United Technologies

Annual Report 2019

United Technologies is a global leader in the aerospace and building industries. Our aerospace businesses — Collins Aerospace Systems and Pratt & Whitney — are redefining the future of flight with next-generation aircraft engines and integrated systems and components. Our commercial building businesses — Carrier and Otis — are carrying on their rich legacy of improving the quality of life by developing sustainable solutions that keep people comfortable and safe, that shape skylines, and that keep people on the move. Through the efforts of our more than 240,000 employees worldwide, UTC continues to build on its legacy of innovation and superior customer service.

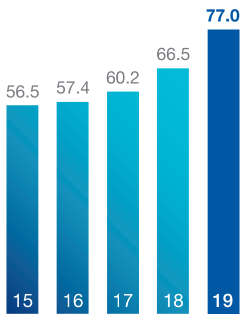
To learn more, visit **www.utc.com**.

Contents

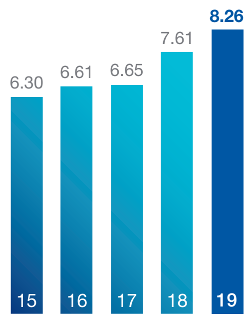
Financials at a Glance

United Technologies provides high-technology products and services to the aerospace and building industries worldwide. In 2019 UTC net sales were $77 billion.

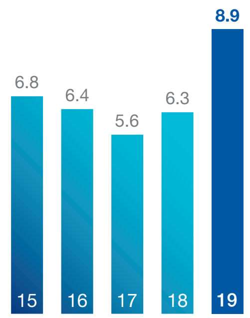
Adjusted net sales[1]
(dollars in billions)



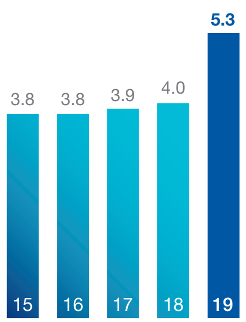
Adjusted diluted earnings per common share from continuing operations[1]
(dollars per share)



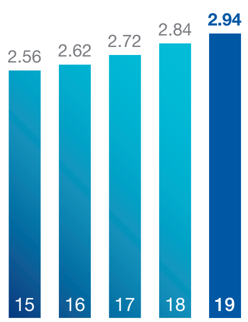
Cash flow from operations
(dollars in billions)



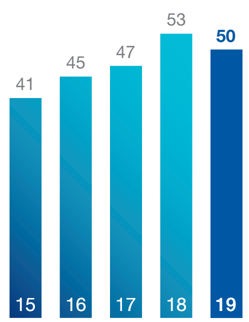
Research and development[2]
(dollars in billions)



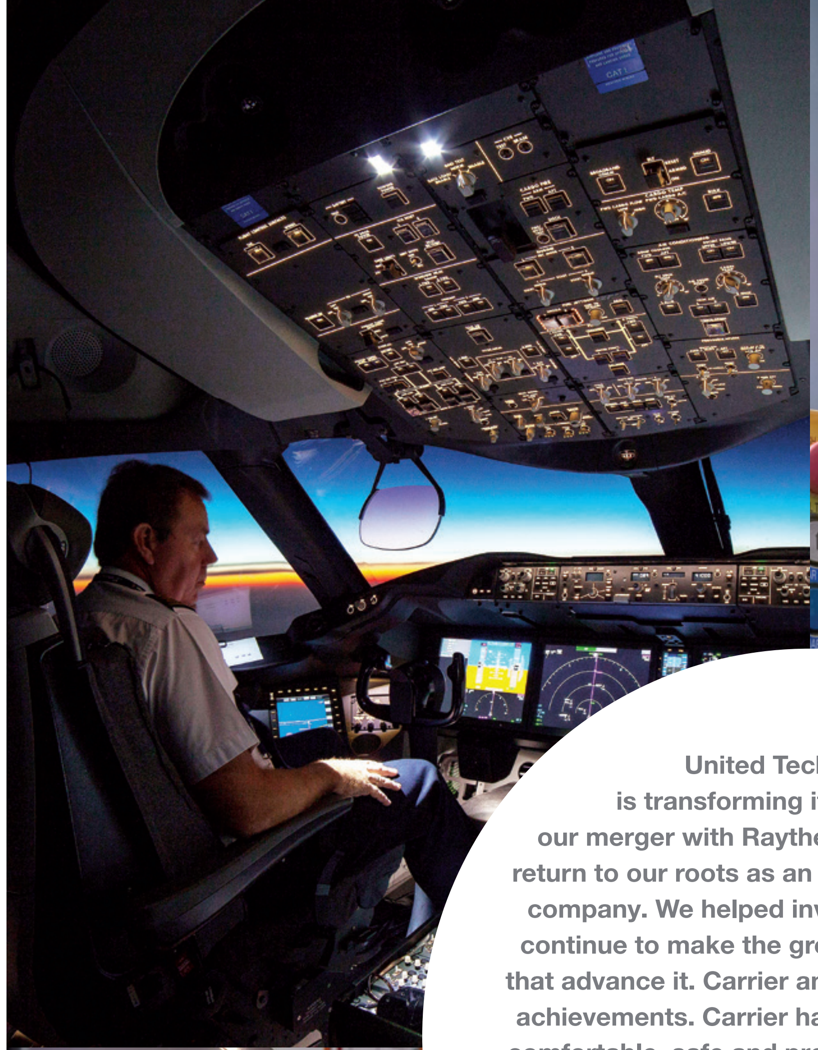
Dividends paid per common share
(dollars per share)



Debt to capital
(percent)



[1] See page 81 for additional information regarding these non-GAAP measures.
[2] Amounts include company- and customer-funded research and development.



United Technologies is transforming itself. Following our merger with Raytheon Company, we will return to our roots as an aerospace and defense company. We helped invent modern flight and continue to make the great leaps in technology that advance it. Carrier and Otis can claim similar achievements. Carrier has been keeping people comfortable, safe and productive for more than a century, while Otis has been shaping skylines and reinventing the way people move for even longer. Following the spinoffs and merger, we will go forward as three great independent companies — Raytheon Technologies, Carrier and Otis.

About the Covers: The front and back covers of our annual report mark two historic events. The back illustrates our first annual report. It was issued in 1929 by United Aircraft & Transport Corporation, the forerunner of what eventually would become United Technologies Corporation. The front cover represents our last annual report as United Technologies. Following our merger with Raytheon Company, we will become Raytheon Technologies Corporation, a premier systems provider with advanced technologies to address rapidly growing segments within aerospace and defense. Carrier and Otis, which became part of UTC in the 1970s, will regain their status as independent companies and continue to develop smart, integrated solutions for their customers.

Captions for page 1: (TOP LEFT) Collins Aerospace's avionics technologies help ensure efficiency and safety in flight operations. Its integrated and advanced flight deck solutions help reduce operating costs and enhance the flying experience. (TOP RIGHT) Otis field professionals maintain more than 2 million elevators and escalators worldwide. (BOTTOM LEFT) Carrier continues to lead the HVAC industry, which it helped to create. Its AquaEdge 23XRV chiller incorporates significant breakthroughs in water-cooled chiller technology to provide excellent reliability and superior efficiencies without compromising the environment. (BOTTOM RIGHT) For nearly a century, Pratt & Whitney has advanced aviation and taken it to new levels. Its revolutionary GTF engine leads in efficiency, environmental performance and noise reduction.

Dear Fellow Investor

Greg Hayes, Chairman & CEO

2019 was an extraordinary year for United Technologies. We achieved record sales, adjusted earnings per share and free cash flow. Importantly, we accomplished this as we embarked on a transformational journey to position our company for a new future.

We announced in June that United Technologies will merge with Raytheon, creating Raytheon Technologies. This followed our announcement in late 2018 that we would separate Carrier and Otis into standalone public companies. Our merger will create a best-in-class, technology-driven, global systems provider. As a focused aerospace and defense company, Raytheon Technologies will define the future of aerospace and defense for decades to come while generating long-term value for our shareowners, our customers and our employees.

We expect to complete the merger with Raytheon in early 2020 upon completion of the Carrier and Otis spinoffs. This will result in three focused, high-performing companies that will continue to lead their respective industries.

Our merger with Raytheon will mark the transformation of United Technologies into Raytheon Technologies. Going forward we will benefit from our legacy of innovation, leading-edge technology and our relentless focus on providing customers with world-leading products and services. United Technologies' success today is built on businesses that were founded by visionary leaders. Elisha Otis invented the elevator safety brake in 1852. Willis Carrier invented modern air conditioning in 1902. Frederick Rentschler developed the Wasp aircraft engine in 1925. Arthur Collins developed the aircraft radio in 1935. Each of these businesses was born of an innovation needed to solve a customer problem and the fundamental belief that there was a better way.

It is not easy to survive, let alone thrive, for nearly a century, but through the principles and visions of our founders, United Technologies has been able to deliver solid returns to our investors while investing in our people and making a positive impact in our communities.

Strong Financial Performance

In 2019 our financial results exceeded the high end of the ranges we communicated at the beginning of the year. United Technologies had sales of $77 billion, driven by Collins Aerospace Systems and Pratt & Whitney. Earnings per share on an adjusted basis were $8.26, a 9% increase over 2018. Spending on research and development totaled $5.3 billion, of which more than $3 billion was company-funded. We generated $8.9 billion of cash flow from operations, and we invested $2.3 billion in capital expenditures to fund future organic growth. Free cash flow was $6.6 billion, including approximately $400 million of one-time cash payments associated with preparing Carrier and Otis to be standalone, independent companies. Dividends totaled $2.4 billion.

5%
Organic growth*

$8.26
Adjusted earnings per share*

$6.6B
Free cash flow*

* See page 81 for additional information regarding non-GAAP financial measures.

Business Highlights

Each of our business units has maintained its unwavering focus on the customer. Pratt & Whitney continues to be a world leader in the manufacture of aircraft engines and auxiliary power systems, and its GTF engine had more than 10,000 firm and option orders at the end of 2019. Approximately 1,400 GTF engines are in service across six continents. Since the engine's entry into service it has saved operators more than $550 million in fuel and more than 2.5 million metric tons of carbon emissions. Pratt & Whitney also was awarded a $5.7 billion contract by the U.S. Department of Defense to fund more than 330 F135 engines, which represents the largest F135 production contract in program history.

The integration of Rockwell Collins with UTC Aerospace Systems formed Collins Aerospace Systems, which exceeded our expectations on multiple fronts. On an adjusted basis, the acquisition accounted for $0.66 of EPS accretion in 2019.* The combined entity delivered on its ambition to bring greater intelligence, connectivity and electrification to aerospace customers. In 2019 Collins Aerospace broke ground on a state-of-the-art electric power systems lab in Rockford, Illinois, that will redefine what is possible in the electrification of flight. On the military side, we were notified that the U.S. Air Force, as part of its Next-Generation Ejection Seat program, plans to award Collins Aerospace a sole-source contract to deliver its new, state-of-the-art ACES 5 ejection seats for use in a number of military aircraft. And for the flying public, the business' focus on innovation resulted in advancements in cabin interiors, more streamlined check-in processes for passengers and faster broadband speeds.

Carrier saw the tremendous global reach of its products and services expand even further, as evidenced by several new business wins. Burger King chose Carrier's Green & Cool natural refrigerant, CO2Y systems, as its preferred condensing units for its restaurants in Spain. Carrier signed a strategic cooperation agreement with Tim Hortons in China to provide integrated HVAC solutions and services for that company's existing and future coffee houses throughout the country. The business also introduced two new refrigerated chiller islands for grocery stores and markets in Europe, and continued its focus on building safety by installing Edwards emergency communications systems in campus environments such as Bentley University in Massachusetts.

Otis, which moves 2 billion people every day, is helping to drive a digital renaissance in elevators. Otis has now equipped more than 75% of its field technicians with iPhones and proprietary Otis apps that streamline service and help to predict future maintenance needs. In 2019 the business made progress in executing on major infrastructure contracts from China to supply more than 2,500 elevators and escalators in 11 cities. Otis also completed the installation of its first inclined elevator in China at the iconic Shanghai Oriental Pearl Tower. And the Empire State Building now has a custom-made "mast car" elevator, delivered and installed by Otis, which completed an eight-year modernization project that was one of the largest and most complex initiatives in the company's 167-year history.

Corporate Responsibility

United Technologies has been at the forefront of the corporate sustainability movement for more than two decades, establishing aggressive impact reduction goals that today are consistent with global initiatives such as the Paris Climate Accord. Since 1997 we have reduced annual greenhouse gas emissions by more than 29% and water use by 57%, and increased recycling of our industrial process waste to more than 90%, all while growing our top and bottom lines by more than 230% and 480%, respectively.

Our commitment to sustainability extends to our products, which are designed with an eye to reducing the energy and environmental footprints associated with their manufacture and use. We continue to be recognized for launching many of the building industry's most energy-efficient heating, air-conditioning and refrigeration products, and for revolutionizing aerospace through quieter, cleaner, more fuel-efficient jet engines.

Our commitment to investing in our people has created an engaged workforce of lifelong learners, committed to solving our world's most complex challenges. Of all our accomplishments over the past 95 years, the success of our Employee Scholar Program is one of our greatest achievements. This program, which was launched in 1996, has enabled our people to earn more than 41,000 college degrees, with UTC picking up the tab for tuition, books and fees as well as paid time off to study. No employer today can guarantee lifetime employment. We can, however, provide the opportunity to become a lifelong learner. We long ago recognized that the skills with which we enter the workforce will sooner or later become obsolete. We therefore made the commitment to our people that we would provide the opportunity for everyone to reskill themselves in order to be better prepared for the inevitable changes that are coming to our factories and offices.

UTC also has continued to take significant steps in addressing important societal issues. We are committed to diversity and inclusion in race, gender and orientation as well as thought. In 2017 we pledged to achieve gender parity in our leadership by 2030. In 2019 we expanded our commitment and launched a strategic partnership in the United States and India with the nonprofit organization Girls Who Code. Together we hope to build one of the largest pipelines of future female leaders in the fields of engineering and technology. Additionally, this past year saw UTC employees generously donate their time to skills-based volunteerism, dedicating thousands of hours to mentor students through *FIRST*, a leading STEM-based educational program, and to help rebuild communities with Engineers Without Borders.

An Exciting Future

For all of us at United Technologies, this past year has been exciting and fulfilling as well as challenging. Our exceptional performance is testament to the dedication, focus and sacrifice of our 240,000 employees. They have continued to excel at the highest levels, and I thank them for their commitment to this company and to our mission.

Everyone here — and all who came before us — have much to be proud of. For nine decades, United Technologies has been a driving force of innovation, performance and excellence. We have served our customers, our shareowners and our communities with dedication; we have positively impacted the industries in which we operate; and we have made the world a safer and better place.

Now as the page turns and this chapter ends, we look forward to an exciting new beginning.

Thank you for your support of United Technologies.

Gregory J. Hayes
Chairman & Chief Executive Officer

Open Gatefold for Our Legacy

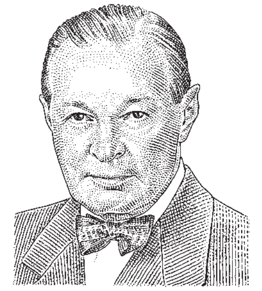
Our Legacy of Transformation

United Technologies has never been a company to stand still. We have continuously transformed and reinvented our businesses in order to offer superior products and services to our customers, and to deliver value to our shareowners and other stakeholders.

Ours is a rich history — one that began in the 1920s and that has flourished throughout the decades. Our aerospace and defense business has advanced commercial and military aviation and has enabled astronauts to walk on the moon and explore new frontiers in space. Our acquisition of Otis in 1976 moved us into the building industry. And our acquisition of Carrier three years later solidified our position as a company that could help develop smart, sustainable cities.

We now have embarked upon the largest transformation in our history — one in which Otis and Carrier will move forward as independent companies while United Technologies transitions into Raytheon Technologies. It is our next chapter. And we look forward to it.

1920s



Frederick B. Rentschler
1925 *President* | 1935 *Chairman*

1925: Beginning of United Technologies
UTC was founded as the Pratt & Whitney Aircraft Company by Frederick B. Rentschler, pioneer of the air-cooled radial engine design, which enabled unprecedented power-to-weight ratio.

1929: Pratt & Whitney Aircraft Company establishes Research Center in East Hartford, Connecticut
Our research staff teams with business units, academic institutions and other global organizations to advance the boundaries of science and technology.

1929: Pratt & Whitney Aircraft Company acquires Sikorsky Aircraft
The company was founded in 1923 by Igor Sikorsky, a pioneer in helicopter and fixed-wing design.

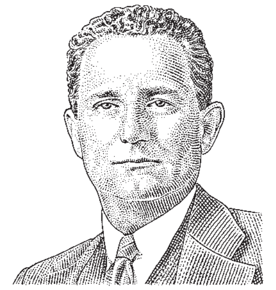
1930s

1934: Company reorganizes as United Aircraft Corporation
Subsidiaries at the time include Boeing, United Airlines, Pratt & Whitney, Sikorsky, Hamilton Standard and Chance Vought.

United Aircraft

1934: First airborne radio on Goodyear airship *Enterprise*
This paves the way for the Collins Autotune radio in 1937, which is hailed as a major advancement in aircraft radio design. It launches Collins Radio Company into the world of aviation.

1940s



H.M. Horner
1944 *President* | 1956 *Chairman*

1944: Pratt & Whitney begins gas turbine and jet propulsion initiative
The company constructs a wind tunnel, laboratory and engineering facilities to support the war effort.

1945: UTC wartime production includes 300,000 Pratt & Whitney engines
Production also includes 500,000 Hamilton Standard propellers, 20,000 Chance Vought airplanes and 150 Sikorsky helicopters.

1950s

1952: Pratt & Whitney engines power the B-52 Stratofortress' first flight
Today the B-52 is powered by Pratt & Whitney TF-33 engines, more than 1,000 of which are still in service with the U.S. Air Force and other customers around the world.

1954: Boeing 707 prototype flies with Pratt & Whitney JT3 engines
It is the first twin-spool engine and powers the first U.S. commercial jet airliner.

1958: UTC forms Missiles and Space Systems division
The company enters the space race with the design and engineering of missiles and spacecraft systems.

1960s

1964: Pratt & Whitney's J58 engines power the SR-71 Blackbird reconnaissance jet
The record-setting jet is capable of flying faster than a rifle bullet.

1964: Pratt & Whitney's PT6 turboprop engine enters service
With its revolutionary free-power-turbine design, the PT6 becomes the most popular gas turbine engine in its class.

1969: Apollo 11 lands on the moon
It is supported by Hamilton Standard environmental controls and portable life-support systems and Pratt & Whitney fuel cells.

1969: Collins Radio communications equipment enables Neil Armstrong's first steps on the moon to be seen around the world
Today Collins Aerospace communications equipment keeps pilots and warfighters safe, connected and informed.

1970s

Harry J. Gray
1972 *CEO* | 1974 *Chairman*

1976: UTC acquires Otis Elevator
The company was founded in 1853 by Elisha Otis, inventor of the elevator safety brake, which enabled the development of modern high-rise buildings.

1977: Rockwell Collins receives the world's first GPS signal
The event revolutionizes commercial and military navigation on land, sea and air.

1978: Sikorsky delivers first production BLACK HAWK helicopter to the U.S. Army
Today there are more than 4,000 BLACK HAWK helicopters in service in the United States and 30 other countries.

1979: UTC acquires Carrier Corporation
The world's largest manufacturer of air-conditioning and refrigeration equipment was founded in 1915 by Willis Carrier, inventor of modern air conditioning.

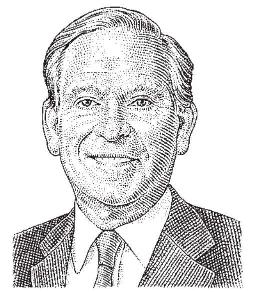
Carrier

1980s

1982: Rockwell Collins' electronic flight instrument system is the first to be FAA certified
This is the first use of an electronic display as a primary flight instrument. It was installed on the Boeing 767, the first completely "digital" aircraft, and is now the industry standard.

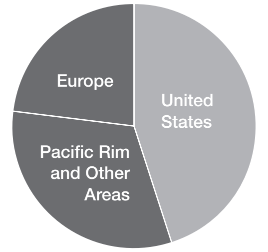
1984: Hamilton Standard introduces first commercial full-authority digital electronic control (FADEC) system for aircraft engines
FADEC enters service on Pratt & Whitney's PW2037 engine to power the Boeing 757.

1990s



George David
1994 *CEO* | 1997 *Chairman*

1990: UTC's international business surpasses half of total revenue for the first time
It is proof of UTC's global reach in the aerospace and building industries.



1993: Carrier is a founding member of the U.S. Green Building Council
Today Carrier also is a founding member of national Green Building Councils in Argentina, China, France, India and Singapore.

1995: UTC announces Employee Scholar Program
As technology accelerates, UTC establishes the ESP to enable employees to stay current in their field of expertise and build skills for the future. ESP pays for tuition, books and time off for study.

1999: UTC acquires Sundstrand Corp. and forms Hamilton Sundstrand
The new division brings increased aerospace capabilities.

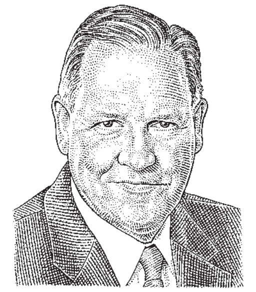
2000s

2003: UTC acquires Chubb
Chubb is a world leader in security and fire protection services.

2006: Pratt & Whitney's F135 engine powers the first flight of the F-35 Lightning II Joint Strike Fighter
The F135 engine enables conventional takeoff, short takeoff, catapult-assisted takeoff and vertical landing.

2008: Pratt & Whitney launches its GTF (geared turbofan) engines
The new engines offer double-digit improvements in fuel burn, environmental emissions, engine noise and operating costs.

2010s



Gregory J. Hayes
2014 *CEO* | 2016 *Chairman*

2011: Boeing 787 Dreamliner enters service equipped with key systems from Hamilton Sundstrand
The 787 contains nine major Hamilton Sundstrand systems, comprising nearly 600 components and subsystems.

2012: UTC acquires Goodrich Corporation and majority ownership in the International Aero Engines collaboration
The acquisitions strengthen UTC's position in the commercial aerospace industry.

GOODRICH

2012: *FlightGlobal* magazine names Rockwell Collins Innovator of the Year for introducing touch-screen flight displays
The displays make it easier for pilots to input flight information.

2015: UTC divests Sikorsky
UTC focuses on four global franchises: Otis, Pratt & Whitney, UTC Aerospace Systems and UTC Climate, Controls & Security.

2020

2016: Pratt & Whitney's GTF engine successfully enters service
It delivers 16% greater fuel efficiency, 75% reduction in noise footprint and 50% reduction in regulated emissions.

2018: UTC acquires Rockwell Collins
It is combined with UTC Aerospace Systems and renamed Collins Aerospace Systems.

2018: UTC announces that Carrier and Otis will become independent companies
With the spinoffs, UTC will return to its roots as a leading aerospace systems supplier.

2019: Merger with Raytheon Company is announced
The combination will create a premier systems provider with advanced technologies to address rapidly growing segments of aerospace and defense.

90 Years of Growth

*Data not available

"As a focused aerospace and defense company, Raytheon Technologies will define the future of aerospace and defense for decades to come while generating long-term value for our shareowners, our customers and our employees."

Gregory J. Hayes

Carrier

Carrier is a leading global provider of innovative HVAC, refrigeration, fire and security technologies. Its portfolio includes industry-leading brands such as Carrier, Chubb, Kidde, Edwards, LenelS2 and Automated Logic.

52,600
Employees

$18.6B
Net sales

$3.0B
Adjusted operating profit*

* See page 81 for additional information regarding non-GAAP financial measures.

As a global provider of sustainable building and refrigeration solutions, we are committed to making the world safer and more comfortable for generations to come. From the beginning, we have led in inventing new technologies. We have forged entire industries. Built iconic brands. Pioneered more than 100 years of firsts. Now, as we are about to become an independent, publicly traded company, we are leaning into our performance-driven culture to drive shareholder value — growing revenue and investing strategically to strengthen our world-leading market position. This is the new Carrier — and Change is in the Air.

Carrier has defined modern life for more than a century. In 2019, for the fifth year in a row, Carrier released more than 100 new products. In its HVAC business, it introduced the first Toshiba Carrier Variable Refrigerant Flow rooftop unit. It delivers greater energy efficiency than comparable models, offers ideal zoned comfort and can be easily installed. Another product launched during 2019 was the AquaEdge 19DV centrifugal chiller. It balances performance and sustainability in ways the industry has never seen and has received five major industry awards in four regions of the world in just over a year.

Also in its HVAC business, Carrier announced an exclusive supplier agreement with Clayton Home Building Group. Carrier will provide its SmartComfort furnaces for Clayton homes constructed off-site, which include manufactured and modular homes.

During the year Automated Logic introduced OptiPoint BACnet thermostats, which can be seamlessly integrated with its WebCTRL building automation system, giving occupants an easy way to control their comfort in facilities such as hotels, dormitories, classrooms and offices.

In its refrigeration business, Carrier continues to help its customers achieve their sustainability goals. Carrier Transicold expanded its industry-leading product offerings with its new Vector HE (high efficiency) trailer refrigeration units, which can reduce fuel consumption by up to 30% and maintenance costs by up to 15%.

Both the container and commercial refrigeration businesses secured notable wins with their natural refrigerant offerings. TOTE Maritime Puerto Rico and DFDS Logistics added Carrier Transicold NaturaLINE units to their fleets. As the industry's only natural refrigerant-based container refrigeration system, NaturaLINE uses the non-ozone-depleting refrigerant CO2. Similarly, Burger King, the world's second-largest fast-food hamburger chain, chose Carrier's commercial refrigeration Green & Cool CO2Y natural refrigerant system for its restaurants in Spain.

Carrier's fire and security businesses continue their legacy of protecting people and property. Both Edwards and Kidde were the first commercial and residential smoke alarm manufacturers to meet 2020 UL safety standards — Edwards with its new Signature Optica smoke alarms and Kidde with its new TruSense alarms. Edwards launched the new EST4, an advanced networked fire alarm and emergency communications platform designed for complex and mid-to-large applications. And Supra has enhanced its TRAC-Mini controller to enable authorized personnel access control in offline locations through mobile credentials and Bluetooth technology.

- With the launch of its TruSense alarms, Kidde became the first smoke alarm manufacturer to meet 2020 UL safety standards. TruSense detects more types of fire faster and virtually eliminates nuisance alarms, such as those caused by burnt food or steam.
- The 19DV centrifugal chiller is an innovative HVAC solution that has been recognized globally by the industry. It provides efficient cooling and heating for commercial buildings, using a refrigerant with an ultra-low global warming potential and the best possible safety rating while also reducing impact on the ozone.
- The Vector HE 19 is a new flagship, next-generation, temperature-controlled trailer refrigeration system. It offers customers a number of advantages, including lower fuel consumption, lower maintenance costs and a lower noise level.
- LenelS2's new OnGuard version 7.6 offers building operators a number of enhancements for a more scalable, accessible and cloud-compatible enterprise security platform.
- The Infinity air conditioner with Greenspeed Intelligence is Carrier's most innovative residential air conditioner. It marries its variable-speed technology with Greenspeed Intelligence to deliver ultra-precise comfort, enhanced humidity management and superior efficiency.

Otis

Otis is the world's leading provider of elevators, escalators and moving walkways. It moves 2 billion people a day and maintains more than 2 million customer units around the world — the industry's largest service portfolio.

69,000
Employees

$13.1B
Net sales

$2.0B
Adjusted operating profit*

Few companies can claim a greater role in creating today's connected urban world. Over the last 167 years, we have helped build cities, transformed how people live and work, and revolutionized architecture itself. Now we are developing bold new solutions to give people freedom to connect and thrive in a taller, faster, smarter world. As we return to our roots as an independent, publicly traded company, our mission remains the same: to be a world-class, customer-centric, service-oriented company.

* See page 81 for additional information regarding non-GAAP financial measures.

Otis is ushering in an exciting new generation of smart, connected products and services for the safety, comfort and convenience of passengers and customers alike. Its CompassPlus dispatching technology, for example, functions like a virtual concierge, directing passengers to the elevator that will get them to their destination the fastest, with the fewest stops — as much as 50 percent faster during peak travel periods. Its eCall smartphone app allows passengers to summon their elevator from anywhere in the building, so the elevator is there waiting for them when they arrive at the elevator bank. The app also can be integrated with the most advanced building access systems, including biometric and facial recognition technology, so people can pass through security and summon their elevator simultaneously.

Otis' new SuperGroup system solves a challenge common to high-rise buildings. By pulling mid-rise elevators into "flex" service, SuperGroup technology allows passengers to travel directly between upper and lower floors without having to return to the lobby or inconvenient transfer floors. This alone can be a game-changer for building owners, since they no longer need to have contiguous floors available when trying to attract new tenants or rent additional space to current tenants.

For a world in motion, it is not just about the destination; it also is about the journey. This is one reason Otis created its eView subscription service. The system streams news, entertainment and more to an in-car display for passengers to enjoy during the ride. For extra peace of mind, the eView screen also can be configured to serve as a direct, live video link between passengers and an OTISLINE customer service representative when needed. The eView system can be programmed to show different messages throughout the day, making it an ideal way for building managers to communicate with tenants and visitors.

Otis also is harnessing the power of big-data analytics, machine learning and other technologies enabled by the internet of things to help predict and prevent service disruptions. In 2019 Otis launched its new IoT-based service platform in China. Sensors collect real-time performance data, which cloud-based algorithms aggregate and analyze. The data is used to alert Otis service centers, field mechanics and safety regulators when a fault is detected in a specific unit — in some cases before it causes an interruption in service.

The new custom-made Gen2 glass "mast car" elevator installed by Otis in 2019 now carries visitors to the Empire State Building's reimagined 102nd Floor Observatory. The installation capped a yearslong modernization of the New York City landmark — among the largest and most complex projects in Otis' history.

Otis installed an inclined elevator in Shanghai's Oriental Pearl Tower in 2019, completing its largest modernization project in China. The elevator carries visitors up one of the tower's diagonal support columns to the first and largest of its 11 distinctive spheres.

A field professional in Seoul, South Korea, uses an Otis smartphone app to review details of his service visit with a customer. A suite of proprietary apps is allowing Otis to serve its customers better by streamlining an array of tasks, from ordering parts to assessing elevator-ride quality.

Collins Aerospace Systems

Collins Aerospace is one of the world's largest suppliers of technologically advanced aerospace and defense products. It designs, manufactures and services systems and components, and provides integrated solutions for commercial, military and space platforms.

77,200
Employees

$26.0B
Net sales

$4.4B
Adjusted operating profit*

Collins Aerospace is committed to redefining aerospace by shaping a future that is more intelligent, more connected and more electric than ever. With our customers, we tackle the industry's toughest challenges and make the skies smarter and safer. We help take passengers on their journeys, protect nations and explore the unknown. With a comprehensive portfolio, extensive capabilities and broad expertise, we develop intelligent solutions for a rapidly evolving global market and provide our customers the best in innovation and technology.

* See page 81 for additional information regarding non-GAAP financial measures.

Collins Aerospace is redefining flight with innovative solutions that enable a more intelligent, more connected, and more electric aerospace and defense industry. One of its most ambitious projects is The Grid, a $50-million facility under construction in Rockford, Illinois, where the company will design and test systems for the next generation of more electric aircraft. With initial operations expected to begin in 2020, it will be the industry's most advanced electric power systems lab and will position Collins Aerospace to remain the world leader in the electrification of aircraft.

Enhancing the passenger experience is a top priority for Collins Aerospace. That is one reason it is collaborating with SES, a leading satellite operator, to bring global business aviation customers LuxStream connectivity service. LuxStream will offer the fastest broadband speeds available for business aircraft — 25 Mbps in the United States and 15 Mbps globally via SES's managed Ku-band satellite network. Vista Global, with a fleet of 116 owned aircraft and access to 1,500 business jets globally, will be the launch customer.

In 2019 Collins Aerospace received two Crystal Cabin Awards for breakthrough concepts that are redefining the passenger experience. The M-Flex Duet is a revolutionary cabin monument designed to transform the least optimized area of the cabin — the aircraft doorway — into a social zone or cabin-attendant working area. Collins Aerospace also was recognized for its µLED reading light, which works in unison with the aircraft's lighting system to enhance the cabin environment.

Collins Aerospace's ACES 5 ejection seat is the most advanced and best-performing ejection seat of its kind and brings significant safety improvements, reduced maintenance costs and increased aircraft availability. In 2019 Collins Aerospace was notified that the U.S. Air Force planned to award it a sole-source contract to deliver ACES 5 ejection seats for use in a number of military aircraft, including Boeing's F-15, A-10 and B-1 as well as Lockheed Martin's F-16 and F-22. The anticipated contract will be part of the Air Force's Next-Generation Ejection Seat program.

Collins Aerospace has a long and storied relationship with NASA. Along with ILC Dover, it has developed a Next-Generation Space Suit system prototype for future missions. The suit was designed with NASA and commercial customer applications in mind and was unveiled at an event on Capitol Hill in late July as part of a celebration of the 50th anniversary of the Apollo 11 lunar mission.

The cabin doorway is the least utilized space on an aircraft. The M-Flex Duet turns that space into a self-serve social zone or cabin-attendant working area without sacrificing seat count.

Collins Aerospace has provided advanced avionics capabilities for the Bombardier Challenger 604 since the aircraft's inception. Its Pro Line Fusion upgrade enhances the aircraft's operational capabilities and modernizes the flight experience for pilots.

Collins Aerospace developed the space suit used in the 1969 Apollo 11 lunar mission. Now, in collaboration with ILC Dover, it has developed a Next-Generation Space Suit system prototype that will enable further exploration of the final frontier.

The next-generation ACES 5 ejection seat helps ensure that the aircrew can safely eject and walk away should their aircraft be compromised. The ACES 5 is the most advanced and best-performing ejection seat of its kind.

Pratt & Whitney

Pratt & Whitney is a world leader in the design, manufacture and service of aircraft engines and auxiliary power systems.

42,200
Employees

$20.9B
Net sales

$1.8B
Adjusted operating profit*

* See page 81 for additional information regarding non-GAAP financial measures.

The demand to fly safer, farther and cleaner — all more cost effectively — is at an all-time high. Along with expectations for engine performance and service, demand also is growing for the next great breakthrough. We say yes to this challenge. We say yes to the innovation it requires. And we say yes to turning possibilities into realities for our customers. Our mission is to innovate and invent — for today and for the future. We believe flight is an engine for human progress. It connects people, grows economies and helps defend freedom. We have been transforming flight for nearly a century. And we continue to do so.

Pratt & Whitney continues to set the industry standard for performance. Its GTF (geared turbofan) engine is the quietest, cleanest and most fuel-efficient engine in its class. Demand for the GTF engine is strong with more than 10,000 firm and option orders at the end of 2019. Approximately 1,400 GTF engines are in service across six continents. During the year 14 airlines took their first GTF-powered aircraft, including Wizz Air, Cebu Pacific and JetSMART. Current customers, such as GoAir and JetBlue, announced additional GTF orders. GTF engines have saved operators more than $550 million in fuel and more than 2.5 million metric tons of carbon emissions since the engine's entry into service. The GTF engine's revolutionary geared turbofan architecture allows for further evolution and performance enhancements.

As demand grows for the GTF engine, Pratt & Whitney is expanding its global network of maintenance, repair and overhaul facilities. At the end of the year, more than 40 repair and overhaul facilities around the globe had joined the GTF network.

Another engine drawing attention is the Pratt & Whitney PW800, designed for long-range business travel. It exceeds industry standards in all areas, including performance, cabin comfort, fuel efficiency and reliability. It is the quietest in its class and delivers a fuel efficiency improvement of more than 10% compared to similar engines. During the year Pratt & Whitney was recognized by Aviation Week Network for its innovation around the PW800 engine.

Pratt & Whitney powers a wide range of military aircraft. In 2019 it was awarded a $5.7 billion contract by the U.S. Department of Defense to fund more than 330 F135 engines for the U.S. armed services and international customers. It is the largest F135 production contract in program history. The F135 engine, the most advanced fighter engine ever produced, powers all three variants of the 5th Generation F-35 Lightning II.

With a diverse range of aviation propulsion systems and leadership positions in each segment of its businesses, Pratt & Whitney once again proved that innovation is in its DNA. During the year it introduced the PT6 E-Series engine, which raises the bar in engine performance, control systems, data intelligence and service solutions for general aviation.

The F-35 Lightning II is the most advanced fighter jet in the world, and it is powered by Pratt & Whitney's F135 engine. During the year the U.S. Department of Defense awarded Pratt & Whitney a $5.7 billion contract to fund more than 330 engines for its F-35 jets. It is the largest production contract in the program's history.

The GTF engine's revolutionary geared turbofan technology is transforming aviation and setting environmental standards. With 16% better fuel efficiency, the GTF engine has significantly lower nitrogen oxide emissions and a 75% smaller noise footprint.

The No. 1 engine in general aviation is now even better. The new PT6 E-Series engine uses advanced technology to improve engine performance, control systems, data intelligence and service solutions. It was selected by Pilatus Aircraft, a Swiss manufacturer, to power its new PC-12 NGX aircraft.

Social Impact

$180+M
invested in our communities over the past 5 years

$28+M
made in employee contributions and matching gifts over the past 5 years

10,700+
community investments made in 2019

We believe that social impact takes many different forms. It means investing in programs that will determine our future success and in programs that enrich our communities. It means giving our customers clean and sustainable products while also reducing our own environmental footprint. And it means providing a safe, healthy and inclusive culture for our employees.

Investing in our Future

Among our more than 240,000 employees are some of the world's most brilliant minds. They drive our success and remind us of the importance of preparing future generations to take their place. This is why we are investing in partnerships with organizations that encourage STEM studies — science, technology, engineering and mathematics. For 24 years we have supported *FIRST*, a K-12 mentor-based robotics competition designed to encourage STEM studies and technical careers. In that time we have contributed more than $20 million to *FIRST*, and thousands of our employees have volunteered as mentors.

We also are a founding partner of Invention Convention Worldwide, a K-12 program that combines STEM education with innovation and entrepreneurship. UTC has sponsored invention education for decades, beginning with the best-in-class Connecticut Invention Convention and expanding our support across the United States and globally.

We believe that digital innovation of the future will be rooted in gender parity. That is why we have partnered with Girls Who Code — a nonprofit that is working to increase and sustain the number of women and underrepresented populations in the technology sector. Our partnership with GWC covers the United States as well as India, Canada and the United Kingdom.

We champion the education and continued development of our employees as well. Lifelong learning is essential in this age of rapidly evolving technology. Our Employee Scholar Program enables employees to stay current in their chosen fields or to develop new skills that can enhance their careers. It is one of the most comprehensive company-sponsored employee education programs in the world. Since its inception in 1996, we have invested more than $1.3 billion in the program, and employees from across the globe have earned more than 41,000 degrees.

Investing in our Communities

UTC is committed to supporting long-term sustainable solutions that benefit local and global communities. In 2019 we announced the expansion of our strategic partnership with Engineers Without Borders USA, a nonprofit dedicated to building a better world. Our employee volunteers work with EWB to design and implement sustainable solutions for some of the world's most pressing infrastructure challenges.

Our businesses play a major role in our community efforts. They proudly embody what it means to be outstanding corporate citizens. Collins Aerospace supports Introduce a Girl to Engineering, a worldwide campaign to engage girls in engineering. Pratt & Whitney is a stalwart champion of Engineers Without Borders. Carrier has long contributed products to Habitat for Humanity, and its employees are active volunteers as well. Both Carrier and Otis employees participate in Green Shoots, a global program that helps youth learn more about the benefits of environmental stewardship and safety.

