2019 | ANNUAL REPORT

Collaboration

Innovation

By Your Side for **Quality**

Expertise

Service

West

West: By Your Side for a Healthier World™

The injectable therapies market is characterized by accelerated change over the past five years. Interest in combination products has surged, as have the regulatory requirements governing them. At the same time, trends toward precision medicine and patient self-administration continue to drive how medicines are designed, developed and commercialized. Now, more than ever, pharmaceutical and biotechnology companies need a strong partner by their sides.

CUSTOMERS: OUR PARTNERS

We take great pride in that, for nearly 100 years, we have helped our customers manage ever-changing market needs and demands, by continuously delivering innovative products and services. West's broad expertise and offerings are a competitive advantage for our biologic, pharmaceutical, generic, medical device, and diagnostic customers. Although these customers have unique requirements, they have a common need for high-quality components. At West, one of our core values is to serve as a Leader in Quality. This means we work every day to bring the highest levels of quality and precision to our work, because we know the products we make are critical to ensuring patient health.

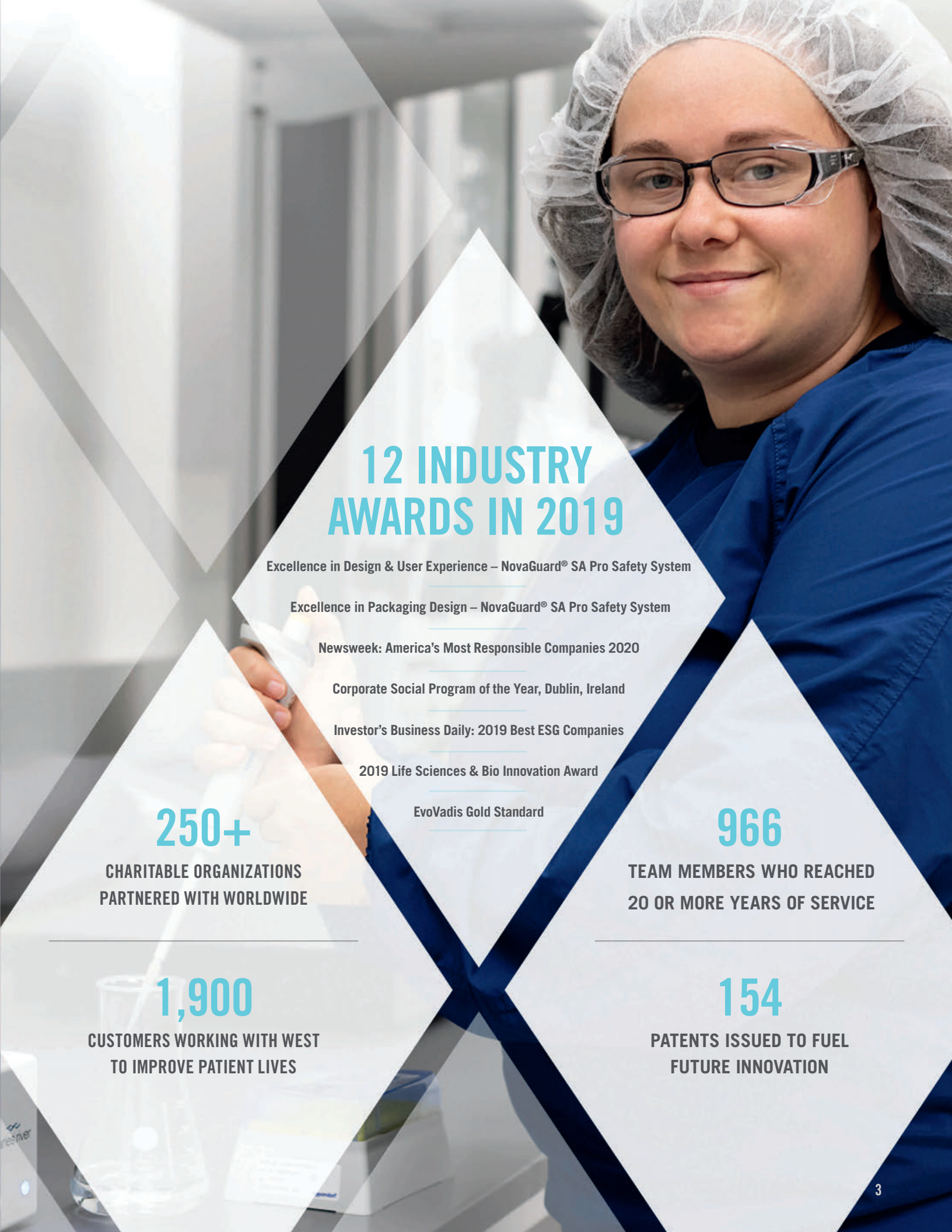
Standing by the side of our customers means accompanying them throughout the entire drug development journey. In addition to supplying our customers with critical packaging and drug delivery products for their injectable medicines, we also offer a range of solutions that draw upon our deep understanding of integrated containment and delivery systems, analytical testing, device manufacturing and assembly, and regulatory submission and approval requirements.

TEAM MEMBERS: OUR PEOPLE

A diverse and dedicated global workforce, bringing together unique perspectives and varied experiences, is critical to our success. With more than 8,000 team members contributing to West's daily innovation and business performance, we are fortunate to have a broad spectrum of team members from all walks of life and backgrounds. Our strong belief in a culture of mutual respect celebrates differences — and similarities — among all stakeholders, both inside and outside our walls.

COMMUNITY: OUR PLACE IN THE WORLD

Just as we are dedicated to helping patients lead longer, healthier lives, we are dedicated to sustainability and to improving the health and prosperity of the communities where we live and work. West makes significant contributions to nonprofit organizations and actively encourages and supports employee volunteerism. In fact, one of our key philanthropic objectives in 2019 was to have each of our global sites organize an employee volunteer program, which resulted in more than 8,000 hours of volunteer time donated this past year. This is just one example of West's broad corporate giving program.



12 INDUSTRY AWARDS IN 2019

Excellence in Design & User Experience – NovaGuard® SA Pro Safety System

Excellence in Packaging Design – NovaGuard® SA Pro Safety System

Newsweek: America's Most Responsible Companies 2020

Corporate Social Program of the Year, Dublin, Ireland

Investor's Business Daily: 2019 Best ESG Companies

2019 Life Sciences & Bio Innovation Award

EvoVadis Gold Standard

250+

CHARITABLE ORGANIZATIONS PARTNERED WITH WORLDWIDE

966

TEAM MEMBERS WHO REACHED 20 OR MORE YEARS OF SERVICE

1,900

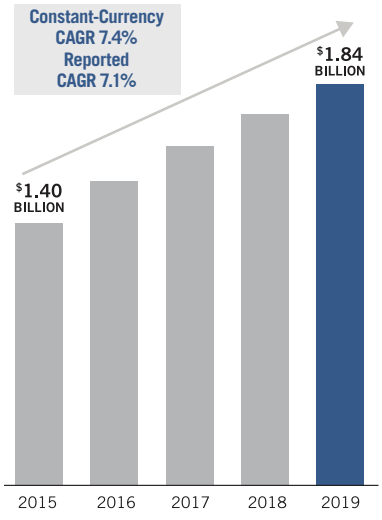
CUSTOMERS WORKING WITH WEST TO IMPROVE PATIENT LIVES

154

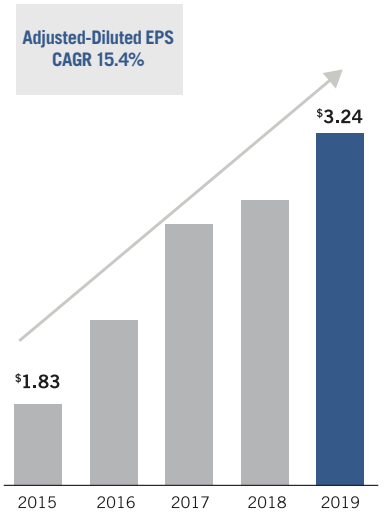
PATENTS ISSUED TO FUEL FUTURE INNOVATION

ANNUAL COMPARISON

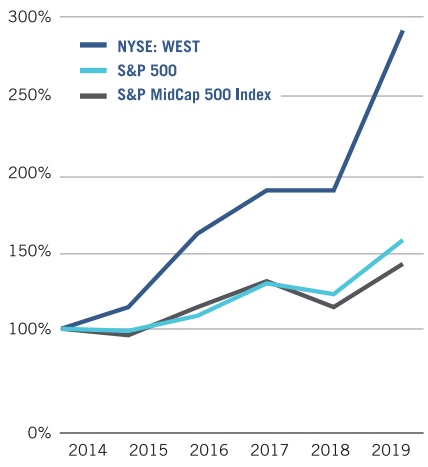
SUSTAINED, CONSISTENT GROWTH



NET SALES[1]



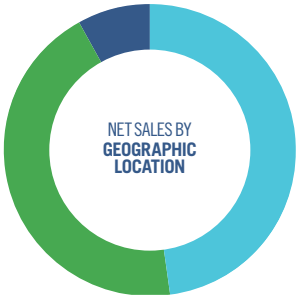
ADJUSTED-DILUTED EPS[2]
(NON-U.S. GAAP)



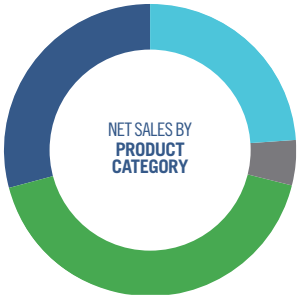
COMPARISON OF CUMULATIVE FIVE-YEAR TOTAL RETURN[3]
(DEC. 31, 2014 - DEC. 31, 2019)

2019 NET SALES[1]

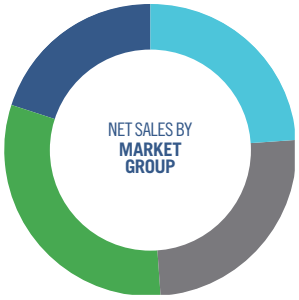
BUSINESS AT A GLANCE



- 48% Americas
- 44% Europe, Middle East, Africa
- 8% Asia Pacific



- 42% High-Value Components
- 29% Standard Packaging
- 5% Delivery Devices
- 24% Contract-Manufactured Products[4]



- 25% Biologics
- 20% Generics
- 31% Pharma
- 24% Contract-Manufactured Products[4]

[1] Based on 2019 consolidated net sales.
[2] Please refer to our February 13, 2020 and January 9, 2019 current reports on Form 8-K for the reconciliation of Non-U.S. GAAP financial measures.
[3] Sources: IR Insight
[4] Non-proprietary products

WEST PHARMACEUTICAL SERVICES, INC. & SUBSIDIARIES

FINANCIAL SUMMARY

	2019	2018
Net Sales[1]	**$1,839.9**	$1,717.4
Organic Net Sales Growth[2]	**10.0%**	
Diluted Earnings Per Share		
As reported (U.S. GAAP)	**$3.21**	$2.74
Restructuring and related charges	**0.04**	0.09
Gain on restructuring–related sales of assets	**(0.02)**	(0.01)
Pension settlement	**0.04**	–
Argentina currency devaluation	**0.01**	0.02
Tax recovery	**(0.04)**	–
Tax law changes	–	(0.03)
As adjusted (Non-U.S. GAAP)	**$3.24**	$2.81

Our 2019 as-reported results include the impact of restructuring and related charges of $3.7 million (net of $1.2 million in tax), a gain on the sale of fixed assets as a result of our restructuring plan of $1.3 million (net of $0.4 million in tax), a pension settlement charge of $2.7 million (net of $0.8 million in tax), a charge of $1.0 million related to the continued devaluation of Argentina's currency, a tax recovery of $2.9 million (net of $1.5 million in tax) related to previously-paid international excise taxes, and a net tax benefit of $0.3 million related to the impact of federal law changes enacted during the year.

Our 2018 as-reported results include the impact of restructuring and related charges of $7.2 million (net of $1.9 million in tax), a gain on the sale of fixed assets as a result of our restructuring plans of $0.9 million (net of $0.2 million in tax), a charge of $1.1 million related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018, and a net tax benefit of $2.5 million for the estimated impact of the Tax Cuts and Jobs Act.

Adjusted results are intended to aid investors in understanding the Company's year-over-year results and are considered Non-U.S. GAAP financial measures. Non-U.S. GAAP financial measures should not be considered in isolation or as an alternative to such measures determined in accordance with U.S. GAAP. Our executive team uses these financial measures to evaluate the performance of the Company in terms of profitability and efficiency, as well as to compare operating results to prior periods.

For a discussion of Non-U.S. GAAP financial measures, please refer to our 2019 Form 10-K filed on February 24, 2020 and our current Form 8-K filed on February 13, 2020.

[1] Dollars in millions, except per share data.
[2] Organic net sales exclude the impact from acquisitions and/or divestitures and translates the current period reported sales of subsidiaries whose functional currency is other than U.S. Dollar at the applicable foreign exchange rates in effect during the comparable prior-year period.

West is a leading global manufacturer in the design and production of technologically advanced, high-quality, integrated containment and delivery systems for injectable medicines. We are a trusted partner to the world's top pharmaceutical and biotechnology companies—working by their side to improve patient health.

A LETTER FROM WEST'S PRESIDENT AND CEO

At West, our mission to improve patient lives propels us each and every day. We fulfill our mission by consistently executing our market-led strategy and earning our customer's business each day. I am pleased to report that we made significant progress on many fronts in 2019, including the introduction of new products and services, optimization of our global operations and supply chain and several strategic growth investments, helping us to drive improved service and quality for our customers and the patients we serve together.

We are committed to consistently delivering strong financial performance. Our results in 2019 reflect that continued commitment and momentum as we move to 2020. Looking to the future, we are well-positioned to deliver against strong customer demand for our products and services and feel confident that West will continue to play an integral role in bringing new medicines to market.

2019 BUSINESS HIGHLIGHTS

In 2019, we reported net sales of $1.84 billion, which represents 10% organic net sales growth over the prior year. Our high-value products, which make up more than 60% of the Proprietary Products segment, had strong growth across all market units throughout the year. Our Contract-Manufactured Products segment also had a good year, posting organic net sales growth of 10%, led by sales of healthcare-related injection and diagnostic devices.

