice President Boeing Engineering, Test & Technology, from March 2016 to August 2016; Vice President and General Manager of Boeing Research & Technology from February 2013 to March 2016 and Vice President and General Manager of Boeing Strategic Missile & Defense Systems from March 2009 to February 2013.

Name	Age	Principal Occupation or Employment/Other Business Affiliations
Timothy J. Keating	58	Executive Vice President, Government Operations since February 2018. Mr. Keating joined Boeing in June 2008 as Senior Vice President, Government Operations. From October 2002 to May 2008 he served as Senior Vice President, Global Government Relations at Honeywell International Inc. Prior thereto, Mr. Keating was Chairman of the Board and Managing Partner of Timmons and Company (a Washington, D.C. lobbying firm).
Jenette E. Ramos	54	Senior Vice President, Manufacturing, Supply Chain & Operations since April 2018. Ms. Ramos joined Boeing in 1988, and her previous positions include Senior Vice President, Supply Chain and Operations from June 2017 to April 2018; Vice President and General Manager, BCA Fabrication from April 2014 to May 2017; Vice President, Supply Chain Management from January 2012 to April 2014; Vice President, Operations Supply Chain Rate, Supplier Management Capability for Boeing Commercial Airplanes from June 2011 to January 2012; director of Business Operations for Boeing Fabrication from June 2009 to May 2011; and General Manager of Boeing Portland from February 2005 to May 2009.
Diana L. Sands	54	Senior Vice President, Office of Internal Governance and Administration since March 2016. Ms. Sands previously served as Senior Vice President, Office of Internal Governance from April 2014 to March 2016; Vice President of Finance and Corporate Controller from February 2012 to April 2014 and Vice President of Investor Relations, Financial Planning & Analysis from February 2010 to February 2012. Prior to that, she held positions in Investor Relations, Financial Planning and in Corporate Treasury.
Gregory D. Smith	53	Chief Financial Officer and Executive Vice President, Enterprise Performance and Strategy since February 2015. Mr. Smith also served as Interim President and Chief Executive Officer from December 2019 to January 2020. He previously served as Executive Vice President, Chief Financial Officer from February 2012 to February 2015; Vice President of Finance and Corporate Controller from February 2010 to February 2012; and Vice President of Financial Planning & Analysis from June 2008 to February 2010. From August 2004 until June 2008, he served as Vice President of Global Investor Relations at Raytheon Company. Prior to that, he held a number of positions at Boeing including CFO, Shared Services Group; Controller, Shared Services Group; Senior Director, Internal Audit; and leadership roles in supply chain, factory operations and program management. Mr. Smith serves on the board of Intel Corporation.

Information relating to our directors and nominees will be included under the caption "Election of Directors" in our proxy statement involving the election of directors, which will be filed with the SEC no later than 120 days after December 31, 2019 and is incorporated by reference herein. Information required by Items 405, 407(d)(4) and 407(d)(5) of Regulation S-K will be included under the captions "Stock Ownership Information" and "Board Committees" in the 2020 Proxy Statement, and that information is incorporated by reference herein.

Codes of Ethics. We have adopted (1) The Boeing Company Code of Ethical Business Conduct for the Board of Directors; (2) The Boeing Company Code of Conduct for Finance Employees which is applicable to our Chief Executive Officer (CEO), Chief Financial Officer (CFO), Controller and all finance employees; and (3) The Boeing Code of Conduct that applies to all employees, including our CEO (collectively, the

Codes of Conduct). The Codes of Conduct are posted on our website, www.boeing.com/company/general-info/corporate-governance.page, and printed copies may be obtained, without charge, by contacting the Office of Internal Governance, The Boeing Company, 100 N. Riverside Plaza, Chicago, IL 60606. We intend to disclose promptly on our website any amendments to, or waivers of, the Codes of Conduct covering our CEO, CFO and/or Controller.

No family relationships exist among any of the executive officers, directors or director nominees.

Item 11. Executive Compensation

The information required by Item 402 of Regulation S-K will be included under the captions "Compensation Discussion and Analysis," "Compensation of Executive Officers," and "Compensation of Directors" in the 2020 Proxy Statement, and that information is incorporated by reference herein. The information required by Item 407(e)(4) and 407(e)(5) of Regulation S-K will be included under the captions "Compensation Committee Interlocks and Insider Participation" and "Compensation Committee Report" in the 2020 Proxy Statement, and that information is incorporated by reference herein.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by Item 403 of Regulation S-K will be included under the caption “Stock Ownership Information” in the 2020 Proxy Statement, and that information is incorporated by reference herein.

Equity Compensation Plan Information

We currently maintain two equity compensation plans that provide for the issuance of common stock to officers and other employees, directors and consultants. Each of these compensation plans was approved by our shareholders. The following table sets forth information regarding outstanding options and shares available for future issuance under these plans as of December 31, 2019:

Plan Category	Number of shares to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding shares reflected in column (a))
	(a)	(b)	(c)
Equity compensation plans approved by shareholders			
Stock options	2,375,583	\$74.79	
Deferred compensation	1,598,089		
Other stock units ⁽¹⁾	3,465,598		
Equity compensation plans not approved by shareholders			
	None	None	None
Total ⁽²⁾	7,439,270	\$74.79	14,332,839

⁽¹⁾ Includes 1,652,252 shares issuable in respect of PBRUs subject to the satisfaction of performance criteria and assumes payout at maximum levels.