- We are partnering with Girls Who Code, a nonprofit organization that aims to support and increase the number of women in technology by equipping them with the skills needed to pursue 21st century opportunities. Our partnership began in the United States and then quickly extended to India, Canada, the United Kingdom and other global regions where we have a large business presence.
- We are passionate about science and technology. Our company was built on both, and our future depends on both. For almost a quarter of a century we have sponsored *FIRST*, the leading nonprofit organization that encourages students to pursue STEM careers. We both fund the organization and encourage our employees to mentor budding technologists.
- UTC is a proud sponsor of the National Invention Convention — a celebration of K-12 inventors and entrepreneurs from across the United States. The 2019 event was held at the Henry Ford Museum of American Innovation.
- As a global company, we see parts of the world where people struggle to meet their basic human needs. Our company and our employees work to help address those needs through Engineers Without Borders. A recent project sent our engineers to San Cristobal Verapaz, Guatemala. Volunteers tested water sources for contamination and developed plans for a new well to be built in 2020.

Social Impact

Our workforce is global and diverse. We strive to create a culture of inclusion and opportunities for personal growth. Our Re-Empower Program helps professionals re-enter the workforce after a career break, including transitioning from military service. And our employee resource groups promote professional development, mentoring and community outreach.

Diversity

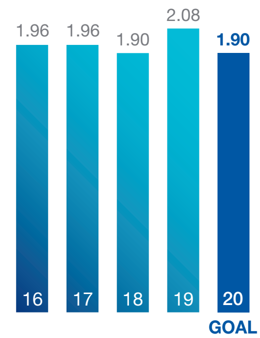
We are committed to creating an environment where employees can be themselves and share ideas openly. As part of this effort, we encourage employees to join employee-led resource groups that foster professional development, mentoring and community outreach. More than 100 chapters across the company support global communities, including African-American, Asian-American, Disability, Generational, Hispanic-American, LGBTQ Pride, Military Veterans, Professional and Women. We also have instituted a program that helps experienced professionals re-enter the workforce after a career break or transitioning from the military. And we have joined the Paradigm for Parity coalition to help us achieve gender parity in our senior leadership team by 2030.

Sustainability

We produce some of the most sustainable products on the market. And we take great care to ensure that our facilities and operations are environmentally sound. For example, Carrier's global headquarters in Palm Beach Gardens is the first commercial building in Florida to achieve LEED Platinum certification. This is the highest recognition for environmental and engineering performance. We also hold ourselves accountable for meeting tough internal sustainability goals. Since 1997 we have reduced our cumulative greenhouse gas emissions by 800,000 metric tons, saved approximately 2.8 billion gallons of water and put safety measures in place that make us one of the safest companies in the industry. We accomplished this during a period of enormous growth that saw sales nearly triple.

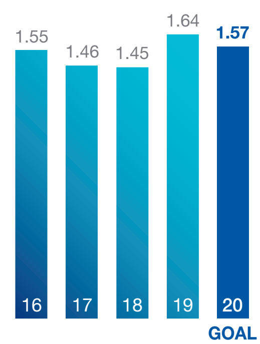
Greenhouse gas emissions

(million metric tons CO2e)



Worldwide water consumption

(billion gallons)



Consistent with the Greenhouse Gas Protocol, UTC's Environment, Health and Safety goals, targets and associated baselines are adjusted to reflect the impact of acquired companies at the time of acquisition and to remove divested companies from UTC's measured performance. Our factory and operational environmental goals measure progress in absolute terms and are not adjusted as a result of increases or decreases in production.

Financials

Five-Year Summary

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS; SHARES IN MILLIONS)	**2019**	2018	2017	2016	2015
For The Year					
Net sales	**$ 77,046**	$ 66,501	$ 59,837	$ 57,244	$ 56,098
Research and development	**3,015**	2,462	2,427	2,376	2,262
Restructuring costs	**425**	307	253	290	396
Net income from continuing operations [1]	**5,948**	5,654	4,920	5,436	4,356
Net income from continuing operations attributable to common shareowners [1]	**5,537**	5,269	4,552	5,065	3,996
Basic earnings per share—Net income from continuing operations attributable to common shareowners	**6.48**	6.58	5.76	6.19	4.58
Diluted earnings per share—Net income from continuing operations attributable to common shareowners	**6.41**	6.50	5.70	6.13	4.53
Cash dividends per common share	**2.94**	2.84	2.72	2.62	2.56
Average number of shares of Common Stock outstanding:					
Basic [2]	**855**	800	790	818	873
Diluted [2]	**864**	810	799	826	883
Cash flows provided by operating activities of continuing operations	**8,883**	6,322	5,631	6,412	6,755
Capital expenditures [3]	**2,256**	1,902	2,014	1,699	1,652
Acquisitions, including debt assumed & equity issued	**56**	31,142	231	712	556
Repurchases of Common Stock [3]	**151**	325	1,453	2,254	10,000
Dividends paid on Common Stock (excluding ESOP)	**2,442**	2,170	2,074	2,069	2,184
At Year End					
Working capital [4]	**$ 2,911**	$ 4,135	$ 8,467	$ 6,644	$ 4,088
Total assets	**139,716**	134,211	96,920	89,706	87,484
Long-term debt, including current portion [5]	**41,284**	44,068	27,093	23,300	19,499
Total debt [5]	**43,648**	45,537	27,485	23,901	20,425
Total debt to total capitalization [5]	**50%**	53%	47%	45%	41%
Total equity [5, 6]	**44,231**	40,610	31,421	29,169	28,844
Number of employees [7]	**243,200**	240,200	204,700	201,600	197,200

Note 1 2019 amounts include pre-tax charges associated with the Company's intention to separate its commercial business of approximately $600 million and tax charges of approximately $730 million. 2018 amounts include unfavorable tax charges of approximately $744 million primarily related to non U.S. taxes that will become due when earnings of certain international subsidiaries are remitted, a $300 million pre-tax charge resulting from customer contract matters, partially offset by a $799 million pre-tax gain on the sale of Taylor. 2017 amounts include unfavorable tax charges of approximately $690 million related to U.S. tax reform legislation enacted in December, 2017, commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA) and a $196 million pre-tax charge resulting from customer contract matters, partially offset by pre-tax gains of approximately $500 million on sales of available for sale securities. 2016 amounts include a $423 million pre-tax pension settlement charge resulting from defined benefit plan de-risking actions. 2015 amounts include pre-tax charges of: $867 million as a result of a settlement with the Canadian government, $295 million from customer contract negotiations at Collins Aerospace Systems, and $237 million related to pending and future asbestos claims.

Note 2 Increase in average number of Common Stock outstanding is due to additional shares issued in connection with the Rockwell Collins acquisition.

Note 3 The decrease in 2019 is due to restrictions arising from the pending merger transaction with Raytheon. The decrease in share repurchases in 2018 is due to the temporary suspension of activity in connection with the acquisition of Rockwell Collins announced on September 4, 2017, excluding activity relating to our employee savings plans. Share repurchases in 2015 include share repurchases under accelerated repurchase agreements of $2.6 billion in the first quarter of 2015 and $6.0 billion in the fourth quarter of 2015.

Note 4 Working capital in 2019 includes tax costs accrued associated with the Company's intention to separate its commercial business of $634 million and Operating lease liabilities, current of $544 million. Working capital in 2018 includes the addition of contract assets and liabilities of $3.5B and $5.7B, respectively in accordance with the New Revenue Standard as well as an increase in current borrowings of $1.8 billion. Working capital in 2015 includes approximately $2.4 billion of taxes payable related to the gain on the sale of Sikorsky, which were paid in 2016. 2015 working capital also reflects the reclassification of current deferred tax assets and liabilities to non-current assets and liabilities in connection with the adoption of Accounting Standards Update 2015-17.

Note 5 The decrease in debt to total capitalization ratio primarily reflects debt repayments in 2019. The increase in the 2018 debt to total capitalization ratio primarily reflects additional borrowings in 2018 used to finance the acquisition of Rockwell Collins. The increase in the 2017 and 2016 debt to total capitalization ratio primarily reflects additional borrowings to fund share repurchases, the 2017 discretionary pension contributions, and for general corporate purposes.

Note 6 The increase in total equity in 2018 is due to UTC common stock issued as Merger Consideration for Rockwell Collins.

Note 7 The increase in employees in 2018 is due to the addition of approximately 30,000 of Rockwell Collins employees.

Management's Discussion and Analysis of Financial Condition and Results of Operations

BUSINESS OVERVIEW

We are a global provider of high technology products and services to the building systems and aerospace industries. Our operations for the periods presented herein are classified into four principal business segments: Otis, Carrier, Pratt & Whitney, and Collins Aerospace Systems. Otis and Carrier are referred to as the "commercial businesses," while Pratt & Whitney and Collins Aerospace Systems are referred to as the "aerospace businesses."

On June 9, 2019, UTC entered into a merger agreement with Raytheon Company (Raytheon) providing for an all-stock merger of equals transaction. The Raytheon merger agreement provides, among other things, that each share of Raytheon common stock issued and outstanding immediately prior to the closing of the Raytheon merger (except for shares held by Raytheon as treasury stock) will be converted into the right to receive 2.3348 shares of UTC common stock. Upon the closing of the Raytheon merger, Raytheon will become a wholly-owned subsidiary of UTC, and UTC will change its name to Raytheon Technologies Corporation. On October 11, 2019, the shareowners of each of UTC and Raytheon approved the proposals necessary to complete the Raytheon merger. The Raytheon merger is expected to close early in the second quarter of 2020 and is subject to customary closing conditions, including receipt of required regulatory approvals, as well as the completion of UTC's separation of its Otis and Carrier businesses.

As has been previously disclosed, in November 2018, the Company announced its intention to separate into three independent companies. The separation will result in three global, industry-leading companies:

- United Technologies, comprised of Collins Aerospace Systems and Pratt & Whitney, will be the preeminent systems supplier to the aerospace and defense industry;
- Otis, the world's leading manufacturer of elevators, escalators and moving walkways; and
- Carrier, a global provider of HVAC, refrigeration, building automation, fire safety and security products with leadership positions across its portfolio.

The proposed separations are expected to be effected through spin-offs of Otis and Carrier that are intended to be tax-free for the Company's shareowners for U.S. federal income tax purposes, and are expected to be completed early in the second quarter of 2020. Separation of Otis and Carrier from UTC via spin-off transactions will be subject to the satisfaction of customary conditions, including, among others, final approval by the Company's Board of Directors, receipt of tax rulings and a tax opinion from external counsel, the filing with the Securities and Exchange Commission (SEC) and effectiveness of Form 10 registration statements, and satisfactory completion of financing (subject to UTC's agreement to consummate the distributions pursuant to, and subject to the terms and conditions of, the Raytheon merger agreement discussed below).

On November 26, 2018, we completed the acquisition of Rockwell Collins (the "Rockwell Acquisition"), a leader in aviation and high-integrity solutions for commercial and military customers as well as leading-edge avionics, flight controls, aircraft interior and data connectivity solutions. The total aggregate consideration payable in the Rockwell Acquisition was $15.5 billion in cash ($14.9 billion net of cash acquired) and 62.2 million shares of Company common stock. In addition, $7.8 billion of Rockwell Collins debt was outstanding at the time of the Rockwell Acquisition. Refer to Note 2 of the Consolidated Financial Statements for additional discussion on the Rockwell Acquisition.

The commercial businesses generally serve customers in the worldwide commercial and residential property industries, with Carrier also serving customers in the commercial and transport refrigeration industries. The aerospace businesses serve commercial and government aerospace customers in both the original equipment and aftermarket parts and services markets. Our consolidated net sales were derived from the commercial and aerospace businesses as follows:

	2019	2018	2017
Commercial and industrial	**41%**	47%	50%
Military aerospace and space	**17%**	14%	13%
Commercial aerospace	**42%**	39%	37%
	100%	100%	100%

Our consolidated net sales were derived from original equipment manufacturing (OEM) and aftermarket parts and services as follows:

	2019	2018	2017
OEM	**54%**	54%	53%
Aftermarket parts and services	**46%**	46%	47%
	100%	100%	100%

Our worldwide operations can be affected by industrial, economic and political factors on both a regional and global level. Our operations include original equipment manufacturing and extensive related aftermarket parts and services in both our commercial and aerospace businesses. Our business mix also reflects the combination of shorter cycles at Carrier and in our commercial aerospace spares businesses, and longer cycles at Otis and in our aerospace OEM and aftermarket maintenance businesses. Our customers are in both the public and private sectors, and our businesses reflect an extensive geographic diversification that has evolved with continued globalization. Refer to Note 20 of the Consolidated Financial Statements for additional discussion of sales attributed to geographic regions.

As part of our growth strategy, we invest in businesses in certain countries that carry high levels of currency, political and/or economic risk, such as Argentina, Brazil, China, India, Indonesia, Mexico, Poland, Russia, South Africa, Turkey, Ukraine and countries in the Middle East and Central Asia. As of December 31, 2019, the net assets in any one of these countries did not exceed 5% of consolidated shareowners' equity.

In a referendum on June 23, 2016, voters in the United Kingdom (the U.K.) voted in favor of the U.K.'s exiting the European Union (the EU). The manner in which the U.K. decides to exit the EU could have negative macroeconomic consequences. Our 2019 full year sales in and from the U.K. were approximately $4 billion and represented less than 5% of our overall sales, and we do not believe the U.K.'s withdrawal from the EU will significantly impact our businesses in the near term.

Organic sales growth was 5% in 2019, reflecting growth across all segments driven by:

- Higher sales across all channels at Pratt & Whitney;
- Higher commercial aftermarket and military sales, partially offset by lower commercial aerospace OEM sales at Collins Aerospace Systems;
- Higher service sales across all regions and higher new equipment sales driven by growth in Asia at Otis;
- Higher commercial and residential HVAC sales at Carrier.

We continue to invest in new platforms and new markets to position the Company for long-term growth, while remaining focused on innovation, structural cost reduction, disciplined capital allocation and execution to meet or exceed customer and shareowner commitments.

As discussed below in "Results of Operations," operating profit in both 2019 and 2018 includes the impact from activities that are not expected to recur often or that are not otherwise reflective of the underlying operations, such as the beneficial impact of net gains from sales of investments, the unfavorable impact of contract matters with customers, transaction, acquisition and integration costs, costs associated with the Company's intention to separate its commercial businesses, and other significant non-recurring and non-operational items. Our earnings growth strategy contemplates earnings from organic sales growth, including growth from new product development and product improvements, structural cost reductions, operational improvements, and incremental earnings from our investments in acquisitions.

In total, our investments in businesses in 2019 and 2018 totaled $56 million and $31,142 million, (including debt assumed of $7,784 million and stock issued of $7,960 million) respectively. Our investments in businesses in 2019 included a number of small acquisitions primarily at Otis. In addition to Rockwell Collins, acquisitions completed in 2018 primarily include an acquisition at Carrier and at Pratt & Whitney.

Both acquisition and restructuring costs associated with business combinations are expensed as incurred. Depending on the nature and level of acquisition activity, earnings could be adversely impacted due to acquisition and restructuring actions initiated in connection with the integration of businesses acquired. For additional discussion of acquisitions and restructuring, see "Liquidity and Financial Condition," "Restructuring Costs" and Notes 2 and 13 to the Consolidated Financial Statements.

RESULTS OF OPERATIONS

Net Sales

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Net sales	**$ 77,046**	$ 66,501	$ 59,837
Percentage change year-over-year	**16%**	11%	5%

The factors contributing to the total percentage change year-over-year in total net sales are as follows:

	2019	2018
Organic volume	**5 %**	8%
Foreign currency translation	**(1)%**	1%
Acquisitions and divestitures, net	**12 %**	1%
Other	**— %**	1%
Total % Change	**16 %**	11%

All four segments experienced organic sales growth during 2019. Pratt & Whitney sales grew 8% organically, reflecting higher military, commercial OEM, and commercial aftermarket sales. Collins Aerospace Systems grew 6% organically, driven by higher commercial aftermarket and military sales, partially offset by lower commercial aerospace OEM sales. Organic sales growth of 5% at Otis reflects higher service sales, driven by broad-based growth across all regions, and higher new equipment sales driven by growth in Asia. Carrier sales grew 1% organically, driven by higher commercial and residential HVAC sales. The 12% increase in Acquisitions and divestitures, net primarily reflects the increase in sales attributed to the Rockwell Acquisition.

All four segments experienced organic sales growth during 2018. Pratt & Whitney sales grew 14% organically, reflecting higher commercial aftermarket, commercial OEM, and military sales. Collins Aerospace Systems grew 8% organically, driven by higher commercial aftermarket and military sales, and higher commercial OEM sales. Organic sales growth of 6% at Carrier was driven by growth in North America residential HVAC, global commercial HVAC, and transport refrigeration sales. Otis sales grew 3% organically, reflecting higher service sales in North America and Asia, and higher new equipment sales in Europe, Asia excluding China, and North America, partially offset by a decline in China.

Cost of Products and Services Sold

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Total cost of products and services sold	**$ 57,065**	$ 49,985	$ 44,201
Percentage change year-over-year	**14%**	13%	7%

The factors contributing to the total percentage change year-over-year in total cost of products and services sold are as follows:

	2019	2018
Organic volume	**5 %**	9%
Foreign currency translation	**(1)%**	1%
Acquisitions and divestitures, net	**11 %**	1%
Other	**(1)%**	2%
Total % Change	**14 %**	13%

The organic increase in total cost of products and services sold in 2019 was primarily driven by the organic sales increases noted above. The 11% increase in Acquisitions and divestitures, net primarily reflects the increase in cost of products and services sold attributed to the Rockwell Acquisition. The 1% decline in Other primarily reflects the absence of a prior year customer contract settlement at Pratt & Whitney (1%).

The organic increase in total cost of products and services sold in 2018 was primarily driven by the organic sales increases noted above. The 2% increase in Other primarily reflects the impact of the adoption of the New Revenue Standard (1%) and a customer contract settlement at Pratt & Whitney (1%), partially offset by the absence of a prior year customer contract matter at Pratt & Whitney.

Gross Margin

(DOLLARS IN MILLIONS)	2019	2018	2017
Gross margin	**$ 19,981**	$ 16,516	$ 15,636
Percentage of net sales	**25.9%**	24.8%	26.1%

The 110 basis point increase in gross margin as a percentage of sales in 2019, includes a 230 basis point increase at Collins Aerospace Systems driven by higher commercial aftermarket volumes and cost reduction, partially offset by adverse commercial OEM mix. Pratt & Whitney's gross margin increased 120 basis points primarily reflecting continued year-over-year cost reduction and favorable mix on large commercial engine shipments. Gross margin at Otis increased 30 basis points largely driven by favorable service contribution. These increases were partially offset by a 30 basis point decline in Carrier's gross margin primarily driven by unfavorable mix, the absence of a favorable prior year contract adjustment related to a large commercial project at Carrier, and the unfavorable year-over-year impact resulting from the revaluation of certain long-term liabilities.

The 130 basis point decrease in gross margin as a percentage of sales in 2018, includes a 300 basis point decline in Pratt & Whitney's gross margin driven by the unfavorable year-over-year impact of customer contract matters and higher negative engine margin from higher engine deliveries. Collins Aerospace Systems' gross margin declined 40 basis points as the benefits of higher commercial aftermarket volumes and cost reduction were more than offset by adverse commercial OEM and military OEM mix, and higher warranty expense. Gross margin at Otis declined 140 basis points largely driven by unfavorable price and mix, primarily in China. These declines were partially offset by a 40 basis point increase in Carrier's gross margin as favorable pricing and the favorable year-over-year impact of contract adjustments related to a large commercial project and a prior year product recall program were partially offset by increased commodities and logistics costs.

Research and Development

(DOLLARS IN MILLIONS)	2019	2018	2017
Company-funded	**$ 3,015**	$ 2,462	$ 2,427
Percentage of net sales	**3.9%**	3.7%	4.1%
Customer-funded	**$ 2,283**	$ 1,517	$ 1,514
Percentage of net sales	**3.0%**	2.3%	2.5%

Research and development spending is subject to the variable nature of program development schedules and, therefore, year-over-year variations in spending levels are expected. The majority of the company-funded spending is incurred by the aerospace businesses and relates largely to the next generation engine product family at Pratt & Whitney and systems being developed to support new aircraft and other program introductions at Collins Aerospace Systems. In 2019, company-funded research and development increased 22% over the prior year. This increase was primarily driven by the impact of the Rockwell Acquisition (18%). Excluding this impact, an increase in company-funded research and development at Collins Aerospace Systems (3%) was driven by higher spend across various commercial programs. Company-funded research and development expense at Pratt & Whitney also increased (2%) driven by higher spend across various commercial programs partially offset by a decline in military program spend.

Customer-funded research and development increased 50% over the prior year, primarily reflecting the impact of the Rockwell Acquisition (53%). Excluding this impact, customer-funded research and development declined year-over-year as a decrease at Pratt & Whitney (4%), primarily driven by lower research and development expenses on military development programs, was partially offset by an increase at Collins Aerospace Systems (2%), primarily driven by higher expenses on various military development programs.

In 2018, company-funded research and development increased 1% over the prior year. This increase was primarily driven by Collins Aerospace Systems (1%) as higher spend across various commercial programs was largely offset by the deferral of certain development costs as contract fulfillment costs in accordance with the New Revenue Standard. Company-funded research and development expense at Pratt & Whitney was consistent with the prior year.

Customer-funded research and development in 2018 was consistent with 2017, as a decrease at Collins Aerospace Systems, primarily driven by the deferral of certain development costs as contract fulfillment costs in accordance with the New Revenue Standard, was offset by an increase at Pratt & Whitney, primarily driven by higher research and development expenses on military development programs.

Selling, General and Administrative

(DOLLARS IN MILLIONS)	2019	2018	2017
Selling, general and administrative	**$ 8,521**	$ 7,066	$ 6,429
Percentage of net sales	**11.1%**	10.6%	10.7%

Selling, general and administrative expenses increased 21% in 2019. This increase primarily reflects the impact of incremental selling, general and administrative expenses resulting from the Rockwell Acquisition (9%), costs associated with the Company's intention to separate its commercial businesses (8%), and costs associated with the Raytheon merger (1%). In addition, 2019 reflects higher expenses at Pratt & Whitney (1%) driven by increased headcount and employee compensation related expenses and costs to support higher volumes as well as higher restructuring costs; higher expenses at Collins Aerospace Systems (1%) primarily driven by increased headcount and employee compensation related expenses partially offset by synergy capture related to the Rockwell Acquisition; higher expenses at Otis (1%) resulting from higher labor and information technology cost; and an increase at Carrier (1%) primarily driven by higher costs related to productivity initiatives and higher employee compensation related expenses.

Selling, general and administrative expenses increased 10% in 2018, but decreased 10 basis points as a percentage of net sales. The increase reflects the impact of incremental selling, general and administrative expenses resulting from the acquisition of Rockwell Collins (1%). In addition, 2018 reflects higher expenses at Collins Aerospace Systems (3%) primarily driven by increased headcount and employee compensation related expenses; an increase at Carrier (2%) primarily driven by employee compensation related expenses; higher expenses at Pratt & Whitney (1%) driven by increased headcount and employee compensation related expenses and costs to support higher volumes; and higher expenses at Otis (1%) resulting from higher labor and information technology costs. The remaining increase includes transaction costs related to the acquisition of Rockwell Collins and the proposed separation of our commercial businesses into independent entities.

We are continuously evaluating our cost structure and have implemented restructuring actions as a method of keeping our cost structure competitive. As appropriate, the amounts reflected above include the beneficial impact of restructuring actions on Selling, general and administrative expenses. See Note 13 "Restructuring Costs" and the "Restructuring Costs" section of "Management's Discussion and Analysis of Financial Condition and Results of Operations" for further discussion.

Other Income, Net

(DOLLARS IN MILLIONS)	2019	2018	2017
Other income, net	**$ 521**	$ 1,565	$ 1,358

Other income, net includes the operational impact of equity earnings in unconsolidated entities, royalty income, foreign exchange gains and losses as well as other ongoing and infrequently occurring items. In 2019, the year-over-year decrease in Other income, net (67%) primarily reflects the absence of the prior year gain on the sale of Taylor Company (51%), the impairment of an investment at Carrier (7%) and the net unfavorable year-over-year impact of foreign exchange gains and losses (5%).

In 2018, the year-over-year increase in Other income, net (15%) is primarily driven by the gain on the sale of Taylor Company (59%), partially offset by the absence of a prior year gain from the sale of Carrier's investments in Watsco, Inc. (28%), lower year-over-year gains on the sale of securities (11%), an impairment of assets related to a previously acquired Collins Aerospace Systems business (4%) and the absence of a prior year gain on the sale of a Carrier business (2%).

Interest Expense, Net

(DOLLARS IN MILLIONS)	2019	2018	2017
Interest expense	**$ 1,773**	$ 1,225	$ 1,017
Interest income	**(162)**	(187)	(108)
Interest expense, net	**$ 1,611**	$ 1,038	$ 909
Average interest expense rate - average outstanding borrowings during the year:			
Short-term borrowings	**1.9%**	1.5%	1.1%
Total debt	**3.7%**	3.5%	3.5%
Average interest expense rate - outstanding borrowings as of December 31:			
Short-term borrowings	**3.1%**	1.2%	2.3%
Total debt	**3.7%**	3.5%	3.5%

Interest expense, net increased 55% in 2019 as compared with 2018. The increase in interest expense primarily reflects interest on debt acquired from the Rockwell Collins acquisition and the impact of the August 16, 2018 issuance of notes representing $11 billion in aggregate principal. The average maturity of our long-term debt at December 31, 2019 is approximately 10 years. The decrease in interest income in 2019 as compared to 2018 primarily reflects the absence of interest earned on higher cash balances held in the prior year in advance of funding the Rockwell Acquisition.

Interest expense, net increased 14% in 2018 as compared with 2017. The increase in interest expense reflects the impact of the August 16, 2018 issuance of notes representing $11 billion in aggregate principal; the May 4, 2017 issuance of notes representing $4 billion in aggregate principal; and the May 18, 2018 issuance of Euro-denominated notes representing €2 billion in aggregate principal. These increases were partially offset by the favorable impact of the repayment at maturity of the following: 1.800% notes in June 2017 representing $1.5 billion in aggregate principal; the 6.8% notes in February 2018 representing $99 million of aggregate principal; the Euro-denominated floating rate notes in February 2018 representing €750 million in aggregate principal; and the 1.778% notes in May 2018 representing $1.1 billion of aggregate principal. The average maturity of our long-term debt at December 31, 2018 is approximately 11 years.

The $11 billion in aggregate principal amount of notes issued on August 16, 2018 was primarily used to fund the cash consideration in the acquisition of Rockwell Collins and related fees, expenses and other amounts. The increase in interest income in 2018 as compared with 2017 primarily reflects interest earned on higher cash balances, including interest earned on cash from the $11 billion of notes issued and held prior to funding the Rockwell Acquisition.

The year-over-year increase in the average interest expense rate for short-term borrowings was primarily driven by increased borrowings under our term credit agreement. In 2018, the year-over-year increase in the average interest expense rate for short-term borrowings was primarily driven by increases in LIBOR rates.

Income Taxes

	2019	2018	2017
Effective income tax rate	**27.8%**	31.7%	36.6%

The 2019 effective tax rate includes $729 million of income tax charges associated with the Company's portfolio separation transactions, offset in part by amounts associated with the conclusion of the audit by the Examination Division of the Internal Revenue Service for the UTC 2014, 2015 and 2016 tax years, the filing by a subsidiary of the Company to participate in an amnesty program offered by the Italian Tax Authority.

On December 22, 2017 Public Law 115-97 *"An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018"* was enacted. This law is commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA).

The 2018 effective tax rate reflects a net charge of $744 million of TCJA related adjustments. The amount primarily relates to accounting completed under SAB 118 for non-U.S. taxes that will become due when previously reinvested earnings of certain international subsidiaries are remitted.

The 2017 effective tax rate reflects a tax charge of $690 million attributable to the passage of the TCJA. This amount relates to U.S. income tax attributable to previously undistributed earnings of UTC's international subsidiaries and equity investments, net of foreign tax credits, and the revaluation of U.S. deferred income taxes.

The effective income tax rate for 2017 also includes tax benefits associated with lower tax rates on international earnings and the expiration of statutes of limitations during 2017 resulted in a favorable adjustment of $55 million largely offset by the unfavorable impact related to a retroactive Quebec tax law change.

For additional discussion of income taxes and the effective income tax rate, see "Critical Accounting Estimates—Income Taxes" and Note 11 to the Consolidated Financial Statements.

Net Income Attributable to Common Shareowners from Continuing Operations

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS)	2019	2018	2017
Net income from continuing operations attributable to common shareowners	**$ 5,537**	$ 5,269	$ 4,552
Diluted earnings per share from continuing operations	**$ 6.41**	$ 6.50	$ 5.70

To help mitigate the volatility of foreign currency exchange rates on our operating results, we maintain foreign currency hedging programs, the majority of which are entered into by Pratt & Whitney Canada (P&WC). In 2019, foreign currency, including hedging at P&WC, had a favorable impact on our consolidated operational results of $0.06 per diluted share. In 2018, foreign currency, including hedging at P&WC, had a favorable impact on our consolidated operational results of $0.02 per diluted share. In 2017, foreign currency, including hedging at P&WC, had a favorable impact on our consolidated operational results of $0.13 per diluted share. For additional discussion of foreign currency exposure, see "Market Risk and Risk Management—Foreign Currency Exposures."

Net income from continuing operations attributable to common shareowners for the year ended December 31, 2019 includes restructuring charges, net of tax benefit, of $317 million ($425 million pre-tax) as well as a net charge for significant non-operational and/or nonrecurring items, including the impact of taxes, of $1,282 million. Non-operational and/or nonrecurring items primarily include costs associated with the Company's intention to separate its commercial businesses, amortization of an inventory fair value adjustment associated with the Rockwell Acquisition, an impairment of an investment, transaction expenses associated with the Raytheon Merger, pension curtailment costs, and transaction and integration costs related to the Rockwell Acquisition. The effect of restructuring charges and nonrecurring items on diluted earnings per share for the year ended December 31, 2019 was a charge of $1.85 per share.

Net income from continuing operations attributable to common shareowners for the year ended December 31, 2018 includes restructuring charges, net of tax benefit, of $228 million ($307 million pre-tax) as well as a net charge for significant non-operational and/or nonrecurring items, including the impact of taxes, of $668 million. Non-operational and/or nonrecurring items include a tax charge in connection with the passage of the TCJA as described in Note 11 and the unfavorable impact of a customer contract matter at Pratt & Whitney, partially offset by a gain on Carrier's sale of Taylor Company. The effect of restructuring charges and nonrecurring items on diluted earnings per share for the year ended December 31, 2018 was a charge of $1.11 per share.

Net income from continuing operations attributable to common shareowners for the year ended December 31, 2017 includes restructuring charges, net of tax benefit, of $176 million ($253 million pre-tax) as well as the net unfavorable impact of significant non-operational and/or nonrecurring items, net of tax, of $587 million. Non-operational and/or nonrecurring items include a tax charge in connection with the passage of the TCJA as described in Note 11, the unfavorable impact of customer contract matters at Pratt & Whitney, and the unfavorable impact of a product recall program at Carrier, partially offset by gains resulting from Carrier's sale of its investments in Watsco, Inc. The effect of restructuring charges and nonrecurring items on diluted earnings per share for 2017 was a charge of $0.95 per share.

RESTRUCTURING COSTS

(DOLLARS IN MILLIONS)	2019	2018	2017
Restructuring costs	**$ 425**	$ 307	$ 253

Restructuring actions are an essential component of our operating margin improvement efforts and relate to existing and recently acquired operations. Charges generally arise from severance related to workforce reductions, facility exit and lease termination costs associated with the consolidation of field and manufacturing operations and costs to exit legacy programs. We continue to closely monitor the economic environment and may undertake further restructuring actions to keep our cost structure aligned with the demands of the prevailing market conditions.

2019 Actions. During 2019, we recorded net pre-tax restructuring charges of $321 million relating to ongoing cost reduction actions initiated in 2019. We are targeting to complete in 2020 and 2021 the majority of the remaining workforce and facility related cost reduction actions initiated in 2019. Approximately 90% of the total pre-tax charge will require cash payments, which we have funded and expect to continue to fund with cash generated from operations. During 2019, we had cash outflows of approximately $199 million related to the 2019 actions. We expect to incur additional restructuring and other charges of $123 million to complete these actions. We expect recurring pre-tax savings to increase over the two-year period subsequent to initiating the actions to approximately $389 million annually, of which, approximately $125 million was realized in 2019.

2018 Actions. During 2019 and 2018, we recorded net pre-tax restructuring charges of $46 million and $207 million, respectively, for actions initiated in 2018. We are targeting to complete in 2020 the majority of the remaining workforce and all facility related cost reduction actions initiated in 2018. Approximately 96% of the total pre-tax charge will require cash payments, which we have and expect to continue to fund with cash generated from operations. During 2019, we had cash outflows of approximately $143 million related to the 2018 actions. We expect to incur additional restructuring charges of $5 million to complete these actions. We expect recurring pre-tax savings to increase over the two-year period subsequent to initiating the actions to approximately $260 million annually.

In addition, during 2019, we recorded net pre-tax restructuring costs totaling $58 million for restructuring actions initiated in 2017 and prior. For additional discussion of restructuring, see Note 13 to the Consolidated Financial Statements.

SEGMENT REVIEW

	Net Sales			Operating Profits			Operating Profit Margin		
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019**	2018	2017	**2019**	2018	2017
Otis	**$ 13,113**	$ 12,904	$ 12,341	**$ 1,948**	$ 1,915	$ 2,002	**14.9%**	14.8%	16.2%
Carrier	**18,608**	18,922	17,812	**2,697**	3,777	3,165	**14.5%**	20.0%	17.8%
Pratt & Whitney	**20,892**	19,397	16,160	**1,668**	1,269	1,300	**8.0%**	6.5%	8.0%
Collins Aerospace Systems	**26,028**	16,634	14,691	**4,100**	2,303	2,191	**15.8%**	13.8%	14.9%
Total segment	**78,641**	67,857	61,004	**10,413**	9,264	8,658	**13.2%**	13.7%	14.2%
Eliminations and other	**(1,595)**	(1,356)	(1,167)	**(932)**	(236)	(81)			
General corporate expenses	**—**	—	—	**(515)**	(475)	(439)			
Consolidated	**$ 77,046**	$ 66,501	$ 59,837	**$ 8,966**	$ 8,553	$ 8,138	**11.6%**	12.9%	13.6%

Commercial Businesses

The financial performance of our commercial businesses can be influenced by a number of external factors including fluctuations in residential and commercial construction activity, regulatory changes, interest rates, labor costs, foreign currency exchange rates, customer attrition, raw material and energy costs, credit markets and other global and political factors. Carrier's financial performance can also be influenced by production and utilization of transport equipment, and weather conditions for its residential business. Geographic and industry diversity across the commercial businesses help to balance the impact of such factors on our consolidated operating results, particularly in the face of uneven economic growth. At constant currency, Otis new equipment orders were consistent with the prior year as order growth in Asia (3%) and Europe (2%) was offset by declines in North America (3%) and the Middle East (20%). At constant currency and excluding the effect of acquisitions and divestitures, Carrier equipment orders for 2019 decreased 8% in comparison to 2018 driven by a decline in global refrigeration (32%). Global HVAC and fire & security products equipment orders for 2019 were consistent with the prior year.

Total commercial business sales generated outside the U.S., including U.S. export sales, were 61% and 62% in 2019 and 2018, respectively. The following table shows sales generated outside the U.S., including U.S. export sales, for each of the commercial business segments:

	2019	2018
Otis	**73%**	73%
Carrier	**52%**	54%

Otis is the world's largest elevator and escalator manufacturing, installation and service company. Otis designs, manufactures, sells and installs a wide range of passenger and freight elevators as well as escalators and moving walkways. In addition to new equipment, Otis provides modernization products to upgrade elevators and escalators as well as maintenance and repair services for both its products and those of other manufacturers. Otis serves customers in the commercial, residential and infrastructure property sectors around the world. Otis sells direct and through sales representatives and distributors.

(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019 Compared with 2018**		2018 Compared with 2017	
				Total Increase (Decrease) Year-Over-Year for:			
Net Sales	**$ 13,113**	$ 12,904	$ 12,341	**$ 209**	**2%**	$ 563	5 %
Cost of Sales	**9,291**	9,192	8,612	**99**	**1%**	580	7 %
	3,822	3,712	3,729				
Operating Expenses and Other	**1,874**	1,797	1,727				
Operating Profits	**$ 1,948**	$ 1,915	$ 2,002	**$ 33**	**2%**	$ (87)	(4)%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2019			2018		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic / Operational	**5 %**	**5 %**	**4 %**	3%	5%	(4)%
Foreign currency translation	**(3)%**	**(4)%**	**(4)%**	1%	1%	2 %
Restructuring costs	**—**	**—**	**1 %**	—	—	(1)%
Other	**—**	**—**	**1 %**	1%	1%	(1)%
Total % change	**2 %**	**1 %**	**2 %**	5%	7%	(4)%

2019 Compared with 2018

The organic sales increase of 5% primarily reflects higher service sales (3%), driven by broad-based growth across all regions, and higher new equipment sales (2%) driven by growth in Asia.

The operational profit increase of 4% was driven by:

- margin contribution from the higher sales volumes noted above (6%)
- favorable price and mix (2%)
- favorable productivity (1%)

These increases were partially offset by:

- higher selling, general and administrative expenses (4%)
- unfavorable transactional foreign exchange gains and losses from mark-to-market adjustments and embedded foreign currency derivatives within certain new equipment contracts (1%)

2018 Compared with 2017

The organic sales increase of 3% primarily reflects higher service sales (2%), driven by growth in North America and Asia, and higher new equipment sales (1%) driven by growth in Europe, Asia excluding China, and North America (combined, 2%), partially offset by a decline in China (1%).

The operational profit decrease of 4% was driven by:

- unfavorable price and mix (8%), primarily in China
- higher selling, general and administrative expenses and research and development costs (3%)
- unfavorable commodity costs (2%)
- unfavorable transactional foreign exchange from mark-to-market adjustments (1%)

These decreases were partially offset by:

- profit contribution from the higher sales volumes noted above (8%)
- favorable productivity (2%)

Carrier is a leading provider of heating, ventilating, air conditioning (HVAC), refrigeration, fire, security, and building automation products, solutions, and services for commercial, government, infrastructure, and residential property applications and refrigeration and transportation applications. Carrier provides a wide range of building systems, including cooling, heating, ventilation, refrigeration, fire, flame, gas, and smoke detection, portable fire extinguishers, fire suppression, intruder alarms, access control systems, video surveillance, and building control systems. Carrier also provides a broad array of related building services, including audit, design, installation, system integration, repair, maintenance, and monitoring services. Carrier also provides refrigeration and monitoring products and solutions to the transport industry.