Along with strong sales growth, our teams continue to expand profit margins through operational excellence and fiscal discipline, while continuing to invest in long-term growth initiatives. This resulted in 27% growth in operating cash flow, which funded capital expenditures and returned cash to the shareholders through a Board-authorized share repurchase program, and an increased dividend, for the 27th year in a row.

DELIVERING ON OUR PASSION FOR CUSTOMERS

In support of our mission, we work by the side of our customers to provide them with the latest innovations to enable the safe delivery of their medicines to the patients who need them. We are passionate in addressing our customers' needs through both the products we offer as well as the services and technical expertise we provide. Examples of this commitment to excellence are demonstrated by several new innovative products introduced this year.

Our new NovaPure® 3mL cartridge components satisfy an unmet market need with the increase in sensitive biologic products being developed in dosages larger than 1mL. With the patient experience in mind, we expanded our self-injection platform with the SmartDose® Gen. II injector, enabling subcutaneous delivery of high viscosity drugs at dosages up to 10mL. We also introduced an advanced elastomer formulation with enhanced performance and reliability, featuring Westar® Select quality and low particulate levels, which mitigates extractable and leachable risk for customers. And we launched AccelTRA® Select, a line of products that provide our Generics customers with high-quality, ready-to-use components with market-leading delivery times. These products offer unique value propositions to customers and make a meaningful difference in the market.

These recent product launches represent our team's continued drive to generate innovative new solutions for customers that address unmet patient needs in the area of injectable drug delivery. To this end, the Company was issued more than 150 patents in 2019.

Our commitment to customers goes beyond the products we deliver and extends to the expertise we offer. Our technical teams raised the bar in 2019, contributing more than 100 scientific publications, presentations and book chapters that furthered the science involved in injectable medicine containment and delivery. These are the same team members who offer our customers advice and support services through our Integrated Solutions program, which leverages West's primary packaging, device, analytical, regulatory and contract manufacturing expertise in a single-source solution.

OPERATING AS A LEADER IN QUALITY

Leadership in Quality is one of our core values and operating with excellence and efficiency is an essential component of that value. We have implemented a number of initiatives across the organization that are driving improved safety for our team members, higher quality products, better service for our customers and increased profitability.

An important foundational element throughout our Global Operations and Supply Management team is Process Excellence. The One West Business System provides a framework for a customer-centered focus and efficient continuous improvement processes that are intended to meet and exceed the needs of our customers. As we look to the future, we will continue to drive operational excellence, as well as implement informed capital investments, as we introduce automation and advanced manufacturing capabilities across our network. We expect these initiatives to result in improved service to our customers and sustainability for our business.

These improvements in our global supply chain are central to delivering the high levels of product quality for which our business is known. We have seen great success in 2019 in enhancing our quality culture with our "patient first focus." By encouraging our team to focus on the patient, we are working to ensure quality in everything that we do because of the daily impact we have on patients.

WORKING AS ONE WEST TEAM

We strive to work as One West team and celebrate our diverse and talented global team. We invested in our Women Initiatives Network across the globe and a leadership development program to support the next generation of West leaders. We worked to attract top talent to join us from outside our walls to ensure that we are bringing forth fresh ideas that translate into better products and services to our customers. We also made great strides in our safety program by reducing our recordable injury rate to an all-time low of 0.7, which represents a 66% reduction since 2015.

Our efforts to build a diverse team and a safe working environment are part of our broader Corporate Responsibility program. We strive to be good stewards in all of our business decisions—from the raw materials we use, to our production and manufacturing techniques, to how we package and distribute our products. Our team members are also passionate about making a difference and donate considerable time and resources through our corporate giving and volunteer programs. We were proud to be recognized by several third parties in 2019 for our efforts across the six pillars of our Corporate Responsibility program.

INVESTING IN OUR FUTURE

We completed several investments during 2019 that are expected to drive future growth in key markets and enhance our team's digital capabilities.

In April, we further expanded our presence in the Asia Pacific region with a new sales office in Korea, through the purchase of the distribution business of GIS Korea Ltd., who previously served as our distributor in that country. By combining the local insight of the GIS Korea team with West's global manufacturing reach and market-leading technical support team, we will be able to better serve our customers and position ourselves to grow our business in this important market.

In October, we increased our minority equity stake to 49 percent in Daikyo Seiko, Ltd., a company that West has partnered with for more than 40 years to develop and manufacture high-quality components and solutions for the primary containment and delivery of injectable medicines. Daikyo and West share a unique commitment to science, quality and technical expertise that continues to prove valuable to the customers and patients we jointly serve. Our increased investment demonstrates our long-term commitment to this strategic partnership, and we look forward to our continued collaboration.

Finally, we proudly opened our Digital Technology Center (DTC) in India, a state-of-the-art business space that serves as a global center of excellence for the Company's Digital and Transformation team. The DTC is an important part of West's ongoing efforts to enhance customer engagement through digital marketing, digital manufacturing and automation to accelerate internal and external business processes.

LOOKING AHEAD TO 2020

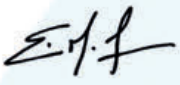
Our Board of Directors continues to guide and support our leadership team, and we are grateful for their continued commitment to West. This past February, we welcomed Robert Friel, who most recently served as the Chief Executive Officer and Chairperson of the Board of Directors of PerkinElmer, Inc. Adding Rob to our already accomplished Board of Directors should benefit our shareholders and all stakeholders significantly.

Our work in 2019 has positioned us well to deliver our long-term financial commitment to grow the business in both revenue and improved profitability, increase our return on invested capital, and increase our operating cash flow, which is funding both investments in the future as well as share repurchases and increasing dividends. We are confident in our growth strategy and the opportunities ahead of us.

We recognize that our products are used daily by millions of patients across the globe, which is why we are dedicated to continuously improving our capabilities, so we can work to serve these patients well into the future.

Thank you for your continued support of West.

Sincerely,



Eric M. Green
President & CEO

CHAIR'S ADDRESS

As we close out the tenth decade that West has been in business, we can look back and see the tremendous progress we have made over these past ten years, and the almost ninety years that came before them. The Company posted another strong set of results for 2019, was recognized for its strong standing as a good corporate citizen and has a sound and sustainable plan for long-term growth.

With so many promising new injectable drug candidates in the development pipeline, it is an exciting time to be a part of the healthcare industry. As a supplier to the world's top pharmaceutical and biotechnology companies, West is in the enviable position to play a significant role in these new medical advances. The Company's market-led strategy, initiated four years ago, has helped the team better anticipate the specific needs of the customers we serve, and has generated excellent results over this same time period. As the Company continues to refine this strategy, with future customer and patient needs in mind, we anticipate continued growth and success.

The Board of Directors has worked together with West's Management Team to ensure that when it comes to broader issues of corporate responsibility, corporate risk and business continuity, the Company has been just as diligent in their strategic approach. Under the counsel of our directors, the business has planned for and delivered against these priorities as well. In fact, the recognition by several third parties in 2019, listing West as a "Most Responsible" and "Best ESG" company, is evidence of this work. I'd like to acknowledge and thank the entire Board for their work over this past year. A special thank you to John Weiland, who retired from the Board last May, for his 12 years of exceptional service to West. In February of this year, we welcomed Robert Friel to the Board, and we look forward to his future contributions.

West is well-positioned to continue the important role it plays in bringing life-saving medicines and therapies to patients across the globe, and in turn, delivering value to all the stakeholders it serves including our customers, our team members and you, our shareholders.

Thank you,

Patrick J. Zenner
Chair, Board of Directors

OUR COMMITMENT

At West, we are dedicated to working by our customers' side to improve patient health worldwide. We also take our role as a corporate citizen seriously, and strive to move from talk of Environment, Social and Governance (ESG) initiatives to action. Taking care of the communities where we live and work, as well as the global environment, are important priorities that we think about daily as we operate our business.

West's commitment to ESG programs is reflected in our achievements in 2019. Key highlights are summarized on the next page, with more details forthcoming in our 2019 Corporate Responsibility Report.

HEALTH & SAFETY

At West, each of our team members shares the responsibility for maintaining a safe workplace. Our Health, Safety and Environment (HSE) Management System, deployed in 2018, continued to deliver great results in 2019, helping us to reduce and eliminate accidents within our facilities around the world. The leading metrics we have put in place helped to drive down our 2019 Recordable Injury Rate (RIR) to 0.7; this represents a 66% reduction in that rate since 2015. We have a number of programs that have contributed to building a strong safety culture.

ENVIRONMENTAL IMPACT

West believes that, as a global organization, we have a duty and obligation to contribute to a sustainable future and that each of us, working together, can make a difference. We factor environmental considerations into our decision-making regarding distribution methods, production processes and sourcing or use of raw materials at all our sites. Each site is managing 15 or more projects that will result in sustainability improvements, such as water savings, LED lighting, optimization of HVAC units and the utilization of exhaust heat recovery.

As part of our sustainability efforts, in 2013, West established emissions, energy and water intensity goals to be achieved by 2020. We exceeded those goals in 2019, so we have published a new set of 5-year goals that will guide our continuous improvement for sustainability and corporate responsibility for the future. We have improved our Carbon Disclosure Project rating by no less than 500 basis points each year since we began reporting in 2013 and achieved our highest ever rating in 2019.

PHILANTHROPY

Our corporate philanthropy program focuses on key priorities — STEM education, children, people with disabilities, and healthcare — and includes a giving strategy anchored with three distinct pillars: West Pharmaceutical Services, Inc. corporate giving; the Herman O. West Foundation, an independently managed 501(c)(3) entity that awards scholarships and matching gifts; and West without Borders, our team-member-led giving program.

In 2019, our philanthropic efforts produced a number of notable achievements. For example, the West Employee Emergency Fund, managed under the Herman O. West Foundation, was established, and in its first year, provided more than 25 hardship grants to team members throughout the world. Total Corporate, Foundation and team member charitable giving totaled $2.8 million, of which more than $560,000 was contributed by our team members through our West without Borders global fundraising campaigns, while team members volunteered extensively at West events and volunteer days, donating more than 8,000 hours of their time. In addition, West's annual Global Food Drive donated more than 65,000 pounds of food to local charities and food banks — 9,000 pounds more than in 2018.

RECOGNITION

West is proud to have been named to Newsweek's list of America's Most Responsible Companies for 2020 based on analysis of key areas that included leadership diversity, employees, philanthropy and engagement, and impact in local communities. West was ranked in the Top 20 companies in the Health Care & Life Sciences Industry. Investor's Business Daily also ranked West at #19 on its list of the 50 Best ESG Companies for 2019, highlighting corporations that maintain a strong commitment to ESG values.

Additionally, West received several other regional corporate responsibility awards in 2019, including the CSR Initiative Award and Corporate Social Responsibility Program of the Year Award, both presented to West's Dublin, Ireland site; the Goodwill Employer of the Year Award, presented to West's Kearney, Nebraska, site; the West Chester University Corporate President's Award; and the Philadelphia Business Journal's Faces of Philanthropy distinction.

15%

IMPROVEMENT IN RECORDABLE INJURY RATE (RIR) OVER 2018

NAMED TO TOP COMPANY LISTS FOR CORPORATE RESPONSIBILITY BY NEWSWEEK, BARRON'S AND INVESTOR'S BUSINESS DAILY

~9.7%

WASTE TO LANDFILL REDUCTION FROM 2018

65,000 LBS OF FOODS DONATED THROUGH WEST'S ANNUAL FOOD DRIVE

2020

BOARD OF DIRECTORS

Mark A. Buthman
Retired Executive Vice President &
Chief Financial Officer
Kimberly-Clark Corporation
Director since 2011
Board committees: Compensation; Finance;
Nominating and Corporate Governance

William F. Feehery, Ph.D.
Chief Executive Officer
Certara
Director since 2012
Board committees: Audit; Compensation;
Nominating and Corporate Governance

Robert F. Friel
Retired Chairman & Chief Executive Officer
PerkinElmer, Inc.
Director since 2020
Board committees: Audit; Finance

Eric M. Green
President & Chief Executive Officer
Director since 2015

Thomas W. Hofmann
Retired Senior Vice President &
Chief Financial Officer
Sunoco, Inc.
Director since 2007
Board committees: Audit; Compensation

Paula A. Johnson, M.D., MPH
President
Wellesley College
Director since 2005
Board committees: Innovation
and Technology; Nominating
and Corporate Governance

Deborah L.V. Keller
Principal
Black Frame Advisors LLC & Retired
Chief Executive Officer,
Covance Drug Development
Director since 2017
Board committees: Audit; Finance;
Innovation and Technology

Myla P. Lai-Goldman, M.D.
Executive Chair
GeneCentric Therapeutics, Inc.
Director since 2014
Board committees: Finance;
Innovation and Technology

Douglas A. Michels
Retired President & Chief Executive Officer
OraSure Technologies, Inc.
Director since 2011
Board committees: Audit; Compensation

Paolo Pucci
Retired Chief Executive Officer
ArQule, Inc.
Director since 2016
Board committees: Finance;
Innovation and Technology

Patrick J. Zenner
Retired President & Chief Executive Officer
Hoffmann-La Roche, Inc.
Director since 2002
Chair of the Board
Board committees: Nominating
and Corporate Governance

HONORARY DIRECTOR

Morihiro Sudo
President
Daikyo Seiko, Ltd.

EXECUTIVE MANAGEMENT TEAM

Silji Abraham*
Senior Vice President & Chief Digital
and Transformation Officer

Bernard J. Birkett*
Senior Vice President &
Chief Financial Officer

Annette F. Favorite*
Senior Vice President &
Chief Human Resources Officer

Eric M. Green*
President & Chief Executive Officer

Quintin J. Lai, Ph.D.*
Vice President, Corporate Development,
Strategy & Investor Relations

George L. Miller*
Senior Vice President, General Counsel
& Corporate Secretary

David A. Montecalvo*
Senior Vice President & Chief
Operations and Supply Chain Officer

Andy Polywacz
Vice President, Quality Assurance

Cindy Reiss-Clark
Senior Vice President, Global Market
Units & Commercial Solutions

Eric Resnick*
Vice President &
Chief Technology Officer

Chris Ryan
Senior Vice President, Commercial
Products & Emerging Markets

Chad Winters
Vice President and Corporate Controller

Charles Witherspoon
Vice President and Treasurer

BOARD COMMITTEES

Audit Committee
Thomas W. Hofmann, Chair

Compensation Committee
Douglas A. Michels, Chair

Finance Committee
Paolo Pucci, Chair

Innovation and Technology Committee
Myla P. Lai-Goldman, M.D., Chair

Nominating and Corporate Governance Committee
William F. Feehery, Ph.D., Chair

** Denotes an Executive Officer of the Company*

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2019

or

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

For the transition period from to

Commission File Number 1-8036

WEST PHARMACEUTICAL SERVICES, INC.