⁽²⁾ Excludes the potential performance awards which the Compensation Committee has the discretion to pay in cash, stock or a combination of both after the three-year performance periods which end in 2019, 2020 and 2021.

For further information, see Note 18 to our Consolidated Financial Statements.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by Item 404 of Regulation S-K will be included under the caption “Related Person Transactions” in the 2020 Proxy Statement, and that information is incorporated by reference herein.

The information required by Item 407(a) of Regulation S-K will be included under the caption “Director Independence” in the 2020 Proxy Statement, and that information is incorporated by reference herein.

Item 14. Principal Accounting Fees and Services

The information required by this Item will be included under the caption “Independent Auditor Fees” in the 2020 Proxy Statement, and that information is incorporated by reference herein.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a) List of documents filed as part of this report:

1. Financial Statements

Our consolidated financial statements are as set forth under Item 8 of this report on Form 10-K.

2. Financial Statement Schedules

All schedules are omitted because they are not applicable, not required, or the information is included in the consolidated financial statements.

3. Exhibits

- 3.1 [Amended and Restated Certificate of Incorporation of The Boeing Company dated May 5, 2006 \(Exhibit 3.1 to the Company's Current Report on Form 8-K dated May 1, 2006\).](#)
 - 3.2 [By-Laws of The Boeing Company, as amended and restated effective October 25, 2019 \(Exhibit 3.2 to the Company's Current Report on Form 8-K dated October 25, 2019\).](#)
 - 4.1 [Description of The Boeing Company Securities Registered under Section 12 of the Exchange Act.](#)
 - 10.1 [364-Day Credit Agreement, dated as of October 30, 2019, among The Boeing Company, for itself and on behalf of its Subsidiaries, as a Borrower, the Lenders party hereto, Citibank, N.A., as administrative agent, JPMorgan Chase Bank, N.A. as syndication agent and Citibank, N.A. and JPMorgan Chase Bank N.A., as Joint Lead Arrangers and Joint Book Managers \(Exhibit 10.1 to the Company's Current Report on Form 8-K dated October 30, 2019\).](#)
 - 10.2 [Five-Year Credit Agreement, dated as of October 30, 2019, among The Boeing Company, for itself and on behalf of its Subsidiaries, as a Borrower, the Lenders party hereto, Citibank, N.A., as administrative agent, JPMorgan Chase Bank, N.A., as syndication agent and Citibank N.A. and JPMorgan Chase Bank, N.A., as Joint Lead Arrangers and Joint Book Managers \(Exhibit 10.2 to the Company's Current Report on Form 8-K dated October 30, 2019\).](#)
 - 10.3 [Three-Year Credit Agreement, dated as of October 30, 2019, among The Boeing Company, for itself and on behalf of its Subsidiaries, as a Borrower, the Lenders party hereto, Citibank, N.A., as administrative agent, JPMorgan Chase Bank, N.A., as syndication agent and Citibank N.A. and JPMorgan Chase Bank, N.A., as Joint Lead Arrangers and Joint Book Managers \(Exhibit 10.3 to the Company's Current Report on Form 8-K dated October 30, 2019\).](#)
 - 10.4 [Joint Venture Master Agreement, dated as of May 2, 2005, by and among Lockheed Martin Corporation, The Boeing Company and United Launch Alliance, L.L.C. \(Exhibit \(10\)\(i\) to the Company's Form 10-Q for the quarter ended June 30, 2005\).](#)
 - 10.5 [Delta Inventory Supply Agreement, dated as of December 1, 2006, by and between United Launch Alliance, L.L.C. and The Boeing Company \(Exhibit \(10\)\(vi\) to the Company's Form 10-K for the year ended December 31, 2006\).](#)
 - 10.6 [Summary of Nonemployee Director Compensation.*](#)
 - 10.7 [Deferred Compensation Plan for Directors of The Boeing Company, as amended and restated effective January 1, 2008 \(Exhibit 10.2 to the Company's Current Report on Form 8-K dated October 28, 2007\).*](#)
 - 10.8 [Deferred Compensation Plan for Employees of The Boeing Company, as amended and restated effective January 1, 2019 \(Exhibit 10.3 to the Company's Form 10-Q for the quarter ended September 30, 2018\).*](#)
-