(DOLLARS IN MILLIONS)	2019	2018	2017	Total Increase (Decrease) Year-Over-Year for: 2019 Compared with 2018		2018 Compared with 2017	
Net Sales	**$ 18,608**	$ 18,922	$ 17,812	**$ (314)**	**(2)%**	$ 1,110	6%
Cost of Sales	**13,180**	13,337	12,630	**(157)**	**(1)%**	707	6%
	5,428	5,585	5,182				
Operating Expenses and Other	**2,731**	1,808	2,017				
Operating Profits	**$ 2,697**	$ 3,777	$ 3,165	**$ (1,080)**	**(29)%**	$ 612	19%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in: 2019			2018		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic / Operational	**1 %**	**2 %**	**(2)%**	6 %	6 %	6 %
Foreign currency translation	**(2)%**	**(2)%**	**(1)%**	1 %	1 %	—
Acquisitions and divestitures, net	**(1)%**	**(1)%**	**(1)%**	(1)%	(1)%	(1)%
Restructuring costs	**—**	**—**	**(1)%**	—	—	1 %
Other	**—**	**—**	**(24)%**	—	—	13 %
Total % change	**(2)%**	**(1)%**	**(29)%**	6 %	6 %	19 %

2019 Compared with 2018

The organic sales increase of 1% was primarily driven by growth in commercial and residential HVAC (1%, combined). Sales in global fire & security and global refrigeration were consistent with the prior year.

Operational profit decreased 2% in comparison to the prior year as the favorable impact of pricing and productivity net of unfavorable commodities and tariffs (4%, combined) were more than offset by lower volume and unfavorable mix (3%), the absence of a favorable prior year contract adjustment related to a large commercial project (1%), and the unfavorable year-over-year impact resulting from the revaluation of certain long-term liabilities (1%).

The 24% decrease in Other primarily reflects the absence of the prior year gain on the sale of Taylor Company (21%) and a current-year impairment of an investment (3%).

2018 Compared with 2017

The organic sales increase of 6% was driven primarily by growth in North America residential HVAC (2%), global commercial HVAC (2%), and global refrigeration (2%).

The operational profit increase of 6% was driven by:

- profit contribution from the higher sales volumes noted above, net of mix (6%)
- the year-over-year impact of contract adjustments related to a large commercial project (3%)
- favorable pricing, net of commodities (2%)

These increases were partially offset by:

- higher logistics costs (3%)
- higher research and development costs (1%)

The 13% increase in Other primarily reflects the year-over-year impact of gains on sale of businesses and investments (11%), primarily driven by the sale of Taylor Company in 2018 (25%), partially offset by the absence of the prior year sale of investments in Watsco, Inc. (12%). The remaining increase in Other is largely driven by the year-over-year impact of a prior year product recall program (2%).

Aerospace Businesses

The financial performance of Pratt & Whitney and Collins Aerospace Systems is directly tied to the economic conditions of the commercial aerospace and defense aerospace industries. In particular, Pratt & Whitney experiences intense competition for new commercial airframe/engine combinations. Engine suppliers may offer substantial discounts and other financial incentives, performance and operating cost guarantees, and participate in financing arrangements in an effort to compete for the aftermarket associated with these engine sales. These OEM engine sales may result in losses on the engine sales, which economically are recovered through the sales and profits generated over the engine's maintenance cycle. At times, the aerospace businesses also enter into development programs and firm fixed-price development contracts, which may require the company to bear cost overruns related to unforeseen technical and design challenges that arise during the development stage of the program. Customer selections of engines and components can also have a significant impact on later sales of parts and service. Predicted traffic levels, load factors, worldwide airline profits, general economic activity and global defense spending have been reliable indicators for new aircraft and aftermarket orders within the aerospace industry. Spare part sales and aftermarket service trends are affected by many factors, including usage, technological improvements, pricing, regulatory changes and the retirement of older aircraft. Our commercial aftermarket businesses continue to evolve as an increasing proportion of our aerospace businesses' customers are covered under long-term aftermarket service agreements. These agreements are comprehensive long-term spare part and service agreements with our customers. We expect a continued shift to long-term aftermarket service agreements in lieu of transactional spare part sales as new aerospace products enter our customers' fleets under long-term aftermarket service agreements and legacy fleets are retired. In 2019, as compared with 2018, total commercial aerospace aftermarket sales increased 2% at Pratt & Whitney and 63% at Collins Aerospace Systems, or 14% excluding the impact of the Rockwell Acquisition.

Our long-term aerospace contracts are subject to strict safety and performance regulations which can affect our ability to estimate costs precisely. Contract cost estimation for the development of complex projects, in particular, requires management to make significant judgments and assumptions regarding the complexity of the work to be performed, availability of materials, the performance by subcontractors, the timing of funding from customers and the length of time to complete the contract. As a result, we review and update our cost estimates on significant contracts on a quarterly basis, and no less frequently than annually for all others, and when circumstances change and warrant a modification to a previous estimate. Changes in estimates relate to the current period impact of revisions to total estimated contract sales and costs at completion. We record changes in contract estimates primarily using the cumulative catch-up method. Operating profits included net unfavorable changes in aerospace contract estimates of approximately $69 million, $50 million and $110 million in 2019, 2018 and 2017, respectively, primarily the result of unexpected increases in estimated costs related to Pratt & Whitney long-term aftermarket agreements. In accordance with our revenue recognition policy, losses, if any, on long-term contracts are provided for when anticipated. There were no material loss provisions recorded in continuing operations in 2019 or 2018.

Performance in the general aviation sector is closely tied to the overall health of the economy. We continue to see growth in a strong commercial airline industry. Airline traffic, as measured by revenue passenger miles (RPMs), grew approximately 4% in the first eleven months of 2019.

Our military sales are affected by U.S. Department of Defense spending levels. Total sales to the U.S. Government were $10.6 billion in 2019, $7.4 billion in 2018, and $5.8 billion in 2017, and were 14% of total UTC sales in 2019, and 11% in 2018 and 10% in 2017. The defense portion of our aerospace business is also affected by changes in market demand and the global political environment. Our participation in long-term production and development programs for the U.S. Government has contributed positively to our results in 2019 and is expected to continue to benefit results in 2020.

Collins Aerospace Systems provides standard and selectable content to Boeing for its 737 MAX aircraft including standard avionics, cockpit flight displays, and cabin interior products. In March 2019, aviation authorities suspended worldwide operations of the Boeing 737 MAX fleet. In January 2020, Boeing announced that it expects the fleet to remain grounded until mid-2020. In addition, Boeing announced the temporary suspension of 737 MAX production. The Company has made various investments in support of content for the 737 MAX which we currently expect to recover despite these delays in the production and operation of the fleet.

Pratt & Whitney is among the world's leading suppliers of aircraft engines for the commercial, military, business jet and general aviation markets. Pratt & Whitney provides fleet management services and aftermarket maintenance, repair and overhaul services. Pratt & Whitney produces and develops families of large engines for wide- and narrow-body and large regional aircraft in the commercial market and for fighter, bomber, tanker and transport aircraft in the military market. P&WC is among the world's leading suppliers of engines powering general and business aviation, as well as regional airline, utility and military airplanes, and helicopters. Pratt & Whitney and P&WC also produce, sell and service auxiliary power units for commercial and military aircraft. Pratt & Whitney's products are sold principally to aircraft manufacturers, airlines and other aircraft operators, aircraft leasing companies and the U.S. and foreign governments.

				Total Increase (Decrease) Year-Over-Year for:			
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019 Compared with 2018**		2018 Compared with 2017	
Net Sales	**$ 20,892**	$ 19,397	$ 16,160	**$ 1,495**	**8%**	$ 3,237	20 %
Cost of Sales	**17,291**	16,301	13,093	**990**	**6%**	3,208	25 %
	3,601	3,096	3,067				
Operating Expenses and Other	**1,933**	1,827	1,767				
Operating Profits	**$ 1,668**	$ 1,269	$ 1,300	**$ 399**	**31%**	$ (31)	(2)%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2019			2018		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic* / Operational*	**8%**	**8 %**	**18 %**	14%	17%	(8)%
Foreign currency (including P&WC net hedging)*	**—**	**—**	**(1)%**	—	1%	—
Acquisitions and divestitures, net	**—**	**—**	**(1)%**	—	—	—
Restructuring costs	**—**	**—**	**(11)%**	—	—	1 %
Other	**—**	**(2)%**	**26 %**	6%	7%	5 %
Total % change	**8%**	**6 %**	**31 %**	20%	25%	(2)%

* As discussed further in the "Business Overview" and "Results of Operations" sections, for Pratt & Whitney only, the transactional impact of foreign exchange hedging at P&WC has been netted against the translational foreign exchange impact for presentation purposes in the above table. For all other segments, these foreign exchange transactional impacts are included within the organic sales/operational operating profit caption in their respective tables. Due to its significance to Pratt & Whitney's overall operating results, we believe it is useful to segregate the foreign exchange transactional impact in order to clearly identify the underlying financial performance.

2019 Compared with 2018

The organic sales growth of 8% primarily reflects higher military sales (4%), higher commercial OEM sales (3%), and higher commercial aftermarket sales (1%).

The operational profit increase of 18% was primarily driven by:

- higher military margin contribution (13%), driven by the sales increase noted above
- higher OEM margin contribution (11%) primarily driven by continued year-over-year cost reduction and favorable mix on large commercial engine shipments

These increases were partially offset by:

- higher research and development costs (4%)
- higher selling, general and administrative expenses (3%)

The 26% increase in "Other" primarily reflects the absence of a prior year customer contract settlement.

2018 Compared with 2017

The organic sales increase of 14% primarily reflects higher commercial aftermarket sales (6%), higher commercial OEM sales (5%) and increased military sales (3%). The 6% increase in Other primarily reflects the impact of the adoption of the New Revenue Standard (4%) and the absence of a prior year customer contract matter (2%).

The operational profit decrease of 8% was primarily driven by:

- lower commercial OEM profit contribution (27%) primarily driven by higher negative engine margin on higher deliveries
- higher selling, general and administrative expenses (5%)
- the absence of the favorable impact from a prior year license agreement (4%)
- higher research and development costs (2%)

These decreases were partially offset by:

- higher commercial aftermarket profit contribution (23%), driven by the sales increase noted above
- higher military profit contribution (5%), driven by the sales increase noted above

The 5% increase in Other primarily reflects the favorable impact resulting from the adoption of the New Revenue Standard (13%) partially offset by the unfavorable year-over-year impact of contract settlements (8%).

Collins Aerospace Systems is a leading global provider of technologically advanced aerospace products and aftermarket service solutions for aircraft manufacturers, airlines, regional, business and general aviation markets, military and space operations. Collins Aerospace Systems' product portfolio includes electric power generation, power management and distribution systems, air data and aircraft sensing systems, engine control systems, intelligence, surveillance and reconnaissance systems, engine components, environmental control systems, fire and ice detection and protection systems, propeller systems, engine nacelle systems, including thrust reversers and mounting pylons, interior and exterior aircraft lighting, aircraft seating and cargo systems, actuation systems, landing systems, including landing gear and wheels and brakes, space products and subsystems, integrated avionics systems, precision targeting, electronic warfare and range and training systems, flight controls, communications systems, navigation systems, oxygen systems, simulation and training systems, food and beverage preparation, storage and galley systems, lavatory and wastewater management systems. Collins Aerospace Systems also designs, produces and supports cabin interior, communications and aviation systems and products and provides information management services through voice and data communication networks and solutions worldwide. Aftermarket services include spare parts, overhaul and repair, engineering and technical support, training and fleet management solutions, and information management services. Collins Aerospace Systems sells aerospace products and services to aircraft manufacturers, airlines and other aircraft operators, the U.S. and foreign governments, maintenance, repair and overhaul providers, and independent distributors.

				Total Increase (Decrease) Year-Over-Year for:			
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019 Compared with 2018**		2018 Compared with 2017	
Net Sales	**$ 26,028**	$ 16,634	$ 14,691	**$ 9,394**	**56%**	$ 1,943	13%
Cost of Sales	**18,702**	12,336	10,838	**6,366**	**52%**	1,498	14%
	7,326	4,298	3,853				
Operating Expenses and Other	**3,226**	1,995	1,662				
Operating Profits	**$ 4,100**	$ 2,303	$ 2,191	**$ 1,797**	**78%**	$ 112	5%

	Factors Contributing to Total % Increase (Decrease) Year-Over-Year in:					
	2019			2018		
	Net Sales	**Cost of Sales**	**Operating Profits**	Net Sales	Cost of Sales	Operating Profits
Organic / Operational	**6%**	**6 %**	**7 %**	8%	7%	10 %
Foreign currency translation	**—**	**(1)%**	**1 %**	—	1%	(1)%
Acquisitions and divestitures, net	**50%**	**46 %**	**68 %**	5%	6%	1 %
Restructuring costs	**—**	**—**	**3 %**	—	—	(4)%
Other	**—**	**1 %**	**(1)%**	—	—	(1)%
Total % change	**56%**	**52 %**	**78 %**	13%	14%	5 %

2019 Compared with 2018

The organic sales increase of 6% primarily reflects higher commercial aerospace aftermarket sales (5%) and higher military sales (2%), partially offset by lower commercial aerospace OEM sales (1%).

The operational profit increase of 7% primarily reflects:

- higher commercial aerospace margin contribution (10%) driven by the commercial aftermarket sales growth noted above, partially offset by lower commercial aerospace OEM margin contribution
- higher military margin contribution (4%) driven by the sales growth noted above

This increase was partially offset by:

- higher selling, general and administrative expenses (4%)
- higher research and development costs (3%)

2018 Compared with 2017

The organic sales growth of 8% primarily reflects higher commercial aftermarket and military sales (combined, 6%) and higher commercial aerospace OEM sales (2%).

The increase in operational profit of 10% primarily reflects:

- higher commercial aftermarket and military profit contribution (combined, 18%) primarily driven by the commercial aftermarket sales growth noted above
- higher commercial aerospace OEM profit contribution (3%)

These increases were partially offset by:

- higher selling, general, and administrative expenses (7%)
- higher warranty costs (4%)

Eliminations and other

	Net Sales			Operating Profits		
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019**	2018	2017
Eliminations and other	**$ (1,595)**	$ (1,356)	$ (1,167)	**$ (932)**	$ (236)	$ (81)
General corporate expenses	**—**	—	—	**(515)**	(475)	(439)

Eliminations and other reflects the elimination of sales, other income and operating profit transacted between segments, as well as the operating results of certain smaller businesses. The year-over-year increase in sales eliminations in 2019 as compared with 2018 reflects an increase in the amount of inter-segment eliminations, principally between our aerospace businesses. The year-over-year decrease in operating profit for 2019 as compared with 2018, is primarily driven by costs associated with the Company's intention to separate its commercial businesses, costs associated with the Raytheon merger, and the absence of the favorable impact of prior year insurance settlements, partially offset by lower year-over-year costs related to the Rockwell Acquisition.

LIQUIDITY AND FINANCIAL CONDITION

(DOLLARS IN MILLIONS)	2019	2018
Cash and cash equivalents	**$ 7,378**	$ 6,152
Total debt	**43,648**	45,537
Net debt (total debt less cash and cash equivalents)	**36,270**	39,385
Total equity	**44,231**	40,610
Total capitalization (total debt plus total equity)	**87,879**	86,147
Net capitalization (total debt plus total equity less cash and cash equivalents)	**80,501**	79,995
Total debt to total capitalization	**50%**	53%
Net debt to net capitalization	**45%**	49%

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing and financing activities. Our principal source of liquidity is operating cash flows from operations. For 2019 our cash flows from operations, net of capital expenditures was $6.6 billion. The 2019 cash flows from operations reflect cash payments associated with the Company's portfolio separation costs of approximately $400 million. In addition to operating cash flows, other significant factors that affect our overall management of liquidity include: capital expenditures, customer financing requirements, investments in businesses, dividends, common stock repurchases, pension funding, access to the commercial paper markets, adequacy of available bank lines of credit, redemptions of debt and the ability to attract long-term capital at satisfactory terms.

At December 31, 2019, we had cash and cash equivalents of $7.4 billion, of which approximately 56% was held by UTC's foreign subsidiaries. We manage our worldwide cash requirements by reviewing available funds among the many subsidiaries through which we conduct our business and the cost effectiveness with which those funds can be accessed. The Company no longer intends to reinvest certain undistributed earnings of its international subsidiaries that have been previously taxed in the U.S. As such, in 2018 it recorded the international taxes associated with the future remittance of these earnings. For the remainder of the Company's undistributed international earnings, unless tax effective to repatriate, UTC will continue to permanently reinvest these earnings. We repatriated $1.6 billion and $6.2 billion of overseas cash for the year ended December 31, 2019 and 2018, respectively.

On occasion, we are required to maintain cash deposits with certain banks with respect to contractual obligations related to acquisitions or divestitures or other legal obligations. As of December 31, 2019, 2018 and 2017, the amount of such restricted cash was approximately $42 million, $60 million and $33 million, respectively.

On November 26, 2018, we completed the acquisition of Rockwell Collins. The total aggregate consideration payable in the Merger was $15.5 billion in cash ($14.9 billion net of cash acquired) and 62.2 million shares of Company common stock. In addition, $7.8 billion of Rockwell Collins debt was outstanding as of the acquisition date. Refer to Note 2 of the Consolidated Financial Statements for additional discussion on the Rockwell Acquisition.

Our domestic pension funds experienced a positive return on assets of 19.8% during 2019 and a negative return on assets of 5.1% during 2018. Approximately 90% of these domestic pension plans' funds are invested in readily-liquid investments, including equity, fixed income, asset-backed receivables and structured products. The balance of these domestic pension plans' funds (10%) is invested in less-liquid but market-valued investments, including real estate and private equity. As part of the Rockwell Collins acquisition on November 26, 2018, we assumed approximately $3.7 billion of projected pension benefit obligations and $3.4 billion of plan assets. As part of our long-term strategy to de-risk our defined benefit pension plans, we made discretionary contributions of approximately $1.9 billion to our domestic defined benefit pension plans in 2017.

The funded status of our defined benefit pension plans is dependent upon many factors, including returns on invested assets, the level of market interest rates and actuarial mortality assumptions. We can contribute cash or UTC shares to our plans at our discretion, subject to applicable regulations. As of December 31, 2019, the total investment by the global defined benefit pension plans in the Company's securities was less than 1% of total plan assets. Our qualified domestic defined benefit pension plans are approximately 99% funded on a projected benefit obligation basis as of December 31, 2019, and we are not required to make additional contributions through the end of 2025. We expect to make total contributions of approximately $125 million to our global defined benefit pension plans in 2020. Contributions to our global defined benefit pension plans in 2020 are expected to meet or exceed the current funding requirements.

Historically, our strong debt ratings and financial position have enabled us to issue long-term debt at favorable market rates. Our ability to obtain debt financing or additional credit facilities at comparable risk-based interest rates is partly a function of our existing debt-to-total-capitalization level as well as our credit standing. Our debt-to-total-capitalization decreased 300 basis points from 53% at December 31, 2018 to 50% at December 31, 2019. The average maturity of our long-term debt at December 31, 2019 is approximately 10 years.

At December 31, 2019, we had revolving credit agreements with various banks permitting aggregate borrowings of up to $10.35 billion pursuant to a $2.20 billion revolving credit agreement and a $2.15 billion multicurrency revolving credit agreement, both of which expire in August 2021; and a $2.0 billion revolving credit agreement and a $4.0 billion term credit agreement, both of which we entered into on March 15, 2019 and which will expire on March 15, 2021 or, if earlier, the date that is 180 days after the date on which each of the separations of Otis and Carrier have been consummated. As of December 31, 2019, we drew down $2.1 billion on the term credit agreement to pay current debt maturities. There were no borrowings on any of the other agreements. The undrawn portions of the revolving credit agreements are also available to serve as backup facilities for the issuance of commercial paper.

As of December 31, 2019, our maximum commercial paper borrowing limit was $6.35 billion. We had no commercial paper borrowings outstanding at December 31, 2019. We use our commercial paper borrowings for general corporate purposes, including the funding of potential acquisitions, pension contributions, debt refinancing, dividend payments and repurchases of our common stock. The need for commercial paper borrowings arises when the use of domestic cash for general corporate purposes exceeds the sum of domestic cash generation and foreign cash repatriated to the U.S.

We have an existing universal shelf registration statement filed with the SEC for an indeterminate amount of debt and equity securities for future issuance, subject to our internal limitations on the amount of debt to be issued under this shelf registration statement.

We had no debt issuances in 2019 and the following issuances of debt in 2018 and 2017:

(DOLLARS AND EUROS IN MILLIONS)

Issuance Date	Description of Notes	Aggregate Principal Balance
August 16, 2018:	3.350% notes due 2021 [1]	$ 1,000
	3.650% notes due 2023 [1]	2,250
	3.950% notes due 2025 [1]	1,500
	4.125% notes due 2028 [1]	3,000
	4.450% notes due 2038 [1]	750
	4.625% notes due 2048 [2]	1,750
	LIBOR plus 0.65% floating rate notes due 2021 [1]	750
May 18, 2018:	1.150% notes due 2024 [3]	€ 750
	2.150% notes due 2030 [3]	500
	EURIBOR plus 0.20% floating rate notes due 2020 [3]	750
November 13, 2017:	EURIBOR plus 0.15% floating rate notes due 2019 [2]	€ 750
May 4, 2017:	1.900% notes due 2020 [4]	$ 1,000
	2.300% notes due 2022 [4]	500
	2.800% notes due 2024 [4]	800
	3.125% notes due 2027 [4]	1,100
	4.050% notes due 2047 [4]	600

1 The net proceeds received from these debt issuances were used to partially finance the cash consideration portion of the purchase price for Rockwell Collins and fees, expenses and other amounts related to the acquisition of Rockwell Collins.

2 The net proceeds from these debt issuances were used to fund the repayment of commercial paper and for other general corporate purposes.

3 The net proceeds received from these debt issuances were used for general corporate purposes.

4 The net proceeds received from these debt issuances were used to fund the repayment at maturity of our 1.800% notes due 2017, representing $1.5 billion in aggregate principal and other general corporate purposes.

We made the following repayments of debt in 2019, 2018 and 2017:

(DOLLARS AND EUROS IN MILLIONS)

Repayment Date	Description of Notes	Aggregate Principal Balance
November 15, 2019	8.875% notes	$ 271
November 13, 2019	EURIBOR plus 0.15% floating rate notes	€ 750
November 1, 2019:	LIBOR plus 0.350% floating rate notes	$ 350
	1.500% notes	$ 650
July 15, 2019:	1.950% notes [1]	$ 300
	5.250% notes [1]	$ 300
December 14, 2018	Variable-rate term loan due 2020 (1 month LIBOR plus 1.25%) [1]	$ 482
May 4, 2018	1.778% junior subordinated notes	$ 1,100
February 22, 2018	EURIBOR plus 0.80% floating rate notes	€ 750
February 1, 2018	6.80% notes	$ 99
June 1, 2017	1.800% notes	$ 1,500

1 These notes and term loan were assumed in connection with the Rockwell Collins acquisition and subsequently repaid.

We believe our future operating cash flows will be sufficient to meet our future operating cash needs. Further, we continue to have access to the commercial paper markets and our existing credit facilities, and our ability to obtain debt or equity financing, as well as the availability under committed credit lines, provides additional potential sources of liquidity should they be required or appropriate.

Cash Flow—Operating Activities

(DOLLARS IN MILLIONS)	2019	2018	2017
Net cash flows provided by operating activities	**$ 8,883**	$ 6,322	$ 5,631

2019 Compared with 2018

Cash generated from operating activities in 2019 was approximately $2.6 billion higher than 2018. This increase is largely driven by an increase in Net income after adjustments for depreciation and amortization, deferred income tax provision, stock compensation costs, net periodic pension and other postretirement benefit, portfolio separation costs, and the gain on the sale of Taylor Company of $2.4 billion and working capital improvements of $0.9 billion, partially offset by outflows with other long term assets and liabilities of $0.9 billion. Reduced factoring activity resulted in a decrease of approximately $1.6 billion in cash flows from operating activities during the year ended December 31, 2019, as compared to the prior year. This decrease in factoring activity was primarily driven from an increase in funded factoring levels at Pratt & Whitney partially offset by increased factoring at Collins Aerospace Systems. Factoring activity does not reflect the factoring of certain receivables performed at customer request for which we are compensated by the customer for the extended collection cycle.

The 2019 cash flows provided by working capital were $175 million. Accounts receivable decreased $419 million primarily driven by a decrease in V2500 sales and lower collaborator receivables at Pratt & Whitney and an increase in factoring activity at Collins Aerospace. Accounts payable and accrued liabilities increased $1.2 billion. The Accounts payable increase is primarily driven by Pratt & Whitney due to an increase in collaborator payables. The increase in Accrued liabilities was driven by an increase in accrued costs for the Company's portfolio separation and various accruals at Collins Aerospace Systems and Pratt & Whitney. Contract liabilities, current increased $359 million driven by Collins Aerospace due to higher advanced billings. These inflows were partially offset by increases in Contract assets, current, Inventory and Other current assets. Contract assets, current increased $307 million due to work performed in excess of billings at Pratt & Whitney and Collins Aerospace. Inventory increased $1.2 billion to support higher sales volume at Collins Aerospace Systems and Pratt & Whitney. Other current assets increased $309 million due to increases in prepaid expenses at Pratt & Whitney.

Total cash contributions to our global defined benefit pension plans were $118 million, $147 million and $2,112 million during 2019, 2018 and 2017, respectively.

2018 Compared with 2017

Cash generated from operating activities in 2018 was approximately $691 million higher than 2017. Cash outflows for working capital increased $703 million over the prior period to support higher top line organic growth. Factoring activity resulted in a decrease of approximately $148 million in cash generated from operating activities during the year ended, December 31, 2018, as compared to the prior year. This decrease was primarily driven from lower factoring levels at Pratt & Whitney and Carrier. Factoring activity does not reflect the factoring of certain aerospace receivables performed at customer request for which we are compensated by the customer for the extended collection cycle.

The 2018 cash outflows from working capital were $755 million. Accounts receivable increased approximately $2.4 billion due to an increase in sales volume. Contract assets, current increased $604 million due to costs in excess of billings primarily at Pratt & Whitney driven by military engines, at Otis due to progression on major projects, and at Collins Aerospace Systems. Inventory increased $537 million primarily driven by an increase in production for the Geared Turbofan at Pratt & Whitney, increases at Carrier to support higher sales volume and increases at Collins Aerospace Systems. This was partially offset by decreases in Other assets of $161 million primarily due to tax refunds received, an increase in Accounts payable and accrued liabilities of approximately $2.4 billion, driven by higher inventory purchasing activity at Pratt & Whitney and higher direct material purchases at Collins Aerospace Systems, as well as an increase in Contract liabilities, current of $205 million driven by progress payments on major contracts and seasonal advanced billings at Otis.

Cash Flow—Investing Activities

(DOLLARS IN MILLIONS)	2019	2018	2017
Net cash flows used in investing activities	**$ (3,092)**	$ (16,973)	$ (3,019)

2019 Compared with 2018

Cash flows used in investing activities for 2019 and 2018 primarily reflect capital expenditures, cash investments in customer financing assets, investments/dispositions of businesses, payments related to our collaboration intangible assets and contractual rights to provide product on new aircraft platforms, and settlements of derivative contracts. The $13.9 billion decrease in cash flows used in investing activities in 2019 the compared to 2018 primarily relates to the absence of cash paid to acquire Rockwell Collins of $14.9 billion in November 2018 and the absence of $1 billion in proceeds from the sale of Taylor Company in June 2018 by Carrier.

Capital expenditures in 2019 ($2.3 billion) primarily relate to several projects at Collins Aerospace Systems and investments in production and aftermarket capacity at Pratt & Whitney.

Cash investments in businesses in 2019 ($56 million) primarily consisted of several acquisitions at Otis. Dispositions of businesses in 2019 ($138 million) primarily consisted of the businesses sold in connection with the Rockwell Collins acquisition.

Customer financing assets is primarily driven by additional Geared Turbofan engines to support customer fleets and was a use of cash of $787 million and $988 million in 2019 and 2018, respectively. The decrease in the source of cash related to customer financing assets of $129 million in 2019 compared to $606 million in 2018 is driven by lower repayments on customer financing. At December 31, 2019, we had commercial aerospace financing and other contractual commitments of approximately $15.0 billion related to commercial aircraft and certain contractual rights to provide product on new aircraft platforms, of which as much as $1.6 billion may be required to be disbursed during 2020. As discussed in Note 1 to the Consolidated Financial Statements, we have entered into certain collaboration arrangements, which may include participation by our collaborators in these commitments. At December 31, 2019, our collaborators' share of these commitments was approximately $5.3 billion of which as much as $508 million may be required to be disbursed to us during 2020. Refer to Note 4 to the Consolidated Financial Statements for additional discussion of our commercial aerospace industry assets and commitments.

In 2019, we increased our collaboration intangible assets by approximately $351 million, which primarily relates to payments made under our 2012 agreement to acquire Rolls-Royce's collaboration interests in IAE.

As discussed in Note 14 to the Consolidated Financial Statements, we enter into derivative instruments for risk management purposes only, including derivatives designated as hedging instruments under the Derivatives and Hedging Topic of the FASB ASC and those utilized as economic hedges. We operate internationally and, in the normal course of business, are exposed to fluctuations in interest rates, foreign exchange rates and commodity prices. These fluctuations can increase the costs of financing, investing and operating the business. We have used derivative instruments, including swaps, forward contracts and options to manage certain foreign currency, interest rate and commodity price exposures. During the years ended December 31, 2019 and 2018, we had net cash receipts of approximately $336 million and $143 million, respectively, from the settlement of these derivative instruments.

2018 Compared with 2017

Cash flows used in investing activities for 2018 and 2017 primarily reflect capital investments/dispositions of businesses, expenditures, cash investments in customer financing assets, payments related to our collaboration intangible assets and contractual rights to provide product on new aircraft platforms and settlements of derivative contracts. The $14 billion increase in cash flows used in investing activities from the prior year primarily relates to the $14.9 billion of cash paid for the acquisition of Rockwell Collins (net of cash acquired) and the absence of $596 million in net proceeds received from Carrier's sale of investments in Watsco, Inc. in 2017, partially offset by proceeds from the sale of Taylor Company in June 2018 by Carrier of $1.0 billion, a decrease in customer financing assets of $593 million and $143 million in receipts from settlements of derivative contracts compared to payments of $317 million in 2017.

Capital expenditures in 2018 ($1,902 million) primarily relate to investments in production capacity at Pratt & Whitney, investments in production capacity and several small projects at Collins Aerospace Systems, and new facilities and investments in products and information technology at Carrier, and investments in digital and information technology at Otis.

Cash investments in businesses (net of cash acquired) in 2018 ($15.4 billion) primarily relate to the acquisition of Rockwell Collins in November 2018. Dispositions of businesses in 2018 of $1.1 billion primarily relate to the sale of Taylor Company.

Customer financing activities, primarily driven by additional Geared Turbofan engines to support customer fleets, were a net use of cash of $382 million and $975 million in 2018 and 2017, respectively. At December 31, 2018, we had commercial aerospace financing and other contractual commitments of approximately $15.5 billion related to commercial aircraft and certain contractual rights to provide product on new aircraft platforms, of which as much as $1.7 billion have been be required to be disbursed during 2019. At December 31, 2018, our collaborators' share of these commitments was approximately $5.3 billion of which as much as $468 million may have been required to be dispersed to us during 2019.

In 2018, we increased our collaboration intangible assets by approximately $400 million, which primarily relates to payments made under our 2012 agreement to acquire Rolls-Royce's collaboration interests in IAE.

Cash Flow—Financing Activities

(DOLLARS IN MILLIONS)	2019	2018	2017
Net cash flows (used in) provided by financing activities	**$ (4,564)**	$ 7,965	$ (993)

2019 Compared with 2018

Our financing activities primarily include the issuance and repayment of short-term and long-term debt, payment of dividends and stock repurchases. Financing activities was a cash outflow of $4.6 billion in 2019 compared to a cash inflow of $8.0 billion in 2018. This change is driven by the absence of $13.5 billion of long-term debt issuances in the prior year which was primarily utilized to fund the Rockwell Acquisition, an increase in debt repayments of $0.3 billion, an increase in dividends paid on common stock of $0.3 billion, partially offset by an increase in short term borrowings of $1.3 billion and a reduction in common stock repurchases of $0.2 billion.

Commercial paper borrowings and revolving credit facilities provide short-term liquidity to supplement operating cash flows and are used for general corporate purposes, including the funding of potential acquisitions and repurchases of our stock. We had no outstanding commercial paper at December 31, 2019.

At December 31, 2019, management had remaining authority to repurchase approximately $1.8 billion of our common stock under the October 14, 2015 share repurchase program. Under this program, shares may be purchased on the open market, in privately negotiated transactions, under accelerated share repurchase programs, and under plans complying with Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended. We may also reacquire shares outside of the program from time to time in connection with the surrender of shares to cover taxes on vesting of restricted stock and as required under our employee savings plan. Our ability to repurchase shares is subject to applicable law, including restrictions arising from the pending merger transaction with Raytheon. We made cash payments of approximately $151 million to repurchase approximately 1.1 million shares of our common stock during the year ended December 31, 2019.

We paid aggregate dividends on common stock of approximately $2.4 billion and $2.2 billion in 2019 and 2018, respectively. On February 3, 2020, the Board of Directors declared a dividend of $0.735 per share payable March 10, 2020 to shareowners of record at the close of business on February 14, 2020.

2018 Compared with 2017

Net cash provided by financing activities increased $8,958 million in 2018 compared to the prior year due to an increase in long-term debt issuances of $8.5 billion, including the $11 billion issued in 2018 for the financing of the Rockwell Collins acquisition, and a decrease in repurchases of common stock of $1.1 billion, partially offset by an increase in repayments of long-term debt of $0.9 billion.

We had approximately $1.3 billion of outstanding commercial paper at December 31, 2018.

We made cash payments of approximately $325 million to repurchase approximately 2.7 million shares of our common stock during the year ended December 31, 2018.

We paid aggregate dividends on common stock of approximately $2.2 billion and $2.1 billion in 2018 and 2017, respectively.

CRITICAL ACCOUNTING ESTIMATES

Preparation of our financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses. Note 1 to the Consolidated Financial Statements describes the significant accounting policies used in preparation of the Consolidated Financial Statements. Management believes the most complex and sensitive judgments, because of their significance to the Consolidated Financial Statements, result primarily from the need to make estimates about the effects of matters that are inherently uncertain. The most significant areas involving management judgments and estimates are described below. Actual results in these areas could differ from management's estimates.

Long-Term Contract Accounting. As described in Note 1, several of our businesses use an over-time revenue recognition model. Revenue is recognized on an over-time basis using an input method for repair contracts within Otis and Carrier; certain U.S. Government and commercial aerospace equipment contracts; and aerospace aftermarket service work. We measure progress toward completion for these contracts using costs incurred to date relative to total estimated costs at completion. This over-time basis using an input method requires estimates of future revenues and costs over the full term of product and/or service delivery. Incurred costs represent work performed, which correspond with and best depict transfer of control to the customer. Contract costs are incurred over a period of time, which can be several years, and the estimation of these costs requires management's judgment.

The long-term nature of these contracts, the complexity of the products, and the strict safety and performance standards under which they are regulated can affect our ability to estimate costs precisely. As a result, we review our cost estimates on significant contracts on a quarterly basis and for others, at least annually or when circumstances change and warrant a modification to a previous estimate. We record changes in contract estimates using the cumulative catch-up method.

Costs incurred for engineering and development of aerospace products under contracts with customers are capitalized as contract fulfillment costs, to the extent recoverable from the associated contract margin, and subsequently amortized as the OEM products are delivered to the customer. The estimation of contract margin requires management's judgment.

Income Taxes. The future tax benefit arising from deductible temporary differences and tax carryforwards was $5.2 billion at December 31, 2019 and $4.7 billion at December 31, 2018. Management believes that our earnings during the periods when the temporary differences become deductible will be sufficient to realize the related future income tax benefits, which may be realized over an extended period of time. For those jurisdictions where the expiration date of tax carryforwards or the projected operating results indicate that realization is not likely, a valuation allowance is provided.

In assessing the need for a valuation allowance, we estimate future taxable income, considering the feasibility of ongoing tax planning strategies and the realizability of tax loss carryforwards. Valuation allowances related to deferred tax assets can be affected by changes to tax laws, changes to statutory tax rates and future taxable income levels. In the event we were to determine that we would not be able to realize all or a portion of our deferred tax assets in the future, we would reduce such amounts through an increase to tax expense in the period in which that determination is made or when tax law changes are enacted. Conversely, if we were to determine that we would be able to realize our deferred tax assets in the future in excess of the net carrying amounts, we would decrease the recorded valuation allowance through a decrease to tax expense in the period in which that determination is made.

In the ordinary course of business there is inherent uncertainty in quantifying our income tax positions. We assess our income tax positions and record tax benefits for all years subject to examination based upon management's evaluation of the facts, circumstances and information available at the reporting date. For those tax positions where it is more likely than not that a tax benefit will be sustained, we have recorded the largest amount of tax benefit with a greater than 50% likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. In addition, we have entered into certain internal legal entity restructuring transactions necessary to effectuate the separation transactions. We have accrued tax on these transactions based on our interpretation of the applicable tax laws and our determination of appropriate entity valuations. See Notes 1 and 11 to the Consolidated Financial Statements for further discussion. Also see Note 18 for discussion of UTC administrative review proceedings with the German Tax Office.

See Note 11 to the Consolidated Financial Statements for additional tax provision items.

Goodwill and Intangible Assets. Our investments in businesses net of cash acquired in 2019 totaled $56 million. The assets and liabilities of acquired businesses are recorded under the acquisition method of accounting at their estimated fair values at the dates of acquisition. Goodwill represents costs in excess of fair values assigned to the underlying identifiable net assets of acquired businesses. Intangible assets consist of service portfolios, patents, trademarks/tradenames, customer relationships and other intangible assets including a collaboration asset established in connection with our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE AG, as discussed in Note 2 to the Consolidated Financial Statements. The fair value for acquired customer relationship intangibles is determined as of the acquisition date based on estimates and judgments regarding expectations for the future after-tax cash flows arising from the follow-on revenue from customer relationships that existed on the acquisition date over their estimated lives, including the probability of expected future contract renewals and revenue, less a contributory assets charge, all of which is discounted to present value. The fair value of the tradename intangible assets were determined utilizing the relief from royalty method which is a form of the income approach. Under this method, a royalty rate based on observed market royalties is applied to projected revenue supporting the tradename and discounted to present value using an appropriate discount rate. See Note 2 to the Consolidated Financial Statements for further details.

Also included within other intangible assets are payments made to secure certain contractual rights to provide products on new commercial aerospace platforms. Such payments are capitalized when there are distinct rights obtained and there are sufficient incremental cash flows to support the recoverability of the assets established. Otherwise, the applicable portion of the payments are expensed. Capitalized payments made on these contractual commitments are amortized as a reduction of sales. We amortize these intangible assets based on the pattern of economic benefit, which typically results in an amortization method other than straight-line. In the aerospace industry, amortization based on the pattern of economic benefit generally results in lower amortization expense during the development period with increasing amortization expense as programs enter full production and aftermarket cycles. If a pattern of economic benefit cannot be reliably determined, a straight-line amortization method is used. The gross value of these contractual commitments at December 31, 2019 was approximately $12.3 billion, of which approximately $3.2 billion has been paid to date. We record these payments as intangible assets when such payments are no longer conditional. The recoverability of these intangibles is dependent upon the future success and profitability of the underlying aircraft platforms including the associated aftermarket revenue streams.