(Exact name of registrant as specified in its charter)

Pennsylvania	**23-1210010**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)
530 Herman O. West Drive, Exton, PA	**19341-0645**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **610-594-2900**

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

Title of each class	**Trading Symbol**	**Name of each exchange on which registered**
Common Stock, par value $.25 per share	WST	New York Stock Exchange

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

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☑	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

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

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

The aggregate market value of the voting stock held by non-affiliates of the registrant as of June 30, 2019 was approximately $9,218,126,218 based on the closing price as reported on the New York Stock Exchange.

As of January 31, 2020, there were 73,837,449 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Document	**Parts Into Which Incorporated**
Proxy Statement for the Annual Meeting of Shareholders to be held May 5, 2020	Part III

TABLE OF CONTENTS

PART I

Unless otherwise indicated, or the context otherwise requires, references in this report to "the Company", "we", "us", "our" and "West" refer to West Pharmaceutical Services, Inc. and its majority-owned subsidiaries.

All trademarks and registered trademarks used in this report are our property, either directly or indirectly through our subsidiaries, unless noted otherwise. Daikyo Crystal Zenith® ("Crystal Zenith") is a registered trademark of Daikyo Seiko, Ltd. ("Daikyo").

Throughout this report, references to "Notes" refer to the Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K ("Form 10-K"), unless otherwise indicated.

Information in this Form 10-K is current as of February 21, 2020, unless otherwise specified.

ITEM 1. BUSINESS

General

We are a leading global manufacturer in the design and production of technologically advanced, high-quality, integrated containment and delivery systems for injectable drugs and healthcare products. Our products include a variety of primary packaging, containment solutions, reconstitution and transfer systems, and drug delivery systems, as well as contract manufacturing, analytical lab services and integrated solutions. Our customers include the leading biologic, generic, pharmaceutical, diagnostic, and additional medical device companies in the world. Our top priority is delivering quality products that meet the exact product specifications and quality standards customers require and expect. This focus on quality includes a commitment to excellence in manufacturing, scientific and technical expertise and management, and enables us to partner with our customers in order to deliver safe, effective drug products to patients quickly and efficiently.

The Company was incorporated under the laws of the Commonwealth of Pennsylvania on July 27, 1923.

Business Segments

Our business operations are organized into two reportable segments, Proprietary Products and Contract-Manufactured Products.

Proprietary Products Segment

Our Proprietary Products reportable segment offers proprietary packaging, containment and drug delivery products, along with analytical lab services and integrated solutions, primarily to biologic, generic and pharmaceutical drug customers. Our packaging products include stoppers and seals for injectable packaging systems, which are designed to help ensure drug compatibility and stability with active drug products, while also supporting operational efficiency for customers. This product portfolio also includes syringe and cartridge components, including custom solutions for the specific needs of injectable drug applications, as well as administration systems that can enhance the safe delivery of drugs through advanced reconstitution, mixing and transfer technologies. We also provide films, coatings, washing and sterilization processes and services to enhance the quality of packaging components and mitigate the risk of contamination and compatibility issues.

This segment's product portfolio also includes drug containment solutions, including Crystal Zenith, a cyclic olefin polymer, in the form of vials, syringes and cartridges. These products can provide a high-quality solution to glass incompatibility issues and can stand up to cold storage environments, while reducing the risk of breakage that exists with glass. In addition, we offer a variety of self-injection devices, designed to address the need to provide at-home delivery of injectable therapies. These devices are patient-centric technologies that are easy-to-use and can be combined with connected health technologies that have the potential to increase adherence.

In addition to our Proprietary Products product portfolio, we provide our customers with a range of integrated solutions, including analytical lab services, pre-approval primary packaging support and engineering development, regulatory expertise, and after-sales technical support. Offering the combination of primary packaging components, containment solutions, and drug delivery devices, as well as a broad range of integrated services, helps to position us as a leader in the integrated containment and delivery of injectable medicines.

This reportable segment has manufacturing facilities in North and South America, Europe, and Asia Pacific, with affiliated companies in Mexico and Japan. Please refer to Item 2, *Properties*, for additional information on our manufacturing and other sites.

Contract-Manufactured Products Segment

Our Contract-Manufactured Products reportable segment serves as a fully integrated business, focused on the design, manufacture, and automated assembly of complex devices, primarily for pharmaceutical, diagnostic, and medical device customers. These products include a variety of custom contract-manufacturing and assembly solutions, which use such technologies as multi-component molding, in-mold labeling, ultrasonic welding, clean room molding and device assembly. We manufacture customer-owned components and devices used in surgical, diagnostic, ophthalmic, injectable, and other drug delivery systems, as well as consumer products.

We have vast expertise in product design and development, including in-house mold design, process design and validation and high-speed automated assemblies.

This reportable segment has manufacturing operations in North America and Europe. Please refer to Item 2, *Properties*, for additional information on our manufacturing and other sites.

International

We have significant operations outside of the United States ("U.S."), which are managed through the same business segments as our U.S. operations – Proprietary Products and Contract-Manufactured Products. Sales outside of the U.S. accounted for 55.7% of our consolidated net sales in 2019. Please refer to Item 2, *Properties*, for additional information on our manufacturing and other sites.

Although the general business processes are similar to the domestic business, international operations are exposed to additional risks. These risks include currency fluctuations relative to the U.S. Dollar ("USD"), multiple tax jurisdictions and, particularly in South America, Israel and the Middle East, uncertain or changing regulatory regimes, or political and social issues, that could destabilize local markets and affect the demand for our products.

See further discussion of our international operations, the risks associated with our international operations, and our attempt to minimize some of these risks in Part I, Item 1A, *Risk Factors;* Part II, Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations* under the caption *Financial Condition, Liquidity and Capital Resources;* Part II, Item 7A, *Quantitative and Qualitative Disclosures About Market Risk;* Note 1 under the captions *Financial Instruments* and *Foreign Currency Translation;* and Note 11, *Derivative Financial Instruments*.

Raw Materials

We use three basic raw materials in the manufacture of our products: elastomers, aluminum and plastic. Elastomers include both natural and synthetic materials. We currently have access to adequate supplies of these raw materials to meet our production needs through agreements with suppliers.

We employ a supply chain management strategy in our business segments, which involves purchasing from integrated suppliers that control their own sources of supply. Due to regulatory control over our production processes, sole source availability, and the cost and time involved in qualifying suppliers, we rely on single-source suppliers for many critical raw materials. We generally purchase certain raw materials in the open market. This strategy increases the risk that our supply chain may be interrupted in the event of a supplier production or

distribution problem. These risks are managed, when and where possible, by selecting suppliers with multiple manufacturing sites, rigorous quality control systems, surplus inventory levels and other methods of maintaining supply in case of an interruption in production or distribution.

Intellectual Property

Intellectual property, including patents, trademarks, copyrights, trade secrets, and know-how, is important to our business. We own or license intellectual property rights, including issued patents and pending patent applications in the U.S. and in other countries, that relate to various aspects of our products. In 2019, more than 150 patents were issued to West across the globe. Some key value-added and proprietary products and processes are licensed from Daikyo. Our intellectual property rights have been useful in establishing our market position and in the growth of our business, and are expected to continue to be of value in the future.

Seasonality

Our business is not inherently seasonal.

Working Capital

We are required to carry significant amounts of inventory to meet customer requirements. In addition, some of our supply agreements require us to purchase inventory in bulk orders, which increases inventory levels but decreases the risk of supply interruption. For a more detailed discussion of working capital, please refer to the discussion in Part II, Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations* under the caption *Financial Condition, Liquidity and Capital Resource*s.

Marketing

Our Proprietary Products customers primarily include many of the major biologic, generic, and pharmaceutical drug companies in the world, which incorporate our components and other offerings into their injectable products for distribution to the point of care and ultimate end-user - the patient.

Our Contract-Manufactured Products customers include many of the world's largest pharmaceutical, diagnostic, and medical device companies. Contract-Manufactured Products components generally are incorporated into our customers' manufacturing lines for further processing or assembly.

Our products and services are sold and distributed primarily through our own sales force and distribution network, with limited use of contract sales agents and regional distributors.

Our ten largest customers accounted for 44.3% of our consolidated net sales in 2019, but none of these customers individually accounted for more than 10% of consolidated net sales. Please refer to Note 3, *Revenue*, and Note 19, *Segment Information*, for additional information on our consolidated net sales.

Order Backlog

Order backlog includes firm orders placed by customers for manufacture over a period of time according to their schedule or upon confirmation by the customer. We also have contractual arrangements with a number of our customers. Products covered by these contracts are included in our backlog only as orders are received. Order backlog may be positively or negatively impacted by several factors, including customer ordering patterns and the necessary lead-time to deliver customer orders. Order backlog is one of many measures we use to understand future demand, and should not be considered in isolation to predict future sales growth.

At December 31, 2019 and 2018, the order backlog for Proprietary Products was $587.9 million and $407.3 million, respectively. The increase in backlog primarily reflects increases in demand for our products due to several successful customer launches in 2019 and expansion of current customer programs due to the success of their drug

products. The majority of the order backlog for Proprietary Products at December 31, 2019 is expected to be filled during 2020.

The majority of Contract-Manufactured Products manufacturing activity is governed by contractual volume expectations, subject to periodic revisions based on customer requirements.

Competition

With our range of proprietary technologies, we compete with several companies across our Proprietary Products product lines. Due to the special nature of our pharmaceutical packaging components and our long-standing participation in the market, competition for these components is based primarily on product design and performance, although total cost is becoming increasingly important as pharmaceutical companies continue with aggressive cost-control programs across their operations.

In addition, there are a number of competitors supplying medical devices and medical device components, including a number of pharmaceutical manufacturers who are also potential customers of our medical devices. We compete in this market on the basis of our reputation for quality and reliability in engineering and project management, as well as our knowledge of, and experience in, compliance with regulatory requirements.

We have specialized knowledge of container closure components, which is integral to developing delivery systems. With our range of proprietary technologies, we compete with new and established companies in the area of drug delivery devices, including suppliers of prefillable syringes, auto-injectors, safety needles, and other proprietary systems.

We seek to differentiate ourselves from our competition by serving as an integrated drug containment and delivery systems global supplier that can provide pre-approval primary packaging support and engineering development, analytical lab services and integrated solutions, regulatory expertise, and after-sale technical support. Customers also appreciate the global scope of our manufacturing capability and our ability to produce many products at multiple sites.

Our Contract-Manufactured Products business operates in very competitive markets for its products. The competition varies from smaller regional companies to large global assembly manufacturers. Given the cost pressures they face, many of our customers look to reduce costs by sourcing from low-cost locations. We seek to differentiate ourselves by leveraging our global capabilities and by employing new technologies such as high-speed automated assembly, insert-molding, multi-shot precision molding, and expertise with multiple-piece closure systems.

Research and Development Activities

We maintain our own research-scale production facilities and laboratories for developing new products, and offer contract engineering design and development services to assist customers with new product development. Our quality control, regulatory and laboratory testing capabilities are used to ensure compliance with applicable manufacturing and regulatory standards for primary and secondary pharmaceutical packaging components and delivery systems.

Commercial development of our new products and services for medical and pharmaceutical applications commonly requires several years. New products that we develop may require separate approval as medical devices, and products that are intended to be used in the packaging and delivery of pharmaceutical products are subject to both customer acceptance of our products and regulatory approval of the customer’s products following our development period.

We continue to pursue innovative strategic platforms in prefillable syringes, injectable containers, advanced injection, and safety and administration systems.

We also continue to seek new innovative opportunities for acquisition, licensing, partnering or development of products, services and technologies that serve the injectable drug containment and delivery market.

Environmental Regulations

We are subject to various national, state and local provisions regulating the discharge of materials into the environment or otherwise relating to the protection of the environment. Our compliance with these laws and regulations has not had a material impact on our financial position, results of operations or cash flows. There were no required material capital expenditures for environmental controls in our facilities in 2019 and there are currently no needed or planned material expenditures for 2020.

Employees

As of December 31, 2019, we employed approximately 8,200 people in our operations throughout the world.

Available Information

We maintain a website at *www.westpharma.com*. Our Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (the "Exchange Act") are available on our website under the *Investors - SEC Filings* caption as soon as reasonably practical after we electronically file the material with, or furnish it to, the U.S. Securities and Exchange Commission ("SEC"). These filings are also available to the public over the Internet at the SEC's website at *www.sec.gov*.

Throughout this Form 10-K, we incorporate by reference certain information from parts of other documents filed with the SEC and from our Proxy Statement for the 2020 Annual Meeting of Shareholders ("2020 Proxy Statement"), which will be filed with the SEC within 120 days following the end of our 2019 fiscal year. Our 2020 Proxy Statement will be available on our website on or about March 31, 2020, under the caption *Investors - Annual Reports & Proxy*.

Information about our corporate governance, including our Corporate Governance Principles and Code of Business Conduct, as well as information about our Directors, Board Committees, Committee Charters, and instructions on how to contact the Board, is available on our website under the *Investors - Corporate Governance* heading. We intend to make any required disclosures regarding any amendments of our Code of Business Conduct or waivers granted to any of our directors or executive officers under the caption *Code of Business Conduct* on our website. Information relating to the West Pharmaceutical Services Dividend Reinvestment Plan is also available on our website under the *Investors - Transfer Agent/Dividend Reinvestment* caption. Information on our website does not constitute part of this document.

We will provide any of the foregoing information without charge upon written request to our Corporate Secretary, West Pharmaceutical Services, Inc., 530 Herman O. West Drive, Exton, PA 19341.

ITEM 1A. RISK FACTORS

The statements in this section describe major risks to our business and should be considered carefully. In addition, these statements constitute our cautionary statements under the Private Securities Litigation Reform Act of 1995.