10.9	<u>Incentive Compensation Plan for Employees of The Boeing Company and Subsidiaries, as amended and restated effective October 31, 2016 (Exhibit (10)(xi) to the Company's Form 10-K for the year ended December 31, 2016).*</u>
10.10	<u>The Boeing Company Elected Officer Annual Incentive Plan, as amended and restated effective October 31, 2016 (Exhibit (10)(xii) to the Company's Form 10-K for the year ended December 31, 2016).*</u>
10.11	<u>The Boeing Company 1997 Incentive Stock Plan, as amended effective May 1, 2000 and further amended effective January 1, 2008 (Exhibit 10.5 to the Company's Current Report on Form 8-K dated October 28, 2007).*</u>
10.12	<u>Supplemental Executive Retirement Plan for Employees of The Boeing Company, as amended and restated as of January 1, 2016 (Exhibit (10)(xvi) to the Company's Form 10-K for the year ended December 31, 2015).*</u>
10.13	<u>The Boeing Company Executive Layoff Benefits Plan, as amended and restated effective January 1, 2017 (Exhibit (10)(xviii) to the Company's Form 10-K for the year ended December 31, 2016).*</u>
10.14	<u>The Boeing Company 2003 Incentive Stock Plan, as amended and restated effective October 31, 2016 (Exhibit (10)(xix)(a) to the Company's Form 10-K for the year ended December 31, 2016).*</u>
10.15	<u>Form of Non-Qualified Stock Option Grant Notice of Terms (Exhibit (10)(xvii)(b) to the Company's Form 10-K for the year ended December 31, 2010).*</u>
10.16	<u>Form of Notice of Terms of Performance-Based Restricted Stock Units (Exhibit 10.2 of the Company's 10-Q for the quarter ended March 31, 2018).*</u>
10.17	<u>Form of Performance Award Notice (Exhibit 10.3 of the Company's 10-Q for the quarter ended March 31, 2018).*</u>
10.18	<u>Form of Notice of Terms of Restricted Stock Units (Exhibit 10.1 to the Company's 10-Q for the quarter ended March 31, 2018).*</u>
10.19	<u>Form of Notice of Terms of Supplemental Restricted Stock Units (Exhibit 10.4 to the Company's 10-Q for the quarter ended March 31, 2018).*</u>
10.20	<u>Form of Notice of Terms of Supplemental Restricted Stock Units (Exhibit 10.1 to the Company's Current Report on Form 8-K dated June 25, 2017).*</u>
10.21	<u>Form of Notice of Terms of Restricted Stock Units dated February 23, 2015. (Exhibit (10)(xviii)(i) to the Company's Form 10-K for the year ended December 31, 2015).*</u>
21	<u>List of Company Subsidiaries.</u>
23	<u>Consent of Independent Registered Public Accounting Firm.</u>
31.1	<u>Certification of Chief Executive Officer pursuant to Section 302 of Sarbanes-Oxley Act of 2002.</u>
31.2	<u>Certification of Chief Financial Officer pursuant to Section 302 of Sarbanes-Oxley Act of 2002.</u>
32.1	<u>Certification of Chief Executive Officer pursuant to Section 906 of Sarbanes-Oxley Act of 2002.</u>
32.2	<u>Certification of Chief Financial Officer pursuant to Section 906 of Sarbanes-Oxley Act of 2002.</u>
99.1	<u>Commercial Program Method of Accounting (Exhibit (99)(i) to the Company's Form 10-K for the year ended December 31, 1997).</u>
101.SCH	XBRL Taxonomy Extension Schema Document

101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File - the cover page XBRL tags are embedded within the Inline XBRL document contained in Exhibit 101

* Management contract or compensatory plan
In accordance with Item 601(b)(4)(iii)(A) of Regulation S-K, copies of certain instruments defining the rights of holders of long-term debt of the Company are not filed herewith. Pursuant to this regulation, we hereby agree to furnish a copy of any such instrument to the SEC upon request.

Item 16. Form 10-K Summary

None

Signatures

Pursuant to the requirements of Section 13 of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on January 31, 2020.

THE BOEING COMPANY

(Registrant)

/s/ Robert E. Verbeck

By:

Robert E. Verbeck – Senior Vice President, Finance and Corporate
Controller

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated on January 31, 2020.

/s/ David L. Calhoun

David L. Calhoun – President and Chief Executive Officer
(Principal Executive Officer)

/s/ Lawrence W. Kellner

Lawrence W. Kellner – Chairman of the Board

/s/ Gregory D. Smith

Gregory D. Smith – Chief Financial Officer and Executive Vice President,
Enterprise Performance and Strategy
(Principal Financial Officer)

/s/ Caroline B. Kennedy

Caroline B. Kennedy – Director

/s/ Robert E. Verbeck

Robert E. Verbeck – Senior Vice President, Finance and Corporate
Controller
(Principal Accounting Officer)

/s/ Edward M. Liddy

Edward M. Liddy – Director

/s/ Robert A. Bradway

Robert A. Bradway – Director

/s/ John M. Richardson

John M. Richardson – Director

/s/ Arthur D. Collins, Jr.

Arthur D. Collins, Jr. – Director

/s/ Susan C. Schwab

Susan C. Schwab – Director

/s/ Edmund P. Giambastiani, Jr.

Edmund P. Giambastiani, Jr. – Director

/s/ Ronald A. Williams

Ronald A. Williams – Director

/s/ Lynn J. Good

Lynn J. Good – Director

/s/ Mike S. Zafirovski

Mike S. Zafirovski – Director

/s/ Nikki R. Haley

Nikki R. Haley – Director