Goodwill and intangible assets deemed to have indefinite lives are not amortized, but are subject to annual, or more frequent if necessary, impairment testing using the guidance and criteria described in the Intangibles—Goodwill and Other Topic of the FASB ASC. A goodwill impairment loss is measured at the amount by which a reporting unit's carrying value exceeds its fair value, without exceeding the recorded amount of goodwill. In developing our estimates for the fair value of our reporting units, significant judgment is required in the determination of the appropriateness of using a qualitative assessment or quantitative assessment. For these quantitative assessments that are performed, fair value is primarily based on income approaches using discounted cash flow models and relief from royalty models, respectively, which have significant assumptions including revenue growth rates, projected operating income, terminal growth rates, discount rates and royalty rates. Such assumptions are subject to variability from year to year and are directly impacted by global market conditions. We completed our annual impairment testing as of July 1, 2019 and determined that no significant adjustments to the carrying value of goodwill or indefinite lived intangible assets were necessary. Although these assets are not currently impaired, there can be no assurance that future impairments will not occur. See Note 2 to the Consolidated Financial Statements for further discussion.

Contingent Liabilities. Our operating units include businesses which sell products and services and conduct operations throughout the world. As described in Note 18 to the Consolidated Financial Statements, contractual, regulatory and other matters, including asbestos claims, in the normal course of business may arise that subject us to claims or litigation. Of note, the design, development, production and support of new aerospace technologies is inherently complex and subject to risk. Since the PW1000G Geared Turbofan engine entered into service in 2016, technical issues have been identified and experienced with the engine, which is typical for new engines and new aerospace technologies. Pratt & Whitney has addressed these issues through various improvements and modifications. These issues have resulted in financial impacts, including increased warranty provisions, customer contract settlements, and reductions in contract performance estimates. Additional technical issues may also arise in the normal course, which may result in financial impacts that could be material to the Company's financial position, results of operations and cash flows.

Additionally, we have significant contracts with the U.S. Government, subject to government oversight and audit, which may require significant adjustment of contract prices. We accrue for liabilities associated with these matters when it is probable that a liability has been incurred and the amount can be reasonably estimated. The most likely cost to be incurred is accrued based on an evaluation of then currently available facts with respect to each matter. When no amount within a range of estimates is more likely, the minimum is accrued. The inherent uncertainty related to the outcome of these matters can result in amounts materially different from any provisions made with respect to their resolution.

Employee Benefit Plans. We sponsor domestic and foreign defined benefit pension and other postretirement plans. Major assumptions used in the accounting for these employee benefit plans include the discount rate, expected return on plan assets, rate of increase in employee compensation levels, mortality rates, and health care cost increase projections. Assumptions are determined based on company data and appropriate market indicators, and are evaluated each year at December 31. A change in any of these assumptions would have an effect on net periodic pension and postretirement benefit costs reported in the Consolidated Financial Statements.

In the following table, we show the sensitivity of our pension and other postretirement benefit plan liabilities and net periodic cost to a 25 basis point change in the discount rates for benefit obligations, interest cost and service cost as of December 31, 2019:

(DOLLARS IN MILLIONS)	Increase in Discount Rate of 25 bps	Decrease in Discount Rate of 25 bps
Pension plans		
Projected benefit obligation	$ (1,141)	$ 1,198
Net periodic pension (benefit) cost	(5)	7
Other postretirement benefit plans [1]		
Accumulated postretirement benefit obligation	(11)	12

1 The impact on net periodic postretirement (benefit) cost is less than $1M.

These estimates assume no change in the shape or steepness of the company-specific yield curve used to plot the individual spot rates that will be applied to the future cash outflows for future benefit payments in order to calculate interest and service cost. A flattening of the yield curve, from a narrowing of the spread between interest and obligation discount rates, would increase our net periodic pension cost. Conversely, a steepening of the yield curve, from an increase in the spread between interest and obligation discount rates, would decrease our net periodic pension cost.

Pension expense is also sensitive to changes in the expected long-term rate of asset return. An increase or decrease of 25 basis points in the expected long-term rate of asset return would have decreased or increased 2019 pension expense by approximately $89 million.

The weighted-average discount rates used to measure pension liabilities and costs are set by reference to UTC-specific analyses using each plan's specific cash flows and are then compared to high-quality bond indices for reasonableness. For our significant plans, we utilize a full yield curve approach in the estimation of the service cost and interest cost components by applying the specific spot rates along the yield curve used in determination of the benefit obligation to the relevant projected cash flows. Global market interest rates have decreased in 2019 as compared with 2018 and, as a result, the weighted-average discount rate used to measure pension liabilities decreased from 4.0% in 2018 to 3.0% in 2019. The weighted-average discount rates used to measure service cost and interest cost was 3.6% in 2019. Across our global pension plans, the amendment to our domestic pension plans to cease accrual of additional benefits and domestic pension plan merger, partially offset by reduction in expected return on assets for 2020, will result in a net periodic pension benefit in 2020 consistent with 2019 amounts.

See Note 12 to the Consolidated Financial Statements for further discussion.

OFF-BALANCE SHEET ARRANGEMENTS AND CONTRACTUAL OBLIGATIONS

We extend a variety of financial guarantees to third parties in support of unconsolidated affiliates and for potential financing requirements of commercial aerospace customers. We also have obligations arising from sales of certain businesses and assets, including indemnities for representations and warranties and environmental, health and safety, tax and employment matters. Circumstances that could cause the contingent obligations and liabilities arising from these arrangements to come to fruition include changes in an underlying transaction (e.g., hazardous waste discoveries, etc.), nonperformance under a contract, customer requests for financing, or deterioration in the financial condition of the guaranteed party.

A summary of our consolidated contractual obligations and commitments as of December 31, 2019 is as follows:

		Payments Due by Period			
(DOLLARS IN MILLIONS)	Total	2020	2021-2022	2023-2024	Thereafter
Long-term debt—principal	$ 41,599	$ 3,496	$ 8,061	$ 6,093	$ 23,949
Long-term debt—future interest	16,865	1,400	2,535	2,136	10,794
Operating leases	3,147	641	952	540	1,014
Purchase obligations	15,334	10,845	4,050	374	65
Other long-term liabilities	3,750	1,020	1,215	491	1,024
Total contractual obligations	$ 80,695	$ 17,402	$ 16,813	$ 9,634	$ 36,846

Purchase obligations include amounts committed for the purchase of goods and services under legally enforceable contracts or purchase orders. Where it is not practically feasible to determine the legally enforceable portion of our obligation under certain of our long-term purchase agreements, we include additional expected purchase obligations beyond what is legally enforceable. Approximately 19% of the purchase obligations disclosed above represent purchase orders for products to be delivered under firm contracts with the U.S. Government for which we have full recourse under customary contract termination clauses.

Other long-term liabilities primarily include those amounts on our December 31, 2019 balance sheet representing obligations under product service and warranty policies, performance and operating cost guarantees, estimated environmental remediation costs and expected contributions under employee benefit programs. The timing of expected cash flows associated with these obligations is based upon management's estimates over the terms of these agreements and is largely based upon historical experience.

In connection with the acquisitions of Rockwell Collins in 2018 and Goodrich in 2012, we recorded assumed liabilities of approximately $1.03 billion and $2.2 billion, respectively related to customer contractual obligations on certain programs with terms less favorable than could be realized in market transactions as of the acquisition date. These liabilities are being liquidated in accordance with the underlying pattern of obligations, as reflected by the net cash outflows incurred on the contracts. Total consumption of the contractual obligations for the year ended December 31, 2019 was approximately $345 million. Total future consumption of the contractual obligations is expected to be as follows: $263 million in 2020, $189 million in 2021, $148 million in 2022, $118 million in 2023, $127 million in 2024 and $563 million thereafter. These amounts are not included in the table above.

The above table also does not reflect unrecognized tax benefits of $1,347 million, the timing of which is uncertain, except for approximately $24 million that may become payable during 2020. Refer to Note 11 to the Consolidated Financial Statements for additional discussion on unrecognized tax benefits.

COMMERCIAL COMMITMENTS

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

		Amount of Commitment Expiration per Period			
(DOLLARS IN MILLIONS)	Committed	2020	2021-2022	2023-2024	Thereafter
Commercial aerospace financing commitments	$ 3,937	$ 911	$ 2,093	$ 863	$ 70
Other commercial aerospace commitments	11,055	702	1,453	1,295	7,605
Commercial aerospace financing arrangements	333	11	10	—	312
Performance guarantees	48	4	—	39	5
Total commercial commitments	$ 15,373	$ 1,628	$ 3,556	$ 2,197	$ 7,992

In connection with our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE AG, additional payments are due to Rolls-Royce contingent upon each hour flown through June 2027 by the V2500-powered aircraft in service as of the acquisition date. These flight hour payments, included in "Other commercial aerospace commitments" in the table above, are being capitalized as collaboration intangible assets. The collaboration intangible assets are amortized based upon the pattern of economic benefit as represented by the underlying cash flows.

We also have other contractual commitments, including commitments to secure certain contractual rights to provide product on new aircraft platforms, which are included in "Other commercial aerospace commitments" in the table above. Such payments are capitalized when distinct rights are obtained and there are sufficient incremental cash flows to support the recoverability of the assets established. Otherwise, the applicable portion of the payments are expensed. Capitalized payments made on these contractual commitments are included in intangible assets and are amortized over the term of underlying economic benefit.

Refer to Notes 1, 4 and 17 to the Consolidated Financial Statements for additional discussion on contractual and commercial commitments.

MARKET RISK AND RISK MANAGEMENT

We are exposed to fluctuations in foreign currency exchange rates, interest rates and commodity prices. To manage certain of those exposures, we use derivative instruments, including swaps, forward contracts and options. Derivative instruments utilized by us in our hedging activities are viewed as risk management tools, involve relatively little complexity and are not used for trading or speculative purposes. We diversify the counterparties used and monitor the concentration of risk to limit our counterparty exposure.

We have evaluated our exposure to changes in foreign currency exchange rates, interest rates and commodity prices in our market risk sensitive instruments, which are primarily cash, debt, and derivative instruments, using a value at risk analysis. Based on a 95% confidence level and a one-day holding period, at December 31, 2019, the potential loss in fair value on our market risk sensitive instruments was not material in relation to our financial position, results of operations or cash flows. Our calculated value at risk exposure represents an estimate of reasonably possible net losses based on volatilities and correlations and is not necessarily indicative of actual results. Refer to Notes 1, 9 and 14 to the Consolidated Financial Statements for additional discussion of foreign currency exchange, interest rates and financial instruments.

Foreign Currency Exposures. We have a large volume of foreign currency exposures that result from our international sales, purchases, investments, borrowings and other international transactions. International segment sales, excluding U.S. export sales, averaged approximately $27 billion over the last three years. We actively manage foreign currency exposures that are associated with committed foreign currency purchases and sales, and other assets and liabilities created in the normal course of business at the operating unit level. More than insignificant exposures that cannot be naturally offset within an operating unit are hedged with foreign currency derivatives. We also have a significant amount of foreign currency net asset exposures. As discussed in Note 9 to the Consolidated Financial Statements, at December 31, 2019 we have approximately €4.20 billion of euro-denominated long-term debt, which qualifies as a net investment hedge against our investments in European businesses. As of December 31, 2019, the net investment hedge is deemed to be effective. Currently, we do not hold any derivative contracts that hedge our foreign currency net asset exposures but may consider such strategies in the future.

Within aerospace, our sales are typically denominated in U.S. Dollars under accepted industry convention. However, for our non-U.S. based entities, such as P&WC, a substantial portion of their costs are incurred in local currencies. Consequently, there is a foreign currency exchange impact and risk to operational results as U.S. Dollars must be converted to local currencies such as the Canadian Dollar in order to meet local currency cost obligations. Additionally, we transact business in various foreign currencies which exposes our cash flows and earnings to changes in foreign currency exchange rates. In order to minimize the exposure that exists from changes in the exchange rate of the U.S. Dollar against these other currencies, we hedge a certain portion of sales to secure the rates at which U.S. Dollars will be converted. The majority of this hedging activity occurs at P&WC and Collins Aerospace Systems, and hedging activity also occurs to a lesser extent at the remainder of Pratt & Whitney. At P&WC and Collins Aerospace Systems, firm and forecasted sales for both original equipment and spare parts are hedged at varying amounts for up to 49 months on the U.S. Dollar sales exposure as represented by the excess of U.S. Dollar sales over U.S. Dollar denominated purchases. Hedging gains and losses resulting from movements in foreign currency exchange rates are partially offset by the foreign currency translation impacts that are generated on the translation of local currency operating results into U.S. Dollars for reporting purposes. While the objective of the hedging program is to minimize the foreign currency exchange impact on operating results, there are typically variances between the hedging gains or losses and the translational impact due to the length of hedging contracts, changes in the sales profile, volatility in the exchange rates and other such operational considerations.

Interest Rate Exposures. Our long-term debt portfolio consists mostly of fixed-rate instruments. From time to time, we may hedge to floating rates using interest rate swaps. The hedges are designated as fair value hedges and the gains and losses on the swaps are reported in interest expense, reflecting that portion of interest expense at a variable rate. We issue commercial paper, which exposes us to changes in interest rates. Currently, we do not hold any derivative contracts that hedge our interest exposures, but may consider such strategies in the future.

Commodity Price Exposures. We are exposed to volatility in the prices of raw materials used in some of our products and from time to time we may use forward contracts in limited circumstances to manage some of those exposures. In the future, if hedges are used, gains and losses may affect earnings. There were no significant outstanding commodity hedges as of December 31, 2019.

ENVIRONMENTAL MATTERS

Our operations are subject to environmental regulation by federal, state and local authorities in the United States and regulatory authorities with jurisdiction over our foreign operations. As a result, we have established, and continually update, policies relating to environmental standards of performance for our operations worldwide. We believe that expenditures necessary to comply with the present regulations governing environmental protection will not have a material effect upon our competitive position, results of operations, cash flows or financial condition.

We have identified 773 locations, mostly in the United States, at which we may have some liability for remediating contamination. We have resolved our liability at 363 of these locations. We do not believe that any individual location's exposure will have a material effect on our results of operations. Sites in the investigation, remediation or operation and maintenance stage represent approximately 91% of our accrued environmental remediation reserve.

We have been identified as a potentially responsible party under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund) at 129 sites. The number of Superfund sites, in and of itself, does not represent a relevant measure of liability because the nature and extent of environmental concerns vary from site to site and our share of responsibility varies from sole responsibility to very little responsibility. In estimating our liability for remediation, we consider our likely proportionate share of the anticipated remediation expense and the ability of other potentially responsible parties to fulfill their obligations.

At December 31, 2019 and 2018, we had $896 million and $830 million reserved for environmental remediation, respectively. Cash outflows for environmental remediation were $52 million in 2019, $48 million in 2018 and $42 million in 2017. We estimate that ongoing environmental remediation expenditures in each of the next two years will not exceed approximately $100 million.

ASBESTOS MATTERS

The estimated range of total liabilities to resolve all pending and unasserted potential future asbestos claims through 2059 is approximately $330 million to $400 million. Where no amount within a range of estimates is more likely, the minimum is accrued. We have recorded the minimum amount of $330 million, which is principally recorded in Other long-term liabilities on our Consolidated Balance Sheet as of December 31, 2019. This amount is on a pre-tax basis, not discounted, and excludes the Company's legal fees to defend the asbestos claims (which will continue to be expensed by the Company as they are incurred). In addition, the Company has an insurance recovery receivable for probable asbestos related recoveries of approximately $140 million, which is included primarily in Other assets on our Consolidated Balance Sheet as of December 31, 2019. See Note 18 "Contingent Liabilities" of our Consolidated Financial Statements for further discussion of this matter.

GOVERNMENT MATTERS

As described in "Critical Accounting Estimates—Contingent Liabilities," our contracts with the U.S. Government are subject to audits. Such audits may recommend that certain contract prices should be reduced to comply with various government regulations, or that certain payments be delayed or withheld. We are also the subject of one or more investigations and legal proceedings initiated by the U.S. Government with respect to government contract matters. See "Legal Proceedings" in Item 1 to this Form 10-K, and Note 11 "Income Taxes" and Note 18 "Contingent Liabilities" of our Consolidated Financial Statements for further discussion of these and other government matters.

Cautionary Note Concerning Factors That May Affect Future Results

This 2019 Annual Report to Shareowners (2019 Annual Report) contains statements which, to the extent they are not statements of historical or present fact, constitute "forward-looking statements" under the securities laws. From time to time, oral or written forward-looking statements may also be included in other information released to the public. These forward-looking statements are intended to provide management's current expectations or plans for our future operating and financial performance, based on assumptions currently believed to be valid. Forward-looking statements can be identified by the use of words such as "believe," "expect," "expectations," "plans," "strategy," "prospects," "estimate," "project," "target," "anticipate," "will," "should," "see," "guidance," "outlook," "confident," "on track" and other words of similar meaning. Forward-looking statements may include, among other things, statements relating to future sales, earnings, cash flow, results of operations, uses of cash, share repurchases, tax rates, R&D spend, other measures of financial performance, potential future plans, strategies or transactions, credit ratings and net indebtedness, other anticipated benefits of the Rockwell Acquisition, the proposed merger with Raytheon or the spin-offs by UTC of Otis and Carrier into separate independent companies (the "separation transactions"), including estimated synergies and customer cost savings resulting from the proposed merger, the expected timing of completion of the proposed merger and the separation transactions, estimated costs associated with such transactions and other statements that are not historical facts. All forward-looking statements involve risks, uncertainties and other factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements. For those statements, we claim the protection of the safe harbor for forward-looking statements contained in the U.S. Private Securities Litigation Reform Act of 1995. Such risks, uncertainties and other factors include, without limitation:

- the effect of economic conditions in the industries and markets in which we and Raytheon operate in the U.S. and globally and any changes therein, including financial market conditions, fluctuations in commodity prices, interest rates and foreign currency exchange rates, levels of end market demand in construction and in both the commercial and defense segments of the aerospace industry, levels of air travel, financial condition of commercial airlines, the impact of pandemic health issues, aviation safety concerns, weather conditions and natural disasters, the financial condition of our customers and suppliers, and the risks associated with U.S. government sales (including changes or shifts in defense spending due to budgetary constraints, spending cuts resulting from sequestration, a government shutdown, or otherwise, and uncertain funding of programs);
- challenges in the development, production, delivery, support, performance and realization of the anticipated benefits (including our expected returns under customer contracts) of advanced technologies and new products and services;
- the scope, nature, impact or timing of the proposed merger with Raytheon and the separation transactions and other merger, acquisition and divestiture activity, including among other things the integration of or with other businesses and realization of synergies and opportunities for growth and innovation and incurrence of related costs and expenses;
- future levels of indebtedness, including indebtedness that may be incurred in connection with the proposed merger with Raytheon and the separation transactions, and capital spending and research and development spending;
- future availability of credit and factors that may affect such availability, including credit market conditions and our capital structure;
- the timing and scope of future repurchases of our common stock, which may be suspended at any time due to various factors, including market conditions and the level of other investing activities and uses of cash, including in connection with the proposed merger with Raytheon;
- delays and disruption in delivery of materials and services from suppliers;
- company and customer-directed cost reduction efforts and restructuring costs and savings and other consequences thereof (including the potential termination of U.S. government contracts and performance under undefinitized contract awards and the potential inability to recover termination costs);
- new business and investment opportunities;
- the ability to realize the intended benefits of organizational changes;
- the anticipated benefits of diversification and balance of operations across product lines, regions and industries;
- the outcome of legal proceedings, investigations and other contingencies;
- pension plan assumptions and future contributions;
- the impact of the negotiation of collective bargaining agreements and labor disputes;
- the effect of changes in political conditions in the U.S. and other countries in which we and Raytheon and our businesses each operate, including the effect of changes in U.S. trade policies or the U.K.'s pending withdrawal from the European Union, on general market conditions, global trade policies and currency exchange rates in the near term and beyond;
- the effect of changes in tax (including U.S. tax reform enacted on December 22, 2017, which is commonly referred to as the Tax Cuts and Jobs Act of 2017), environmental, regulatory and other laws and regulations (including, among other things, export and import requirements such as the International Traffic in Arms Regulations and the Export Administration Regulations, anti-bribery and anti-corruption requirements, including the Foreign Corrupt Practices Act, industrial cooperation agreement obligations, and procurement and other regulations) in the U.S. and other countries in which we, Raytheon and our businesses each operate;
- negative effects of the announcement or pendency of the proposed merger with Raytheon or the separation transactions on the market price of our and/or Raytheon's respective common stock and/or on our respective financial performance;
- the ability of UTC and Raytheon to receive the required regulatory approvals for the proposed merger (and the risk that such approvals may result in the imposition of conditions that could adversely affect the combined company or the expected benefits of the transaction) and to satisfy the other conditions to the closing of the merger on a timely basis or at all;

- the occurrence of events that may give rise to a right of one or both of UTC or Raytheon to terminate the merger agreement;
- risks relating to the value of our shares to be issued in the proposed merger with Raytheon, significant transaction costs and/or unknown liabilities;
- the possibility that the anticipated benefits from the proposed merger with Raytheon cannot be realized in full or at all or may take longer to realize than expected, including risks associated with third party contracts containing consent and/or other provisions that may be triggered by the proposed transaction;
- risks associated with merger-related litigation;
- the possibility that costs or difficulties related to the integration of UTC's and Raytheon's operations will be greater than expected;
- risks relating to completed merger, acquisition and divestiture activity, including UTC's integration of Rockwell Collins, including the risk that the integration may be more difficult, time-consuming or costly than expected or may not result in the achievement of estimated synergies within the contemplated time frame or at all;
- the ability of each of UTC, Raytheon, the companies resulting from the separation transactions and the combined company to retain and hire key personnel;
- the expected benefits and timing of the separation transactions, and the risk that conditions to the separation transactions will not be satisfied and/or that the separation transactions will not be completed within the expected time frame, on the expected terms or at all;
- the intended qualification of (i) the merger as a tax-free reorganization and (ii) the separation transactions as tax-free to UTC and UTC's shareowners, in each case, for U.S. federal income tax purposes;
- the possibility that any opinions, consents, approvals or rulings required in connection with the separation transactions will not be received or obtained within the expected time frame, on the expected terms or at all;
- expected financing transactions undertaken in connection with the proposed merger with Raytheon and the separation transactions and risks associated with additional indebtedness;
- the risk that dissynergy costs, costs of restructuring transactions and other costs incurred in connection with the separation transactions will exceed our estimates; and
- the impact of the proposed merger and the separation transactions on the respective businesses of UTC and Raytheon and the risk that the separation transactions may be more difficult, time-consuming or costly than expected, including the impact on UTC's resources, systems, procedures and controls and the impact on relationships with customers, suppliers, employees and other business counterparties.

In addition, our Annual Report on Form 10-K for 2019 includes important information as to risks, uncertainties and other factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements. See the "Notes to Consolidated Financial Statements" under the heading "Note 18: Contingent Liabilities," the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the headings "Business Overview," "Results of Operations," "Liquidity and Financial Condition," and "Critical Accounting Estimates," and the section titled "Risk Factors." Our Annual Report on Form 10-K for 2019 also includes important information as to these factors in the "Business" section under the headings "General," "Description of Business by Segment" and "Other Matters Relating to Our Business as a Whole," and in the "Legal Proceedings" section. Additional important information as to these factors is included in this 2019 Annual Report in the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" under the headings "Restructuring Costs," "Environmental Matters" and "Governmental Matters" and in our Form S-4 Registration Statements (Registration No. 333-220883) and (Registration No. 333-232696) under the heading "Risk Factors." The forward-looking statements speak only as of the date of this report or, in the case of any document incorporated by reference, the date of that document. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law. Additional information as to factors that may cause actual results to differ materially from those expressed or implied in the forward-looking statements is disclosed from time to time in our other filings with the SEC.

Management's Report on Internal Control over Financial Reporting

The management of UTC is responsible for establishing and maintaining adequate internal control over financial reporting. 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 reporting purposes in accordance with accounting principles generally accepted in the United States of America. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements.

Management has assessed the effectiveness of UTC's internal control over financial reporting as of December 31, 2019. In making its assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in its *Internal Control—Integrated Framework*, released in 2013. Management concluded that based on its assessment, UTC's internal control over financial reporting was effective as of December 31, 2019. The effectiveness of UTC's internal control over financial reporting, as of December 31, 2019, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Gregory J. Hayes
Chairman, President and Chief Executive Officer

Neil G. Mitchill, Jr.
Acting Senior Vice President & Chief Financial Officer

Robert J. Bailey
Corporate Vice President, Controller

Report of Independent Registered Public Accounting Firm

TO THE SHAREOWNERS AND BOARD OF DIRECTORS OF UNITED TECHNOLOGIES CORPORATION

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of United Technologies Corporation and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of operations, of comprehensive income, of changes in equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited 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 (COSO).

In our opinion, the consolidated financial statements referred to above 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. Also 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 the COSO.

Changes in Accounting Principles

As discussed in Note 19 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019 and, as discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in 2018.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, 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 opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated 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.

Revenue Recognition - Estimated Costs at Completion for Certain Long-Term Aerospace Aftermarket Service Contracts
As described in Notes 1 and 20 to the consolidated financial statements, the Company recognizes revenue on an over-time basis on certain long-term aerospace aftermarket service contracts. A substantial portion of the Company's $8.0 billion Pratt & Whitney segment service sales is derived from long-term contracts providing fleet management services and aftermarket maintenance, repair and overhaul services. As disclosed by management, the Company generally measures progress toward completion for these contracts using costs incurred to date relative to total estimated costs at completion because management believes that measure best depicts the transfer of control to the customer, which occurs as the Company incurs costs on the contracts. Due to the long-term duration of these contracts and technical complexity of the engines on which the work is required to be performed for many of the performance obligations, management's estimation of costs at completion is complex and requires significant judgment. Periodically during the year, or as needed when circumstances change and warrant a modification to a previous estimate, cost estimates requiring management judgment are updated to measure the revenue to recognize in line with progress made on contracts.

The principal considerations for our determination that performing procedures relating to revenue recognition - estimated costs at completion for certain long-term aerospace aftermarket service contracts is a critical audit matter are there was significant judgment by management to determine the estimated costs at completion. This in turn led to significant auditor judgment, subjectivity and effort in performing procedures and evaluating audit evidence relating to the estimates of the costs to complete.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the revenue recognition process, specifically as it relates to controls over significant assumptions used in the development of estimated costs at contract completion. These procedures also included, among others, evaluating and testing management's process for developing estimated costs at contract completion, which included evaluating on a test basis the reasonableness of assumptions considered by management specific to each contract. Evaluating the assumptions related to the estimated costs at completion involved evaluating whether the assumptions used were reasonable considering (i) management's historical forecasting accuracy, (ii) current and past service cost and frequency experience, (iii) the consistent application of accounting policies, and (iv) the timely identification of circumstances which may warrant a modification to a previous estimate.

Goodwill and Intangible Assets Quantitative Impairment Assessments
As described in Notes 1 and 2 to the consolidated financial statements, the Company's consolidated goodwill and intangible asset balances were $48.1 billion and $26.0 billion, respectively as of December 31, 2019. Intangible assets included unamortized intangible assets of $3.9 billion as of December 31, 2019. Goodwill and unamortized intangible assets are subject to annual impairment testing, or more frequent if a triggering event occurs. In developing the estimates for the fair value of reporting units and unamortized intangible assets, significant judgment is required by management in the determination of the appropriateness of using a qualitative assessment or quantitative assessment. The quantitative impairment testing compares carrying values to fair values and, when appropriate, the carrying value of these assets is reduced to fair value. For these quantitative assessments that are performed for goodwill and unamortized intangible assets, fair value is primarily based on income approaches using discounted cash flow and relief from royalty models, respectively, which have significant assumptions, including revenue growth rates, projected operating income, terminal growth rates, discount rates and royalty rates.

The principal considerations for our determination that performing procedures relating to the goodwill and unamortized intangible assets quantitative impairment assessments is a critical audit matter as there was significant judgment by management when developing the fair value measurements of these assets. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures to evaluate management's fair value measurements and significant assumptions for both goodwill and unamortized intangible assets, including revenue growth rates, projected operating income, terminal growth rates, and discount rates. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill and unamortized intangible assets quantitative impairment assessments, including controls over the valuation of the Company's reporting units and unamortized intangible assets. These procedures also included, among others, testing management's process for developing the fair value estimates; evaluating the appropriateness of the discounted cash flow and relief from royalty models; testing the completeness, accuracy, and relevance of underlying data in the models; and evaluating the significant assumptions used by management, including revenue growth rates, projected operating income, terminal value growth rates and discount rates. Evaluating management's assumptions related to revenue growth rates, projected operating income, and terminal growth rates involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting units and unamortized intangible assets, (ii) the consistency with external market and industry data, and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's discounted cash flow models and certain significant assumptions, including discount rates.

PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Hartford, Connecticut
February 6, 2020

We have served as the Company's auditor since 1947.

Consolidated Statement of Operations

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS; SHARES IN MILLIONS)	**2019**	2018	2017
Net Sales:			
Product sales	**$ 54,004**	$ 45,434	$ 41,361
Service sales	**23,042**	21,067	18,476
	77,046	66,501	59,837
Costs and Expenses:			
Cost of products sold	**42,444**	36,754	31,224
Cost of services sold	**14,621**	13,231	12,977
Research and development	**3,015**	2,462	2,427
Selling, general and administrative	**8,521**	7,066	6,429
	68,601	59,513	53,057
Other income, net	**521**	1,565	1,358
Operating profit	**8,966**	8,553	8,138
Non-service pension (benefit)	**(888)**	(765)	(534)
Interest expense, net	**1,611**	1,038	909
Income from operations before income taxes	**8,243**	8,280	7,763
Income tax expense	**2,295**	2,626	2,843
Net income from operations	**5,948**	5,654	4,920
Less: Noncontrolling interest in subsidiaries' earnings from operations	**411**	385	368
Net income attributable to common shareowners	**$ 5,537**	$ 5,269	$ 4,552
Earnings Per Share of Common Stock—Basic:			
Net income attributable to common shareowners	**$ 6.48**	$ 6.58	$ 5.76
Earnings Per Share of Common Stock—Diluted:			
Net income attributable to common shareowners	**$ 6.41**	$ 6.50	$ 5.70
Weighted average number of shares outstanding:			
Basic shares	**854.8**	800.4	790.0
Diluted shares	**863.9**	810.1	799.1

See accompanying Notes to Consolidated Financial Statements

Consolidated Statement of Comprehensive Income

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Net income from operations	**$ 5,948**	$ 5,654	$ 4,920
Other comprehensive (loss) income, net of tax			
Foreign currency translation adjustments			
Foreign currency translation adjustments arising during period	**266**	(516)	620
Less: Reclassification adjustments for gain on sale of an investment in a foreign entity recognized in Other income, net	**2**	(2)	(10)
	268	(518)	610
Tax expense	**(43)**	(4)	—
	225	(522)	610
Pension and postretirement benefit plans			
Net actuarial (loss) gain arising during period	**(543)**	(1,819)	241
Prior service (cost) credit arising during period	**(6)**	(22)	2
Amortization of actuarial loss and prior service cost	**228**	344	529
Other	**(93)**	105	(116)
	(414)	(1,392)	656
Tax benefit (expense)	**97**	326	(263)
	(317)	(1,066)	393
Unrealized (loss) gain on available-for-sale securities			
Unrealized holding gain arising during period	**—**	—	5
Reclassification adjustments for gain included in Other income, net	**—**	—	(566)
ASU 2016-01 adoption impact (Note 10)	**—**	(5)	—
	—	(5)	(561)
Tax benefit	**—**	—	213
	—	(5)	(348)
Change in unrealized cash flow hedging			
Unrealized cash flow hedging (loss) gain arising during period	**(33)**	(307)	347
Loss (gain) reclassified into Product sales	**51**	(16)	(39)
	18	(323)	308
Tax (expense) benefit	**(11)**	78	(74)
	7	(245)	234
Other comprehensive (loss) income, net of tax	**(85)**	(1,838)	889
Comprehensive income	**5,863**	3,816	5,809
Less: comprehensive income attributable to noncontrolling interest	**(399)**	(355)	(448)
Comprehensive income attributable to common shareowners	**$ 5,464**	$ 3,461	$ 5,361

See accompanying Notes to Consolidated Financial Statements

Consolidated Balance Sheet

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS; SHARES IN THOUSANDS)	2019	2018
Assets		
Cash and cash equivalents	**$ 7,378**	$ 6,152
Accounts receivable (net of allowance for doubtful accounts of $389 and $488)	**13,524**	14,271
Contract assets, current	**4,184**	3,486
Inventory, net	**10,950**	10,083
Other assets, current	**1,461**	1,511
Total Current Assets	**37,497**	35,503
Customer financing assets	**3,477**	3,023
Future income tax benefits	**1,611**	1,646
Fixed assets, net	**12,755**	12,297
Operating lease right-of-use assets	**2,599**	—
Goodwill	**48,063**	48,112
Intangible assets, net	**26,046**	26,424
Other assets	**7,668**	7,206
Total Assets	**$ 139,716**	$ 134,211
Liabilities and Equity		
Short-term borrowings	**$ 2,364**	$ 1,469
Accounts payable	**10,809**	11,080
Accrued liabilities	**11,737**	10,223
Contract liabilities, current	**6,180**	5,720
Long-term debt currently due	**3,496**	2,876
Total Current Liabilities	**34,586**	31,368
Long-term debt	**37,788**	41,192
Future pension and postretirement benefit obligations	**3,502**	4,018
Operating lease liabilities	**2,144**	—
Contract liabilities, long-term	**5,732**	5,069
Other long-term liabilities	**11,638**	11,845
Total Liabilities	**95,390**	93,492
Commitments and contingent liabilities (Notes 4 and 18)		
Redeemable noncontrolling interest	**95**	109
Shareowners' Equity:		
Capital Stock:		
Preferred Stock, $1 par value; 250,000 shares authorized; None issued or outstanding	**—**	—
Common Stock, $1 par value; 4,000,000 shares authorized; 1,450,845 and 1,446,961 shares issued	**23,019**	22,514
Treasury Stock— 586,479 and 585,479 common shares at average cost	**(32,626)**	(32,482)
Retained earnings	**61,594**	57,823
Unearned ESOP shares	**(64)**	(76)
Total Accumulated other comprehensive loss	**(10,149)**	(9,333)
Total Shareowners' Equity	**41,774**	38,446
Noncontrolling interest	**2,457**	2,164
Total Equity	**44,231**	40,610
Total Liabilities and Equity	**$ 139,716**	$ 134,211

See accompanying Notes to Consolidated Financial Statements

Consolidated Statement of Cash Flows

(DOLLARS IN MILLIONS)	2019	2018	2017
Operating Activities:			
Net income from operations	**$ 5,948**	$ 5,654	$ 4,920
Adjustments to reconcile income from operations to net cash flows provided by operating activities:			
Depreciation and amortization	**3,783**	2,433	2,140
Deferred income tax provision	**35**	735	62
Stock compensation cost	**356**	251	192
Net periodic pension and other postretirement benefit	**(525)**	(393)	(158)
Portfolio separation tax cost	**634**	—	—
Gain on sale of Taylor Company	**—**	(799)	—
Change in:			
Accounts receivable	**419**	(2,426)	(448)
Contract assets, current	**(307)**	(604)	—
Inventory	**(1,216)**	(537)	(1,074)
Other current assets	**(309)**	161	(101)
Accounts payable and accrued liabilities	**1,229**	2,446	1,571
Contract liabilities, current	**359**	205	—
Income taxes	**(406)**	(195)	1,579
Global pension contributions	**(118)**	(147)	(2,112)
Canadian government settlement	**(38)**	(429)	(285)
Other operating activities, net	**(961)**	(33)	(655)
Net cash flows provided by operating activities	**8,883**	6,322	5,631
Investing Activities:			
Capital expenditures	**(2,256)**	(1,902)	(2,014)
Increase in customer financing assets	**(787)**	(988)	(1,197)
Decrease in customer financing assets	**129**	606	222
Investments in businesses (Note 2)	**(56)**	(15,398)	(231)
Dispositions of businesses (Note 2)	**138**	1,105	70
Proceeds from sale of investments in Watsco, Inc.	**—**	—	596
Increase in collaboration intangible assets	**(351)**	(400)	(380)
Receipts (payments) from settlements of derivative contracts	**336**	143	(317)
Other investing activities, net	**(245)**	(139)	232
Net cash flows used in investing activities	**(3,092)**	(16,973)	(3,019)
Financing Activities:			
Issuance of long-term debt	**88**	13,455	4,954
Repayment of long-term debt	**(2,830)**	(2,520)	(1,604)
Increase (decrease) in short-term borrowings, net	**927**	(356)	(271)
Proceeds from Common Stock issued under employee stock plans	**27**	36	31
Dividends paid on Common Stock	**(2,442)**	(2,170)	(2,074)
Repurchase of Common Stock	**(151)**	(325)	(1,453)
Other financing activities, net	**(183)**	(155)	(576)
Net cash flows (used in) provided by financing activities	**(4,564)**	7,965	(993)
Effect of foreign exchange rate changes on cash and cash equivalents	**(19)**	(120)	210
Net increase (decrease) in cash, cash equivalents and restricted cash	**1,208**	(2,806)	1,829
Cash, cash equivalents and restricted cash, beginning of year	**6,212**	9,018	7,189
Cash, cash equivalents and restricted cash, end of year	**7,420**	6,212	9,018
Less: Restricted cash, included in Other assets	**42**	60	33
Cash and cash equivalents, end of year	**$ 7,378**	$ 6,152	$ 8,985
Supplemental Disclosure of Cash Flow Information:			
Interest paid, net of amounts capitalized	**$ 1,801**	$ 1,027	$ 974
Income taxes paid, net of refunds	**$ 1,768**	$ 1,714	$ 1,326

See accompanying Notes to Consolidated Financial Statements

Consolidated Statement of Changes in Equity

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS; SHARES IN THOUSANDS)	2019	2018	2017
Equity at January 1	**$ 40,610**	$ 31,421	$ 29,169
Common Stock			
Balance at January 1	**22,514**	17,574	17,285
Common Stock issued under employee plans	**525**	423	331
Common Stock repurchased	**—**	—	1
Common Stock issued for Rockwell Collins outstanding common stock & equity awards	**—**	4,523	—
(Purchase) sale of subsidiary shares from noncontrolling interest, net	**(20)**	(6)	4
Redeemable noncontrolling interest fair value adjustment	**—**	—	(47)
Balance at December 31	**23,019**	22,514	17,574
Treasury Stock			
Balance at January 1	**(32,482)**	(35,596)	(34,150)
Common Stock issued under employee plans	**7**	6	7
Common Stock repurchased	**(151)**	(329)	(1,453)
Common Stock issued for Rockwell Collins outstanding common stock & equity awards	**—**	3,437	—
Balance at December 31	**(32,626)**	(32,482)	(35,596)
Retained Earnings			
Balance at January 1	**57,823**	55,242	52,873
Net Income	**5,537**	5,269	4,552
Dividends on Common Stock	**(2,442)**	(2,170)	(2,074)
Dividends on ESOP Common Stock	**(70)**	(71)	(72)
Redeemable noncontrolling interest fair value adjustment	**4**	7	(42)
ASU 2018-02 adoption impact (Note 10)	**745**	—	—
New Revenue Standard adoption impact	**—**	(480)	—
Other	**(3)**	26	5
Balance at December 31	**61,594**	57,823	55,242
Unearned ESOP Shares			
Balance at January 1	**(76)**	(85)	(95)
Common Stock issued under employee plans	**12**	9	10
Balance at December 31	**(64)**	(76)	(85)
Accumulated Other Comprehensive (Loss) Income			
Balance at January 1	**(9,333)**	(7,525)	(8,334)
Other comprehensive (loss) income, net of tax	**(816)**	(1,808)	809
Balance at December 31	**(10,149)**	(9,333)	(7,525)
Noncontrolling Interest			
Balance at January 1	**2,164**	1,811	1,590
Net Income	**411**	385	368
Redeemable noncontrolling interest in subsidiaries' earnings	**7**	(4)	(17)
Other comprehensive (loss) income, net of tax	**(12)**	(30)	56
Dividends attributable to noncontrolling interest	**(268)**	(315)	(336)
Sale (purchase) of subsidiary shares from noncontrolling interest, net	**70**	(23)	—
(Disposition) acquisition of noncontrolling interest, net	**(23)**	(8)	14
Capital contributions	**108**	342	135
Other	**—**	6	1
Balance at December 31	**2,457**	2,164	1,811
Equity at December 31	**$ 44,231**	$ 40,610	$ 31,421
Supplemental share information			
Shares of Common Stock issued under employee plans	**3,883**	2,775	3,205
Shares of Common Stock repurchased	**1,133**	2,727	12,900
Dividends per share of Common Stock	**$ 2.94**	$ 2.84	$ 2.72

See accompanying Notes to Consolidated Financial Statements

NOTE 1: SUMMARY OF ACCOUNTING PRINCIPLES

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses. Actual results could differ from those estimates. Certain reclassifications have been made to the prior year amounts to conform to the current year presentation.