Our disclosure and analysis in this Form 10-K contains some forward-looking statements that are based on management's beliefs and assumptions, current expectations, estimates and forecasts. We also provide forward-looking statements in other materials we release to the public as well as oral forward-looking statements. Such statements give our current expectations or forecasts of future events. They do not relate strictly to historical or current facts. We have attempted, wherever possible, to identify forward-looking statements by using words such as "estimate," "expect," "intend," "believe," "plan," "anticipate" and other words and phrases of similar meaning. In particular, these include statements relating to future actions, business plans and prospects, new products, future

performance or results of current or anticipated products, sales efforts, expenses, interest rates, foreign-exchange rates, economic effects, the outcome of contingencies, such as legal proceedings, and financial results.

Many of the factors that will determine our future results are beyond our ability to control or predict. Achievement of future results is subject to known or unknown risks or uncertainties, including, without limitation, the risks set forth below. Therefore, actual results could differ materially from past results and those expressed or implied in any forward-looking statement. You should bear this in mind as you consider forward-looking statements.

Unless required by applicable securities law, we undertake no obligation to publicly update forward-looking statements, whether as a result of new information, future events or otherwise. We also refer you to further disclosures we make on related subjects in our Quarterly Reports on Form 10-Q and Current Reports on Form 8-K to the SEC.

Our operating results may be adversely affected by unfavorable economic and market conditions.

The current uncertainty in the global economy, including the effects of recession or slow economic growth in the U.S., Europe, and emerging markets in Asia and South America, may negatively affect our operating results. Examples of the effects of these global economic challenges include: our suppliers' and our customers' inability to access the credit markets at commercially reasonable rates; reduction in sales due to customers decreasing their inventories in the near-term or long-term or due to liquidity difficulties; reduction in sales due to shortages of materials we purchase from our suppliers; reduction in research and development efforts and expenditures by our customers; our inability to hedge our currency and raw material risks sufficiently or at commercially reasonable prices; insolvency of suppliers or customers; inflationary pressures on our supplies or our products; and increased expenses due to growing global taxation of corporate profits or revenues or changes in, or expirations of, a country's tax laws or regulations. Our operating results in one or more geographic regions may also be affected by uncertain or changing economic conditions within that region. If economic and market conditions in the U.S. or Europe, or in emerging markets, weaken further, we may experience material adverse impacts on our business, financial condition and results of operations.

Our sales and profitability are largely dependent on the sale of drug products delivered by injection and the packaging of drug products. If the drug products developed by our customers in the future use another delivery system or are reconfigured to require less frequent dosing, our sales and profitability could suffer.

Our business depends to a substantial extent on customers' continued sales and development of products that are delivered by injection. If (i) our customers fail to continue to sell, develop and deploy injectable products; (ii) our customers reconfigure their drug product or develop new drug products requiring less frequent dosing; or (iii) we are unable to develop new products that assist in the delivery of drugs by alternative methods, our sales and profitability may suffer.

Changes in foreign currency exchange rates could have a material adverse effect on our business and/or results of operations.

Our business is subject to foreign currency exchange rate fluctuations. Sales outside of the U.S. accounted for 55.7% of our consolidated net sales in 2019 and we anticipate that sales from international operations will continue to represent a significant portion of our total sales in the future. In addition, many of our manufacturing facilities and suppliers are located outside of the U.S. Further, we intend to continue our expansion into emerging and/or faster-growing markets outside of the U.S. in the future. Virtually all of our international sales, assets and related operating costs and expenses are earned, valued or incurred in the currency of the local country, primarily the Euro, the Singapore Dollar ("SGD"), and the Danish Krone. In addition, we are exposed to Japanese Yen ("Yen"), as we maintain a 49% ownership interest in, and we purchase finished goods and other materials from, Daikyo. We are also exposed to currencies in emerging market countries, such as the Chinese Yuan, the Indian Rupee, the South Korean Won, and various South American currencies. Our consolidated financial statements are presented in USD, and, therefore, we must translate the reported values of our foreign assets, liabilities, revenues, and expenses into USD, which can result in significant fluctuations in the amount of those assets, liabilities, revenues, or expenses. The

exchange rates between these foreign currencies and USD in recent years have fluctuated significantly and may continue to do so in the future. Increases or decreases in the value of USD compared to these foreign currencies may negatively affect the value of these items in our consolidated financial statements, which could have a material adverse effect on our operating results.

In addition to translation risks, we incur currency transaction risk when we or one of our subsidiaries enters into a purchase or sales transaction in a currency other than that entity's local currency. In order to reduce our exposure to fluctuations in certain exchange rates, we have entered, and expect to continue to enter, into hedging arrangements, including the use of financial derivatives. There can be no certainty that we will be able to enter into or maintain hedges of these currency risks, or that our hedges will be effective, which could have a significant effect on our financial condition and operating results.

If we are unable to provide comparative value advantages, timely fulfill customer orders, or resist pricing pressure, we will have to reduce our prices, which may reduce our profit margins.

We compete with several companies across our major product lines. Because of the special nature of these products, competition is based primarily on product design and performance, although total cost is becoming increasingly important as pharmaceutical companies continue with aggressive cost-control programs across their operations. Companies often compete on the basis of price. We aim to differentiate ourselves from our competition by being a "full-service, value-added" global supplier that is able to provide pre-sale compatibility studies, engineering support, and other services and sophisticated post-sale technical support on a global basis. However, we face continued pricing pressure from our customers and competitors. If we are unable to resist or offset the effects of continued pricing pressure through our value-added services, improved operating efficiencies and reduced expenditures, or if we have to reduce our prices, our sales and profitability may suffer.

Consolidation in the pharmaceutical and healthcare industries could adversely affect our future revenues and operating income.

The pharmaceutical and healthcare industries have experienced a significant amount of consolidation. As a result of this consolidation, competition to provide goods and services to customers has increased. In addition, group purchasing organizations and integrated health delivery networks have served to concentrate purchasing decisions for some customers, which has placed pricing pressure on suppliers. Further consolidation within the industries we serve could exert additional pressure on the prices of our products.

We are subject to regulation by governments around the world, and if these regulations are not complied with, existing and future operations may be curtailed, and we could be subject to liability.

The design, development, manufacturing, marketing and labeling of certain of our products and our customers' products that incorporate our products are subject to regulation by governmental authorities in the U.S., Europe and other countries, including the U.S. Food and Drug Administration ("FDA"), the European Medicines Agency and the National Medical Products Administration (China). Complying with governmental regulation can be costly and can result in required modification or withdrawal of existing products and a substantial delay in the introduction of new products. Failure to comply with applicable regulatory requirements or failure to obtain regulatory approval for a new product could result in expenses and actions that could adversely affect our business and financial performance.

Products that incorporate our technologies and medical devices that we produce are subject to regulations and extensive approval or clearance processes, which make the timing and success of new-product commercialization difficult to predict.

The process of obtaining and maintaining FDA and other required regulatory approvals is expensive and time-consuming. Historically, most medical devices that incorporate our technologies and medical devices that we produce have been subject to the FDA's 510(k) marketing approval process, which typically lasts from six to nine months. Supplemental or full pre-market approval reviews require a significantly longer period, delaying

commercialization. Changes in regulation on a global scale must be monitored and actions taken to ensure ongoing compliance. Pharmaceutical products that incorporate our technologies and medical devices that we produce are subject to the FDA's New Drug Application process, which typically takes a number of years to complete. Additionally, biotechnology products that incorporate our technologies and medical devices that we produce are subject to the FDA's Biologics License Application process, which also typically takes a number of years to complete. Outside of the U.S., sales of medical devices and pharmaceutical or biotechnology products are subject to international regulatory requirements that vary from country to country. The time required to obtain approval for sale internationally may be longer or shorter than that required for FDA approval. There is no certainty that any regulatory approval may be obtained or maintained indefinitely, and our ability to launch products on to the market and maintain market presence is not guaranteed.

Changes in the regulation of drug products and devices may increase competitive pressure and adversely affect our business.

An effect of the governmental regulation of our medical devices and our customers' drug products, devices, and manufacturing processes is that compliance with regulations makes it difficult to change components and devices produced by one supplier with those from another supplier, due to the large amount of data and information that customers must generate to demonstrate that the components and devices are equivalent and pose no additional risk to the patient. The regulation of our medical devices and our customers' products that incorporate our components and devices has increased over time. If the applicable regulations were to be modified in a way that reduced the level of data and information needed to prove equivalency for a change from one supplier's components or devices to those made by another, it is likely that the competitive pressure would increase and adversely affect our sales and profitability.

If we are not successful in protecting our intellectual property rights, our ability to compete may be affected.

Our patents, trademarks and other intellectual property are important to our business. We rely on patent, trademark, copyright, trade secret, and other intellectual property laws, as well as nondisclosure and confidentiality agreements and other methods, to protect our proprietary products, information, technologies and processes. We also have obligations with respect to the non-use and non-disclosure of third-party intellectual property. We may need to engage in litigation or similar activities to enforce our intellectual property rights, to protect our trade secrets or to determine the validity and scope of proprietary rights of others. Any such litigation could require us to expend significant resources and divert the efforts and attention of our management and other personnel from our business operations. There can be no assurance that the steps we will take to prevent misappropriation, infringement or other violation of our intellectual property or the intellectual property of others will be successful. In addition, effective patent, copyright, trademark, and trade secret protection may be unavailable or limited for some of our proprietary products in some countries. Failure to protect our intellectual property or successfully invalidate or defend against intellectual property protections of third parties could harm our business and results of operations. In addition, if relevant and effective patent protection is not available or has expired, we may not be able to prevent competitors from independently developing products and services similar or duplicative to ours.

Disruption in our manufacturing facilities could have a material adverse effect on our ability to make and sell products and have a negative impact on our reputation, performance or financial condition.

We have manufacturing sites throughout the world. In some instances, however, the manufacturing of certain product lines is concentrated in one or only a few of our plants. The functioning of our manufacturing and distribution assets and systems could be disrupted for reasons either within or beyond our control, including, without limitation: extreme weather or longer-term climatic changes; natural disasters; pandemic; war; accidental damage; disruption to the supply of material or services; product quality and safety issues; systems failure; workforce actions; or environmental contamination. There is a risk that incident management systems in place may prove inadequate and that any disruption may materially adversely affect our ability to make and sell products and, therefore, materially adversely affect our reputation, performance or financial condition.

The medical technology industry is very competitive and customer demands and/or new products in the marketplace could cause a reduction in demand.

The medical technology industry is subject to rapid technological changes, and we face significant competition across our product lines and in each market in which our products are sold. We face this competition from a wide range of companies, including large medical device companies, some of which have greater financial and marketing resources than we do. We also face competition from firms that are more specialized than we are with respect to particular markets. In some instances, competitors, including pharmaceutical companies, also offer, or are attempting to develop, alternative therapies for diseases that may be delivered via their own, or without, a medical device. The development of new or improved products, processes or technologies by other companies (such as needle-free injection technology) may reduce customer demand for our products or render some of our products or proposed products obsolete or less competitive. In addition, any failure or inability to meet increased customer quality expectations could cause a reduction in demand.

Significant developments in U.S. policies could have a material adverse effect on our business and/or results of operations.

Changes in U.S. social, political, regulatory, and economic conditions, or in laws and policies governing foreign trade, manufacturing, development, immigration, and investment, could have an adverse effect on our financial condition, results of operations and cash flows.

Our international sales and operations are subject to risks and uncertainties that vary by country and which could have a material adverse effect on our business and/or results of operations.

We conduct business in most of the major pharmaceutical markets in the world. Our international operations and our ability to implement our overall business strategy (including our plan to continue expanding into emerging and/or faster-growing markets outside of the U.S.) are subject to risks and uncertainties that can vary by country, and include: transportation delays and interruptions; political and economic instability and disruptions, including the United Kingdom's referendum on withdrawal from the European Union; imposition of duties and tariffs; import and export controls; the risks of divergent business expectations or cultural incompatibility inherent in establishing and maintaining operations in foreign countries; difficulties in staffing and managing multi-national operations; labor strikes and/or disputes; and potentially adverse tax consequences. Limitations on our ability to enforce legal rights and remedies with third parties or our joint venture partners outside of the U.S. could also create exposure. In addition, we may not be able to operate in compliance with foreign laws and regulations, or comply with applicable customs, currency exchange control regulations, transfer pricing regulations or any other laws or regulations to which we may be subject, in the event that these laws or regulations change. Any of these events could have an adverse effect on our international operations in the future by reducing the demand for our products or decreasing the prices at which we can sell our products, or otherwise have an adverse effect on our financial condition, results of operations and cash flows.

Disruptions in the supply of key raw materials could adversely impact our operations.

We generally purchase our raw materials and supplies required for the production of our products in the open market. For reasons of quality assurance, sole source availability or cost effectiveness, many components and raw materials are available and/or purchased only from a single supplier. Due to the stringent regulations and requirements of the FDA and other regulatory authorities regarding the manufacture of our products and the availability of such raw materials, we may not be able to quickly establish additional or replacement sources for these components or raw materials or do so without excessive cost. As a result, a reduction or interruption in supply, or an inability to secure alternative sources of raw materials or components, could have a material adverse effect on our business and/or results of operations.

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

Our systems and networks, as well as those of our customers, suppliers, service providers, and banks, have and may in the future become the target of cyberattacks or information security breaches which, in turn, could result in the unauthorized release and misuse of confidential or proprietary information about our company, our employees or our customers, as well as disrupt our operations or damage our facilities or those of third parties. Additionally, our systems are subject to regulation to preserve the privacy of certain data held on those systems. We maintain an extensive network of technical security controls, policy enforcement mechanisms and monitoring systems, in order to address these threats. While these measures are designed to prevent, detect and respond to unauthorized activity in our systems, certain types of attacks could result in financial or information losses and/or reputational harm. If we cannot comply with regulations or prevent the unauthorized access, release and/or corruption of our or our customers' confidential, classified or personally identifiable information, our reputation could be damaged, and/or we could face financial losses. We may also be required to incur additional costs to modify or enhance our systems, or to try to prevent or remediate any such attacks. Modifying or enhancing our systems may result in unanticipated or prolonged disruption events, which could have a material adverse effect on our business and/or results of operations.