Consolidation. The Consolidated Financial Statements include the accounts of United Technologies Corporation (UTC) and its controlled subsidiaries. Intercompany transactions have been eliminated.

Cash and Cash Equivalents. Cash and cash equivalents includes cash on hand, demand deposits and short-term cash investments that are highly liquid in nature and have original maturities of three months or less.

On occasion, we are required to maintain cash deposits with certain banks with respect to contractual obligations related to acquisitions or divestitures or other legal obligations. As of December 31, 2019 and 2018, the amount of such restricted cash was approximately $42 million and $60 million, respectively.

Accounts Receivable. Accounts receivable are stated at their net estimated realized value. The allowance for doubtful accounts is based upon an assessment of customer creditworthiness, historical payment experience, and the age and status of outstanding receivables. Current and long-term accounts receivable as of December 31, 2019 includes retainage of $111 million and unbilled receivables of $522 million, which primarily includes unbilled receivables with commercial aerospace customers. Current and long-term accounts receivable as of December 31, 2018 include retainage of $116 million and unbilled receivables of $678 million, which primarily includes unbilled receivables with commercial aerospace customers. See Note 4 for discussion of commercial aerospace industry assets and commitments.

Retainage represents amounts that, pursuant to the applicable contract, are not due until project completion and acceptance by the customer. Unbilled receivables represent revenues that are not currently billable to the customer under the terms of the contract. These items are expected to be billed and collected in the normal course of business. Unbilled receivables where we have an unconditional right to payment are included in Accounts receivable.

Contract Assets and Liabilities. Contract assets and liabilities represent the difference in the timing of revenue recognition from receipt of cash from our customers. Contract assets reflect revenue recognized and performance obligations satisfied in advance of customer billing. Performance obligations partially satisfied in advance of customer billings are included in contract assets.

Contract liabilities relate to payments received in advance of the satisfaction of performance under the contract. We receive payments from customers based on the terms established in our contracts. See Note 6 for further discussion of contract assets and liabilities.

Inventory. Inventory is stated at the lower of cost or estimated realizable value and are primarily based on first-in, first-out (FIFO) or average cost methods; however, certain Collins Aerospace Systems and Carrier entities use the last-in, first-out (LIFO) method. If inventories that were valued using the LIFO method had been valued under the FIFO method, they would have been higher by $126 million and $119 million at December 31, 2019 and 2018, respectively.

Valuation reserves for excess, obsolete, and slow-moving inventory are estimated by comparing the inventory levels of individual parts to both future sales forecasts or production requirements and historical usage rates in order to identify inventory where the resale value or replacement value is less than inventoriable cost. Other factors that management considers in determining the adequacy of these reserves include whether individual inventory parts meet current specifications and cannot be substituted for a part currently being sold or used as a service part, overall market conditions, and other inventory management initiatives. Manufacturing costs are allocated to current production and firm contracts.

Equity Method Investments. Investments in which we have the ability to exercise significant influence, but do not control, are accounted for under the equity method of accounting and are included in Other assets on the Consolidated Balance Sheet. Under this method of accounting, our share of the net earnings or losses of the investee is included in Other income, net on the Consolidated Statement of Operations since the activities of the investee are closely aligned with the operations of the business segment holding the investment. We evaluate our equity method investments whenever events or changes in circumstance indicate that the carrying amounts of such investments may be impaired. If a decline in the value of an equity method investment is determined to be other than temporary, a loss is recorded in earnings in the current period. UTC sells products to and purchases products from unconsolidated entities accounted for under the equity method, which are considered related parties. This activity is predominantly within our Carrier segment and is not considered material to the Consolidated Statement of Operations nor Consolidated Balance Sheet of UTC.

Customer Financing Assets. Customer Financing Assets (CFA) primarily relate to the aerospace business in which we provide financing to airline customers. The most common types of financing include products under lease, notes receivable, long-term accounts receivable and lease receivable. We record revenue from lease assets by applying Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) Topic 842, Leases, and from interest on the notes, accounts and lease receivables. Interest from notes and financing leases, rental income from operating lease assets and gains or losses on sales of operating lease assets is aggregated under the caption of “Other income, net” in the Consolidated Statement of Operations. The current portion of these financing arrangements are aggregated under the caption of “Other assets, current” and the non-current portions of these financing arrangements are aggregated under the caption of “Customer financing assets” in the Consolidated Balance Sheet. The increases and decreases in CFA from funding, receipts and certain other activity, are reflected as Investing Activities in the Consolidated Statement of Cash Flows. The product under lease assets are valued at cost and reviewed for impairment when circumstances indicate that the related carrying amounts may not be recoverable. Notes, accounts and lease receivable are valued at cost and reviewed for impairment when it is probable that we will be unable to collect amounts due. As of December 31, 2019 the reserves related to customer financing assets are not material.

Business Combinations. We account for transactions that are classified as business combinations in accordance with FASB ASC Topic 805, *"Business Combinations."* Once a business is acquired, the fair value of the identifiable assets acquired and liabilities assumed is determined with the excess cost recorded to goodwill. As required, a preliminary fair value is determined once a business is acquired, with the final determination of the fair value being completed within the one year measurement period from the date of acquisition.

Goodwill and Intangible Assets. Goodwill represents costs in excess of fair values assigned to the underlying net assets of acquired businesses. Goodwill and intangible assets deemed to have indefinite lives are not amortized. Goodwill and indefinite-lived intangible assets are subject to annual impairment testing or when a triggering event occurs using the guidance and criteria described in the Intangibles - Goodwill and Other Topic of the FASB ASC. This testing compares carrying values to fair values and, when appropriate, the carrying value of these assets is reduced to fair value.

Intangible assets consist of service portfolios, patents, trademarks/tradenames, customer relationships and other intangible assets including collaboration assets, as discussed further in Note 2. Acquired intangible assets are recognized at fair value in purchase accounting and then amortized to cost of sales and selling, general & administrative expenses over the applicable useful lives. Also included within other intangible assets are commercial aerospace payments made to secure certain contractual rights to provide product on new aircraft platforms. We classify amortization of such payments as a reduction of sales. Such payments are capitalized when there are distinct rights obtained and there are sufficient incremental cash flows to support the recoverability of the assets established. Otherwise, the applicable portion of the payments are expensed. Consideration paid on these contractual commitments is capitalized when it is no longer conditional.

Useful lives of finite-lived intangible assets are estimated based upon the nature of the intangible asset and the industry in which the intangible asset is used. These intangible assets are amortized based on the pattern in which the economic benefits of the intangible assets are consumed. For both our commercial aerospace collaboration assets and exclusivity arrangements, the pattern of economic benefit generally results in lower amortization during the development period with increasing amortization as programs enter full rate production and aftermarket cycles. If a pattern of economic benefit cannot be reliably determined or if straight-line amortization approximates the pattern of economic benefit, a straight-line amortization method may be used. The range of estimated useful lives is as follows:

Collaboration assets	30 years
Customer relationships and related programs	1 to 32 years
Purchased service contracts	5 to 25 years
Patents & trademarks	4 to 40 years
Exclusivity assets	5 to 25 years

Leases. We account for leases in accordance with ASC Topic 842: Leases. Under Topic 842, the right-of-use model requires a lessee to record a right-of-use asset and a lease liability on the Consolidated Balance Sheet for all leases with terms longer than 12 months. Leases are classified as either finance or operating, with classification affecting the pattern of expense recognition in the Consolidated Statement of Operations. In addition, Topic 842 requires a lessor to classify leases as either sales-type, finance or operating. A lease will be treated as a sale if it transfers all of the risks and rewards, as well as control of the underlying asset, to the lessee. If risks and rewards are conveyed without the transfer of control, the lease is treated as financing. If the lessor doesn't convey risks and rewards or control, the lease is treated as operating.

We enter into lease agreements for the use of real estate space, vehicles, information technology equipment, and certain other equipment under operating and finance leases. We determine if an arrangement contains a lease at inception. Operating leases are included in Operating lease right-of-use assets, Accrued liabilities, and Operating lease liabilities in our Consolidated Balance Sheet. Finance leases are not considered significant to our Consolidated Balance Sheet or Consolidated Statement of Operations. Finance lease right-of-use assets at December 31, 2019 of $55 million are included in Other assets in our Consolidated Balance Sheet. Finance lease liabilities at December 31, 2019 of $84 million are included in Long-term debt currently due, and Long-term debt in our Consolidated Balance Sheet.

Right-of-use 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. Lease right-of-use assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As most of our leases do not provide an implicit rate, we use our incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments, and use the implicit rate when readily determinable. We determine our incremental borrowing rate through market sources including relevant industry rates. Our lease right-of-use assets also include any lease pre-payments and exclude lease incentives. Certain of our leases include variable payments, which may vary based upon changes in facts or circumstances after the start of the lease. We exclude variable payments from lease right-of-use assets and lease liabilities, to the extent not considered fixed, and instead, expense variable payments as incurred. Variable lease expense and lease expense for short duration contracts is not a material component of lease expense. Our leases generally have remaining lease terms of 1 to 20 years, some of which include options to extend leases. For the majority of our leases with options to extend, those options are up to 5 years with the ability to terminate the lease within 1 year. The exercise of lease renewal options is at our sole discretion and our lease right-of-use assets and liabilities reflect only the options we are reasonably certain that we will exercise. Lease expense is recognized on a straight-line basis over the lease term.

In limited instances we act as a lessor, primarily for commercial aerospace engines and certain heating, ventilation and air conditioning (HVAC) systems and commercial equipment, all of which are classified as operating leases. These leases are not significant to our Consolidated Balance Sheet or Consolidated Statement of Operations.

Other Long-Lived Assets. We evaluate the potential impairment of other long-lived assets whenever events or changes in circumstances indicate that the related carrying amounts may not be recoverable. If the carrying value of other long-lived assets held and used exceeds the sum of the undiscounted expected future cash flows, the carrying value is written down to fair value.

Long-Term Financing Receivables. Our long-term financing receivables primarily represent balances related to the aerospace businesses such as long-term trade accounts receivable, leases, and notes receivable. We also have other long-term receivables in our commercial businesses; however, both the individual and aggregate amounts of those other receivables are not significant.

Long-term trade accounts receivable are principally amounts arising from the sale of goods and services with a contractual maturity date or realization period of greater than one year and are recognized as “Other assets” in our Consolidated Balance Sheet. Notes and leases receivable are recognized as “Customer financing assets” in our Consolidated Balance Sheet. These exclude receivables related to operating leases. The following table summarizes the balance by class of aerospace business-related long-term receivables as of December 31, 2019 and 2018:

(DOLLARS IN MILLIONS)	2019	2018
Long-term trade accounts receivable	**$ 251**	$ 269
Notes and leases receivable	**265**	258
Total long-term receivables	**$ 516**	$ 527

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 contractual terms of the receivable agreement. Factors considered in assessing collectability and risk include, but are not limited to, examination of credit quality indicators and other evaluation measures, underlying value of any collateral or security interests, significant past due balances, historical losses, and existing economic conditions.

We determine credit ratings for each customer in our portfolio based upon public information and information obtained directly from our customers. We conduct a review of 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 these balances quarterly or when events and circumstances warrant. Customer credit ratings range from customers with an extremely strong capacity to meet financial obligations, to customers whose uncollateralized receivable is in default. There can be no assurance that actual results will not differ from estimates or that consideration of these factors in the future will not result in an increase or decrease to the allowance for credit losses on long-term receivables. Based upon the customer credit ratings, approximately $150 million of our long-term receivables were considered to bear high credit risk as of December 31, 2019 and 2018. See Note 4 for further discussion of commercial aerospace industry assets and commitments.

Reserves for credit losses on receivables relate to specifically identified receivables that are evaluated individually for impairment. For notes and leases receivable, we determine a specific reserve for exposure based on the difference between the carrying value of the receivable and the estimated fair value of the related collateral in connection with the evaluation of credit risk and collectability. For long-term trade accounts receivable, we evaluate credit risk and collectability individually to determine if an allowance is necessary. Our long-term receivables reflected in the table above, which include reserves of $17 million and $16 million as of December 31, 2019 and 2018, respectively, are individually evaluated for impairment. At both December 31, 2019 and 2018, we did not have any significant balances that are considered to be delinquent, on non-accrual status, past due 90 days or more, or considered to be impaired.

Income Taxes. In the ordinary course of business there is inherent uncertainty in quantifying our income tax positions. We assess our income tax positions and record tax benefits for all years subject to examination based upon management’s evaluation of the facts, circumstances, and information available at the reporting date. For those tax positions where it is more-likely-than-not that a tax benefit will be sustained, we have recorded the largest amount of tax benefit with a greater than 50% likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more-likely-than-not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. Where applicable, associated interest expense has also been recognized. We recognize accrued interest related to unrecognized tax benefits in interest expense. Penalties, if incurred, would be recognized as a component of income tax expense.

On December 22, 2017 the TCJA was enacted. The TCJA contains a new law that subjects the Company to a tax on Global Intangible Low-Taxed Income (GILTI), beginning in 2018. GILTI is a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. The FASB has provided that companies subject to GILTI have the option to account for the GILTI tax as a period cost if and when incurred, or to recognize deferred taxes for temporary differences, including outside basis differences, expected to reverse as GILTI. We have elected to account for GILTI as a period cost, as incurred.

Revenue Recognition. We account for revenue in accordance with ASC Topic 606: Revenue from Contracts with Customers. We adopted ASC 606 effective January 1, 2018 and elected the modified retrospective approach. The results for periods before 2018 were not adjusted for the new standard and the cumulative effect of the change in accounting was recognized through retained earnings at the date of adoption. Under Topic 606, a performance obligation is a promise in a contract with a customer to transfer a distinct good or service to the customer. Some of our contracts with customers contain a single performance obligation, while others contain multiple performance obligations most commonly when a contract spans multiple phases of the product life-cycle such as development, production, maintenance and support. A contract’s transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. When there are multiple performance obligations within a contract, we allocate the transaction price to each performance obligation based on its standalone selling price.

We consider the contractual consideration payable by the customer and assess variable consideration that may affect the total transaction price, including contractual discounts, contract incentive payments, estimates of award fees, unfunded contract value under U.S. Government contracts, and other sources of variable consideration, when determining the transaction price of each contract. We include variable consideration in the estimated transaction price when there is a basis to reasonably estimate the amount. These estimates are based on historical experience, anticipated performance and our best judgment at the time. We also consider whether our contracts provide customers with significant financing. Generally, our contracts do not contain significant financing.

Timing of the satisfaction of performance obligations varies across our businesses due to our diverse product and service mix, customer base, and contractual terms.

Point in time revenue recognition. Performance obligations are satisfied as of a point in time for heating, ventilating, air-conditioning and refrigeration systems, certain alarm and fire detection and suppression systems, and certain aerospace components, engines, and spare parts. Revenue is recognized when control of the product transfers to the customer, generally upon product shipment.

Over-time revenue recognition. Performance obligations are satisfied over-time if the customer receives the benefits as we perform work, if the customer controls the asset as it is being produced, or if the product being produced for the customer has no alternative use and we have a contractual right to payment. Revenue is recognized for our construction-type and certain production-type contracts on an over-time basis. We recognize revenue on an over-time basis on certain long-term aerospace aftermarket contracts and aftermarket service work; development, fixed price, and other cost reimbursement contracts in our aerospace businesses; and elevator and escalator sales, installation, service, modernization and other construction contracts in our commercial businesses. For construction and installation contracts within our commercial businesses and aerospace performance obligations satisfied over time, revenue is recognized using costs incurred to date relative to total estimated costs at completion to measure progress. Incurred costs represent work performed, which correspond with and best depict transfer of control to the customer. Contract costs include labor, materials, and subcontractors' costs, or other direct costs, and where applicable on government and commercial contracts, indirect costs.

For certain of our long-term aftermarket contracts, revenue is recognized over the contract period. In the commercial businesses, revenue is primarily recognized on a straight-line basis over the contract period. In the aerospace businesses, we generally account for such contracts as a series of daily obligations to stand ready to provide spare parts and product maintenance and aftermarket services. These arrangements include the sale of spare parts with integral services to our customers, and are generally classified as Service sales, with the corresponding costs classified in Cost of services sold, within the Consolidated Statement of Operations. Revenue is primarily recognized in proportion to cost as sufficient historical evidence indicates that the cost of performing services under the contract is incurred on an other than straight-line basis. Aerospace contract modifications are routine and contracts are often modified to account for changes in contract specifications or requirements. Contract modifications that are for goods or services that are not distinct are accounted for as part of the existing contract.

We incur costs for engineering and development of aerospace products directly related to existing or anticipated contracts with customers. Such costs generate or enhance our ability to satisfy our performance obligations under these contracts. We capitalize these costs as contract fulfillment costs to the extent the costs are recoverable from the associated contract margin and subsequently amortize the costs as the original equipment (OEM) products performance obligations are satisfied. In instances where intellectual property does not transfer to the customer, we defer the customer funding of OEM product engineering and development and recognize revenue when the OEM products performance obligations are satisfied. Capitalized contract fulfillment costs were $1,519 million and $914 million as of December 31, 2019 and 2018, respectively and are recognized in "Other assets" in our Consolidated Balance Sheet and are included in Other operating activities, net in our Consolidated Statement of Cash Flows. The increase in capitalized net contract fulfillment costs is driven by current year activity at Collins Aerospace Systems. Costs to obtain contracts are not material.

Loss provisions on OEM contracts are recognized to the extent that estimated contract costs exceed the estimated consideration from the products contemplated under the contractual arrangement. For new commitments, we generally record loss provisions at the earlier of contract announcement or contract signing except for certain contracts under which losses are recorded upon receipt of the purchase order that obligates us to perform. For existing commitments, anticipated losses on contractual arrangements are recognized in the period in which losses become evident. Products contemplated under contractual arrangements include firm quantities of product sold under contract and, in the commercial engine and wheels and brakes businesses, future highly probable sales of replacement parts required by regulation that are expected to be sold subsequently for incorporation into the original equipment. In the commercial engine and wheels and brakes businesses, when the combined original equipment and aftermarket arrangement for each individual sales campaign are profitable, we record original equipment product losses, as applicable, at the time of delivery.

We review our cost estimates on significant contracts on a quarterly basis and for others, no less frequently than annually or when circumstances change and warrant a modification to a previous estimate. We record changes in contract estimates using the cumulative catch-up method. Operating profits included net unfavorable changes in aerospace contract estimates of approximately $69 million, $50 million, and $110 million in 2019, 2018 and 2017, respectively, primarily the result of unexpected increases in estimated costs related to Pratt & Whitney long-term aftermarket contracts.

Collaborations: Sales generated from engine programs, spare parts sales, and aftermarket business under collaboration arrangements are recorded consistent with our revenue recognition policies in our Consolidated Financial Statements. Amounts attributable to our collaborators for their share of sales are recorded as cost of sales in our Consolidated Financial Statements based upon the terms and nature of the arrangement. Costs associated with engine programs under collaborative arrangements are expensed as incurred. Under these arrangements, collaborators contribute their program share of engine parts, incur their own production costs and make certain payments to Pratt & Whitney for shared or joint program costs. The reimbursement from collaborators of their share of program costs is recorded as a reduction of the related expense item at that time.

Cash Payments to Customers: Carrier customarily offers its customers incentives to purchase products to ensure an adequate supply of its products in the distribution channels. The principal incentive program provides reimbursements to distributors for offering promotional pricing for our products. We account for incentive payments made as a reduction in sales. In our aerospace businesses, we offer customers certain incentives to purchase our products. These incentives may result in payments made to customers. In addition, we may make participation payments to certain aerospace customers to secure certain contractual rights. To the extent these rights are incremental and are supported by the incremental cash flows obtained, they are capitalized as intangible assets. Otherwise, such payments are recorded as a reduction in sales. We classify the subsequent amortization of the capitalized acquired intangible assets from our customers as a reduction in sales. Contractually stated prices in arrangements with our customers that include the acquisition of intangible rights within the scope of the Intangibles - Goodwill and Other Topic of the FASB ASC and deliverables within the scope of the Revenue Recognition Topic of the FASB ASC are not presumed to be representative of fair value for determining the amounts to allocate to each element of an arrangement.

Remaining Performance Obligations (RPO). RPO represents the aggregate amount of total contract transaction price that is unsatisfied or partially unsatisfied. As of December 31, 2019 our total RPO was approximately $132.7 billion compared to $115.5 billion as of December 31, 2018. Of the total RPO as of December 31, 2019, we expect approximately 45% will be recognized as sales over the following 24 months.

Research and Development. Research and development costs not specifically covered by contracts and those related to the company sponsored share of research and development activity in connection with cost-sharing arrangements are charged to expense as incurred. Government research and development support, not associated with specific contracts, is recorded as a reduction to research and development expense in the period earned.

Research and development costs incurred under contracts with customers are included as a contract cost and reported as a component of cost of products sold when revenue from such contracts is recognized. Research and development costs in excess of contractual consideration are expensed as incurred.

Foreign Exchange. We conduct business in many different currencies and, accordingly, are subject to the inherent risks associated with foreign exchange rate movements. The financial position and results of operations of substantially all of our foreign subsidiaries are measured using the local currency as the functional currency. Foreign currency denominated assets and liabilities are translated into U.S. Dollars at the exchange rates existing at the respective balance sheet dates, and income and expense items are translated at the average exchange rates during the respective periods. The aggregate effects of translating the balance sheets of these subsidiaries are deferred as a separate component of shareowners' equity.

Derivatives and Hedging Activity. We have used derivative instruments, including swaps, forward contracts and options, to help manage certain foreign currency, interest rate and commodity price exposures. Derivative instruments are viewed as risk management tools by us and are not used for trading or speculative purposes. By their nature, all financial instruments involve market and credit risks. We enter into derivative and other financial instruments with major investment grade financial institutions and have policies to monitor the credit risk of those counterparties. We limit counterparty exposure and concentration of risk by diversifying counterparties. While there can be no assurance, we do not anticipate any material non-performance by any of these counterparties. We enter into transactions that are subject to enforceable master netting arrangements or similar agreements with various counterparties. However, we have not elected to offset multiple contracts with a single counterparty and, as a result, the fair value of the derivative instruments in a loss position is not offset against the fair value of derivative instruments in a gain position.

Derivatives used for hedging purposes may be designated and effective as a hedge of the identified risk exposure at the inception of the contract. All derivative instruments are recorded on the balance sheet at fair value. Derivatives used to hedge foreign currency denominated balance sheet items are reported directly in earnings along with offsetting transaction gains and losses on the items being hedged. Derivatives used to hedge forecasted cash flows associated with foreign currency commitments or forecasted commodity purchases may be accounted for as cash flow hedges, as deemed appropriate. Gains and losses on derivatives designated as cash flow hedges are recorded in other comprehensive income and reclassified to earnings as a component of product sales or expenses, as applicable, when the hedged transaction occurs. Gains and losses on derivatives designated as cash flow hedges are recorded in Other operating activities, net within the Consolidated Statement of Cash Flows. To the extent that a previously designated hedging transaction is no longer an effective hedge, any ineffectiveness measured in the hedging relationship is recorded currently in earnings in the period it occurs. As discussed in Note 14, at December 31, 2019 we have approximately €4.20 billion of euro-denominated long-term debt, which qualifies as a net investment hedge against our investments in European businesses.

To the extent the hedge accounting criteria are not met, the foreign currency forward contracts are utilized as economic hedges and changes in the fair value of these contracts are recorded currently in earnings in the period in which they occur. Additional information pertaining to foreign currency forward contracts and net investment hedging is included in Note 14.

Environmental. Environmental investigatory, remediation, operating and maintenance costs are accrued when it is probable that a liability has been incurred and the amount can be reasonably estimated. The most likely cost to be incurred is accrued based on an evaluation of currently available facts with respect to each individual site, including existing technology, current laws and regulations and prior remediation experience. Where no amount within a range of estimates is more likely, the minimum is accrued. For sites with multiple responsible parties, we consider our likely proportionate share of the anticipated remediation costs and the ability of the other parties to fulfill their obligations in establishing a provision for those costs. Liabilities with fixed or reliably determinable future cash payments are discounted. Accrued environmental liabilities are not reduced by potential insurance reimbursements. See Note 18 for additional details on the environmental remediation activities.

Pension and Postretirement Obligations. Guidance under the Compensation - Retirement Benefits Topic of the FASB ASC requires balance sheet recognition of the overfunded or underfunded status of pension and postretirement benefit plans. Under this guidance, actuarial gains and losses, prior service costs or credits, and any remaining transition assets or obligations that have not been recognized under previous accounting standards must be recognized in other comprehensive income, net of tax effects, until they are amortized as a component of net periodic benefit cost.

Product Performance Obligations. We extend performance and operating cost guarantees beyond our normal service and warranty policies for extended periods on some of our products, particularly commercial aircraft engines. Liability under such guarantees is based upon future product performance and durability. We accrue for such costs that are probable and can be reasonably estimated. In addition, we incur discretionary costs to service our products in connection with product performance issues. The costs associated with these product performance and operating cost guarantees require estimates over the full terms of the agreements, and require management to consider factors such as the extent of future maintenance requirements and the future cost of material and labor to perform the services. These cost estimates are largely based upon historical experience. See Note 17 for further discussion.

Collaborative Arrangements. In view of the risks and costs associated with developing new engines, Pratt & Whitney has entered into certain collaboration arrangements in which sales, costs and risks are shared. Sales generated from engine programs, spare parts, and aftermarket business under collaboration arrangements are recognized in our financial statements when earned. Amounts attributable to our collaborators for their share of sales are recorded as an expense in our financial statements based upon the terms and nature of the arrangement. Costs associated with engine programs under collaborative arrangements are expensed as incurred. Under these arrangements, collaborators contribute their program share of engine parts, incur their own production costs and make certain payments to Pratt & Whitney for shared or joint program costs. The reimbursement from the collaborators of their share of program costs is recorded as a reduction of the related expense item at that time. As of December 31, 2019, the collaborators' interests in all commercial engine programs ranged from 13% to 49%, inclusive of a portion of Pratt & Whitney's interests held by other participants. Pratt & Whitney is the principal participant in all existing collaborative arrangements, with the exception of the Engine Alliance (EA), a joint venture with GE Aviation, which markets and manufactures the GP7000 engine for the Airbus A380 aircraft. There are no individually significant collaborative arrangements and none of the collaborators individually exceed a 31% share in an individual program. The following table illustrates the Consolidated Statement of Operations classification and amounts attributable to transactions arising from the collaborative arrangements between participants for each period presented.

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Collaborator share of sales:			
Cost of products sold	**$ 2,097**	$ 1,688	$ 1,789
Cost of services sold	**1,674**	1,765	929
Collaborator share of program costs (reimbursement of expenses incurred):			
Cost of products sold	**(190)**	(209)	(143)
Research and development	**(219)**	(225)	(190)
Selling, general and administrative	**(101)**	(87)	(74)

Accounting Pronouncements. In June 2016, the FASB issued Accounting Standards Update (ASU) 2016-13, Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments. This ASU and its related amendments modifies the impairment model to utilize an expected loss methodology in place of the incurred loss methodology for financial instruments, including trade receivables, contract assets, long-term receivables and off-balance sheet credit exposures. The amendment requires entities to consider a broader range of information to estimate expected credit losses, including historical information, current conditions and a reasonable forecast period, which may result in earlier recognition of certain losses. The provisions of this ASU are effective for years beginning after December 15, 2019, with early adoption permitted. A modified retrospective approach is required with a cumulative-effect adjustment to retained earnings as of January 1, 2020. We are still quantifying the impact of this ASU and its related amendments on our Consolidated Financial Statements which is not expected to be material.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement. The new standard removes the disclosure requirements for the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy. This standard did not have a material impact on our financial statement disclosures. We early adopted this standard effective January 1, 2019.

In August 2018, the FASB issued ASU 2018-14, Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans. The new standard includes updates to the disclosure requirements for defined benefit plans including several additions, deletions and modifications to the disclosure requirements. The provisions of this ASU are effective for fiscal years ending after December 15, 2020, with early adoption permitted. We are currently evaluating the impact of this ASU.

In August 2018, the FASB issued ASU 2018-15, Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract. The new standard provides updated guidance surrounding implementation costs associated with cloud computing arrangements that are service contracts. The provisions of this ASU are effective for years beginning after December 15, 2019, with early adoption permitted. We adopted the new standard prospectively effective January 1, 2020. We do not expect this ASU to have a material impact on the Consolidated Financial Statements.

In October 2018, the FASB issued ASU 2018-17, Consolidation (Topic 810): Targeted Improvements to Related Party Guidance for Variable Interest Entities. The amendments in this update for determining whether a decision-making fee is a variable interest require reporting entities to consider indirect interests held through related parties under common control on a proportional basis rather than as the equivalent of a direct interest in its entirety (as currently required in generally accepted accounting principles (GAAP)). These amendments also will create alignment between determining whether a decision making fee is a variable interest and determining whether a reporting entity within a related party group is the primary beneficiary of a VIE. This will significantly reduce the risk that decision makers with insignificant direct and indirect interests could be deemed the primary beneficiary of a VIE. The provisions of this ASU are effective for years beginning after December 15, 2019, with early adoption permitted. We adopted the new standard effective January 1, 2020. This ASU did not have an impact on the Consolidated Financial Statements.

In November 2018, the FASB issued ASU 2018-18, Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606. The amendments in this update make targeted improvements to GAAP for collaborative arrangements as follows: clarify that certain transactions between collaborative arrangement participants should be accounted for as revenue under Topic 606 when the collaborative arrangement participant is a customer in the context of a unit of account. In those situations, all the guidance in Topic 606 should be applied, including recognition, measurement, presentation, and disclosure requirements; add unit-of-account guidance in Topic 808 to align with the guidance in Topic 606 (that is, a distinct good or service) when an entity is assessing whether the collaborative arrangement or a part of the arrangement is within the scope of Topic 606; and require that in a transaction with a collaborative arrangement participant that is not directly related to sales to third parties, presenting the transaction together with revenue recognized under Topic 606 is precluded if the collaborative arrangement participant is not a customer. The provisions of this ASU are effective for years beginning after December 15, 2019, with early adoption permitted. We adopted the new standard effective January 1, 2020. This ASU did not have an impact on the Consolidated Financial Statements.

In December 2019, the FASB issued ASU 2019-12, Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes. The amendments in this update remove certain exceptions of Topic 740 including: exception to the incremental approach for intraperiod tax allocation when there is a loss from continuing operations and income or gain from other items; exception to the requirement to recognize a deferred tax liability for equity method investments when a foreign subsidiary becomes an equity method investment; exception to the ability not to recognize a deferred tax liability for a foreign subsidiary when a foreign equity method investment becomes a subsidiary; exception to the general methodology for calculating income taxes in an interim period when a year-to-date loss exceeds the anticipated loss for the year. There are also additional areas of guidance in regards to: franchise and other taxes partially based on income and the interim recognition of enactment of tax laws and rate changes. The provisions of this ASU are effective for years beginning after December 15, 2020, with early adoption permitted. We are currently evaluating the impact of this ASU on our consolidated financial statements.

NOTE 2: BUSINESS ACQUISITIONS, DISPOSITIONS, GOODWILL AND INTANGIBLE ASSETS

Business Acquisitions. Our investments in businesses net of cash acquired in 2019, 2018 and 2017 totaled $56 million, $31,142 million (including debt assumed of $7,784 million and stock issued of $7,960 million), and $231 million respectively. Our investments in businesses in 2019 primarily consisted of several acquisitions at Otis. Our investments in businesses in 2018 primarily consisted of the acquisition of Rockwell Collins, Inc. (Rockwell Collins). Our investments in businesses in 2017 consisted of a number of small acquisitions, primarily in our commercial businesses.

On June 9, 2019, UTC entered into a merger agreement with Raytheon Company (Raytheon) providing for an all-stock merger of equals transaction. The Raytheon merger agreement provides, among other things, that each share of Raytheon common stock issued and outstanding immediately prior to the closing of the Raytheon merger (except for shares held by Raytheon as treasury stock) will be converted into the right to receive 2.3348 shares of UTC common stock. Upon the closing of the Raytheon merger, Raytheon will become a wholly-owned subsidiary of UTC, and UTC will change its name to Raytheon Technologies Corporation. On October 11, 2019, the shareowners of each of UTC and Raytheon approved the proposals necessary to complete the Raytheon merger. The Raytheon merger is expected to close early in the second quarter 2020 and is subject to customary closing conditions, including receipt of required regulatory approvals, as well as the completion of UTC's previously announced separation of its Otis and Carrier businesses.

On November 26, 2018, we completed the acquisition of Rockwell Collins (the "Rockwell Acquisition"), a leader in aviation and high-integrity solutions for commercial and military customers as well as leading-edge avionics, flight controls, aircraft interior and data connectivity solutions. Under the terms of the Rockwell acquisition agreement, each share of common stock, par value $0.01 per share, of Rockwell Collins issued and outstanding immediately prior to the effective time of the Rockwell Acquisition (other than shares held by Rockwell Collins, the Company, Riveter Merger Sub Corp or any of their respective wholly owned subsidiaries) was converted into the right to receive (1) $93.33 in cash, without interest, and (2) 0.37525 shares of Company common stock (together, the "Acquisition Consideration"), less any applicable withholding taxes, with cash paid in lieu of fractional shares. The total aggregate consideration payable in the Rockwell Acquisition was $15.5 billion in cash ($14.9 billion net of cash acquired) and 62.2 million shares of Company common stock. In addition, $7.8 billion of Rockwell Collins debt was outstanding at the time of the Rockwell Acquisition. This equated to a total enterprise value of $30.6 billion, including the $7.8 billion of Rockwell Collins' outstanding debt.

(DOLLARS IN MILLIONS)	Amount
Cash consideration paid for Rockwell Collins outstanding common stock & equity awards	$ 15,533
Fair value of UTC common stock issued for Rockwell Collins outstanding common stock & equity awards	7,960
Total consideration transferred	$ 23,493

The cash consideration utilized for the Rockwell Acquisition was partially financed through the previously disclosed issuance of $11.0 billion aggregate principal notes on August 16, 2018 for net proceeds of $10.9 billion. For the remainder of the cash consideration, we utilized repatriated cash and cash equivalents and cash flow generated from operating activities.

Final Allocation of Consideration Transferred to Net Assets Acquired:

The table below represents the final determination of the fair value of identifiable assets acquired and liabilities assumed from the Rockwell Collins acquisition after utilizing the one year measurement period allowed by the FASB ASC Topic 805, *"Business Combinations."*

(DOLLARS IN MILLIONS)	
Cash and cash equivalents	$ 640
Accounts receivable	1,659
Inventory	1,487
Contract assets, current	320
Other assets, current	251
Future income tax benefits	38
Fixed assets	1,542
Intangible assets:	
Customer relationships	8,720
Tradenames/trademarks	1,870
Developed technology	600
Other assets	217
Total identifiable assets acquired	17,344
Short-term borrowings	2,254
Accounts payable	520
Accrued liabilities	1,663
Contract liabilities, current	299
Long-term debt	5,530
Future pension and postretirement benefit obligation	502
Other long-term liabilities	3,614
Noncontrolling interest	6
Total liabilities acquired	14,388
Total identifiable net assets	2,956
Goodwill	20,537
Total consideration transferred	$ 23,493

In order to allocate the consideration transferred for Rockwell Collins, the fair values of all identifiable assets and liabilities were established. For accounting and financial reporting purposes, fair value is defined under FASB ASC Topic 820, *"Fair Value Measurements and Disclosures"* as the price that would be received upon sale of an asset or the amount paid to transfer a liability in an orderly transaction between market participants at the measurement date. Market participants are assumed to be buyers and sellers in the principal (most advantageous) market for the asset or liability. Additionally, fair value measurements for an asset assume the highest and best use of that asset by market participants. Use of different estimates and judgments could yield different results. Fair value adjustments to Rockwell Collins' identified assets and liabilities resulted in an increase in inventory and fixed assets of $282 million and $244 million, respectively. In determining the fair value of identifiable assets acquired and liabilities assumed, a review was conducted for any significant contingent assets or liabilities existing as of the acquisition date. This assessment did not note any significant contingencies related to existing legal or government action.

The fair values of the customer relationship and related program intangible assets, which include the related aerospace program original equipment (OEM) and aftermarket cash flows, were determined by using an "income approach." Under this approach, the net earnings attributable to the asset or liability being measured are isolated using the discounted projected net cash flows. These projected cash flows are isolated from the projected cash flows of the combined asset group over the remaining economic life of the intangible asset or liability being measured. Both the amount and the duration of the cash flows are considered from a market participant perspective. Our estimates of market participant net cash flows considered historical and projected pricing, remaining developmental effort, operational performance, including company specific synergies, aftermarket retention, product life cycles, material and labor pricing, and other relevant customer, contractual and market factors. Where appropriate, the net cash flows are probability-adjusted to reflect the uncertainties associated with the underlying assumptions as well as the risk profile of the net cash flows utilized in the valuation. The probability-adjusted future cash flows are then discounted to present value using an appropriate discount rate. The customer relationship and related program intangible assets are being amortized on a straight-line basis (which approximates the economic pattern of benefits) over the estimated economic life of the underlying programs of 10 to 23 years. The developed technology intangible asset is being amortized over the economic pattern of benefit. The fair value of the tradename intangible assets were determined utilizing the relief from royalty method which is a form of the income approach. Under this method, a royalty rate based on observed market royalties is applied to projected revenue supporting the valuation of the tradename and discounted to present value using an appropriate discount rate. The tradename intangible assets have been determined to have an indefinite life. The intangible assets included above consist of the following:

(DOLLARS IN MILLIONS)	Fair Value	Estimated Life
Acquired customer relationships	$ 8,720	10-23 years
Acquired tradenames/trademarks	1,870	indefinite
Acquired developed technology	600	15 years
	$ 11,190	

We also identified customer contractual obligations on certain contracts with economic returns that are lower than could be realized in market transactions as of the acquisition date. We measured these liabilities under the measurement provisions of FASB ASC Topic 820, *"Fair Value Measurements and Disclosures,"* which is based on the price to transfer the obligation to a market participant at the measurement date, assuming that the liability will remain outstanding in the marketplace. Based on the estimated net cash outflows of the programs plus a reasonable contracting profit margin required to transfer the contracts to market participants, we recorded assumed liabilities of approximately $1.02 billion in connection with the Rockwell Acquisition. These liabilities will be liquidated in accordance with the underlying pattern of obligations, as reflected by the expenses incurred on the contracts. Total consumption of the contractual obligation in 2019 was $129 million. Total consumption of the contractual obligation for the next five years is expected to be as follows: $104 million in 2020, $104 million in 2021, $112 million in 2022, $96 million in 2023, and $101 million in 2024.