Raw material and energy prices have a significant impact on our profitability. If raw material and/or energy prices increase, and we cannot pass those price increases on to our customers, our profitability and financial condition may suffer.

We use three basic raw materials in the manufacture of our products: elastomers (which include synthetic and natural material), aluminum and plastic. In addition, our manufacturing facilities consume a wide variety of energy products to fuel, heat and cool our operations. Supply and demand factors, which are beyond our control, generally affect the price of our raw materials and utility costs. If we are unable to pass along increased raw material prices and energy costs to our customers, our profitability, and thus our financial condition, may be adversely affected. The prices of many of these raw materials and utilities are cyclical and volatile. For example, the prices of certain commodities, particularly petroleum-based raw materials, have in the recent past exhibited rapid changes, affecting the cost of synthetic elastomers and plastic. While we generally attempt to pass along increased costs to our customers in the form of sales price increases, historically there has been a time delay between raw material and/or energy price increases and our ability to increase the prices of our products. In some circumstances, we may not be able to increase the prices of our products due to competitive pressure and other factors.

If we are not timely or successful in new-product innovation or the development and commercialization of proprietary multi-component systems, our future revenues and operating income could be adversely affected.

Our growth partly depends on new-product innovation and the development and commercialization of proprietary multi-component systems for injectable drug administration and other healthcare applications. Product development and commercialization is inherently uncertain and is subject to a number of factors outside of our control, including any necessary regulatory approvals and commercial acceptance for the products. The ultimate timing and successful commercialization of new products and systems requires substantial evaluations of the functional, operational, clinical, and economic viability of our products. In addition, the timely and adequate availability of filling capacity is essential to both conducting definitive stability trials and the timing of commercialization of customers' products in Crystal Zenith vials, syringes and cartridges. Delays, interruptions or failures in developing and commercializing new-product innovations or proprietary multi-component systems could adversely affect future revenues and operating income. In addition, adverse conditions may also result in future charges to recognize impairment in the carrying value of our goodwill and other intangible assets, which could have a material adverse effect on our financial results.

We may not succeed in finding and completing acquisitions or other strategic transactions, which could have an adverse effect on our business and results of operations.

We have historically engaged in acquisition activity and we may in the future engage in acquisitions or other strategic transactions, such as joint ventures or investments in other entities. We may be unable to identify suitable

targets, opportunistic or otherwise, for acquisitions or other strategic transactions in the future. If we identify a suitable candidate, our ability to successfully implement the strategic transaction would depend on a variety of factors, including our ability to obtain financing on acceptable terms and to comply with the restrictions contained in our debt agreements. Strategic transactions involve risks, including those associated with integrating the operations or maintaining the operations as separate (as applicable), financial reporting, disparate technologies, and personnel of acquired companies, joint ventures or related companies; managing geographically dispersed operations or other strategic investments; the diversion of management's attention from other business concerns; the inherent risks in entering markets or lines of business in which we have either limited or no direct experience; the potential loss of key employees, customers and strategic partners of acquired companies, joint ventures or companies in which we may make strategic investments; and potentially other unknown risks. We may not successfully integrate any businesses or technologies we may acquire or strategically develop in the future and may not achieve anticipated revenue and cost benefits relating to any such strategic transactions. Strategic transactions may be expensive, time consuming and may strain our resources. Strategic transactions may not be accretive to our earnings and may negatively impact our results of operations as a result of, among other things, the incurrence of debt, one-time write-offs of goodwill, additional carrying costs of patent or trademark portfolios, and amortization expenses of other intangible assets. In addition, strategic transactions that we may pursue could result in dilutive issuances of equity securities.

Product defects could adversely affect the results of our operations.

The design, manufacture and marketing of pharmaceutical packaging and medical devices involve certain inherent risks. Manufacturing or design defects, unanticipated use of our products, or inadequate disclosure of risks relating to the use of our products can lead to injury or other adverse events. These events could lead to recalls or safety alerts relating to our products (either voluntary or required by the FDA or similar governmental authorities in other countries), and could result, in certain cases, in the removal of a product from the market. A recall could result in significant costs, as well as negative publicity and damage to our reputation that could reduce demand for our products. Personal injuries relating to the use of our products can also result in product liability claims being brought against us. In some circumstances, such adverse events could also cause delays in new product approvals. Please refer to Note 3, *Revenue*, for the discussion of the voluntary recall of our Vial2Bag® product line.

Our operations must comply with environmental statutes and regulations, and any failure to comply could result in extensive costs which would harm our business.

The manufacture of some of our products has involved, and may continue to involve, the use, transportation, storage, and disposal of hazardous or toxic materials and is subject to various environmental protection and occupational health and safety laws and regulations in the countries in which we operate. This has exposed us in the past, and could expose us in the future, to risks of accidental contamination and events of non-compliance with environmental laws. Any such occurrences could result in regulatory enforcement or personal injury and property damage claims or could lead to a shutdown of some of our operations, which could have an adverse effect on our business and results of operations. We currently incur costs to comply with environmental laws and regulations and these costs may become more significant.

A loss of key personnel or highly skilled employees could disrupt our operations.

Our future success depends, in large part, on our ability to retain key employees, including our executive officers and individuals in technical, marketing, sales, and research positions. Competition for experienced employees, particularly for persons with specialized skills, can be intense. Our ability to recruit such talent will depend on a number of factors, including compensation and benefits, work location and work environment. If we cannot effectively recruit and retain qualified executives and employees, our business could be adversely affected. Although we believe that we will be able to attract and retain talented personnel and replace key personnel should the need arise, our inability to do so on a timely basis could disrupt the operations of the unit affected or our overall operations. In addition, because of the complex nature of many of our products and programs, we are generally

dependent on an educated and highly skilled engineering staff and workforce. Our operations could be disrupted by a shortage of available skilled employees.

The uncertain effects of climate change and potential climate change legislation could lead to business interruption, significantly increased costs and/or other adverse consequences to our business.

Climate change and potential climate change legislation may present risks to our operations, including business interruption, significantly increased costs and/or other adverse consequences to our business. Some of the potential impacts of climate change to our business include physical risks to our facilities, water and energy supply limitations or interruptions, disruptions to our supply chain and impairment of other resources. In addition, if legislation or regulations are enacted or promulgated in the U.S., Europe or Asia or any other jurisdictions in which we do business that limit or reduce allowable greenhouse gas emissions and other emissions, such restrictions could have a significant effect on our operating and financial decisions, including those involving capital expenditures to reduce emissions, and our results of operations. Our manufacturing operations may not be able to operate as planned if we are not able to comply with new legal and regulatory legislation around climate change, or it may become too costly to operate in a profitable manner. Additionally, suppliers' added expenses could be passed on to us in the form of higher prices and we may not be able to pass on such expenses to our customers through price increases.

Healthcare reform may adversely affect our results of operations.

Changes in the U.S. or international healthcare systems, including the Patient Protection and Affordable Care Act (the "PPACA"), could result in reduced demand for our products, as our sales depend, in part, on the extent to which pharmaceutical companies and healthcare providers and facilities are reimbursed by government authorities, private insurers and other third-party payers for the costs of our products. The coverage policies and reimbursement levels of third-party payers, which can vary among public and private sources, may affect which products customers purchase and the prices they are willing to pay for these products in a particular jurisdiction. Legislative or administrative reforms to reimbursement systems in the U.S. (including the possible termination of the PPACA and potential replacement thereafter with a different system) or abroad (for example, those under consideration in France, Germany, Italy and the United Kingdom) could significantly reduce reimbursement for our customers' products, which could in turn reduce the demand for our products.

Moreover, in the coming years, additional changes could be made to global governmental healthcare programs that could significantly impact the success of our products. We will continue to evaluate the PPACA, as amended, the implementation of regulations or guidance related to various provisions of the PPACA by federal agencies, the potential repeal and replacement of the PPACA, as well as trends and changes that may be encouraged by the legislation and other healthcare legislation globally and that may potentially impact our business over time.

LIBOR reform may adversely affect our financial condition, results of operations and cash flows.

Our variable-rate debt, which includes our new senior unsecured, multi-currency revolving credit facility agreement (the "Credit Agreement") and our new term loan (the "Term Loan"), currently use the London Interbank Offered Rate ("LIBOR") as a benchmark for establishing the interest rate. LIBOR is the subject of recent national, international and other regulatory guidance and proposals for reform. These proposals for reform and other pressures may cause LIBOR to disappear entirely or to perform differently than in the past. If the method for calculation of LIBOR changes, if LIBOR is no longer available or if lenders have increased costs due to changes in LIBOR, we may suffer from potential increases in interest rates on our variable-rate debt, which could have a material adverse effect on our financial condition, results of operations and cash flows. Further, we may need to amend our Credit Agreement and Term Loan as a factor in determining the interest rate to replace LIBOR with the new standard that is established. We will continue to monitor the proposals for reform relating to LIBOR.

No assurance can be given that we will continue to pay or declare dividends.

We have historically paid dividends. However, there can be no assurance that we will pay or declare dividends in the future. The actual declaration and payment of future dividends, the amount of any such dividends, and the

establishment of record and payment dates, if any, are subject to determination by our Board of Directors each quarter after its review of our then-current strategy, applicable debt covenants and financial performance and position, among other things. Our declaration and payment of future dividends is subject to risks and uncertainties, including: deterioration of our financial performance or position; inability to declare a dividend in compliance with applicable laws or debt covenants; an increase in our cash needs or decrease in available cash; and the business judgment of the Board of Directors that a declaration of a dividend is not in our best interest.

Our results of operations and earnings may not meet guidance or expectations.

We provide public guidance on our expected results of operations for future periods. This guidance is comprised of forward-looking statements subject to risks and uncertainties, including the risks and uncertainties described in this Form 10-K and in our other public filings and public statements, and is based necessarily on assumptions we make at the time we provide such guidance. Our guidance may not always be accurate. If, in the future, our results of operations for a particular period do not meet our guidance or the expectations of investment analysts, or if we reduce our guidance for future periods, the market price of our common stock could decline significantly.

We are exposed to credit risk on accounts receivable and certain prepayments made in the normal course of business. This risk is heightened during periods when economic conditions worsen.

A substantial majority of our outstanding trade receivables are not covered by collateral or credit insurance. In addition, we have made prepayments associated with insurance premiums and other advances in the normal course of business. While we have procedures to monitor and limit exposure to credit risk on trade receivables and other current assets, there can be no assurance such procedures will effectively limit our credit risk and avoid losses, which could have a material adverse effect on our financial condition and operating results.

If we fail to comply with our obligations under our distributorship or license agreements with Daikyo, the agreements are terminated early or we are unable to renew these agreements on the same or substantially similar terms, we could lose license rights that are important to our business.

Key value-added and proprietary products and processes are licensed from our affiliate, Daikyo, including but not limited to, Crystal Zenith, FluroTec® and B2-coating technologies. Our rights to these products and processes are licensed pursuant to agreements that expire in 2027. However, if the agreements are terminated early, our business could be adversely impacted. Please refer to Note 7, *Affiliated Companies,* for information relating to the increase in our ownership interest in Daikyo in 2019.

ITEM IB. UNRESOLVED STAFF COMMENTS

As of the filing of this Form 10-K, there were no unresolved comments from the Staff of the SEC.

ITEM 2. PROPERTIES

Our corporate headquarters are located at 530 Herman O. West Drive, Exton, Pennsylvania.

The following table summarizes production facilities by segment and geographic region. All facilities shown are owned except where otherwise noted.

Proprietary Products

Manufacturing:

North American Operations	*European Operations*	*Asia Pacific Operations*
United States	Denmark	China
Jersey Shore, PA	Horsens	Qingpu
Kearney, NE	England	India
Kinston, NC	St. Austell	Sri City
Scottsdale, AZ (2)	France	Singapore
St. Petersburg, FL (1)	Le Nouvion	Jurong
	Le Vaudreuil	
South American Operations	Germany	
Brazil	Eschweiler (1) (2)	
Sao Paulo	Stolberg	
	Ireland	
	Waterford	
	Serbia	
	Kovin	

Mold-and-Die Tool Shop:		**Contract Analytical Laboratory:**
North American Operations	*European Operations*	*North American Operations*
United States	England	United States
Upper Darby, PA	Bodmin (2)	Exton, PA

Contract-Manufactured Products

Manufacturing:

North American Operations	*European Operations*
United States	Ireland
Grand Rapids, MI	Dublin (2)
Phoenix, AZ (2)	
Tempe, AZ (2)	
Williamsport, PA	
Puerto Rico	
Cayey	

(1) This manufacturing facility is also used for research and development activities.
(2) This facility is leased in whole or in part.

Our Proprietary Products reportable segment leases facilities located in Germany and Israel for research and development, as well as other activities. Sales offices in various locations are leased under short-term arrangements.

ITEM 3. LEGAL PROCEEDINGS

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

The executive officers of the Company are set forth in this table. Generally, executive officers are elected by the Board of Directors annually at the regular meeting of the Board of Directors following the Annual Meeting of Shareholders. Additionally, executive officers may be elected upon hire or due to a promotion.

Name	Age	Position
Silji Abraham	48	Senior Vice President, Chief Digital and Transformation Officer since February 2018. Prior to joining West, he most recently served as Executive Vice President and Chief Information Officer of MilliporeSigma, a subsidiary of Merck KGaA, Darmstadt, Germany. Prior to this role, he served as Chief Information Officer at Sigma-Aldrich Corporation, a leading life science and technology company, and worked in various leadership roles at Invensys Operations Management, ArvinMeritor and Chrysler Group.
Bernard J. Birkett	51	Senior Vice President and Chief Financial Officer since June 2018. In addition, Treasurer from June 2018 to December 2019. Principal Accounting Officer since October 2019. Prior to joining West, he spent more than 20 years at Merit Medical Systems, Inc., a leading manufacturer of disposable medical devices, where he served in a number of senior global leadership roles, including Chief Financial Officer and Treasurer, Controller for Europe, Middle East and Africa (EMEA) and Vice President of International Finance.
Annette F. Favorite	55	Senior Vice President and Chief Human Resources Officer since October 2015. Prior to joining West, she spent more than 25 years at IBM Corporation, an information technology services company, in a number of strategic and global human resources roles, including Vice President, Global Talent Management, Vice President of Human Resources for Worldwide Software Sales, and Human Resources Leader for the company's Southwest European Region, based out of Spain.
Eric M. Green	50	Chief Executive Officer since April 2015 and President since December 2015. Prior to joining West, he was Executive Vice President and President of the Research Markets business unit at Sigma-Aldrich Corporation from 2013 to 2015. From 2009 to 2013, he served as Vice President and Managing Director, International, where he was responsible for Asia Pacific and Latin America, and prior thereto, held various commercial and operational roles.
Quintin J. Lai	53	Vice President, Corporate Development, Strategy and Investor Relations since January 2016. Prior to joining West, he was Vice President of Investor Relations and Corporate Strategy at Sigma-Aldrich Corporation from 2012 to 2015. From 2002 to 2012, he was at Robert W. Baird & Company, where he held various roles, including Managing Director and Senior Equity Research Analyst of the Life Science Tools and Diagnostic sector and Associate Director of Equity Research.
George L. Miller	65	Senior Vice President, General Counsel and Corporate Secretary since joining West in November 2015. Previously, he served as Senior Vice President, General Counsel and Corporate Secretary for Sigma-Aldrich Corporation from 2009 to 2015. Prior to working at Sigma-Aldrich, he held senior legal positions with Novartis AG, a global healthcare company.