Acquisition-Related Costs:
Acquisition-related costs have been expensed as incurred. In 2019, 2018, and 2017 approximately $40 million, $112 million, and $39 million respectively, of transaction and integration costs have been incurred. These costs were recorded in Selling, general and administrative expenses within the Consolidated Statement of Operations.

Supplemental Pro-Forma Data:
Rockwell Collins' results of operations have been included in UTC's financial statements for the period subsequent to the completion of the acquisition on November 26, 2018. Rockwell Collins contributed sales of approximately $778 million and operating profit of approximately $11 million for the year ended December 31, 2018. The following unaudited supplemental pro-forma data presents consolidated information as if the acquisition had been completed on January 1, 2017. The pro-forma results were calculated by combining the results of UTC with the stand-alone results of Rockwell Collins for the pre-acquisition periods, which were adjusted to account for certain costs that would have been incurred during this pre-acquisition period:

	Year Ended December 31,	
(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS)	2018	2017
Net sales	$ 74,136	$ 68,033
Net income attributable to common shareowners from continuing operations	$ 6,064	$ 4,662
Basic earnings per share of common stock from continuing operations	$ 6.82	$ 5.45
Diluted earnings per share of common stock from continuing operations	$ 6.76	$ 5.39

The unaudited supplemental pro-forma data above includes the following significant adjustments made to account for certain costs which would have been incurred if the acquisition had been completed on January 1, 2017, as adjusted for the applicable tax impact. As our acquisition of Rockwell Collins was completed on November 26, 2018, the pro-forma adjustments in the table below only include the required adjustments through November 26, 2018:

	Year Ended December 31,	
(DOLLARS IN MILLIONS)	2018	2017
Amortization of inventory and fixed asset fair value adjustment [1]	58	$ (192)
Amortization of acquired Rockwell Collins intangible assets, net [2]	(193)	(202)
Utilization of contractual customer obligation [3]	16	116
UTC/Rockwell fees for advisory, legal, accounting services [4]	212	(212)
Interest expense incurred on acquisition financing, net [5]	(199)	(234)
Elimination of capitalized pre-production engineering amortization [6]	63	42
Adjustment to net periodic pension cost [7]	42	34
Adjustment to reflect the adoption of ASC 606 [8]	106	—
Elimination of entities held for sale [9]	(47)	(35)
Inclusion of B/E Aerospace [10]	—	(51)
	$ 58	$ (734)

1 2018 reflects the elimination of the inventory step-up amortization recorded by UTC in 2018 as this would have been completed within the first two quarters of 2017. Additionally, this adjustment reflects the amortization of the fixed asset fair value adjustment as of the acquisition date.

2 Reflects the additional amortization of the acquired Rockwell Collins' intangible assets recognized at fair value in purchase accounting and eliminates the historical Rockwell Collins intangible asset amortization expense.

3 Reflects the additional amortization of liabilities recognized for acquired contracts with terms less favorable than could be realized in market transactions as of the acquisition date and eliminates Rockwell Collins historical amortization of these liabilities.

4 2018 reflects the elimination of transaction-related fees incurred by UTC and Rockwell Collins in connection with the acquisition and assumes all of the fees were incurred during the first quarter of 2017.

5 Reflects the additional interest expense incurred on debt to finance our acquisition of Rockwell Collins and reduces interest expense for the debt fair value adjustment which would have been amortized.

6 Reflects the elimination of Rockwell Collins capitalized pre-production engineering amortization to conform to UTC policy.

7 Reflects adjustments for the elimination of amortization of prior service cost and actuarial loss amortization, which was recorded by Rockwell Collins, as a result of fair value purchase accounting, net of the impact of the revised pension and post-retirement benefit (expense) as determined under UTC's plan assumptions.

8 Reflects adjustments to Rockwell Collins revenue recognition as if they adopted the New Revenue Standard as of January 1, 2018 and primarily relates to capitalization of contract costs and changes in timing of sales recognition for contracts requiring an over time method of revenue recognition, partially offset by deferral of revenue recognized on OEM product engineering and development.

9 Reflects the elimination of entities required to be sold for regulatory approvals.

10 Reflects adjustments to include the results and related adjustments for B/E Aerospace as if it had been acquired by Rockwell Collins on January 1, 2017.

The unaudited supplemental pro-forma financial information does not reflect the potential realization of cost savings related to the integration of the two companies. Further, the pro-forma data should not be considered indicative of the results that would have occurred if the acquisition and related financing had been consummated on January 1, 2017, nor are they indicative of future results.

Dispositions. Cash inflows related to dispositions during the 2019 were $138 million and primarily consisted of the dispositions of businesses held for sale associated with the Rockwell Collins acquisition. In accordance with conditions imposed for regulatory approval of the acquisition, Rockwell Collins was required to dispose of certain businesses. These businesses were held separate from UTC's and Rockwell Collins' ongoing businesses pursuant to regulatory requirements. Definitive agreements to sell each of the businesses were entered into prior to the completion of UTC's acquisition of Rockwell Collins. The related assets and liabilities of these businesses had been accounted for as held for sale at fair value less cost to sell. As of December 31, 2018, assets held for sale of $175 million were included within Other assets, current and liabilities held for sale of $40 million were included within Accrued liabilities on the Consolidated Balance Sheet. The major classes of assets and liabilities primarily included net Inventory of $51 million and net Fixed assets of $37 million. In the first quarter of 2019, Rockwell Collins completed the sale of all businesses which were held for sale as of December 31, 2018.

On November 26, 2018, the Company announced its intention to separate into three independent companies. Following the separations, the Company will operate as an aerospace company comprised of Collins Aerospace Systems and the Pratt & Whitney businesses, and Otis and Carrier will become independent companies. The proposed separations are expected to be effected through spin-offs of Otis and Carrier that are intended to be tax-free for the Company's shareowners for U.S. federal income tax purposes, and are expected to be completed in the first half of 2020. Separation of Otis and Carrier from UTC via spin-off transactions will be subject to the satisfaction of customary conditions, including, among others, final approval by the Company's Board of Directors, receipt of tax rulings and a tax opinion from external counsel, the filing with the Securities and Exchange Commission (SEC) and effectiveness of Form 10 registration statements, and satisfactory completion of financing (subject to UTC's agreement to consummate the distributions pursuant to, and subject to the terms and conditions of, the Raytheon merger agreement). As of December 31, 2019, approximately $600 million of charges have been incurred related to the separation activities which are predominantly recorded in Selling, general and administrative costs and approximately $730 million of tax charges have been incurred.

On June 21, 2018, Carrier completed its sale of Taylor Company for proceeds of $1.0 billion resulting in a pre-tax gain of $799 million ($591 million after tax).

On January 20, 2020 the Company reached an agreement with BAE Systems, Inc. on a proposed sale of assets related to the Collins Aerospace Systems military global positioning system business for $1.93 billion. The proposed sale is required as a regulatory condition to the Raytheon merger, and is subject to the completion of the Raytheon merger, as well as the satisfaction of other customary closing conditions, including receipt of required regulatory approvals. Due to these closing conditions, the criteria for held for sale accounting treatment were not met as of December 31, 2019.

Goodwill. Changes in our goodwill balances for the year ended in 2019 were as follows:

(DOLLARS IN MILLIONS)	Balance as of January 1, 2019	Goodwill resulting from business combinations	Foreign currency translation and other	**Balance as of December 31, 2019**
Otis	$ 1,688	$ 16	$ (57)	**$ 1,647**
Carrier	9,835	1	(29)	**9,807**
Pratt & Whitney	1,567	—	(4)	**1,563**
Collins Aerospace Systems	35,001	75	(51)	**35,025**
Total Segments	48,091	92	(141)	**48,042**
Eliminations and other	21	—	—	**21**
Total	$ 48,112	$ 92	$ (141)	**$ 48,063**

The $75 million increase in Goodwill at Collins Aerospace Systems reflects a $475 million net increase in Goodwill resulting from several individually insignificant purchase accounting adjustments related to the Rockwell Acquisition, partially offset by a $400 million decrease in Goodwill related to adjustments to the customer relationship intangible asset associated with the Rockwell Acquisition.

Intangible Assets. Identifiable intangible assets are comprised of the following:

	2019		2018	
(DOLLARS IN MILLIONS)	**Gross Amount**	**Accumulated Amortization**	Gross Amount	Accumulated Amortization
Amortized:				
Service portfolios	**$ 2,105**	**$ (1,626)**	$ 2,164	$ (1,608)
Patents and trademarks	**356**	**(250)**	361	(236)
Collaboration intangible assets	**4,862**	**(920)**	4,509	(649)
Customer relationships and other	**23,210**	**(5,607)**	22,525	(4,560)
	30,533	**(8,403)**	29,559	(7,053)
Unamortized:				
Trademarks and other	**3,916**	**—**	3,918	—
Total	**$ 34,449**	**$ (8,403)**	$ 33,477	$ (7,053)

In addition to acquired customer relationship intangible assets, customer relationship intangible assets include payments made to our customers to secure certain contractual rights. Such payments are capitalized when distinct rights are obtained and sufficient incremental cash flows to support the recoverability of the assets have been established. Otherwise, the applicable portion of the payments is expensed. We amortize these intangible assets based on the underlying pattern of economic benefit, which may result in an amortization method other than straight-line. In the aerospace industry, amortization based on the pattern of economic benefit generally results in lower amortization expense during the development period with amortization expense increasing as programs enter full production and aftermarket cycles. If a pattern of economic benefit cannot be reliably determined, a straight-line amortization method may be used. We classify amortization of such payments as a reduction of sales. Amortization of intangible assets was $1,452 million, $976 million and $834 million in 2019, 2018 and 2017, respectively. The collaboration intangible assets are amortized based upon the pattern of economic benefits as represented by the underlying cash flows. The following is the expected amortization of total intangible assets for 2020 through 2024, which reflects the pattern of expected economic benefit on certain aerospace intangible assets:

(DOLLARS IN MILLIONS)	2020	2021	2022	2023	2024
Amortization expense	$ 1,438	$ 1,420	$ 1,420	$ 1,411	$ 1,381

Other Matters. In January 2020, Boeing announced that it expects the 737 Max fleet to remain grounded until mid-2020. In addition, Boeing has also announced the temporary suspension of its production of the 737 Max. The Company considered the potential impact of these developments on goodwill and intangible asset balances that could be impacted by this situation and concluded that the balances remain recoverable and no adjustment was required.

NOTE 3: EARNINGS PER SHARE

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS; SHARES IN MILLIONS)	2019	2018	2017
Net income attributable to common shareowners	**$ 5,537**	$ 5,269	$ 4,552
Basic weighted average number of shares outstanding	**854.8**	800.4	790.0
Stock awards and equity units (share equivalent)	**9.1**	9.7	9.1
Diluted weighted average number of shares outstanding	**863.9**	810.1	799.1
Earnings Per Share of Common Stock:			
Basic	**$ 6.48**	$ 6.58	$ 5.76
Diluted	**$ 6.41**	$ 6.50	$ 5.70

The computation of diluted earnings per share excludes the effect of the potential exercise of stock awards, including stock appreciation rights and stock options, when the average market price of the common stock is lower than the exercise price of the related stock awards during the period because the effect would be anti-dilutive. In addition, the computation of diluted earnings per share excludes the effect of the potential exercise of stock awards when the awards' assumed proceeds exceed the average market price of the common shares during the period. For 2019, 2018 and 2017, there were 8.3 million, 5.1 million and 5.9 million anti-dilutive stock awards excluded from the computation, respectively.

NOTE 4: COMMERCIAL AEROSPACE INDUSTRY ASSETS AND COMMITMENTS

We have receivables and other financing assets with commercial aerospace industry customers totaling $11,394 million and $11,695 million at December 31, 2019 and 2018, respectively. These include customer financing assets related to commercial aerospace industry customers, consisting of products under lease of $3,185 million and $2,736 million, and notes and leases receivable of $308 million and $299 million, at December 31, 2019 and 2018, respectively.

Aircraft financing commitments, in the form of debt or lease financing, are provided to commercial aerospace customers. The extent to which the financing commitments will be utilized is not currently known, since customers may be able to obtain more favorable terms from other financing sources. We may also arrange for third-party investors to assume a portion of these commitments. If financing commitments are exercised, debt financing is generally secured by assets with fair market values equal to or exceeding the financed amounts consistent with market terms and conditions. We may also lease aircraft and subsequently sublease the aircraft to customers under long-term non-cancelable operating leases. Our financing commitments with customers are contingent upon maintenance of certain levels of financial condition by the customers.

We have also made residual value and other guarantees related to various commercial aerospace customer financing arrangements. The estimated fair market values of the guaranteed assets equal or exceed the value of the related guarantees, net of existing reserves. We have residual value and other guarantees of $333 million as of December 31, 2019. Partner share of these guarantees is $142 million. Refer to Note 17 to the Consolidated Financial Statements for additional discussion on guarantees.

We also have other contractual commitments, including commitments to secure certain contractual rights to provide product on new aircraft platforms, which are included in "Other commercial aerospace commitments" in the table below. Payments made on these contractual commitments are included within other intangible assets and are to be amortized over the term of underlying economic benefit. Our commercial aerospace financing and other contractual commitments as of December 31, 2019 were approximately $15.0 billion. We have entered into certain collaboration arrangements, which may include participation by our collaboration partners in these commitments.

The following is the expected maturity of commercial aerospace industry assets and commitments as of December 31, 2019:

(DOLLARS IN MILLIONS)	Committed	2020	2021	2022	2023	2024	Thereafter
Notes and leases receivable	**$ 308**	$ 30	$ 23	$ 14	$ 22	$ 38	$ 181
Commercial aerospace financing commitments	**$ 3,937**	$ 911	$ 1,119	$ 974	$ 819	$ 44	$ 70
Other commercial aerospace commitments	**11,055**	702	736	717	668	627	7,605
Collaboration partners' share	**(5,284)**	(508)	(623)	(571)	(538)	(193)	(2,851)
Total commercial commitments	**$ 9,708**	$ 1,105	$ 1,232	$ 1,120	$ 949	$ 478	$ 4,824

In connection with our 2012 agreement to acquire Rolls-Royce's ownership and collaboration interests in IAE AG, additional payments are due to Rolls-Royce contingent upon each hour flown through June 2027 by the V2500-powered aircraft in service as of the acquisition date. These flight hour payments, included in "Other commercial aerospace commitments" in the table above, are being capitalized as collaboration intangible assets.

We have long-term aftermarket maintenance contracts with commercial aerospace industry customers for which revenue is recognized over-time in proportion to actual costs incurred relative to total expected costs to be incurred over the respective contract periods. Billings, however, are typically based on factors such as aircraft or engine flight hours. The timing differences between the billings and the maintenance costs incurred generates both Contract assets and Contract liabilities. Additionally, we have other contracts with commercial aerospace industry customers which can result in the generation of Contract assets and Contract liabilities. Contract assets totaled $2,741 million and $2,247 million at December 31, 2019 and 2018, respectively, and are included in “Contract assets, current” and “Other assets” in the accompanying Consolidated Balance Sheet.

Allowance for doubtful accounts was $248 million and $245 million at December 31, 2019 and 2018, respectively. Reserves related to financing commitments and guarantees were $7 million and $15 million at December 31, 2019 and 2018, respectively.

In addition, in connection with the acquisition of Rockwell Collins in 2018 and Goodrich in 2012, we recorded assumed liabilities of approximately $1.02 billion and $2.2 billion, respectively related to customer contractual obligations on certain programs with terms less favorable than could be realized in market transactions as of the acquisition date. These liabilities are being liquidated in accordance with the underlying pattern of obligations, as reflected by the net cash outflows incurred on the contracts. Total consumption of the contractual obligations for the years ended December 31, 2019 and 2018 was approximately $345 million and $252 million, respectively. The balance of the contractual obligations at December 31, 2019 was $1,408 million, with future consumption expected to be as follows: $263 million in 2020, $189 million in 2021, $148 million in 2022, $118 million in 2023, $127 million in 2024 and $563 million thereafter.

We also have intangible assets associated with commercial aerospace. Refer to Note 2 for discussion of intangible assets. Refer to Note 1 for discussion of contract fulfillment costs. Refer to Note 19 for discussion of leases, including those that were disclosed as commitments prior to the adoption of ASC 842.

NOTE 5: INVENTORY, NET

(DOLLARS IN MILLIONS)	**2019**	2018
Raw materials	**$ 3,357**	$ 3,052
Work-in-process	**2,726**	2,673
Finished goods	**4,867**	4,358
	$ 10,950	$ 10,083

Raw materials, work-in-process and finished goods are net of valuation reserves of $1,377 million and $1,270 million as of December 31, 2019 and 2018, respectively.

NOTE 6: CONTRACT ASSETS AND LIABILITIES

Contract assets reflect revenue recognized and performance obligations satisfied in advance of customer billing. Contract liabilities relate to payments received in advance of the satisfaction of performance under the contract. We receive payments from customers based on the terms established in our contracts. Total contract assets and contract liabilities as of December 31, 2019 and 2018 are as follows:

(DOLLARS IN MILLIONS)	**2019**	2018
Contract assets, current	**$ 4,184**	$ 3,486
Contract assets, noncurrent (included within Other assets)	**1,338**	1,142
Total contract assets	**5,522**	4,628
Contract liabilities, current	**(6,180)**	(5,720)
Contract liabilities, noncurrent	**(5,732)**	(5,069)
Total contract liabilities	**(11,912)**	(10,789)
Net contract liabilities	**$ (6,390)**	$ (6,161)

Contract assets increased $894 million during the year ended December 31, 2019 due to revenue recognition in excess of customer billings, primarily on Pratt & Whitney military and commercial aftermarket service agreements and various programs at Collins Aerospace Systems. Contract liabilities increased $1,123 million during the year ended December 31, 2019 primarily due to customer billings in excess of revenue recognized on Pratt & Whitney commercial aftermarket service agreements and various programs at Collins Aerospace Systems. We recognized revenue of $4.9 billion during the year ended December 31, 2019 related to contract liabilities as of December 31, 2018.

NOTE 7: FIXED ASSETS

(DOLLARS IN MILLIONS)	Estimated Useful Lives	**2019**	2018
Land		**$ 447**	$ 425
Buildings and improvements	12-40 years	**6,673**	6,486
Machinery, tools and equipment	3-20 years	**16,353**	15,119
Other, including assets under construction		**2,213**	2,054
		25,686	24,084
Accumulated depreciation		**(12,931)**	(11,787)
		$ 12,755	$ 12,297

Depreciation expense is recorded predominantly utilizing the straight-line method and was $1,506 million in 2019, $1,240 million in 2018 and $1,178 million in 2017.

NOTE 8: ACCRUED LIABILITIES

(DOLLARS IN MILLIONS)	**2019**	2018
Accrued salaries, wages and employee benefits	**$ 2,407**	$ 2,074
Service and warranty accruals	**734**	754
Interest payable	**608**	637
Litigation and contract matters	**502**	461
Income taxes payable	**928**	460
Accrued property, sales and use taxes	**320**	277
Canadian government settlement - current portion	**—**	34
Accrued restructuring costs	**208**	249
Accrued workers compensation	**157**	142
Liabilities held for sale	**—**	40
Operating lease liabilities, current	**544**	—
Other	**5,329**	5,095
	$ 11,737	$ 10,223

The increase in Income taxes payable is primarily related to income taxes associated with the Company’s portfolio separation transactions. Refer to Note 19 for discussion of leases.

NOTE 9: BORROWINGS AND LINES OF CREDIT

(DOLLARS IN MILLIONS)	2019	2018
Short-term borrowings:		
Commercial paper	$ —	$ 1,257
Other borrowings	2,364	212
Total short-term borrowings	$ 2,364	$ 1,469

At December 31, 2019, we had credit agreements with various banks permitting aggregate borrowings of up to $10.35 billion including a $2.20 billion revolving credit agreement and a $2.15 billion multicurrency revolving credit agreement, both of which expire in August 2021; and a $2.0 billion revolving credit agreement and a $4.0 billion term credit agreement, both of which we entered into on March 15, 2019 and which will expire on March 15, 2021 or, if earlier, the date that is 180 days after the date on which each of the separations of Otis and Carrier have been consummated. As of December 31, 2019, there were borrowings of $2.10 billion under the $4.0 billion term credit agreement. The undrawn portions of the revolving credit agreements are also available to serve as backup facilities for the issuance of commercial paper.

As of December 31, 2019, our maximum commercial paper borrowing limit was $6.35 billion. We had no commercial paper borrowings as of December 31, 2019. We use our commercial paper borrowings for general corporate purposes, including the funding of potential acquisitions, pension contributions, debt refinancing, dividend payments and repurchases of our common stock. The need for commercial paper borrowings arises when the use of domestic cash for general corporate purposes exceeds the sum of domestic cash generation and foreign cash repatriated to the U.S.

At December 31, 2019, approximately $2.3 billion was available under short-term lines of credit with local banks at our various domestic and international subsidiaries. The weighted-average interest expense rates applicable to short-term borrowings and total debt were as follows:

	2019	2018
Average interest expense rate - average outstanding borrowings during the year:		
Short-term borrowings	1.9%	1.5%
Total debt	3.7%	3.5%
Average interest expense rate - outstanding borrowings as of December 31:		
Short-term borrowings	3.1%	1.2%
Total debt	3.7%	3.5%

Long-term debt consisted of the following as of December 31:

(DOLLARS IN MILLIONS)	2019	2018
Libor plus 0.350% floating rate notes due 2019 [3]	$ —	$ 350
1.500% notes due 2019 [1]	—	650
1.950% notes due 2019 [4]	—	300
Euribor plus 0.15% floating rate notes due 2019 (€750 million principal value) [2]	—	858
5.250% notes due 2019 [4]	—	300
8.875% notes due 2019	—	271
4.875% notes due 2020 [1]	171	171
4.500% notes due 2020 [1]	1,250	1,250
1.900% notes due 2020 [1]	1,000	1,000
EURIBOR plus 0.20% floating rate notes due 2020 (€750 million principal value) [2]	831	858
8.750% notes due 2021	250	250
3.100% notes due 2021 [4]	250	250
3.350% notes due 2021 [1]	1,000	1,000
LIBOR plus 0.650% floating rate notes due 2021 [1,3]	750	750
1.950% notes due 2021 [1]	750	750
1.125% notes due 2021 (€950 million principal value) [1]	1,053	1,088
2.300% notes due 2022 [1]	500	500
2.800% notes due 2022 [4]	1,100	1,100
3.100% notes due 2022 [1]	2,300	2,300
1.250% notes due 2023 (€750 million principal value) [1]	831	858
3.650% notes due 2023 [1]	2,250	2,250
3.700% notes due 2023 [4]	400	400
2.800% notes due 2024 [1]	800	800
3.200% notes due 2024 [4]	950	950
1.150% notes due 2024 (€750 million principal value) [1]	831	858
3.950% notes due 2025 [1]	1,500	1,500
1.875% notes due 2026 (€500 million principal value) [1]	554	573
2.650% notes due 2026 [1]	1,150	1,150
3.125% notes due 2027 [1]	1,100	1,100
3.500% notes due 2027 [4]	1,300	1,300
7.100% notes due 2027	141	141
6.700% notes due 2028	400	400
4.125% notes due 2028 [1]	3,000	3,000
7.500% notes due 2029 [1]	550	550
2.150% notes due 2030 (€500 million principal value) [1]	554	573
5.400% notes due 2035 [1]	600	600
6.050% notes due 2036 [1]	600	600
6.800% notes due 2036 [1]	134	134
7.000% notes due 2038	159	159
6.125% notes due 2038 [1]	1,000	1,000
4.450% notes due 2038 [1]	750	750
5.700% notes due 2040 [1]	1,000	1,000
4.500% notes due 2042 [1]	3,500	3,500
4.800% notes due 2043 [4]	400	400
4.150% notes due 2045 [1]	850	850
3.750% notes due 2046 [1]	1,100	1,100
4.050% notes due 2047 [1]	600	600
4.350% notes due 2047 [4]	1,000	1,000
4.625% notes due 2048 [1]	1,750	1,750
Project financing obligations [5]	309	287
Other (including finance leases)	331	287
Total principal long-term debt	41,599	44,416
Other (fair market value adjustments, discounts and debt issuance costs)	(315)	(348)
Total long-term debt	41,284	44,068
Less: current portion	3,496	2,876
Long-term debt, net of current portion	$ 37,788	$ 41,192

1 We may redeem these notes at our option pursuant to their terms.

2 The three-month EURIBOR rate as of December 31, 2019 was approximately (0.383)%. The notes may be redeemed at our option in whole, but not in part, at any time in the event of certain developments affecting U.S. taxation.

3 The three-month LIBOR rate as of December 31, 2019 was approximately 1.908%.

4 Rockwell Collins debt which remained outstanding following the Merger.

5 The project financing obligations included in the table above are associated with the sale of rights to unbilled revenues related to the ongoing activity of an entity owned by Carrier.

We had no debt issuances during 2019 and the following issuances of debt in 2018:

(DOLLARS AND EUROS IN MILLIONS)

Issuance Date	Description of Notes	Aggregate Principal Balance
August 16, 2018:	3.350% notes due 2021 [1]	$ 1,000
	3.650% notes due 2023 [1]	2,250
	3.950% notes due 2025 [1]	1,500
	4.125% notes due 2028 [1]	3,000
	4.450% notes due 2038 [1]	750
	4.625% notes due 2048 [2]	1,750
	LIBOR plus 0.65% floating rate notes due 2021 [1]	750
May 18, 2018:	1.150% notes due 2024 [3]	€ 750
	2.150% notes due 2030 [3]	500
	EURIBOR plus 0.20% floating rate notes due 2020 [3]	750

1 The net proceeds received from these debt issuances were used to partially finance the cash consideration portion of the purchase price for Rockwell Collins and fees, expenses and other amounts related to the acquisition of Rockwell Collins.

2 The net proceeds from these debt issuances were used to fund the repayment of commercial paper and for other general corporate purposes.

3 The net proceeds received from these debt issuances were used for general corporate purposes.

We made the following repayments of debt in 2019 and 2018:

(DOLLARS AND EUROS IN MILLIONS)

Repayment Date	Description of Notes	Aggregate Principal Balance
November 15, 2019	8.875% notes	$ 271
November 13, 2019	EURIBOR plus 0.15% floating rate notes	€ 750
November 1, 2019:	LIBOR plus 0.350% floating rate notes	$ 350
	1.500% notes	$ 650
July 15, 2019:	1.950% notes [1]	$ 300
	5.250% notes [1]	$ 300
December 14, 2018	Variable-rate term loan due 2020 (1 month LIBOR plus 1.25%)[1]	$ 482
May 4, 2018	1.778% junior subordinated notes	$ 1,100
February 22, 2018	EURIBOR plus 0.80% floating rate notes	€ 750
February 1, 2018	6.80% notes	$ 99

1 These notes and term loan were assumed in connection with the Rockwell Collins acquisition and subsequently repaid.

The percentage of total short-term borrowings and long-term debt at variable interest rates was 9% and 10% at December 31, 2019 and 2018, respectively. Interest rates on our commercial paper borrowings are considered variable due to their short-term duration and high-frequency of turnover.

The average maturity of our long-term debt at December 31, 2019 is approximately 10 years. The schedule of principal payments required on long-term debt for the next five years and thereafter is:

(DOLLARS IN MILLIONS)	
2020	$ 3,496
2021	4,142
2022	3,919
2023	3,501
2024	2,592
Thereafter	23,949
Total	$ 41,599

On September 27, 2019 we filed a universal shelf registration statement with the SEC for an indeterminate amount of debt and equity securities for future issuance, subject to our internal limitations on the amount of debt to be issued under the shelf registration statement.

NOTE 10: ACCUMULATED OTHER COMPREHENSIVE INCOME

A summary of the changes in each component of Accumulated other comprehensive (loss) income, net of tax for the years ended December 31, 2019 and 2018 is provided below:

(DOLLARS IN MILLIONS)	Foreign Currency Translation	Defined Benefit Pension and Postretirement Plans	Unrealized Gains (Losses) on Available-for-Sale Securities	Unrealized Hedging (Losses) Gains	Accumulated Other Comprehensive (Loss) Income
Balance at December 31, 2017	$ (2,950)	$ (4,652)	$ 5	$ 72	$ (7,525)
Other comprehensive income before reclassifications, net	(486)	(1,736)	—	(307)	(2,529)
Amounts reclassified, pre-tax	(2)	344	—	(16)	326
Tax (expense) benefit	(4)	326	—	78	400
ASU 2016-01 adoption impact	$ —	$ —	$ (5)	$ —	$ (5)
Balance at December 31, 2018	$ (3,442)	$ (5,718)	$ —	$ (173)	$ (9,333)
Other comprehensive loss before reclassifications, net	**280**	**(584)**	**—**	**(33)**	**(337)**
Amounts reclassified, pre-tax	**2**	**170**	**—**	**51**	**223**
Tax (expense) benefit	**(43)**	**97**	**—**	**(11)**	**43**
ASU 2018-02 adoption impact	**(8)**	**(737)**	**—**	**—**	**(745)**
Balance at December 31, 2019	**$ (3,211)**	**$ (6,772)**	**$ —**	**$ (166)**	**$ (10,149)**

In February 2018, the FASB issued ASU 2018-02, *Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income (Topic 220)*. The new standard allows companies to reclassify to retained earnings the stranded tax effects in Accumulated other comprehensive income (AOCI) from the TCJA. We elected to reclassify the income tax effects of TCJA from AOCI of $745 million to retained earnings, effective January 1, 2019.

In January 2016, the FASB issued ASU 2016-01, Financial Instruments - Overall: Recognition and Measurement of Financial Assets and Financial Liabilities. This ASU modifies how entities measure equity investments and present changes in the fair value of financial liabilities. Upon adoption, investments that do not result in consolidation and are not accounted for under the equity method generally must be carried at fair value, with changes in fair value recognized in net income. We had approximately $5 million of unrealized gains on these securities recorded in Accumulated other comprehensive loss in our Consolidated Balance Sheet as of December 31, 2017. We adopted this standard effective January 1, 2018, with these amounts recorded directly to retained earnings as of that date.

Amounts reclassified that relate to our defined benefit pension and postretirement plans include the amortization of prior service costs and actuarial net losses recognized during each period presented. These costs are recorded as components of net periodic pension cost for each period presented. Additionally, during 2019, we recorded a curtailment gain of $98 million in the Consolidated Statement of Operations which is included within amounts reclassified related to our defined pension and postretirement plans (see Note 12 for additional details).

All noncontrolling interests with redemption features, such as put options, that are not solely within our control (redeemable noncontrolling interests) are reported in the mezzanine section of the Consolidated Balance Sheet, between liabilities and equity, at the greater of redemption value or initial carrying value.

NOTE 11: INCOME TAXES

Income Before Income Taxes. The sources of income from continuing operations before income taxes are:

(DOLLARS IN MILLIONS)	2019	2018	2017
United States	**$ 3,207**	$ 3,630	$ 2,990
Foreign	**5,036**	4,650	4,773
	$ 8,243	$ 8,280	$ 7,763

On December 22, 2017 Public Law 115-97 "*An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018*" was enacted. This law is commonly referred to as the Tax Cuts and Jobs Act of 2017 (TCJA).

The Company no longer intends to reinvest certain undistributed earnings of its international subsidiaries that have been previously taxed in the U.S. As such, in 2018 it recorded the international taxes associated with the future remittance of these earnings. For the remainder of the Company's undistributed international earnings, unless tax effective to repatriate, UTC will continue to permanently reinvest these earnings. As of December 31, 2019, such undistributed earnings were approximately $21 billion, excluding other comprehensive income amounts. It is not practicable to estimate the amount of tax that might be payable on the remaining amounts.

Provision for Income Taxes. The income tax expense (benefit) for the years ended December 31, 2019, 2018 and 2017 consisted of the following components:

(DOLLARS IN MILLIONS)	2019	2018	2017
Current:			
United States:			
Federal	**$ 188**	$ 442	$ 1,577
State	**48**	211	64
Foreign	**2,024**	1,238	1,140
	2,260	1,891	2,781
Future:			
United States:			
Federal	**111**	57	(27)
State	**52**	62	84
Foreign	**(128)**	616	5
	35	735	62
Income tax expense	**$ 2,295**	$ 2,626	$ 2,843
Attributable to items credited (charged) to equity	**$ 40**	$ 501	$ (128)

Reconciliation of Effective Income Tax Rate. Differences between effective income tax rates and the statutory U.S. federal income tax rate are as follows:

	2019	2018	2017
Statutory U.S. federal income tax rate	**21.0 %**	21.0%	35.0 %
Tax related separation activities	**8.8 %**	—%	— %
Tax on international activities	**1.9 %**	0.9%	(6.4)%
Tax audit settlements	**(3.5)%**	—%	(0.7)%
U.S. tax reform	**— %**	9.0%	8.9 %
Other	**(0.4)%**	0.8%	(0.2)%
Effective income tax rate	**27.8 %**	31.7%	36.6 %

The 2019 effective tax rate includes $729 million of income taxes associated with the Company's portfolio separation transactions, offset in part by amounts associated with the conclusion of the audit by the Examination Division of the Internal Revenue Service for the UTC 2014, 2015 and 2016 tax years, the filing by a subsidiary of the Company to participate in an amnesty program offered by the Italian Tax Authority.

The 2019 increase in the cost of U.S. and foreign tax on international activities is primarily attributable to the full phase-in of the TCJA provisions on the Company's international subsidiaries. The increase in the benefit of other activities is primarily related to additional research and development credits and equity compensation deductions.

The 2018 effective tax rate reflects a net tax charge of $744 million for TCJA related adjustments. The amount is primarily associated with non-U.S. taxes that will become due when previously reinvested earnings of certain international subsidiaries are remitted. The 2018 and 2019 effective tax rate reconciliation reflects the corporate rate reduction enacted by the TCJA. The decrease in international activities is primarily related to higher international tax costs compared to the U.S. federal statutory rate.

The 2017 effective tax rate reflects a net tax charge of $690 million attributable to the passage of the TCJA. These 2017 provisional amounts, recorded as described in SAB 118, relate to U.S. income tax attributable to previously undistributed earnings of UTC's international subsidiaries and equity investments, net of foreign tax credits, and the revaluation of U.S. deferred income taxes.

Deferred Tax Assets and Liabilities. Future income taxes represent the tax effects of transactions which are reported in different periods for tax and financial reporting purposes. These amounts consist of the tax effects of temporary differences between the tax and financial reporting balance sheets and tax carryforwards. Future income tax benefits and payables within the same tax paying component of a particular jurisdiction are offset for presentation in the Consolidated Balance Sheet.

The tax effects of temporary differences and tax carryforwards which gave rise to future income tax benefits and payables at December 31, 2019 and 2018 are as follows:

(DOLLARS IN MILLIONS)	2019	2018
Future income tax benefits:		
Insurance and employee benefits	**$ 1,205**	$ 1,154
Other asset basis differences	**829**	1,013
Other liability basis differences	**2,153**	1,482
Tax loss carryforwards	**622**	583
Tax credit carryforwards	**1,021**	1,050
Valuation allowances	**(616)**	(605)
	$ 5,214	$ 4,677
Future income taxes payable:		
Intangible assets	**$ 4,293**	$ 4,462
Other asset basis differences	**2,904**	2,159
Other items, net	**143**	123
	$ 7,340	$ 6,744

Valuation allowances have been established primarily for tax credit carryforwards, tax loss carryforwards, and certain foreign temporary differences to reduce the future income tax benefits to expected realizable amounts.

Tax Credit and Loss Carryforwards. At December 31, 2019, tax credit carryforwards, principally state and foreign, and tax loss carryforwards, principally state and foreign, were as follows:

(DOLLARS IN MILLIONS)	Tax Credit Carryforwards	Tax Loss Carryforwards
Expiration period:		
2020-2024	$ 59	$ 393
2025-2029	27	179
2030-2039	336	394
Indefinite	599	2,218
Total	$ 1,021	$ 3,184

Unrecognized Tax Benefits. At December 31, 2019, we had gross tax-effected unrecognized tax benefits of $1,347 million, of which $1,338 million, if recognized, would impact the effective tax rate. A reconciliation of the beginning and ending amounts of unrecognized tax benefits and interest expense related to unrecognized tax benefits for the years ended December 31, 2019, 2018 and 2017 is as follows:

(DOLLARS IN MILLIONS)	2019	2018	2017
Balance at January 1	**$ 1,619**	$ 1,189	$ 1,086
Additions for tax positions related to the current year	**131**	192	192
Additions for tax positions of prior years	**73**	344	73
Reductions for tax positions of prior years	**(101)**	(91)	(91)
Settlements	**(375)**	(15)	(71)
Balance at December 31	**$ 1,347**	$ 1,619	$ 1,189
Gross interest expense related to unrecognized tax benefits	**$ 57**	$ 37	$ 34
Total accrued interest balance at December 31	**$ 249**	$ 255	$ 215

The 2018 amounts above include amounts related to the acquisition of Rockwell Collins.

We conduct business globally and, as a result, UTC or one or more of our subsidiaries files income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. In the normal course of business we are subject to examination by taxing authorities throughout the world, including such major jurisdictions as Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong, India, Italy, Japan, Mexico, Netherlands, Poland, Singapore, South Korea, Spain, Switzerland, the United Kingdom and the United States. With few exceptions, we are no longer subject to U.S. federal, state and local, or non-U.S. income tax examinations for years before 2009.

During 2019, the Company recognized a net gain of approximately $307 million, including pre-tax interest of approximately $56 million as a result of the conclusion of the IRS audit of the Company's 2014, 2015 and 2016 tax years as well as an amnesty filing in Italy made to resolve certain tax litigation. The Company also recognized a non-cash gain of approximately $40 million, primarily tax, as a result of the closure of an IRS audit of the 2014 tax year of a subsidiary acquired as part of UTC's acquisition of Rockwell Collins. This gain was partially offset by the unfavorable pre-tax impact of a reversal of a related indemnity asset of approximately $23 million. Finally, the Company recognized net non-cash gains of approximately $18 million, including pre-tax interest of approximately $5 million, as a result of various federal, state and non-US statute of limitations expirations and settlements with tax authorities.

During 2017, the Company recognized a noncash gain of approximately $64 million, including a pre-tax interest adjustment of $9 million, as a result of federal, state and non-U.S. tax year closures related to audit resolutions and the expiration of applicable statutes of limitation, including expiration of the U.S. federal income tax statute of limitations for UTC's 2013 tax year.

The Examination Division of the Internal Revenue Service (IRS) is currently auditing Rockwell Collins fiscal tax years 2016 and 2017, prior to its acquisition by UTC, which will continue into 2020. Separately, the Examination Division of the IRS has notified the Company of its intention to commence an audit of UTC tax years 2017 and 2018 during the first half of 2020.

It is reasonably possible that a net reduction within the range of $50 million to $650 million of unrecognized tax benefits may occur over the next 12 months as a result of the contemplated separation of Carrier and Otis, additional worldwide uncertain tax positions, the revaluation of current uncertain tax positions arising from developments in examinations, in appeals, or in the courts, or the closure of tax statutes.

See Note 18 "Contingent Liabilities" for discussion regarding uncertain tax positions, included in the above range, related to pending litigation with respect to certain deductions claimed in Germany.

NOTE 12: EMPLOYEE BENEFIT PLANS

We sponsor numerous domestic and foreign employee benefit plans, which are discussed below.