David A. Montecalvo	54	Senior Vice President and Chief Operations and Supply Chain Officer since February 2019. Senior Vice President, Global Operations and Supply Chain from September 2016 until February 2019. Prior to joining West, he served in a number of senior leadership roles at Medtronic plc, including Vice President, Contract Manufacturing Operations, for the company's Restorative Therapies Group, Vice President, Business Operations Integration, where he was responsible for directing and leading the global operations integration of Covidien plc into Medtronic, and Vice President, Product Development and Operations for Medtronic Cardiovascular. Prior thereto, he held senior operations and product development roles at Urologix, Inc. and LecTec Corporation.
Eric Resnick	56	Vice President and Chief Technology Officer since March 2016. Previously, he served as Vice President and General Manager of Integrated Packaging and Delivery within West's Innovation and Technology Team and President Proprietary Products - Pharmaceutical Delivery Systems from March 2015 until March 2016. He served as Vice President Research and Development and Self-Injection Systems from March 2014 until March 2015, and Vice President and General Manager of West's Contract Manufacturing Delivery Devices division from 2008 until March 2014. Prior thereto, he held various positions since joining The Tech Group in 2001, and held engineering and operating roles with Eastman Kodak Company and Ortho Clinical Diagnostics.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Our common stock is listed on the New York Stock Exchange ("NYSE") under the symbol "WST."

As of January 31, 2020, we had 756 shareholders of record, which excludes shareholders whose shares were held by brokerage firms, depositaries and other institutional firms in "street names" for their customers.

On November 1, 2019, in connection with the amendment of certain commercial agreements with Daikyo, we increased our ownership interest from 25% to 49% in Daikyo in exchange for $85.1 million in cash and $4.9 million in shares of our treasury stock to certain stockholders of Daikyo (the "Stock Consideration"). Please refer to Note 7, *Affiliated Companies,* for additional information on our ownership interest in Daikyo. The issuance of the Stock Consideration is exempt from registration under the Securities Act of 1933 (the "Securities Act") pursuant to Section 4(a)(2) under the Securities Act. Our reliance upon Section 4(a)(2) of the Securities Act in issuing the securities was based upon the following factors: (a) the issuance of the securities was an isolated private transaction by us which did not involve a public offering; (b) there were only a limited number of recipients; (c) the negotiations for the issuance of the securities took place directly between the recipients and the Company; and (d) the recipients of the securities were sophisticated, accredited investors.

Dividends

Our common stock paid a quarterly dividend of $0.14 per share in each of the first three quarters of 2018; $0.15 per share in the fourth quarter of 2018 and each of the first three quarters of 2019; and $0.16 per share in the fourth quarter of 2019.

Issuer Purchases of Equity Securities

During the three months ended December 31, 2019, there were no purchases of our common stock made by us or any of our "affiliated purchasers" as defined in Rule 10b-18(a)(3) under the Exchange Act.

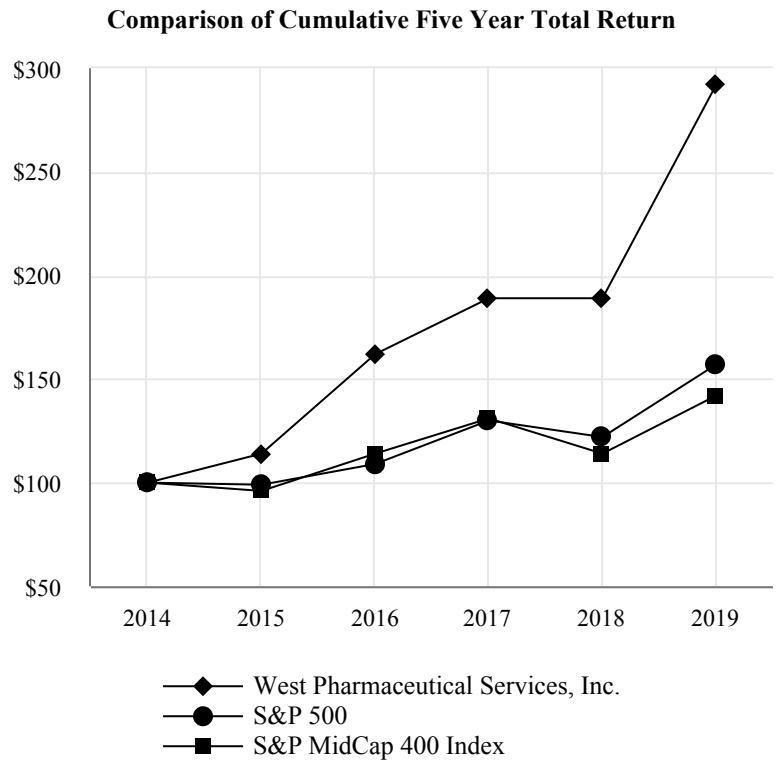
In February 2019, we announced a share repurchase program for calendar-year 2019 authorizing the repurchase of up to 800,000 shares of our common stock from time to time on the open market or in privately-negotiated transactions as permitted under Exchange Act Rule 10b-18. The number of shares repurchased and the timing of such transactions depended on a variety of factors, including market conditions. There were no shares purchased during the three months ended December 31, 2019. During the year ended December 31, 2019, we purchased 800,000 shares of our common stock under the now-completed program at a cost of $83.1 million, or an average price of $103.89 per share.

In December 2019, we announced a share repurchase program for calendar-year 2020 authorizing the repurchase of up to 848,000 shares of our common stock from time to time on the open market or in privately-negotiated transactions as permitted under Exchange Act Rule 10b-18. The number of shares to be repurchased and the timing of such transactions will depend on a variety of factors, including market conditions. This share repurchase program is expected to be completed by December 31, 2020.

Performance Graph

The following performance graph compares the cumulative total return to holders of our common stock with the cumulative total return of the following Standard & Poor's ("S&P") indices, for the five years ended December 31, 2019: 500 and MidCap 400 Index. The performance graph does not necessarily reflect management's opinion that such indices are an appropriate measure of the relative performance of the stock involved, and is not intended to forecast or be indicative of possible future performance of the Company's common stock.

Cumulative total return to shareholders is measured by dividing total dividends (assuming dividend reinvestment) plus the per-share price change for the period by the share price at the beginning of the period. The Company's cumulative shareholder return is based on an investment of $100 on December 31, 2014 and is compared to the cumulative total return of the S&P indices mentioned above over the period with a like amount invested.



ITEM 6. SELECTED FINANCIAL DATA

FIVE-YEAR SUMMARY
West Pharmaceutical Services, Inc. and Subsidiaries

(in millions, except per share data)	2019	2018	2017	2016	2015
SUMMARY OF OPERATIONS					
Net sales	$ 1,839.9	$ 1,717.4	$ 1,599.1	$ 1,509.1	$ 1,399.8
Operating profit †	296.6	240.3	225.8	195.2	177.0
Net income	241.7	206.9	150.7	143.6	95.6
Net income per share:					
Basic (1)	$ 3.27	$ 2.80	$ 2.04	$ 1.96	$ 1.33
Diluted (2)	3.21	2.74	1.99	1.91	1.30
Weighted average common shares outstanding	74.0	73.9	73.9	73.3	72.0
Weighted average shares assuming dilution	75.4	75.4	75.8	75.0	73.8
Dividends declared per common share	$ 0.62	$ 0.58	$ 0.54	$ 0.50	$ 0.46
YEAR-END FINANCIAL POSITION					
Cash and cash equivalents	$ 439.1	$ 337.4	$ 235.9	$ 203.0	$ 274.6
Working capital	717.1	610.7	464.0	400.9	359.4
Total assets	2,341.4	1,978.9	1,862.8	1,716.7	1,695.1
Total invested capital:					
Total debt	257.3	196.1	197.0	228.6	298.2
Total equity	1,573.2	1,396.3	1,279.9	1,117.5	1,023.9
Total invested capital	$ 1,830.5	$ 1,592.4	$ 1,476.9	$ 1,346.1	$ 1,322.1
PERFORMANCE MEASUREMENTS (3)					
Gross margin (a)	32.9%	31.8%	32.1%	33.2%	32.6%
Operating profitability (b) †	16.1%	14.0%	14.1%	12.9%	12.6%
Effective tax rate (4)	20.2%	17.2%	36.4%	28.7%	22.6%
Return on invested capital (c) †	13.8%	13.0%	10.2%	10.4%	10.5%
Net debt-to-total invested capital (d)	N/A	N/A	N/A	2.2%	2.3%
Research and development expenses	$ 38.9	$ 40.3	$ 39.1	$ 36.8	$ 34.1
Operating cash flow	367.2	288.6	263.3	219.4	212.4
Stock price range	$152.12-93.08	$125.09-82.74	$103.36-77.97	$86.50-53.88	$64.59-48.66

(1) Based on weighted average common shares outstanding.

(2) Based on weighted average shares, assuming dilution.

(3) Performance measurements represent indicators commonly used in the financial community. The following performance measures are not in conformity with U.S. generally accepted accounting principles ("U.S. GAAP") and should not be used as a substitute for the comparable U.S. GAAP financial measures. The non-U.S. GAAP financial measures are included as management uses them in evaluating our results of operations and believes that this information provides users with a valuable insight into our overall performance and financial position.

(a) Net sales minus cost of goods and services sold, including applicable depreciation and amortization, divided by net sales.
(b) Operating profit divided by net sales.
(c) Operating profit multiplied by one minus the effective tax rate divided by average total invested capital.
(d) Net debt (total debt less cash and cash equivalents) divided by total invested capital less cash and cash equivalents.

(4) As a result of the Tax Cuts and Jobs Act (the "2017 Tax Act"), the federal statutory rate was reduced from 35.0% to 21.0% effective for tax years beginning after December 31, 2017. Please refer to Note 17, *Income Taxes*, for further discussion of the 2017 Tax Act.

† Reflects our adoption of the guidance issued by the Financial Accounting Standards Board ("FASB") regarding the presentation of net periodic pension and postretirement benefit cost (net benefit cost).

Factors affecting the comparability of the information reflected in the selected financial data:

- Net income in 2019 included the impact of restructuring and related charges of $3.7 million (net of $1.2 million in tax), a gain on the sale of fixed assets as a result of our restructuring plan of $1.3 million (net of $0.4 million in tax), a pension settlement charge of $2.7 million (net of $0.8 million in tax), a charge of $1.0 million related to the continued devaluation of Argentina's currency, a tax recovery of $2.9 million (net of $1.5 million in tax) related to previously-paid international excise taxes, a net tax benefit of $0.3 million related to the impact of federal law changes enacted during the year, and a tax benefit of $10.3 million associated with stock-based compensation.

- Net income in 2018 included the impact of restructuring and related charges of $7.2 million (net of $1.9 million in tax), a gain on the sale of fixed assets as a result of our restructuring plans of $0.9 million (net of $0.2 million in tax), a charge of $1.1 million related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018, a net tax benefit of $2.5 million for the estimated impact of the 2017 Tax Act, and a tax benefit of $14.3 million associated with stock-based compensation.

- Net income in 2017 included the impact of a discrete tax charge of $48.8 million related to the 2017 Tax Act and the impact of changes in enacted international tax rates on previously-recorded deferred tax asset and liability balances, as well as a tax benefit of $33.1 million associated with stock-based compensation and a charge of $11.1 million related to the deconsolidation of our Venezuelan subsidiary.

- Net income in 2016 included the impact of restructuring and related charges of $17.4 million (net of $9.0 million in tax), a charge related to the devaluation of the Venezuelan Bolivar of $2.7 million, a pension curtailment gain of $1.3 million (net of $0.8 million in tax), and a discrete tax charge of $1.0 million.

- Net income in 2015 included the impact of a pension settlement charge of $32.0 million (net of $18.4 million in tax), a charge for executive retirement and related costs of $6.9 million (net of $4.0 million in tax) and a discrete tax charge of $0.8 million.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

OVERVIEW

The following discussion is intended to further the reader's understanding of the consolidated financial condition and results of operations of our Company. It should be read in conjunction with our consolidated financial statements and the accompanying footnotes included in Part II, Item 8 of this Form 10-K. These historical financial statements may not be indicative of our future performance. This Management's Discussion and Analysis of Financial Condition and Results of Operations contains a number of forward-looking statements, all of which are based on our current expectations and could be affected by the uncertainties and risks discussed in Part I, Item 1A of this Form 10-K.

Non-U.S. GAAP Financial Measures

For the purpose of aiding the comparison of our year-over-year results, we may refer to net sales and other financial results excluding the effects of changes in foreign currency exchange rates. The constant-currency amounts are calculated by translating the current year's functional currency results at the prior-year period's exchange rate. We

may also refer to consolidated operating profit and consolidated operating profit margin excluding the effects of unallocated items. The re-measured results excluding effects from currency translation and excluding the effects of unallocated items are not in conformity with U.S. GAAP and should not be used as a substitute for the comparable U.S. GAAP financial measures. The non-U.S. GAAP financial measures are included in our discussion and analysis as management uses them in evaluating our results of operations and believes that this information provides users with a valuable insight into our overall performance and financial position.