In March 2017, the FASB issued ASU 2017-07, Compensation-Retirement Benefits (Topic 715), Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. This ASU requires an employer to report the service cost component of net periodic pension benefit cost in the same line item(s) as other compensation costs arising from services rendered by the pertinent employees during the period, with other cost components presented separately from the service cost component and outside of income from operations. This ASU also allows only the service cost component of net periodic pension benefit cost to be eligible for capitalization when applicable. This ASU was effective for years beginning after December 15, 2017. The Company adopted this standard on January 1, 2018 applying the presentation requirements retrospectively. We elected to apply the practical expedient, which allows us to reclassify amounts disclosed previously in the employee benefit plans note as the basis for applying retrospective presentation for comparative periods as it is impracticable to determine the disaggregation of the cost components for amounts capitalized and amortized in those periods. Provisions related to presentation of the service cost component eligibility for capitalization were applied prospectively.

The effect of the retrospective presentation change related to the net periodic benefit cost of our defined benefit pension and postretirement plans on our Consolidated Statement of Operations was as follows:

	2017		
(DOLLARS IN MILLIONS)	Previously Reported	Effect of Change Higher/(Lower)	As Revised
Cost of product sold	$ 31,027	$ 197	$ 31,224
Cost of services sold	12,926	51	12,977
Research and development	2,387	40	2,427
Selling, general and administrative	6,183	246	6,429
Non-service pension (benefit)	—	(534)	(534)

Employee Savings Plans. We sponsor various employee savings plans. Our contributions to employer sponsored defined contribution plans were $549 million, $403 million and $351 million for 2019, 2018 and 2017, respectively.

Our non-union domestic employee savings plan uses an Employee Stock Ownership Plan (ESOP) for employer matching contributions. External borrowings were used by the ESOP to fund a portion of its purchase of ESOP stock from us. The external borrowings have been extinguished and only re-amortized loans remain between UTC and the ESOP Trust. As ESOP debt service payments are made, common stock is released from an unreleased shares account. ESOP debt may be prepaid or re-amortized to either increase or decrease the number of shares released so that the value of released shares equals the value of plan benefit. We may also, at our option, contribute additional common stock or cash to the ESOP.

Shares of common stock are allocated to employees' ESOP accounts at fair value on the date earned. Cash dividends on common stock held by the ESOP are used for debt service payments. Participants may choose to have their ESOP dividends reinvested or distributed in cash. Common stock allocated to ESOP participants is included in the average number of common shares outstanding for both basic and diluted earnings per share. At December 31, 2019, 23.4 million common shares had been allocated to employees, leaving 7.9 million unallocated common shares in the ESOP Trust, with an approximate fair value of $1.2 billion.

Pension Plans. We sponsor both funded and unfunded domestic and foreign defined benefit pension plans that cover a large number of our employees. Our largest plans are generally closed to new participants. Our plans use a December 31 measurement date consistent with our fiscal year.

(DOLLARS IN MILLIONS)	2019	2018
Change in Benefit Obligation:		
Beginning balance	**$ 37,795**	$ 36,999
Service cost	**359**	372
Interest cost	**1,340**	1,117
Actuarial loss (gain)	**4,651**	(2,048)
Total benefits paid	**(2,174)**	(1,932)
Net settlement, curtailment and special termination benefits	**(267)**	(38)
Plan amendments	**6**	65
Business combinations	**(6)**	3,694
Other	**127**	(434)
Ending balance	**$ 41,831**	$ 37,795
Change in Plan Assets:		
Beginning balance	**$ 35,253**	$ 35,689
Actual return on plan assets	**6,311**	(1,667)
Employer contributions	**207**	238
Benefits paid	**(2,174)**	(1,932)
Settlements	**(54)**	(38)
Business combinations	**(10)**	3,355
Other	**156**	(392)
Ending balance	**$ 39,689**	$ 35,253
Funded Status:		
Fair value of plan assets	**$ 39,689**	$ 35,253
Benefit obligations	**(41,831)**	(37,795)
Funded status of plan	**$ (2,142)**	$ (2,542)
Amounts Recognized in the Consolidated Balance Sheet Consist of:		
Noncurrent assets	**$ 617**	$ 686
Current liability	**(88)**	(88)
Noncurrent liability	**(2,671)**	(3,140)
Net amount recognized	**$ (2,142)**	$ (2,542)
Amounts Recognized in Accumulated Other Comprehensive Loss Consist of:		
Net actuarial loss	**$ 8,910**	$ 8,606
Prior service cost	**203**	139
Net amount recognized	**$ 9,113**	$ 8,745

In September 2019, we amended our domestic pension plans to cease accrual of additional benefits for future service and compensation for non-union participants effective December 31, 2019. Beginning January 1, 2020, these participants will earn additional contributions under our domestic savings plan. We utilized the practical expedient and remeasured plan assets and pension benefit obligations for the affected pension plans as of the nearest month-end, August 31, 2019, resulting in a net actuarial loss of $425 million. This reflects a benefit obligation gain of $180 million resulting from the benefit plan change that was offset by remeasurement losses of $605 million. The remeasurement losses are driven by a reduction of 124 basis points in the projected benefit obligation (PBO) discount rate as of the remeasurement date compared to December 31, 2018, partially offset by actual asset returns of approximately 17% as of the remeasurement date.

In September 2019, we recorded a curtailment gain of $98 million in the Consolidated Statement of Operations, due to the recognition of previously unrecognized prior service credits for the affected pension plans. Additionally, as a result of the remeasurement, pension income (excluding curtailment) decreased by approximately $39 million for the year ended December 31, 2019.

The amounts included in "Other" in the above table primarily reflect the impact of foreign exchange translation, primarily for plans in the U.K. and Canada.

As part of the Rockwell acquisition on November 26, 2018, we assumed approximately $3.7 billion of pension projected benefit obligations and $3.4 billion of plan assets.

Qualified domestic pension plan benefits comprise approximately 75% of the projected benefit obligation. Benefits for union employees are generally based on a stated amount for each year of service. For non-union employees, benefits for service up to December 31, 2014 are generally based on an employee's years of service and compensation through December 31, 2014. Benefits for service after December 31, 2014 through December 31, 2019 are based on the existing cash balance formula that was adopted in 2003 for newly hired non-union employees and for other non-union employees who made a one-time voluntary election to have future benefit accruals determined under this formula. Certain foreign plans, which comprise approximately 24% of the projected benefit obligation, are considered defined benefit plans for accounting purposes. Nonqualified domestic pension plans provide supplementary retirement benefits to certain employees and are not a material component of the projected benefit obligation.

We made $25 million of cash contributions to our domestic defined benefit pension plans and made $93 million of cash contributions to our foreign defined benefit pension plans in 2019. In 2018, we made no cash contributions to our domestic defined benefit pension plans and made $147 million of cash contributions to our foreign defined benefit pension plans.

Information for pension plans with accumulated benefit obligations in excess of plan assets:

(DOLLARS IN MILLIONS)	**2019**	2018
Projected benefit obligation	**$ 39,267**	$ 25,884
Accumulated benefit obligation	**38,816**	25,455
Fair value of plan assets	**36,530**	22,803

Information for pension plans with projected benefit obligations in excess of plan assets:

(DOLLARS IN MILLIONS)	**2019**	2018
Projected benefit obligation	**$ 39,680**	$ 28,591
Accumulated benefit obligation	**39,178**	27,968
Fair value of plan assets	**36,921**	25,362

The accumulated benefit obligation for all defined benefit pension plans was $41.3 billion and $37.0 billion at December 31, 2019 and 2018, respectively.

The components of the net periodic pension benefit are as follows:

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Pension Benefits:			
Service cost	**$ 359**	$ 372	$ 374
Interest cost	**1,340**	1,117	1,120
Expected return on plan assets	**(2,430)**	(2,255)	(2,215)
Amortization of prior service cost (credit)	**17**	(41)	(36)
Recognized actuarial net loss	**265**	401	575
Net settlement, curtailment and special termination benefits (gain) loss	**(54)**	1	3
Net periodic pension benefit - employer	**$ (503)**	$ (405)	$ (179)

Other changes in plan assets and benefit obligations recognized in other comprehensive loss in 2019 are as follows:

(DOLLARS IN MILLIONS)	
Current year actuarial loss	**$ 553**
Amortization of actuarial loss	**(265)**
Current year prior service cost	**6**
Amortization of prior service cost	**(17)**
Net settlement and curtailment	**57**
Other	**34**
Total recognized in other comprehensive loss	**$ 368**
Net recognized in net periodic pension benefit and other comprehensive loss	**$ (135)**

The amount included in "Other" in the above table primarily reflects the impact of foreign exchange translation, primarily for plans in the U.K. and Canada.

The estimated amount that will be amortized from accumulated other comprehensive loss into net periodic pension (benefit) cost in 2020 is as follows:

(DOLLARS IN MILLIONS)	
Net actuarial loss	$ 371
Prior service cost	51
	$ 422

Major assumptions used in determining the benefit obligation and net cost for pension plans are presented in the following table as weighted-averages:

	Benefit Obligation		Net Cost		
	2019	2018	**2019**	2018	2017
Discount rate					
PBO	**3.0%**	4.0%	**3.9%**	3.4%	3.8%
Interest cost [1]	**—**	—	**3.6%**	3.0%	3.3%
Service cost [1]	**—**	—	**3.6%**	3.3%	3.6%
Salary scale	**4.2%**	4.2%	**4.2%**	4.2%	4.1%
Expected return on plan assets	**—**	—	**6.7%**	6.8%	7.3%

Note 1 The discount rates used to measure the service cost and interest cost applies to our significant plans. The PBO discount rate is used for the service cost and interest cost measurements for non-significant plans.

In determining the expected return on plan assets, we consider the relative weighting of plan assets, the historical performance of total plan assets and individual asset classes, and economic and other indicators of future performance. In addition, we may consult with and consider the opinions of financial and other professionals in developing appropriate capital market assumptions. Return projections are also validated using a simulation model that incorporates yield curves, credit spreads and risk premiums to project long-term prospective returns.

The plans' investment management objectives include providing the liquidity and asset levels needed to meet current and future benefit payments, while maintaining a prudent degree of portfolio diversification considering interest rate risk and market volatility. Globally, investment strategies target a mix of 45% to 50% of growth seeking assets and 50% to 55% of income generating and hedging assets using a wide set of diversified asset types, fund strategies and investment managers. The growth seeking allocation consists of global public equities in developed and emerging countries, private equity, real estate and multi-asset class strategies. Growth assets include an enhanced alpha strategy that invests in publicly traded equity and fixed income securities, derivatives and foreign currency. Investments in private equity are primarily via limited partnership interests in buy-out strategies with smaller allocations to distressed debt funds. The real estate strategy is principally concentrated in directly held U.S. core investments with some smaller investments in international, value-added and opportunistic strategies. Within the income generating assets, the fixed income portfolio consists of mainly government and broadly diversified high quality corporate bonds.

The plans have continued their pension risk management techniques designed to reduce their interest rate risk. Specifically, the plans have incorporated liability hedging programs that include the adoption of a risk reduction objective as part of the long-term investment strategy. Under this objective the interest rate hedge is intended to increase as funded status improves. The hedging programs incorporate a range of assets and investment tools, each with varying interest rate sensitivities. As result of the improved funded status of the plans due to favorable asset returns and funding of the plans, the interest rate hedge increased significantly during 2017. The investment portfolios are currently hedging approximately 65% to 70% of the interest rate sensitivity of the pension plan liabilities.

As a result of the shift in the target asset mix to higher income generating and hedging assets and lower growth seeking assets, combined with reduced capital market assumptions for most asset classes, we will reduce the expected return on plan assets assumption for 2020 including the assumption of a 6.5% return on plan assets for our qualified domestic pension plans, down from 7.0% in 2019.

The fair values of pension plan assets at December 31, 2019 and 2018 by asset category are as follows:

(DOLLARS IN MILLIONS)	Quoted Prices in Active Markets For Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Not Subject to Leveling	Total
Asset Category:					
Public Equities					
Global Equities	**$ 3,588**	**$ 5**	**$ —**	**$ —**	**$ 3,593**
Global Equity Commingled Funds [1]	**—**	**1,734**	**—**	**—**	**1,734**
Enhanced Global Equities [2]	**322**	**393**	**—**	**—**	**715**
Global Equity Funds at net asset value [8]	**—**	**—**	**—**	**6,318**	**6,318**
Private Equities [3,8]	**—**	**—**	**202**	**1,230**	**1,432**
Fixed Income Securities					
Governments	**969**	**116**	**—**	**—**	**1,085**
Corporate Bonds	**1**	**13,059**	**5**	**—**	**13,065**
Structured Products	**—**	**17**	**—**	**—**	**17**
Fixed Income Securities [8]	**—**	**—**	**—**	**6,262**	**6,262**
Real Estate [4,8]	**—**	**13**	**1,464**	**372**	**1,849**
Other [5,8]	**—**	**343**	**—**	**2,834**	**3,177**
Cash & Cash Equivalents [6,8]	**—**	**47**	**—**	**76**	**123**
Subtotal	**$ 4,880**	**$ 15,727**	**$ 1,671**	**$ 17,092**	**39,370**
Other Assets & Liabilities [7]					**319**
Total at December 31, 2019					**$ 39,689**
Public Equities					
Global Equities	$ 2,917	$ 4	$ —	$ —	$ 2,921
Global Equity Commingled Funds [1]	185	426	—	—	611
Enhanced Global Equities [2]	79	605	—	—	684
Global Equity Funds at net asset value [8]	—	—	—	7,386	7,386
Private Equities [3,8]	—	—	133	1,194	1,327
Fixed Income Securities					
Governments	1,789	162	—	—	1,951
Corporate Bonds	—	11,527	18	29	11,574
Fixed Income Securities [8]	—	—	—	3,599	3,599
Real Estate [4,8]	—	13	1,387	429	1,829
Other [5,8]	—	262	—	2,368	2,630
Cash & Cash Equivalents [6,8]	—	220	—	138	358
Subtotal	$ 4,970	$ 13,219	$ 1,538	$ 15,143	34,870
Other Assets & Liabilities [7]					383
Total at December 31, 2018					$ 35,253

Note 1 Represents commingled funds that invest primarily in common stocks.

Note 2 Represents enhanced equity separate account and commingled fund portfolios. A portion of the portfolio may include long-short market neutral and relative value strategies that invest in publicly traded, equity and fixed income securities, as well as derivatives of equity and fixed income securities and foreign currency.

Note 3 Represents limited partner investments with general partners that primarily invest in debt and equity.

Note 4 Represents investments in real estate including commingled funds and directly held properties.

Note 5 Represents insurance contracts and global balanced risk commingled funds consisting mainly of equity, bonds and some commodities.

Note 6 Represents short-term commercial paper, bonds and other cash or cash-like instruments.

Note 7 Represents trust receivables and payables that are not leveled.

Note 8 In accordance with ASU 2015-07, *Fair Value Measurement (Topic 820)*, certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented for the total pension benefits plan assets.

Derivatives in the plan are primarily used to manage risk and gain asset class exposure while still maintaining liquidity. Derivative instruments mainly consist of equity futures, interest rate futures, interest rate swaps and currency forward contracts.

Our common stock represents less than 1% of total plan assets at December 31, 2019 and 2018. We review our assets at least quarterly to ensure we are within the targeted asset allocation ranges and, if necessary, asset balances are adjusted back within target allocations. We employ a broadly diversified investment manager structure that includes diversification by active and passive management, style, capitalization, country, sector, industry and number of investment managers.

The fair value measurement of plan assets using significant unobservable inputs (Level 3) changed due to the following:

(DOLLARS IN MILLIONS)	Private Equities	Corporate Bonds	Real Estate	Total
Balance, December 31, 2017	$ 46	$ —	$ 1,446	$ 1,492
Plan assets acquired	—	33	—	33
Realized (losses) gains	—	(1)	10	9
Unrealized gains relating to instruments still held in the reporting period	—	2	38	40
Purchases, sales, and settlements, net	87	(16)	(107)	(36)
Balance, December 31, 2018	133	18	1,387	1,538
Realized losses	—	—	(2)	(2)
Unrealized gains relating to instruments still held in the reporting period	32	—	27	59
Purchases, sales, and settlements, net	37	(13)	52	76
Balance, December 31, 2019	**$ 202**	**$ 5**	**$ 1,464**	**$ 1,671**

Quoted market prices are used to value investments when available. Investments in securities traded on exchanges, including listed futures and options, are valued at the last reported sale prices on the last business day of the year or, if not available, the last reported bid prices. Fixed income securities are primarily measured using a market approach pricing methodology, where observable prices are obtained by market transactions involving identical or comparable securities of issuers with similar credit ratings. Mortgages have been valued on the basis of their future principal and interest payments discounted at prevailing interest rates for similar investments. Investment contracts are valued at fair value by discounting the related cash flows based on current yields of similar instruments with comparable durations. Real estate investments are valued on a quarterly basis using discounted cash flow models which consider long-term lease estimates, future rental receipts and estimated residual values. Valuation estimates are supplemented by third-party appraisals on an annual basis.

Private equity limited partnerships are valued quarterly using discounted cash flows, earnings multiples and market multiples. Valuation adjustments reflect changes in operating results, financial condition, or prospects of the applicable portfolio company. Over-the-counter securities and government obligations are valued at the bid prices or the average of the bid and ask prices on the last business day of the year from published sources or, if not available, from other sources considered reliable, generally broker quotes. Temporary cash investments are stated at cost, which approximates fair value.

As a result of the $1.9 billion contribution in 2017, we are not required to make additional contributions to our domestic defined benefit pension plans through the end of 2025. We expect to make total contributions of approximately $125 million to our global defined benefit pension plans in 2020. Contributions do not reflect benefits to be paid directly from corporate assets.

Benefit payments, including amounts to be paid from corporate assets, and reflecting expected future service, as appropriate, are expected to be paid as follows: $2,428 million in 2020, $2,230 million in 2021, $2,263 million in 2022, $2,289 million in 2023, $2,303 million in 2024, and $11,597 million from 2025 through 2029.

Postretirement Benefit Plans. We sponsor a number of postretirement benefit plans that provide health and life benefits to eligible retirees. Such benefits are provided primarily from domestic plans, which comprise approximately 84% of the benefit obligation. The postretirement plans are primarily unfunded. The assets we hold are invested in approximately 50% growth seeking assets and 50% income generating assets.

(DOLLARS IN MILLIONS)	2019	2018
Change in Benefit Obligation:		
Beginning balance	**$ 810**	$ 767
Service cost	**2**	2
Interest cost	**31**	26
Actuarial gain	**(11)**	(52)
Total benefits paid	**(69)**	(70)
Business combinations	**—**	186
Plan amendments	**—**	(43)
Other	**2**	(6)
Ending balance	**$ 765**	$ 810
Change in Plan Assets:		
Beginning balance	**$ 20**	$ —
Employer contributions	**69**	69
Benefits paid	**(69)**	(70)
Business combinations	**—**	20
Other	**—**	1
Ending balance	**$ 20**	$ 20
Funded Status:		
Fair value of plan assets	**$ 20**	$ 20
Benefit obligations	**(765)**	(810)
Funded status of plan	**$ (745)**	$ (790)
Amounts Recognized in the Consolidated Balance Sheet Consist of:		
Current liability	**$ (47)**	$ (61)
Noncurrent liability	**(698)**	(729)
Net amount recognized	**$ (745)**	$ (790)
Amounts Recognized in Accumulated Other Comprehensive Loss Consist of:		
Net actuarial gain	**$ (181)**	$ (184)
Prior service credit	**(4)**	(47)
Net amount recognized	**$ (185)**	$ (231)

As part of our acquisition of Rockwell on November 26, 2018, we assumed approximately $186 million of postretirement benefit obligations and $20 million of plan assets.

We modified the postretirement medical benefits provided to legacy Rockwell salaried employees by eliminating any company subsidy from retirements that occur after December 31, 2019. This resulted in a $43 million reduction in the benefit obligation as of November 26, 2018.

The components of net periodic benefit cost are as follows:

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Other Postretirement Benefits:			
Service cost	**$ 2**	$ 2	$ 2
Interest cost	**31**	26	29
Expected return on plan assets	**(1)**	—	—
Amortization of prior service credit	**(42)**	(6)	(1)
Recognized actuarial net gain	**(12)**	(10)	(9)
Net periodic other postretirement (benefit) cost	**$ (22)**	$ 12	$ 21

Other changes in plan assets and benefit obligations recognized in other comprehensive loss in 2019 are as follows:

(DOLLARS IN MILLIONS)	
Current year actuarial gain	**$ (10)**
Amortization of prior service credit	**42**
Amortization of actuarial net gain	**12**
Other	**2**
Total recognized in other comprehensive loss	**$ 46**
Net recognized in net periodic other postretirement benefit cost and other comprehensive loss	**$ 24**

The estimated amounts that will be amortized from accumulated other comprehensive loss into net periodic benefit cost in 2020 include actuarial net gains of $13 million and prior service credits of $3 million.

Major assumptions used in determining the benefit obligation and net cost for postretirement plans are presented in the following table as weighted-averages:

	Benefit Obligation		Net Cost		
	2019	2018	**2019**	2018	2017
Discount rate	**3.0%**	4.1%	**4.0%**	3.4%	3.8%
Expected return on assets	**—**	—	**7.0%**	7.0%	N/A

Assumed health care cost trend rates are as follows:

	2019	2018
Health care cost trend rate assumed for next year	**6.5%**	7.0%
Rate that the cost trend rate gradually declines to	**5.0%**	5.0%
Year that the rate reaches the rate it is assumed to remain at	**2026**	2026

Assumed health care cost trend rates have a significant effect on the amounts reported for the health care plans. A one-percentage-point change in assumed health care cost trend rates would have the following effects:

	2019 One-Percentage-Point	
(DOLLARS IN MILLIONS)	**Increase**	**Decrease**
Effect on total service and interest cost	$ 1	$ (1)
Effect on postretirement benefit obligation	25	(22)

Benefit payments, including net amounts to be paid from corporate assets and reflecting expected future service, as appropriate, are expected to be paid as follows: $67 million in 2020, $64 million in 2021, $60 million in 2022, $56 million in 2023, $53 million in 2024, and $210 million from 2025 through 2029.

Multiemployer Benefit Plans. We contribute to various domestic and foreign multiemployer defined benefit pension plans. The risks of participating in these multiemployer plans are different from single-employer plans in that assets contributed are pooled and may be used to provide benefits to employees of other participating employers. If a participating employer stops contributing to the plan, the unfunded obligations of the plan may be borne by the remaining participating employers. Lastly, if we choose to stop participating in some of our multiemployer plans, we may be required to pay those plans a withdrawal liability based on the underfunded status of the plan.

Our participation in these plans for the annual periods ended December 31 is outlined in the table below. Unless otherwise noted, the most recent Pension Protection Act (PPA) zone status available in 2019 and 2018 is for the plan's year-end at June 30, 2018, and June 30, 2017, respectively. The zone status is based on information that we received from the plan and is certified by the plan's actuary. Our significant plan is in the green zone which represents a plan that is at least 80% funded and does not require a financial improvement plan (FIP) or a rehabilitation plan (RP). An extended amortization provision of ten years is utilized to recognize investment gains or losses for our significant plan.

(DOLLARS IN MILLIONS)		Pension Protection Act Zone Status		FIP/ RP Status	Contributions				Expiration Date of Collective-Bargaining Agreement
Pension Fund	EIN/Pension Plan Number	**2019**	2018	Pending/ Implemented	**2019**	2018	2017	Surcharge Imposed	
National Elevator Industry Pension Plan	23-2694291	**Green**	Green	No	**$ 127**	$ 120	$ 114	No	July 8, 2022
Other funds					**32**	31	31		
					$ 159	$ 151	$ 145		

For the plan years ended June 30, 2018 and 2017, respectively, we were listed in the National Elevator Industry Pension Plan's Forms 5500 as providing more than 5% of the total contributions for the plan. At the date these financial statements were issued, Forms 5500 were not available for the plan year ending June 30, 2019.

In addition, we participate in several multiemployer arrangements that provide postretirement benefits other than pensions, with the National Elevator Industry Health Benefit Plan being the most significant. These arrangements generally provide medical and life benefits for eligible active employees and retirees and their dependents.

Contributions to multiemployer plans that provide postretirement benefits other than pensions were $21 million, $20 million and $19 million for 2019, 2018 and 2017, respectively.

Stock-based Compensation. UTC's long-term incentive plans authorize various types of market and performance based incentive awards that may be granted to officers and employees. The UTC 2018 Long-Term Incentive Plan (the "2018 LTIP") was approved by shareholders on April 30, 2018 and its predecessor plan (the "Legacy LTIP"), was last amended on February 5, 2016. A total of 184 million shares have been authorized for issuance pursuant to awards under these Plans. There are 252,000 shares outstanding that were issued under the Rockwell Collins, Inc. 2015 Long-Term Incentive Plan. No new equity awards will be issued under that plan. As of December 31, 2019, approximately 42 million shares remain available for awards under the 2018 LTIP. No shares remain available for future awards under the Legacy LTIP. Neither plan contains an aggregate annual award limit, however, each Plan sets an annual award limit per participant. We expect that the shares awarded on an annual basis will range from 1.0% to 1.5% of shares outstanding. The 2018 LTIP will expire after all authorized shares have been awarded or April 30, 2028, whichever is sooner.

Under both Plans, the exercise price of awards is set on the grant date and may not be less than the fair market value per share on that date. Generally, stock appreciation rights and stock options have a term of ten years and a three-year vesting period, subject to limited exceptions. In the event of retirement, annual stock appreciation rights, stock options, and restricted stock units held for more than one year may become vested and exercisable, subject to certain terms and conditions. LTIP awards with performance-based vesting generally have a minimum three-year vesting period and vest based on actual performance against pre-established metrics. In the event of retirement, performance-based awards held for more than one year, remain eligible to vest based on actual performance relative to target metrics. We have historically repurchased shares of our common stock in an amount at least equal to the number of shares issued under our equity compensation arrangements and will continue to evaluate this policy in conjunction with our overall share repurchase program.

We measure the cost of all share-based payments, including stock options, at fair value on the grant date and recognize this cost in the Consolidated Statement of Operations, net of expected forfeitures, as follows:

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Total compensation cost recognized	**$ 356**	$ 251	$ 192

The associated future income tax benefit recognized was $66 million, $42 million and $38 million for the years ended December 31, 2019, 2018 and 2017, respectively. The amounts have been adjusted for the impact of the TCJA.

For the years ended December 31, 2019, 2018 and 2017, the amount of cash received from the exercise of stock options was $27 million, $36 million and $29 million, respectively, with an associated tax benefit realized of $75 million, $59 million and $100 million, respectively. In addition, for the years ended December 31, 2019, 2018 and 2017, the associated tax benefit realized from the vesting of performance share units and other restricted awards was $36 million, $13 million and $12 million, respectively.

At December 31, 2019, there was $291 million of total unrecognized compensation cost related to non-vested equity awards granted under long-term incentive plans. This cost is expected to be recognized ratably over a weighted-average period of 2.9 years.

A summary of the transactions under all long-term incentive plans for the year ended December 31, 2019 follows:

	Stock Options		Stock Appreciation Rights		Performance Share Units		Other Incentive Shares/Units
(SHARES AND UNITS IN THOUSANDS)	Shares	Average Price *	Shares	Average Price *	Units	Average Price *	
Outstanding at:							
December 31, 2018	1,603	$ 99.89	32,066	$ 99.95	1,806	$ 110.41	3,047
Granted	**339**	**124.72**	**8,081**	**123.54**	**839**	**121.22**	**1,223**
Aneillary **	**—**	**—**	**—**	**—**	**101**	**95.28**	**—**
Exercised / earned	**(317)**	**88.61**	**(6,843)**	**84.44**	**(758)**	**95.28**	**(816)**
Cancelled	**(57)**	**121.69**	**(591)**	**122.76**	**(69)**	**118.21**	**(135)**
December 31, 2019	**1,568**	**$ 106.75**	**32,713**	**$ 108.61**	**1,919**	**$ 120.04**	**3,319**

* weighted-average grant / exercise price

** ancillary shares earned based on actual performance achieved on the 2016 award

The weighted-average grant date fair value of stock options and stock appreciation rights granted during 2019, 2018 and 2017 was $20.81, $20.24 and $17.22, respectively. The weighted-average grant date fair value of performance share units, which vest upon achieving certain performance metrics, granted during 2019, 2018 and 2017 was $117.87, $131.55 and $111.00, respectively. The total fair value of awards vested during the years ended December 31, 2019, 2018 and 2017 was $211 million, $149 million and $138 million, respectively. The total intrinsic value (which is the amount by which the stock price exceeded the exercise price on the date of exercise) of stock options and stock appreciation rights exercised during the years ended December 31, 2019, 2018 and 2017 was $383 million, $283 million and $320 million, respectively. The total intrinsic value (which is the stock price at vesting) of performance share units and other restricted awards vested was $188 million, $74 million and $49 million during the years ended December 31, 2019, 2018 and 2017, respectively.

The following table summarizes information about equity awards outstanding that are vested and expected to vest as well as equity awards outstanding that are exercisable at December 31, 2019:

	Equity Awards Vested and Expected to Vest				Equity Awards That Are Exercisable			
(SHARES IN THOUSANDS; AGGREGATE INTRINSIC VALUE IN MILLIONS)	Awards	Average Price *	Aggregate Intrinsic Value	Remaining Term **	Awards	Average Price *	Aggregate Intrinsic Value	Remaining Term **
Stock Options/Stock Appreciation Rights	33,769	$ 107.58	$ 1,424	5.9 years	19,285	$ 96.56	$ 1,026	4.0 years
Performance Share Units/Restricted Stock	5,514	—	826	2.1 years				

* weighted-average exercise price per share

** weighted-average contractual remaining term in years

The fair value of each option award is estimated on the date of grant using a binomial lattice model. The following table indicates the assumptions used in estimating fair value for the years ended December 31, 2019, 2018 and 2017. Lattice-based option models incorporate ranges of assumptions for inputs; those ranges are as follows:

	2019	2018	2017
Expected volatility	**18.8% - 19.7%**	17.5% - 21.1%	19%
Weighted-average volatility	**20%**	18%	19%
Expected term (in years)	**6.5 - 6.6**	6.5 - 6.6	6.5
Expected dividend yield	**2.4%**	2.2%	2.4%
Risk-free rate	**2.3% - 2.7%**	1.3% - 2.7%	0.5% - 2.5%

Expected volatilities are based on the returns of our stock, including implied volatilities from traded options on our stock for the binomial lattice model. We use historical data to estimate equity award exercise and employee termination behavior within the valuation model. The expected term represents an estimate of the period of time equity awards are expected to remain outstanding. The risk-free rate is based on the term structure of interest rates at the time of equity award grant.

NOTE 13: RESTRUCTURING COSTS

During 2019, we recorded net pre-tax restructuring costs totaling $425 million for new and ongoing restructuring actions. We recorded charges in the segments as follows:

(DOLLARS IN MILLIONS)	
Otis	$ 54
Carrier	126
Pratt & Whitney	133
Collins Aerospace Systems	106
Eliminations and other	6
Total	**$ 425**

Restructuring charges incurred in 2019 primarily relate to actions initiated during 2019 and 2018, and were recorded as follows:

(DOLLARS IN MILLIONS)	
Cost of sales	$ 231
Selling, general & administrative	190
Non-service pension (benefit)	4
Total	**$ 425**

2019 Actions. During 2019, we recorded net pre-tax restructuring costs totaling $321 million for restructuring actions initiated in 2019, consisting of $168 million in cost of sales and $153 million in selling, general and administrative expenses. The 2019 actions relate to ongoing cost reduction efforts, including workforce reductions and consolidation of field operations.

We are targeting to complete in 2020 and 2021 the majority of the remaining workforce and all facility related cost reduction actions initiated in 2019. No specific plans for significant other actions have been finalized at this time. The following table summarizes the accrual balances and utilization by cost type for the 2019 restructuring actions:

(DOLLARS IN MILLIONS)	Severance	Facility Exit & Other Costs	Total
Net pre-tax restructuring costs	$ 298	$ 23	$ 321
Utilization, foreign exchange and other costs	(193)	(10)	(203)
Balance at December 31, 2019	**$ 105**	**$ 13**	**$ 118**

The following table summarizes expected, incurred and remaining costs for the 2019 restructuring actions by segment:

(DOLLARS IN MILLIONS)	Expected Costs	**Cost Incurred During 2019**	**Remaining Costs at December 31, 2019**
Otis	$ 65	**$ (45)**	**$ 20**
Carrier	120	**(110)**	**10**
Pratt & Whitney	133	**(133)**	**—**
Collins Aerospace Systems	120	**(27)**	**93**
Eliminations and other	6	**(6)**	**—**
Total	**$ 444**	**$ (321)**	**$ 123**

2018 Actions. During 2019, we recorded net pre-tax restructuring costs totaling $46 million for restructuring actions initiated in 2018, consisting of $21 million in cost of sales and $25 million in selling, general and administrative expenses. The 2018 actions relate to ongoing cost reduction efforts, including workforce reductions and the consolidation of field operations. The following table summarizes the accrual balances and utilization by cost type for the 2018 restructuring actions:

(DOLLARS IN MILLIONS)	Severance	Facility Exit & Other Costs	Total
Restructuring accruals at January 1, 2019	$ 115	$ 23	$ 138
Net pre-tax restructuring costs	38	8	46
Utilization, foreign exchange and other costs	(132)	(29)	(161)
Balance at December 31, 2019	**$ 21**	**$ 2**	**$ 23**

The following table summarizes expected, incurred and remaining costs for the 2018 programs by segment:

(DOLLARS IN MILLIONS)	Expected Costs	Costs Incurred During 2018	**Costs Incurred During 2019**	**Remaining Costs at December 31, 2019**
Otis	$ 57	$ (48)	**$ (7)**	**$ 2**
Carrier	80	(64)	**(16)**	**—**
Pratt & Whitney	3	(3)	**—**	**—**
Collins Aerospace Systems	111	(87)	**(23)**	**1**
Eliminations and other	7	(5)	**—**	**2**
Total	**$ 258**	$ (207)	**$ (46)**	**$ 5**

2017 and Prior Actions. During 2019, we recorded net pre-tax restructuring costs totaling $58 million for restructuring actions initiated in 2017 and prior. As of December 31, 2019, we have approximately $67 million of accrual balances remaining related to 2017 and prior actions.

NOTE 14: FINANCIAL INSTRUMENTS

We enter into derivative instruments primarily for risk management purposes, including derivatives designated as hedging instruments under the Derivatives and Hedging Topic of the FASB ASC and those utilized as economic hedges. We operate internationally and in the normal course of business, are exposed to fluctuations in interest rates, foreign exchange rates and commodity prices. These fluctuations can increase the costs of financing, investing and operating the business. We have used derivative instruments, including swaps, forward contracts and options to manage certain foreign currency, interest rate and commodity price exposures.

The four quarter rolling average of the notional amount of foreign exchange contracts hedging foreign currency transactions was $17.8 billion and $20.1 billion at December 31, 2019 and 2018, respectively. Additional information pertaining to foreign exchange and hedging activities is included in Note 1.

The following table summarizes the fair value and presentation in the Consolidated Balance Sheets for derivative instruments as of December 31, 2019 and 2018:

(DOLLARS IN MILLIONS)	Balance Sheet Location	**2019**	2018
Derivatives designated as hedging instruments:			
Foreign exchange contracts	Asset Derivatives:		
	Other assets, current	**$ 11**	$ 10
	Other assets	**13**	12
	Total asset derivatives	**$ 24**	$ 22
	Liability Derivatives:		
	Accrued liabilities	**(72)**	(83)
	Other long-term liabilities	**(98)**	(111)
	Total liability derivatives	**$ (170)**	$ (194)
Derivatives not designated as hedging instruments:			
Foreign exchange contracts	Asset Derivatives:		
	Other assets, current	**27**	44
	Other assets	**5**	19
	Total asset derivatives	**$ 32**	$ 63
	Liability Derivatives:		
	Accrued liabilities	**(116)**	(89)
	Other long-term liabilities	**(1)**	(3)
	Total liability derivatives	**$ (117)**	$ (92)

The effect of cash flow hedging relationships on accumulated other comprehensive income for the years ended December 31, 2019 and 2018 are presented in the table below. The amounts of gain or (loss) are attributable to foreign exchange contract activity and are recorded as a component of Product sales when reclassified from accumulated other comprehensive income.

	Year Ended December 31,	
(DOLLARS IN MILLIONS)	**2019**	2018
Loss recorded in Accumulated other comprehensive loss	**$ (33)**	$ (307)
Loss (Gain) reclassified from Accumulated other comprehensive loss into Product sales	**$ 51**	$ (16)

The table above reflects the effect of cash flow hedging relationships on the Consolidated Statement of Operations for the years ended December 31, 2019 and 2018. The Company utilizes the critical terms match method in assessing derivatives for hedge effectiveness. Accordingly, the hedged items and derivatives designated as hedging instruments are highly effective.

We have approximately €4.2 billion of euro-denominated long-term debt, which qualifies as a net investment hedge against our investments in European businesses. As of December 31, 2019, the net investment hedge is deemed to be effective.

Assuming current market conditions continue, a $32 million pre-tax loss is expected to be reclassified from Accumulated other comprehensive loss into Product sales to reflect the fixed prices obtained from foreign exchange hedging within the next 12 months. At December 31, 2019, all derivative contracts accounted for as cash flow hedges will mature by January 2024.

The effect of derivatives not designated as hedging instruments within Other income, net, on the Consolidated Statement of Operations was as follows:

	Year Ended December 31,	
(DOLLARS IN MILLIONS)	**2019**	2018
Foreign exchange contracts	**$ 46**	$ 115

NOTE 15: FAIR VALUE MEASUREMENTS

In accordance with the provisions of ASC 820, the following tables provide the valuation hierarchy classification of assets and liabilities that are carried at fair value and measured on a recurring and nonrecurring basis in our Consolidated Balance Sheet as of December 31, 2019 and 2018:

	December 31, 2019			
(DOLLARS IN MILLIONS)	**Total**	**Level 1**	**Level 2**	**Level 3**
Recurring fair value measurements:				
Available-for-sale securities	**$ 57**	**$ 57**	**$ —**	**$ —**
Derivative assets	**56**	**—**	**56**	**—**
Derivative liabilities	**(287)**	**—**	**(287)**	**—**

	December 31, 2018			
(DOLLARS IN MILLIONS)	Total	Level 1	Level 2	Level 3
Recurring fair value measurements:				
Available-for-sale securities	$ 51	$ 51	$ —	$ —
Derivative assets	85	—	85	—
Derivative liabilities	(286)	—	(286)	—

Valuation Techniques. Our available-for-sale securities include equity investments that are traded in active markets, either domestically or internationally, and are measured at fair value using closing stock prices from active markets. Our derivative assets and liabilities include foreign exchange contracts that are measured at fair value using internal models based on observable market inputs such as forward rates, interest rates, our own credit risk and our counterparties' credit risks. As of December 31, 2019, there were no significant transfers in or out of Level 1 or Level 2.

As of December 31, 2019, there has not been any significant impact to the fair value of our derivative liabilities due to our own credit risk. Similarly, there has not been any significant adverse impact to our derivative assets based on our evaluation of our counterparties' credit risks.