Our Operations

We are a leading global manufacturer in the design and production of technologically advanced, high-quality, integrated containment and delivery systems for injectable drugs and healthcare products. Our products include a variety of primary packaging, containment solutions, reconstitution and transfer systems, and drug delivery systems, as well as contract manufacturing, analytical lab services and integrated solutions. Our customers include the leading biologic, generic, pharmaceutical, diagnostic, and additional medical device companies in the world. Our top priority is delivering quality products that meet the exact product specifications and quality standards customers require and expect. This focus on quality includes a commitment to excellence in manufacturing, scientific and technical expertise and management, and enables us to partner with our customers in order to deliver safe, effective drug products to patients quickly and efficiently. The Company was incorporated under the laws of the Commonwealth of Pennsylvania on July 27, 1923.

Our business operations are organized into two reportable segments, Proprietary Products and Contract-Manufactured Products. Our Proprietary Products reportable segment offers proprietary packaging, containment and drug delivery products, along with analytical lab services and integrated solutions, primarily to biologic, generic and pharmaceutical drug customers. Our Contract-Manufactured Products reportable segment serves as a fully integrated business, focused on the design, manufacture, and automated assembly of complex devices, primarily for pharmaceutical, diagnostic, and medical device customers. We also maintain collaborations to share technologies and market products with affiliates in Japan and Mexico.

2019 Financial Performance Summary

Consolidated net sales increased by $122.5 million, or 7.1%, in 2019. Excluding foreign currency translation effects of $52.2 million, as well as incremental sales of $3.3 million from our recent acquisition, consolidated net sales increased by $171.4, or 10.0%.

Net income in 2019 was $241.7 million, or $3.21 per diluted share, compared to $206.9 million, or $2.74 per diluted share, in 2018. Net income in 2019 included the impact of restructuring and related charges of $3.7 million (net of $1.2 million in tax), or $0.04 per diluted share, a gain on the sale of fixed assets as a result of our restructuring plan of $1.3 million (net of $0.4 million in tax), or $0.02 per diluted share, a pension settlement charge of $2.7 million (net of $0.8 million in tax), or $0.04 per diluted share, a charge of $1.0 million related to the continued devaluation of Argentina's currency, or $0.01 per diluted share, a tax recovery related to previously-paid international excise taxes of $2.9 million (net of $1.5 million in tax), or $0.04 per diluted share, a net tax benefit of $0.3 million related to the impact of federal law changes enacted during the year, and a tax benefit of $10.3 million, or $0.14 per diluted share, associated with stock-based compensation. Net income in 2018 included the impact of restructuring and related charges of $7.2 million (net of $1.9 million in tax), or $0.09 per diluted share, a gain on the sale of fixed assets as a result of our restructuring plans of $0.9 million (net of $0.2 million in tax), or $0.01 per diluted share, a charge of $1.1 million, or $0.02 per diluted share, related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018, a net tax benefit of $2.5 million, or $0.03 per diluted share, for the estimated impact of the 2017 Tax Act, and a tax benefit of $14.3 million, or $0.19 per diluted share, associated with stock-based compensation.

At December 31, 2019, our cash and cash equivalents balance totaled $439.1 and our available borrowing capacity under our $300.0 million multi-currency revolving credit facility (the "Credit Facility") was $297.5 million.

RESULTS OF OPERATIONS

We evaluate the performance of our segments based upon, among other things, segment net sales and operating profit. Segment operating profit excludes general corporate costs, which include executive and director compensation, stock-based compensation, adjustments to annual incentive plan expense for over- or under-attainment of targets, certain pension and other retirement benefit costs, and other corporate facilities and administrative expenses not allocated to the segments. Also excluded are items that we consider not representative of ongoing operations. Such items are referred to as other unallocated items and generally include restructuring and related charges, certain asset impairments and other specifically-identified income or expense items.

Percentages in the following tables and throughout this *Results of Operations* section may reflect rounding adjustments.

Net Sales

The following table presents net sales, consolidated and by reportable segment:

	Year Ended December 31,			% Change	
($ in millions)	2019	2018	2017	2019/2018	2018/2017
Proprietary Products	$ 1,398.6	$ 1,308.6	$ 1,236.9	6.9%	5.8%
Contract-Manufactured Products	441.5	409.1	362.5	7.9%	12.9%
Intersegment sales elimination	(0.2)	(0.3)	(0.3)	(33.3)%	—%
Consolidated net sales	$ 1,839.9	$ 1,717.4	$ 1,599.1	7.1%	7.4%

2019 compared to 2018

Consolidated net sales increased by $122.5 million, or 7.1%, in 2019, including an unfavorable foreign currency translation impact of $52.2 million. Excluding foreign currency translation effects, as well as incremental sales of $3.3 million from our recent acquisition, consolidated net sales increased by $171.4 million, or 10.0%.

Proprietary Products – Proprietary Products net sales increased by $90.0 million, or 6.9%, in 2019, including an unfavorable foreign currency translation impact of $43.1 million. Excluding foreign currency translation effects, as well as incremental sales of $3.3 million from our recent acquisition, net sales increased by $129.8 million, or 9.9%, primarily due to growth in our high-value product offerings, including our Daikyo components, our ready-to-use seals, stoppers, and plungers, our NovaPure® components and Crystal Zenith products, and our self-injection systems and FluroTec-coated components.

Contract-Manufactured Products – Contract-Manufactured Products net sales increased by $32.4 million, or 7.9%, in 2019, including an unfavorable foreign currency translation impact of $9.1 million. Excluding foreign currency translation effects, net sales increased by $41.5 million, or 10.1%, due to an increase in the sale of healthcare-related injection and diagnostic devices.

The intersegment sales elimination, which is required for the presentation of consolidated net sales, represents the elimination of components sold between our segments.

2018 compared to 2017

Consolidated net sales increased by $118.3 million, or 7.4%, in 2018, including a favorable foreign currency translation impact of $28.6 million. Excluding foreign currency translation effects, consolidated net sales increased by $89.7 million, or 5.6%.

Proprietary Products – Proprietary Products net sales increased by $71.7 million, or 5.8%, in 2018, including a favorable foreign currency translation impact of $23.8 million. Excluding foreign currency translation effects, net sales increased by $47.9 million, or 3.9%, as growth in our high-value product offerings, including our Westar® and

FluroTec-coated components, our ready-to-use seals, stoppers, and plungers, and our NovaPure products, as well as sales price increases, partially offset the impact of the voluntary recall of Vial2Bag products and the deconsolidation of our Venezuelan subsidiary as of April 1, 2017.

Contract-Manufactured Products – Contract-Manufactured Products net sales increased by $46.6 million, or 12.9%, in 2018, including a favorable foreign currency translation impact of $4.8 million. Excluding foreign currency translation effects, net sales increased by $41.8 million, or 11.6%, despite the impact of the loss of a consumer-product customer in early 2018. Higher sales volume, particularly in Ireland, contributed 10.4 percentage points of the increase, and sales price increases contributed 1.2 percentage points of the increase.

Gross Profit

The following table presents gross profit and related gross margins, consolidated and by reportable segment:

	Year Ended December 31,			% Change	
($ in millions)	2019	2018	2017	2019/2018	2018/2017
Proprietary Products:					
Gross profit	$ 540.4	$ 485.4	$ 449.3	11.3%	8.0%
Gross profit margin	38.6%	37.1%	36.3%		
Contract-Manufactured Products:					
Gross profit	$ 65.5	$ 60.0	$ 63.6	9.2%	(5.7)%
Gross profit margin	14.8%	14.7%	17.5%		
Unallocated items	$ (0.2)	$ —	$ —		
Consolidated gross profit	$ 605.7	$ 545.4	$ 512.9	11.1%	6.3%
Consolidated gross profit margin	32.9%	31.8%	32.1%		

2019 compared to 2018

Consolidated gross profit increased by $60.3 million, or 11.1%, in 2019, including an unfavorable foreign currency translation impact of $15.7 million. Consolidated gross profit margin increased by 1.1 margin points in 2019.

Proprietary Products – Proprietary Products gross profit increased by $55.0 million, or 11.3%, in 2019, including an unfavorable foreign currency translation impact of $14.3 million. Proprietary Products gross profit margin increased by 1.5 margin points in 2019, due to a favorable mix of products sold, production efficiencies, and sales price increases, partially offset by increased overhead costs.

Contract-Manufactured Products – Contract-Manufactured Products gross profit increased by $5.5 million, or 9.2%, in 2019, including an unfavorable foreign currency translation impact of $1.4 million. Contract-Manufactured Products gross profit margin increased by 0.1 margin points in 2019, due to production efficiencies and lower raw material costs, partially offset by increased overhead costs and an unfavorable mix of products sold.

2018 compared to 2017

Consolidated gross profit increased by $32.5 million, or 6.3%, in 2018, including a favorable foreign currency translation impact of $9.3 million. Consolidated gross profit margin decreased by 0.3 margin points in 2018.

Proprietary Products – Proprietary Products gross profit increased by $36.1 million, or 8.0%, in 2018, including a favorable foreign currency translation impact of $8.5 million. Proprietary Products gross profit margin increased by 0.8 margin points in 2018, as production efficiencies, a favorable mix of products sold, and sales price increases were partially offset by the impact of under-absorbed overhead costs from our new facility in Waterford, Ireland and the deconsolidation of our Venezuelan subsidiary as of April 1, 2017, as well as increased labor and depreciation costs and higher raw material costs.

Contract-Manufactured Products – Contract-Manufactured Products gross profit decreased by $3.6 million, or 5.7%, in 2018, including a favorable foreign currency translation impact of $0.8 million. Contract-Manufactured Products gross profit margin decreased by 2.8 margin points in 2018, due to unabsorbed overhead from plant consolidation activities, start-up costs associated with the launch of new programs, an unfavorable mix of product sales, and lower profitability on development and tooling agreements, and higher raw material costs, partially offset by sales price increases and production efficiencies.

Research and Development ("R&D") Costs

The following table presents R&D costs, consolidated and by reportable segment:

	Year Ended December 31,			% Change	
($ in millions)	2019	2018	2017	2019/2018	2018/2017
Proprietary Products	$ 38.9	$ 40.3	$ 39.1	(3.5)%	3.1%
Contract-Manufactured Products	—	—	—	—	—
Consolidated R&D costs	$ 38.9	$ 40.3	$ 39.1	(3.5)%	3.1%

2019 compared to 2018
Consolidated R&D costs decreased by $1.4 million, or 3.5%, in 2019, primarily due to an increase in customer-funded R&D projects via customer development agreements.

2018 compared to 2017
Consolidated R&D costs increased by $1.2 million, or 3.1%, in 2018. Efforts remained focused on the continued investment in self-injection systems development, elastomeric packaging components, and formulation development.

All of the R&D costs incurred during 2019, 2018 and 2017 related to Proprietary Products.

Selling, General and Administrative ("SG&A") Costs

The following table presents SG&A costs, consolidated and by reportable segment and corporate:

	Year Ended December 31,			% Change	
($ in millions)	2019	2018	2017	2019/2018	2018/2017
Proprietary Products	$ 189.9	$ 185.0	$ 175.3	2.6%	5.5%
Contract-Manufactured Products	16.2	16.5	15.4	(1.8)%	7.1%
Corporate and unallocated items	66.6	61.4	55.3	8.5%	11.0%
Consolidated SG&A costs	$ 272.7	$ 262.9	$ 246.0	3.7%	6.9%
SG&A as a % of net sales	*14.8%*	*15.3%*	*15.4%*		

2019 compared to 2018
Consolidated SG&A costs increased by $9.8 million, or 3.7%, in 2019, including the impact of foreign currency translation, which decreased SG&A costs by $0.3 million.

Proprietary Products – Proprietary Products SG&A costs increased by $4.9 million, or 2.6%, in 2019, primarily due to an increase in compensation costs and incremental costs associated with our voluntary recall and the acquisition of our distributor in South Korea, partially offset by ongoing cost control measures. Foreign currency translation decreased Proprietary Products SG&A costs by $0.3 million.

Contract-Manufactured Products – Contract-Manufactured Products SG&A costs decreased by $0.3 million, or 1.8%, in 2019, due to ongoing cost control measures.

Corporate and unallocated items – Corporate SG&A costs increased by $5.2 million, or 8.5%, in 2019, primarily due to increases in stock-based compensation costs and incentive compensation costs, partially offset by a decrease in U.S. pension costs due to the cessation of our U.S. qualified and non-qualified defined benefit pension plans as of January 1, 2019 (except for interest crediting) and ongoing cost control measures.

2018 compared to 2017

Consolidated SG&A costs increased by $16.9 million, or 6.9%, in 2018, including the impact of foreign currency translation, which increased SG&A costs by $2.4 million.

Proprietary Products – Proprietary Products SG&A costs increased by $9.7 million, or 5.5%, in 2018, due to higher commercial sales compensation costs and legal costs. Foreign currency translation increased Proprietary Products SG&A costs by $2.3 million.

Contract-Manufactured Products – Contract-Manufactured Products SG&A costs increased by $1.1 million, or 7.1%, in 2018, due to increases in compensation and miscellaneous costs.

Corporate and unallocated items – Corporate SG&A costs increased by $6.1 million, or 11.0%, in 2018, primarily due to the impact of higher achievement levels on incentive compensation costs and increased personnel costs.

Other (Income) Expense

The following table presents other income and expense items, consolidated and by reportable segment and unallocated items:

(Income) Expense	Year Ended December 31,		
($ in millions)	2019	2018	2017
Proprietary Products	$ (2.0)	$ (6.3)	$ (8.9)
Contract-Manufactured Products	0.2	(0.8)	(0.1)
Corporate and unallocated items	(0.7)	9.0	11.0
Consolidated other (income) expense	$ (2.5)	$ 1.9	$ 2.0

Other income and expense items, consisting of foreign exchange transaction gains and losses, gains and losses on the sale of fixed assets, development and licensing income, contingent consideration, and miscellaneous income and charges, are generally recorded within segment results.

2019 compared to 2018

Consolidated other (income) expense changed by $4.4 million in 2019.

Proprietary Products – Proprietary Products other income decreased by $4.3 million in 2019, primarily due to increased contingent consideration costs. Please refer to Note 12, *Fair Value Measurements*, for further discussion of this item.