The following table provides carrying amounts and fair values of financial instruments that are not carried at fair value in our Consolidated Balance Sheet at December 31, 2019 and 2018:

	December 31, 2019		December 31, 2018	
(DOLLARS IN MILLIONS)	**Carrying Amount**	**Fair Value**	Carrying Amount	Fair Value
Long-term receivables	**$ 344**	**$ 347**	$ 334	$ 314
Customer financing notes receivable	**283**	**283**	272	265
Short-term borrowings	**(2,364)**	**(2,364)**	(1,469)	(1,469)
Long-term debt (excluding finance leases)	**(41,199)**	**(46,202)**	(43,996)	(44,003)
Long-term liabilities	**(336)**	**(322)**	(508)	(467)

The following table provides the valuation hierarchy classification of assets and liabilities that are not carried at fair value in our Consolidated Balance Sheet as of December 31, 2019 and 2018:

	December 31, 2019			
(DOLLARS IN MILLIONS)	**Total**	**Level 1**	**Level 2**	**Level 3**
Long-term receivables	**$ 347**	**$ —**	**$ 347**	**$ —**
Customer financing notes receivable	**283**	**—**	**283**	**—**
Short-term borrowings	**(2,364)**	**—**	**—**	**(2,364)**
Long-term debt (excluding finance leases)	**(46,202)**	**—**	**(45,802)**	**(400)**
Long-term liabilities	**(322)**	**—**	**(322)**	**—**

	December 31, 2018			
(DOLLARS IN MILLIONS)	Total	Level 1	Level 2	Level 3
Long-term receivables	$ 314	$ —	$ 314	$ —
Customer financing notes receivable	265	—	265	—
Short-term borrowings	(1,469)	—	(1,258)	(211)
Long-term debt (excluding finance leases)	(44,003)	—	(43,620)	(383)
Long-term liabilities	(467)	—	(467)	—

NOTE 16: VARIABLE INTEREST ENTITIES

Pratt & Whitney holds a 61% program share interest in the International Aero Engines AG (IAE) collaboration with MTU Aero Engines AG (MTU) and Japanese Aero Engines Corporation (JAEC) and a 49.5% ownership interest in IAE. IAE's business purpose is to coordinate the design, development, manufacturing and product support of the V2500 engine program through involvement with the collaborators. Additionally, Pratt & Whitney, JAEC and MTU are participants in International Aero Engines, LLC (IAE LLC), whose business purpose is to coordinate the design, development, manufacturing and product support for the PW1100G-JM engine for the Airbus A320neo aircraft and the PW1400G-JM engine for the Irkut MC21 aircraft. Pratt & Whitney holds a 59% program share interest and a 59% ownership interest in IAE LLC. IAE and IAE LLC retain limited equity with the primary economics of the programs passed to the participants. As such, we have determined that IAE and IAE LLC are variable interest entities with Pratt & Whitney the primary beneficiary. IAE and IAE LLC have, therefore, been consolidated. The carrying amounts and classification of assets and liabilities for variable interest entities in our Consolidated Balance Sheet as of December 31, 2019 and 2018 are as follows:

(DOLLARS IN MILLIONS)	2019	2018
Current assets	$ 4,573	$ 4,732
Noncurrent assets	1,919	1,600
Total assets	$ 6,492	$ 6,332
Current liabilities	$ 4,916	$ 4,946
Noncurrent liabilities	2,149	1,898
Total liabilities	$ 7,065	$ 6,844

NOTE 17: GUARANTEES

We extend a variety of financial, market value and product performance guarantees to third parties. As of December 31, 2019 and 2018, the following financial guarantees were outstanding:

	December 31, 2019		December 31, 2018	
(DOLLARS IN MILLIONS)	Maximum Potential Payment	Carrying Amount of Liability	Maximum Potential Payment	Carrying Amount of Liability
Commercial aerospace financing arrangements (see Note 4)	$ 333	$ 7	$ 348	$ 9
Credit facilities and debt obligations	—	—	116	—
Performance guarantees	48	—	55	5

We also have obligations arising from sales of certain businesses and assets, including those from representations and warranties and related indemnities for environmental, health and safety, tax and employment matters. The maximum potential payment related to these obligations is not a specified amount as a number of the obligations do not contain financial caps. The carrying amount of liabilities related to these obligations was $166 million and $175 million at December 31, 2019 and 2018, respectively. For additional information regarding the environmental indemnifications, see Note 18.

We accrue for costs associated with guarantees when it is probable that a liability has been incurred and the amount can be reasonably estimated. The most likely cost to be incurred is accrued based on an evaluation of currently available facts, and where no amount within a range of estimates is more likely, the minimum is accrued. In accordance with the Guarantees Topic of the FASB ASC, we record these liabilities at fair value.

We provide service and warranty policies on our products and extend performance and operating cost guarantees beyond our normal service and warranty policies on some of our products, particularly commercial aircraft engines. In addition, we incur discretionary costs to service our products in connection with specific product performance issues. Liabilities for performance and operating cost guarantees are based upon future product performance and durability, and are largely estimated based upon historical experience. Adjustments are made to accruals as claim data and historical experience warrant. The changes in the carrying amount of service and product warranties and product performance guarantees for the years ended December 31, 2019 and 2018 are as follows:

(DOLLARS IN MILLIONS)	2019	2018
Balance as of January 1	$ 1,449	$ 1,146
Warranties and performance guarantees issued	635	604
Settlements made	(512)	(493)
Other [1]	(24)	192
Balance as of December 31	$ 1,548	$ 1,449

1 Other in 2018 is driven by the Rockwell Collins acquisition.

NOTE 18: CONTINGENT LIABILITIES

Except as otherwise noted, while we are unable to predict the final outcome, based on information currently available, we do not believe that resolution of any of the following matters will have a material adverse effect upon our competitive position, results of operations, cash flows or financial condition.

Environmental. Our operations are subject to environmental regulation by federal, state and local authorities in the United States and regulatory authorities with jurisdiction over our foreign operations. As described in Note 1 to the Consolidated Financial Statements, we have accrued for the costs of environmental remediation activities, including but not limited to investigatory, remediation, operating and maintenance costs and performance guarantees, and periodically reassess these amounts. We believe that the likelihood of incurring losses materially in excess of amounts accrued is remote. As of December 31, 2019 and 2018, we had approximately $896 million and $830 million, respectively reserved for environmental remediation. Additional information pertaining to environmental matters is included in Note 1 to the Consolidated Financial Statements.

Government. In the ordinary course of business, the Company and its subsidiaries and our properties are subject to regulatory and governmental examinations, information gathering requests, inquiries, investigations and threatened legal actions and proceedings. For example, we are now, and believe that, in light of the current U.S. Government contracting environment, we will continue to be the subject of one or more U.S. Government investigations. Such U.S. Government investigations often take years to complete and could result in administrative, civil or criminal liabilities, including repayments, fines, treble and other damages, forfeitures, restitution or penalties, or could lead to suspension or debarment of U.S. Government contracting privileges. For instance, if we or one of our business units were charged with wrongdoing as a result of any of these investigations or other government investigations (including violations of certain environmental or export laws) the U.S. Government could suspend us from bidding on or receiving awards of new U.S. Government contracts pending the completion of legal proceedings. If convicted or found liable, the U.S. Government could fine and debar us from new U.S. Government contracting for a period generally not to exceed three years. The U.S. Government also reserves the right to debar a contractor from receiving new government contracts for fraudulent, criminal or other seriously improper conduct. The U.S. Government could void any contracts found to be tainted by fraud.

Our contracts with the U.S. Government are also subject to audits. Like many defense contractors, we have received audit reports recommending the reduction of certain contract prices because, for example, cost or pricing data or cost accounting practices used to price and negotiate those contracts may not have conformed to government regulations. Some of these audit reports recommend that certain payments be repaid, delayed, or withheld, and may involve substantial amounts. We have made voluntary refunds in those cases we believe appropriate, have settled some allegations and, in some cases, continue to negotiate and/or litigate. The Company may be, and has been, required to make payments into escrow of disputed liabilities while the related litigation is pending. If the litigation is resolved in the Company's favor, any such payments will be returned to the Company with interest. In addition, we accrue for liabilities associated with those matters that are probable and can be reasonably estimated. The most likely settlement amount to be incurred is accrued based upon a range of estimates. Where no amount within a range of estimates is more likely, then we accrue the minimum amount.

Legal Proceedings. *Cost Accounting Standards Claims:* As previously disclosed, in April 2019, a Divisional Administrative Contracting Officer (DACO) of the United States Defense Contract Management Agency (DCMA) asserted a claim against Pratt & Whitney to recover overpayments of approximately $1.73 billion plus interest (approximately $563 million through December 31, 2019). The claim is based on Pratt & Whitney's alleged noncompliance with cost accounting standards from January 1, 2007 to March 31, 2019, due to its method of allocating independent research and development costs to government contracts. Pratt & Whitney believes that the claim is without merit and filed an appeal to the Armed Services Board of Contract Appeals (ASBCA) on June 7, 2019.

As previously disclosed, in December 2013, a DCMA DACO asserted a claim against Pratt & Whitney to recover overpayments of approximately $177 million plus interest (approximately $98.4 million through December 31, 2019). The claim is based on Pratt & Whitney's alleged noncompliance with cost accounting standards from January 1, 2005 to December 31, 2012, due to its method of determining the cost of collaborator parts used in the calculation of material overhead costs for government contracts. In 2014, Pratt & Whitney filed an appeal to the ASBCA. An evidentiary hearing was held and completed in June 2019. The parties are now engaged in post-hearing briefing, and a decision from the ASBCA will follow. We continue to believe that the claim is without merit. In December 2018, a DCMA DACO issued a second claim against Pratt & Whitney that similarly alleges that its method of determining the cost of collaborator parts does not comply with the cost accounting standards for calendar years 2013 through 2017. This second claim demands payment of $269 million plus interest (approximately $56.2 million through December 31, 2019), which we also believe is without merit and which Pratt & Whitney appealed to the ASBCA in January 2019.

German Tax Litigation: As previously disclosed, UTC has been involved in administrative review proceedings with the German Tax Office, which concern approximately €215 million (approximately $239 million) of tax benefits that we have claimed related to a 1998 reorganization of the corporate structure of Otis operations in Germany. Upon audit, these tax benefits were disallowed by the German Tax Office. UTC estimates interest associated with the aforementioned tax benefits is an additional approximately €118 million (approximately $131 million). On August 3, 2012, we filed suit in the local German Tax Court (Berlin-Brandenburg). In March 2016, the local German Tax Court dismissed our suit, and we appealed this decision to the German Federal Tax Court (FTC). Following a hearing on July 24, 2018, the FTC remanded the matter to the local German Tax Court for further proceedings. In 2015, UTC made tax and interest payments to German tax authorities of €275 million (approximately $300 million) in order to avoid additional interest accruals pending final resolution of this matter.

Asbestos Matters: As previously disclosed, like many other industrial companies, we and our subsidiaries have been named as defendants in lawsuits alleging personal injury as a result of exposure to asbestos integrated into certain of our products or business premises. While we have never manufactured asbestos and no longer incorporate it in any currently-manufactured products, certain of our historical products, like those of many other manufacturers, have contained components incorporating asbestos. A substantial majority of these asbestos-related claims have been dismissed without payment or were covered in full or in part by insurance or other forms of indemnity. Additional cases were litigated and settled without any insurance reimbursement. The amounts involved in asbestos related claims were not material individually or in the aggregate in any year.

The amounts recorded by UTC for asbestos-related liabilities are based on currently available information and assumptions that we believe are reasonable and are made with input from outside actuarial experts. The estimated range of total liabilities to resolve all pending and unasserted potential future asbestos claims through 2059 is approximately $330 million to $400 million. Where no amount within a range of estimates is more likely, the minimum is accrued. We have recorded the minimum amount of $330 million, which is principally recorded in Other long-term liabilities on our Consolidated Balance Sheet as of December 31, 2019. This amount is on a pre-tax basis, not discounted, and excludes the Company's legal fees to defend the asbestos claims, which will continue to be expensed by the Company as they are incurred. In addition, the Company has an insurance recovery receivable for probable asbestos related recoveries of approximately $140 million, which is included primarily in Other assets on our Consolidated Balance Sheet as of December 31, 2019.

The amounts recorded by UTC for asbestos-related liabilities and insurance recoveries are based on currently available information and assumptions that we believe are reasonable. Our actual liabilities or insurance recoveries could be higher or lower than those recorded if actual results vary significantly from the assumptions. Key variables in these assumptions include the number and type of new claims to be filed each year, the outcomes or resolution of such claims, the average cost of resolution of each new claim, the amount of insurance available, allocation methodologies, the contractual terms with each insurer with whom we have reached settlements, the resolution of coverage issues with other excess insurance carriers with whom we have not yet achieved settlements, and the solvency risk with respect to our insurance carriers. Other factors that may affect our future liability include uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case, legal rulings that may be made by state and federal courts, and the passage of state or federal legislation. At the end of each year, the Company will evaluate all of these factors and, with input from an outside actuarial expert, make any necessary adjustments to both our estimated asbestos liabilities and insurance recoveries.

Other. As described in Note 17 to the Consolidated Financial Statements, we extend performance and operating cost guarantees beyond our normal warranty and service policies for extended periods on some of our products. We have accrued our estimate of the liability that may result under these guarantees and for service costs that are probable and can be reasonably estimated.

We also have other commitments and contingent liabilities related to legal proceedings, self-insurance programs and matters arising out of the normal course of business. We accrue contingencies based upon a range of possible outcomes. If no amount within this range is a better estimate than any other, then we accrue the minimum amount. Of note, the design, development, production and support of new aerospace technologies is inherently complex and subject to risk. Since the PW1000G Geared TurboFan engine entered into service in 2016, technical issues have been identified and experienced with the engine, which is usual for new engines and new aerospace technologies. Pratt & Whitney has addressed these issues through various improvements and modifications. These issues have resulted in financial impacts, including increased warranty provisions, customer contract settlements, and reductions in contract performance estimates. Additional technical issues may also arise in the normal course, which may result in financial impacts that could be material to the Company's financial position, results of operations and cash flows.

In the ordinary course of business, the Company and its subsidiaries are also routinely defendants in, parties to or otherwise subject to many pending and threatened legal actions, claims, disputes and proceedings. These matters are often based on alleged violations of contract, product liability, warranty, regulatory, environmental, health and safety, employment, intellectual property, tax and other laws. In some of these proceedings, claims for substantial monetary damages are asserted against the Company and its subsidiaries and could result in fines, penalties, compensatory or treble damages or non-monetary relief. We do not believe that these matters will have a material adverse effect upon our competitive position, results of operations, cash flows or financial condition.

NOTE 19: LEASES

ASU 2016-02, *Leases (Topic 842)* and its related amendments (collectively, the New Lease Accounting Standard) are effective for reporting periods beginning after December 15, 2018. We adopted the New Lease Accounting Standard effective January 1, 2019 and elected the modified retrospective approach in which results for periods before 2019 were not adjusted for the new standard and the cumulative effect of the change in accounting was recognized through retained earnings at the date of adoption.

We have elected certain of the practical expedients available under the New Lease Accounting Standard. We have applied the practical expedient which allows prospective transition to the New Lease Accounting Standard on January 1, 2019. Under the transition practical expedient, we did not reassess lease classification, embedded leases or initial direct costs. We have applied the practical expedient for short-term leases. We have lease agreements with lease and non-lease components. We have elected the practical expedients to combine these components for certain equipment leases. Additionally, for certain equipment leases, we apply a portfolio approach to effectively account for the operating lease right-of-use assets and liabilities. The adoption of the New Lease Accounting Standard did not have a material effect on our Consolidated Statement of Operations or Consolidated Statement of Cash Flows. Upon adoption, we recorded a $2.6 billion right-of-use asset and a $2.7 billion lease liability. The adoption of the New Lease Accounting Standard had an immaterial impact on retained earnings.

Operating lease expense for the year ended December 31, 2019 was approximately $720 million.

Supplemental cash flow information related to operating leases was as follows:

(DOLLARS IN MILLIONS)	Year ended December 31, 2019
Operating cash flows used in the measurement of operating lease liabilities	**$ 746**
Operating lease right-of-use assets obtained in exchange for operating lease obligations	**416**

Operating lease right-of-use assets and liabilities are reflected on our Consolidated Balance Sheet as follows:

(DOLLARS IN MILLIONS, EXCEPT LEASE TERM AND DISCOUNT RATE)	December 31, 2019
Operating lease right-of-use assets	**$ 2,599**
Accrued liabilities	$ (544)
Operating lease liabilities	(2,144)
Total operating lease liabilities	**$ (2,688)**

Supplemental balance sheet information related to operating leases was as follows:

	December 31, 2019
Weighted Average Remaining Lease Term (in years)	**7.9**
Weighted Average Discount Rate	**3.5%**

Undiscounted maturities of operating lease liabilities as of December 31, 2019 are as follows:

(DOLLARS IN MILLIONS)	
2020	$ 641
2021	542
2022	410
2023	306
2024	234
Thereafter	1,014
Total undiscounted lease payments	**3,147**
Less imputed interest	(459)
Total discounted lease payments	**$ 2,688**

Prior to the adoption of the New Lease Accounting Standard, rental commitments on an undiscounted basis were approximately $2.9 billion at December 31, 2018 under long-term non-cancelable operating leases and were payable as follows: $683 million in 2019, $544 million in 2020, $407 million in 2021, $301 million in 2022, $235 million in 2023 and $746 million thereafter.

NOTE 20: SEGMENT FINANCIAL DATA

Our operations for the periods presented herein are classified into four principal segments. The segments are generally determined based on the management structure of the businesses and the grouping of similar operating companies, where each management organization has general operating autonomy over diversified products and services.

Otis products include elevators, escalators, moving walkways and service sold to customers in the commercial, residential and infrastructure property sectors around the world.

Carrier products and related services include HVAC and refrigeration systems, building controls and automation, fire and special hazard suppression systems and equipment, security monitoring and rapid response systems, provided to a diversified international customer base principally in the industrial, commercial and residential property and commercial transportation sectors.

Pratt & Whitney products include commercial, military, business jet and general aviation aircraft engines, parts and services sold to a diversified customer base, including international and domestic commercial airlines and aircraft leasing companies, aircraft manufacturers, and U.S. and foreign governments. Pratt & Whitney also provides product support and a full range of overhaul, repair and fleet management services.

Collins Aerospace Systems provides technologically advanced aerospace products and aftermarket service solutions for aircraft manufacturers, airlines, regional, business and general aviation markets, military and space operations. Products include electric power generation, power management and distribution systems, air data and aircraft sensing systems, engine control systems, intelligence, surveillance and reconnaissance systems, engine components, environmental control systems, fire and ice detection and protection systems, propeller systems, engine nacelle systems, including thrust reversers and mounting pylons, interior and exterior aircraft lighting, aircraft seating and cargo systems, actuation systems, landing systems, including landing gear, wheels and brakes, and space products and subsystems, integrated avionics systems, precision targeting, electronic warfare and range and training systems, flight controls, communications systems, navigation systems, oxygen systems, simulation and training systems, food and beverage preparation, storage and galley systems, lavatory and wastewater management systems. Aftermarket services include spare parts, overhaul and repair, engineering and technical support, training and fleet management solutions, and information management services.

We have reported our financial and operational results for the periods presented herein under the four principal segments noted above, consistent with how we have reviewed our business operations for decision-making purposes, resource allocation and performance assessment during 2019.

Segment Information. Total sales by segment include intersegment sales, which are generally made at prices approximating those that the selling entity is able to obtain on external sales. Segment information for the years ended December 31 is as follows:

	Net Sales			Operating Profits		
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019**	2018	2017
Otis	**$ 13,113**	$ 12,904	$ 12,341	**$ 1,948**	$ 1,915	$ 2,002
Carrier	**18,608**	18,922	17,812	**2,697**	3,777	3,165
Pratt & Whitney	**20,892**	19,397	16,160	**1,668**	1,269	1,300
Collins Aerospace Systems	**26,028**	16,634	14,691	**4,100**	2,303	2,191
Total segment	**78,641**	67,857	61,004	**10,413**	9,264	8,658
Eliminations and other	**(1,595)**	(1,356)	(1,167)	**(932)**	(236)	(81)
General corporate expenses	**—**	—	—	**(515)**	(475)	(439)
Consolidated	**$ 77,046**	$ 66,501	$ 59,837	**$ 8,966**	$ 8,553	$ 8,138

	Total Assets			Capital Expenditures			Depreciation & Amortization		
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019**	2018	2017	**2019**	2018	2017
Otis	**$ 9,973**	$ 9,374	$ 9,421	**$ 145**	$ 172	$ 133	**$ 337**	$ 190	$ 177
Carrier	**22,789**	22,189	22,657	**243**	263	326	**513**	357	372
Pratt & Whitney	**31,271**	29,341	26,768	**822**	866	923	**980**	852	672
Collins Aerospace Systems	**74,049**	73,115	34,567	**959**	515	527	**1,749**	883	823
Total segment	**138,082**	134,019	93,413	**2,169**	1,816	1,909	**3,579**	2,282	2,044
Eliminations and other	**1,634**	192	3,507	**87**	86	105	**204**	151	96
Consolidated	**$ 139,716**	$ 134,211	$ 96,920	**$ 2,256**	$ 1,902	$ 2,014	**$ 3,783**	$ 2,433	$ 2,140

Geographic External Sales and Operating Profit. Geographic external sales and operating profits are attributed to the geographic regions based on their location of origin. U.S. external sales include export sales to commercial customers outside the U.S. and sales to the U.S. Government, commercial and affiliated customers, which are known to be for resale to customers outside the U.S. Long-lived assets are net fixed assets attributed to the specific geographic regions.

	External Net Sales			Operating Profits			Long-Lived Assets		
(DOLLARS IN MILLIONS)	**2019**	2018	2017	**2019**	2018	2017	**2019**	2018	2017
United States Operations	**$ 48,288**	$ 39,481	$ 33,912	**$ 5,505**	$ 4,941	$ 4,126	**$ 7,498**	$ 7,111	$ 5,323
International Operations									
Europe	**13,664**	12,857	11,879	**2,476**	2,141	1,959	**1,889**	1,908	1,817
Asia Pacific	**9,391**	8,847	8,770	**1,662**	1,476	1,491	**1,359**	1,349	1,113
Other	**7,298**	6,672	6,443	**770**	706	1,082	**1,412**	1,363	1,389
Eliminations and other	**(1,595)**	(1,356)	(1,167)	**(1,447)**	(711)	(520)	**597**	566	544
Consolidated	**$ 77,046**	$ 66,501	$ 59,837	**$ 8,966**	$ 8,553	$ 8,138	**$ 12,755**	$ 12,297	$ 10,186

Sales from U.S. operations include export sales as follows:

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Europe	**$ 7,122**	$ 6,285	$ 5,273
Asia Pacific	**6,479**	5,429	3,634
Other	**3,847**	2,514	2,217
Total	**$ 17,448**	$ 14,228	$ 11,124

Sales by primary geographical market for the year ended December 31, 2019 is as follows:

(DOLLARS IN MILLIONS)	Otis	Carrier	Pratt & Whitney	Collins Aerospace Systems	Total
Primary Geographical Markets					
United States	$ 3,589	$ 9,574	$ 16,148	$ 18,977	**$ 48,288**
Europe	3,919	5,326	498	3,921	**13,664**
Asia Pacific	4,591	2,811	1,164	825	**9,391**
Other*	1,014	897	3,082	2,305	**7,298**
Total segment	**$ 13,113**	**$ 18,608**	**$ 20,892**	**$ 26,028**	**$ 78,641**
Eliminations and other					**(1,595)**
Consolidated					**$ 77,046**

Sales by primary geographical market for the year ended December 31, 2018 is as follows:

(DOLLARS IN MILLIONS)	Otis	Carrier	Pratt & Whitney	Collins Aerospace Systems	Total
Primary Geographical Markets					
United States	$ 3,433	$ 9,402	$ 14,852	$ 11,794	$ 39,481
Europe	4,055	5,710	594	2,498	12,857
Asia Pacific	4,354	2,849	1,277	367	8,847
Other*	1,062	961	2,674	1,975	6,672
Total segment	$ 12,904	$ 18,922	$ 19,397	$ 16,634	$ 67,857
Eliminations and other					(1,356)
Consolidated					$ 66,501

* Other includes sales to other regions as well as intersegment sales.

Segment sales disaggregated by product type and product versus service for the year ended December 31, 2019 are as follows:

(DOLLARS IN MILLIONS)	Otis	Carrier	Pratt & Whitney	Collins Aerospace Systems	**Total**
Product Type					
Commercial and industrial, non aerospace	$ 13,113	$ 18,608	$ 102	$ 51	**$ 31,874**
Commercial aerospace	—	—	14,516	19,005	**33,521**
Military aerospace	—	—	6,274	6,972	**13,246**
Total segment	**$ 13,113**	**$ 18,608**	**$ 20,892**	**$ 26,028**	**$ 78,641**
Eliminations and other					**(1,595)**
Consolidated					**$ 77,046**
Sales Type					
Product	$ 5,669	$ 15,360	$ 12,977	$ 21,440	**$ 55,446**
Service	7,444	3,248	7,915	4,588	**23,195**
Total segment	**$ 13,113**	**$ 18,608**	**$ 20,892**	**$ 26,028**	**$ 78,641**
Eliminations and other					**(1,595)**
Consolidated					**$ 77,046**

Segment sales disaggregated by product type and product versus service for the year ended December 31, 2018 are as follows:

(DOLLARS IN MILLIONS)	Otis	Carrier	Pratt & Whitney	Collins Aerospace Systems	Total
Product Type					
Commercial and industrial, non aerospace	$ 12,904	$ 18,922	$ 55	$ 60	$ 31,941
Commercial aerospace	—	—	14,027	12,564	26,591
Military aerospace	—	—	5,315	4,010	9,325
Total segment	$ 12,904	$ 18,922	$ 19,397	$ 16,634	$ 67,857
Eliminations and other					(1,356)
Consolidated					$ 66,501
Sales Type					
Product	$ 5,636	$ 15,682	$ 11,410	$ 13,915	$ 46,643
Service	7,268	3,240	7,987	2,719	21,214
Total segment	$ 12,904	$ 18,922	$ 19,397	$ 16,634	$ 67,857
Eliminations and other					(1,356)
Consolidated					$ 66,501

Major Customers. Net Sales include sales under prime contracts and subcontracts to the U.S. Government, primarily related to Pratt & Whitney and Collins Aerospace Systems products, as follows:

(DOLLARS IN MILLIONS)	**2019**	2018	2017
Pratt & Whitney	**$ 5,614**	$ 4,489	$ 3,347
Collins Aerospace Systems	**4,802**	2,779	2,299
Other	**227**	175	152
Total	**$ 10,643**	$ 7,443	$ 5,798

Sales to Airbus prior to discounts and incentives, primarily related to Pratt & Whitney and Collins Aerospace Systems products, were approximately $9,879 million, $10,025 million and $8,908 million for the years ended December 31, 2019, 2018 and 2017, respectively.

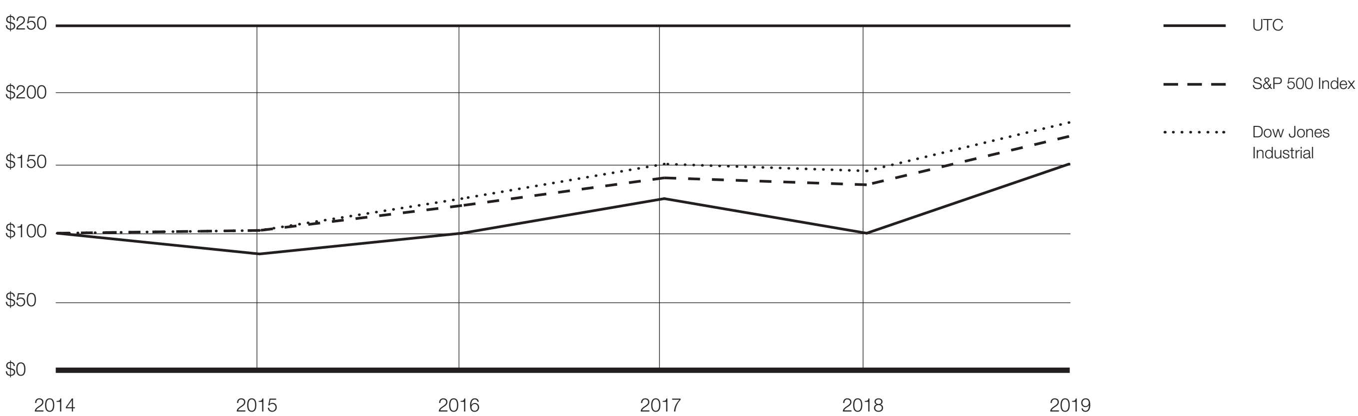
Selected Quarterly Financial Data (Unaudited)

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS)	2019 Quarters First	Second	Third	Fourth	2018 Quarters First	Second	Third	Fourth
Net Sales	**$ 18,365**	**$ 19,634**	**$ 19,496**	**$ 19,551**	$ 15,242	$ 16,705	$ 16,510	$ 18,044
Gross margin	**4,658**	**5,221**	**5,285**	**4,817**	3,962	4,283	3,974	4,297
Net income attributable to common shareowners	**1,346**	**1,900**	**1,148**	**1,143**	1,297	2,048	1,238	686
Earnings per share of Common Stock:								
Basic - net income	**$ 1.58**	**$ 2.22**	**$ 1.34**	**$ 1.33**	$ 1.64	$ 2.59	$ 1.56	$ 0.83
Diluted - net income	**$ 1.56**	**$ 2.20**	**$ 1.33**	**$ 1.32**	$ 1.62	$ 2.56	$ 1.54	$ 0.83

PERFORMANCE GRAPH (UNAUDITED)

The following graph presents the cumulative total shareholder return for the five years ending December 31, 2019 for our common stock, as compared to the Standard & Poor's 500 Stock Index and to the Dow Jones 30 Industrial Average. Our common stock price is a component of both indices. These figures assume that all dividends paid over the five-year period were reinvested, and that the starting value of each index and the investment in common stock was $100.00 on December 31, 2014.

COMPARISON OF CUMULATIVE FIVE YEAR TOTAL RETURN



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Reconciliation of Non-GAAP Measures to Corresponding GAAP Measures

RECONCILIATION OF NET SALES (GAAP) TO ADJUSTED NET SALES (NON-GAAP)

(DOLLARS IN MILLIONS)	**2019**	2018	2017	2016	2015
Net sales	**$ 77,046**	$ 66,501	$ 59,837	$ 57,244	$ 56,098
Adjustments to net sales:					
Pratt & Whitney - charge resulting from ongoing customer contract matters	**—**	—	385	184	142
UTC Aerospace Systems - charge resulting from customer contract matters	**—**	—	—	—	210
Adjusted net sales	**$ 77,046**	$ 66,501	$ 60,222	$ 57,428	$ 56,450

RECONCILIATION OF DILUTED EARNINGS PER SHARE TO ADJUSTED DILUTED EARNINGS PER SHARE

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS)	**2019**	2018	2017	2016	2015
Net income from continuing operations attributable to common shareowners	**$ 5,537**	$ 5,269	$ 4,552	$ 5,065	$ 3,996
Adjustments to net income from continuing operations attributable to common shareowners:					
Restructuring costs	**421**	309	253	290	396
Significant non-recurring and non-operational charges (gains)	**989**	(170)	(146)	690	1,446
Income tax benefit on restructuring costs and significant non-recurring and non-operational items	**(249)**	(5)	(11)	(354)	(617)
Significant non-recurring and non-operational (gains) charges recorded within income tax expense	**431**	773	667	(231)	342
Significant non-recurring and non-operational items - Noncontrolling interest	**7**	(7)	—	—	—
Total adjustments to net income from continuing operations attributable to common shareowners	**1,599**	896	763	395	1,567
Adjusted net income from continuing operations attributable to common shareowners	**$ 7,136**	$ 6,165	$ 5,315	$ 5,460	$ 5,563
Weighted average diluted shares outstanding	**$ 864**	$ 810	$ 799	$ 826	$ 883
Diluted earnings per share—Net income from continuing operations attributable to common shareowners	**$ 6.41**	$ 6.50	$ 5.70	$ 6.13	$ 4.53
Impact of non-recurring and non-operational charges (gains) on diluted earnings per share	**1.85**	1.11	0.95	0.48	1.77
Adjusted diluted earnings per share—Net income from continuing operations attributable to common shareowners	**$ 8.26**	$ 7.61	$ 6.65	$ 6.61	$ 6.30

RECONCILIATION OF SEGMENT RESULTS TO ADJUSTED SEGMENT RESULTS

(DOLLARS IN MILLIONS)	**Otis**	**Carrier**	**Pratt & Whitney**	**Collins Aerospace Systems**
2019 Segment operating profit	**$ 1,948**	**$ 2,697**	**$ 1,668**	**$ 4,100**
Adjustments to segment operating profit:				
Restructuring costs	54	126	133	102
Costs associated with the Company’s intention to separate its commercial businesses	9	6	—	1
Costs associated with pension plan amendment	3	7	—	33
Investment impairment	—	108	—	—
Consultant contract termination	—	34	—	—
Loss on sale of business	—	—	—	25
Amortization of Rockwell Collins inventory fair value adjustment	—	—	—	181
2019 Adjusted segment operating profit	**$ 2,014**	**$ 2,978**	**$ 1,801**	**$ 4,442**

RECONCILIATION OF CASH FLOWS FROM OPERATING ACTIVITIES (GAAP) TO FREE CASH FLOW (NON-GAAP)

(DOLLARS IN MILLIONS, EXCEPT PER SHARE AMOUNTS)	**2019**	2018	2017	2016	2015
Net cash flows provided by operating activities of continuing operations	**$ 8,883**	$ 6,322	$ 5,631	$ 6,412	$ 6,755
Less: Capital expenditures	**2,256**	1,902	2,014	1,699	1,652
Free Cash Flow	**$ 6,627**	$ 4,420	$ 3,617	$ 4,713	$ 5,103

Use and Definitions of Non-GAAP Financial Measures

United Technologies Corporation reports its financial results in accordance with accounting principles generally accepted in the United States (“GAAP”). We supplement the reporting of our financial information determined under GAAP with certain non-GAAP financial information. The non-GAAP information presented provides investors with additional useful information, but should not be considered in isolation or as substitutes for the related GAAP measures. Moreover, other companies may define non-GAAP measures differently, which limits the usefulness of these measures for comparisons with such other companies. We encourage investors to review our financial statements and publicly filed reports in their entirety and not to rely on any single financial measure.

Adjusted net sales, organic sales, adjusted operating profit, and adjusted earnings per share (“EPS”) are non-GAAP financial measures. Adjusted net sales represents consolidated net sales from continuing operations (a GAAP measure), excluding significant items of a non-recurring and/or nonoperational nature (hereinafter referred to as “other significant items”). Organic sales represents consolidated net sales (a GAAP measure), excluding the impact of foreign currency translation, acquisitions and divestitures completed in the preceding twelve months and other significant items. Adjusted operating pro fit represents income from continuing operations (a GAAP measure), excluding restructuring costs and other significant items. Adjusted EPS represents diluted earnings per share from continuing operations (a GAAP measure), excluding restructuring costs and other significant items. For the business segments, when applicable, adjustments of net sales and operating profit similarly reflect continuing operations, excluding restructuring and other significant items. Management believes that the non-GAAP measures just mentioned are useful in providing period-to-period comparisons of the results of the Company’s ongoing operational performance.

Free cash flow is a non-GAAP financial measure that represents cash flow from operations (a GAAP measure) less capital expenditures. Management believes free cash flow is a useful measure of liquidity and an additional basis for assessing UTC’s ability to fund its activities, including the financing of acquisitions, debt service, repurchases of UTC’s common stock and distribution of earnings to shareowners.

A reconciliation of the non-GAAP measures to the corresponding amounts prepared in accordance with GAAP appears in the tables above. The tables above provide additional information as to the items and amounts that have been excluded from the adjusted measures.

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Collins Aerospace

David R. Whitehouse*
Corporate Vice President
Treasurer

* Executive Officer

Shareowner Information

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www.utc.com

This report is made available to shareowners in advance of the annual meeting of shareowners to be held at 8:00 a.m., April 27, 2020, in McLean, Virginia. The proxy statement will be made available to shareowners on or about March 13, 2020, at which time proxies for the meeting will be requested.

STOCK LISTING
New York Stock Exchange (ticker symbol UTX)

TRANSFER AGENT AND REGISTRAR
Computershare Trust Company, N.A., is the transfer agent, registrar and dividend disbursing agent for UTC's common stock. Questions and communications from registered shareowners regarding transfer of stock, replacement of lost certificates, dividends, address changes, and the Stock Purchase and Dividend Reinvestment Plan administered by Computershare should be directed to:

Computershare Trust Company, N.A.
462 South 4th Street
Suite 1600
Louisville, KY 40202
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DIVIDENDS
Dividends are usually paid on the 10th day of March, June, September and December.

ELECTRONIC ACCESS OR DELIVERY OF SHAREOWNER COMMUNICATIONS
Registered shareowners can help conserve natural resources and reduce printing and mailing costs incurred by UTC by signing up for electronic communications, including annual meeting materials, stock plan statements and tax documents at:
www.computershare-na.com/green.

Beneficial shareowners may be able to request electronic access or delivery by contacting their broker or bank, or Broadridge Financial Solutions at: **enroll.icsdelivery.com/utc**.

2019 ANNUAL REPORT ON FORM 10-K
Copies of the UTC Annual Report on Form 10-K as filed with the U.S. Securities and Exchange Commission can be accessed and downloaded via our website at:
ir.utc.com/financial-information/sec-filings.

Copies also can be obtained, without charge, from:

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Fortune
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Latina Style 50
Among the best companies for Latinas

Human Rights Campaign Foundation
Among the best places to work for LGBTQ equality

Diversity Best Practices Inclusion Index
Among 80 businesses recognized for encouraging a corporate culture of inclusion and diversity

Disability Equality Index
Among the best places to work for disability inclusion

Newsweek
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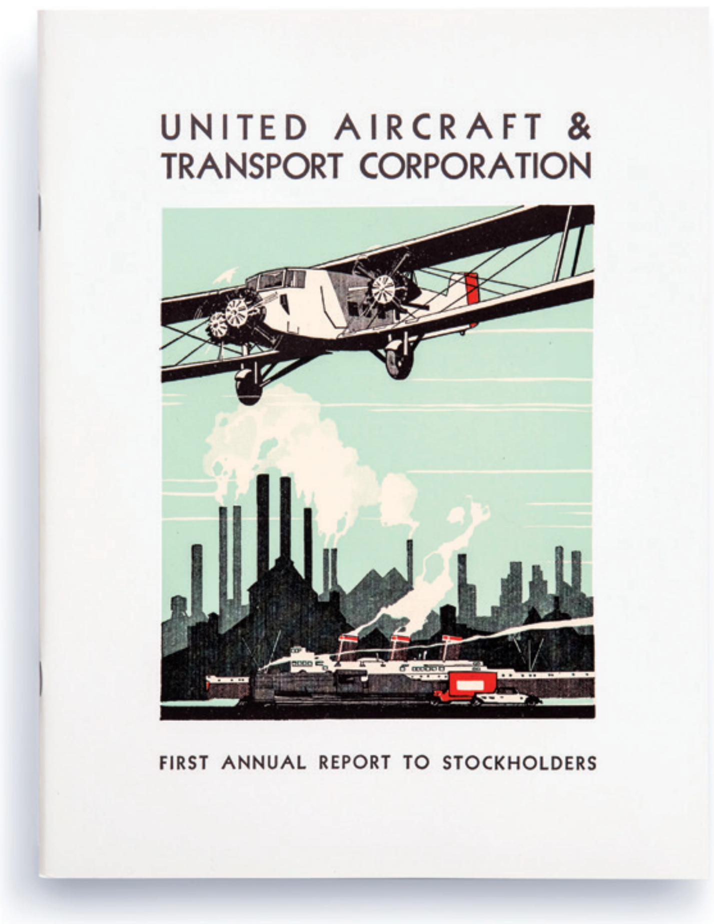

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