Contract-Manufactured Products – Contract-Manufactured Products other expense (income) changed by $1.0 million in 2019, primarily due to a decrease in gains on the sale of fixed assets during 2019.

Corporate and unallocated items – Corporate and unallocated items changed by $9.7 million in 2019. During 2019, we recorded $4.9 million in restructuring and related charges, a $1.9 million gain on the sale of fixed assets as a result of our restructuring plan, and a charge of $1.0 million as a result of the continued devaluation of Argentina's currency. We expect that our 2018 restructuring plan, which is now considered complete, will provide annualized

savings of approximately $14.0 million. In addition, during 2019, we recognized a tax recovery of $4.7 million related to previously-paid international excise taxes, following a favorable court ruling. Please refer to Note 16, *Other (Income) Expense*, for further discussion of these items.

2018 compared to 2017

Consolidated other expense decreased by $0.1 million in 2018.

Proprietary Products – Proprietary Products other income decreased by $2.6 million in 2018, primarily as we recorded income of $9.1 million attributable to the reimbursement of certain costs related to a technology that we subsequently licensed to a third party in 2017, partially offset by foreign exchange transaction gains in Europe in 2018. Please refer to Note 16, *Other (Income) Expense*, for further discussion of the $9.1 million attributable to the reimbursement of certain costs.

Contract-Manufactured Products – Contract-Manufactured Products other income increased by $0.7 million in 2018, due to gains on the sale of fixed assets.

Corporate and unallocated items – Corporate and unallocated items changed by $2.0 million in 2018. During 2018, we recorded $9.1 million in restructuring and related charges, a $1.1 million gain on the sale of fixed assets as a result of our restructuring plans, and a charge of $1.1 million related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018. Please refer to Note 16, *Other (Income) Expense*, for further discussion of these items.

Operating Profit

The following table presents adjusted operating profit, consolidated and by reportable segment, corporate and unallocated items:

	Year Ended December 31,			% Change	
($ in millions)	2019	2018	2017	2019/2018	2018/2017
Proprietary Products	$ 313.6	$ 266.4	$ 243.8	17.7%	9.3%
Contract-Manufactured Products	49.1	44.3	48.3	10.8%	(8.3)%
Corporate	(66.3)	(61.3)	(55.2)	8.2%	11.1%
Adjusted consolidated operating profit	$ 296.4	$ 249.4	$ 236.9	18.8%	5.3%
Adjusted consolidated operating profit margin	16.1%	14.5%	14.8%		
Unallocated items	0.2	(9.1)	(11.1)		
Consolidated operating profit	$ 296.6	$ 240.3	$ 225.8	23.4%	6.4%
Consolidated operating profit margin	16.1%	14.0%	14.1%		

2019 compared to 2018

Consolidated operating profit increased by $56.3 million, or 23.4%, in 2019, including a favorable foreign currency translation impact of $0.6 million.

Proprietary Products – Proprietary Products operating profit increased by $47.2 million, or 17.7%, in 2019, including a favorable foreign currency translation impact of $0.6 million, due to the factors described above.

Contract-Manufactured Products – Contract-Manufactured Products operating profit increased by $4.8 million, or 10.8%, in 2019, due to the factors described above.

Corporate – Corporate costs increased by $5.0 million, or 8.2%, in 2019, due to the factors described above.

Unallocated items – Please refer to the *Other (Income) Expense* section for details.

Excluding the unallocated items, our adjusted consolidated operating profit margin increased by 1.6 margin points in 2019.

2018 compared to 2017

Consolidated operating profit increased by $14.5 million, or 6.4%, in 2018, including a favorable foreign currency translation impact of $6.6 million.

Proprietary Products – Proprietary Products operating profit increased by $22.6 million, or 9.3%, in 2018, including a favorable foreign currency translation impact of $5.9 million, due to the factors described above.

Contract-Manufactured Products – Contract-Manufactured Products operating profit decreased by $4.0 million, or 8.3%, in 2018, including a favorable foreign currency translation impact of $0.7 million, due to the factors described above.

Corporate – Corporate costs increased by $6.1 million, or 11.1%, in 2018, due to the factors described above.

Unallocated items – Please refer to the *Other (Income) Expense* section for details.

Excluding the unallocated items, our adjusted consolidated operating profit margin decreased by 0.3 margin points in 2018.

Interest Expense, Net

The following table presents interest expense, net, by significant component:

	Year Ended December 31,			% Change	
($ in millions)	2019	2018	2017	2019/2018	2018/2017
Interest expense	$ 9.4	$ 9.3	$ 10.5	1.1%	(11.4)%
Capitalized interest	(0.9)	(0.9)	(2.7)	—%	(66.7)%
Interest income	(3.8)	(2.1)	(1.3)	81.0%	61.5%
Interest expense, net	$ 4.7	$ 6.3	$ 6.5	(25.4)%	(3.1)%

2019 compared to 2018

Interest expense, net, decreased by $1.6 million, or 25.4%, in 2019, due to an increase in interest income in 2019 resulting from higher interest rates on our deposit accounts and higher average cash and cash equivalents balances.

2018 compared to 2017

Interest expense, net, decreased by $0.2 million, or 3.1%, in 2018, due to lower interest expense resulting from less average debt outstanding during 2018, as compared to 2017, and an increase in interest income, partially offset by a decrease in capitalized interest due to the completion of several major projects in 2017, including certain components of our new facility in Waterford, Ireland. The Waterford facility began commercial production during the second half of 2018.

Other Nonoperating Expense (Income)

2019 compared to 2018

Other nonoperating expense (income) changed by $6.8 million in 2019, primarily due to a decrease in the expected return on pension plan assets and a pension settlement charge of $3.5 million recorded in 2019, as we determined that normal-course lump-sum payments for each of our U.S. qualified and non-qualified defined benefit pension plans exceeded the threshold for settlement accounting under U.S. GAAP for the year. Effective January 1, 2019, except for interest crediting, benefit accruals under these defined benefit pension plans ceased.

2018 compared to 2017

Other nonoperating income increased by $3.6 million in 2018, due to an increase in the expected return on pension plan assets and a decrease in recognized actuarial losses for 2018.

Income Taxes

The provision for income taxes was $59.0 million, $41.4 million, and $80.9 million for the years 2019, 2018, and 2017, respectively, and the effective tax rate was 20.2%, 17.2%, and 36.4%, respectively.

During 2019, we recorded a net tax benefit of $0.3 million due to the impact of federal law changes enacted during the year, as well as a tax benefit of $10.3 million associated with stock-based compensation.

During 2018, we recorded a net tax benefit of $2.5 million for the estimated impact of the 2017 Tax Act and a tax benefit of $14.3 million associated with stock-based compensation. Please refer to Note 17, *Income Taxes*, for further discussion of the 2017 Tax Act.

During 2017, we recorded a discrete tax charge of $48.8 million related to the 2017 Tax Act and the impact of changes in enacted international tax rates on previously-recorded deferred tax asset and liability balances, as well as a tax benefit of $33.1 million associated with stock-based compensation.

Please refer to Note 17, *Income Taxes*, for further discussion of our income taxes.

Equity in Net Income of Affiliated Companies

Equity in net income of affiliated companies represents the contribution to earnings from our 25% ownership interest in Daikyo, which increased to 49% during the fourth quarter of 2019, and our 49% ownership interest in five companies majority-owned by a long-time partner located in Mexico. Please refer to Note 7, *Affiliated Companies*, for further discussion. Equity in net income of affiliated companies was $8.9 million, $7.6 million, and $9.2 million for the years 2019, 2018, and 2017, respectively. Equity in net income of affiliated companies increased by $1.3 million, or 17.1%, in 2019, primarily due to favorable operating results at Daikyo. Equity in net income of affiliated companies decreased by $1.6 million, or 17.4%, in 2018, primarily due to the impact of gains on the sale of investment securities by Daikyo in 2017.

Net Income

Net income in 2019 was $241.7 million, or $3.21 per diluted share, compared to $206.9 million, or $2.74 per diluted share, in 2018. Our 2019 results included the impact of restructuring and related charges of $3.7 million (net of $1.2 million in tax), a gain on the sale of fixed assets as a result of our restructuring plan of $1.3 million (net of $0.4 million in tax), a pension settlement charge of $2.7 million (net of $0.8 million in tax), a charge of $1.0 million related to the continued devaluation of Argentina's currency, a tax recovery of $2.9 million (net of $1.5 million in tax) related to previously-paid international excise taxes, a net tax benefit of $0.3 million related to the impact of federal law changes enacted during the year, and a tax benefit of $10.3 million associated with stock-based compensation.

Net income in 2018 was $206.9 million, or $2.74 per diluted share, compared to $150.7 million, or $1.99 per diluted share, in 2017. Our 2018 results included the impact of restructuring and related charges of $7.2 million (net of $1.9 million in tax), a gain on the sale of fixed assets as a result of our restructuring plans of $0.9 million (net of $0.2 million in tax), a charge of $1.1 million related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018, a net tax benefit of $2.5 million for the estimated impact of the 2017 Tax Act, and a tax benefit of $14.3 million associated with stock-based compensation.

Net income in 2017 was $150.7 million, or $1.99 per diluted share, compared to $143.6 million, or $1.91 per diluted share, in 2016. Our 2017 results included the impact of a discrete tax charge of $48.8 million related to the 2017 Tax Act and the impact of changes in enacted international tax rates on previously-recorded deferred tax asset and

liability balances, as well as a tax benefit of $33.1 million associated with stock-based compensation and a charge of $11.1 million related to the deconsolidation of our Venezuelan subsidiary.

FINANCIAL CONDITION, LIQUIDITY AND CAPITAL RESOURCES

Cash Flows

The following table presents cash flow data for the years ended December 31:

($ in millions)	2019	2018	2017
Net cash provided by operating activities	$ 367.2	$ 288.6	$ 263.3
Net cash used in investing activities	$ (228.0)	$ (100.8)	$ (133.6)
Net cash used in financing activities	$ (36.8)	$ (80.7)	$ (109.0)

Net Cash Provided by Operating Activities

2019 compared to 2018

Net cash provided by operating activities increased by $78.6 million in 2019, primarily due to improved operating results and changes in assets and liabilities.

2018 compared to 2017

Net cash provided by operating activities increased by $25.3 million in 2018, primarily due to improved operating results and a decrease in pension plan contributions in 2018.

Net Cash Used in Investing Activities

2019 compared to 2018

Net cash used in investing activities increased by $127.2 million in 2019, primarily due to the increase in our ownership interest in Daikyo, an increase in capital expenditures, and the acquisition of our distributor in South Korea.

2018 compared to 2017

Net cash used in investing activities decreased by $32.8 million in 2018, mostly due to a $26.1 million decrease in capital spending due to the completion of several major projects in 2017, including certain components of our new facility in Waterford, Ireland.

Net Cash Used in Financing Activities

2019 compared to 2018

Net cash used in financing activities decreased by $43.9 million in 2019, primarily due to borrowings of $90.0 million under our Term Loan, partially offset by net repayments of our outstanding long-term borrowings under our Credit Facility and increases in purchases under our share repurchases programs and dividend payments.

2018 compared to 2017

Net cash used in financing activities decreased by $28.3 million in 2018, primarily due to lower debt repayment activity in 2018.

We paid cash dividends totaling $45.1 million ($0.61 per share), $42.1 million ($0.57 per share), and $39.1 million ($0.53 per share) during 2019, 2018, and 2017, respectively.

Liquidity and Capital Resources

The table below presents selected liquidity and capital measures as of:

($ in millions)	December 31, 2019	December 31, 2018
Cash and cash equivalents	$ 439.1	$ 337.4
Accounts receivable, net	$ 319.3	$ 288.2
Inventories	$ 235.7	$ 214.5
Accounts payable	$ 156.8	$ 130.4
Debt	$ 257.3	$ 196.1
Equity	$ 1,573.2	$ 1,396.3
Working Capital	$ 717.1	$ 610.7

Cash and cash equivalents include all instruments that have maturities of ninety days or less when purchased. Working capital is defined as current assets less current liabilities.

Cash and cash equivalents – Our cash and cash equivalents balance at December 31, 2019 consisted of cash held in depository accounts with banks around the world and cash invested in high-quality, short-term investments. The cash and cash equivalents balance at December 31, 2019 included $217.2 million of cash held by subsidiaries within the U.S. and $221.9 million of cash held by subsidiaries outside of the U.S. In response to the 2017 Tax Act, we reevaluated our position regarding permanent reinvestment of foreign subsidiary earnings and profits through 2017 (with the exception of China and Mexico) and decided that those profits were no longer permanently reinvested. As of January 1, 2018, we reasserted indefinite reinvestment related to all post-2017 unremitted earnings in all of our foreign subsidiaries. In general, it is our practice and intention to permanently reinvest the earnings of our foreign subsidiaries and repatriate earnings only when the tax impact is de minimis, and that position has not changed subsequent to the one-time transition tax under the 2017 Tax Act, except as noted above. Accordingly, no deferred taxes have been provided for withholding taxes or other taxes that would result upon repatriation of approximately $214.2 million of undistributed earnings from foreign subsidiaries to the U.S., as those earnings continue to be permanently reinvested. Further, it is impracticable for us to estimate any future tax costs for any unrecognized deferred tax liabilities associated with our indefinite reinvestment assertion, because the actual tax liability, if any, would be dependent on complex analysis and calculations considering various tax laws, exchange rates, circumstances existing when there is a repatriation, sale or liquidation, or other factors.

Working capital – Working capital at December 31, 2019 increased by $106.4 million, or 17.4%, as compared to December 31, 2018, including an increase of $11.3 million due to foreign currency translation. Excluding the impact of currency exchange rates, cash and cash equivalents, accounts receivable, inventories, and total current liabilities increased by $102.4 million, $33.3 million, $23.2 million, and $60.0 million, respectively. The increase in accounts receivable was due to increased sales activity and longer customer payment terms. The increase in total current liabilities was primarily due to increases in accounts payable, accrued salaries, wages and benefits, and other current liabilities, as well as our adoption of Accounting Standards Codification ("ASC") Topic 842 ("ASC 842"), which required us to record operating lease liabilities for operating leases where we are the lessee in our consolidated balance sheet as of December 31, 2019.

Debt and credit facilities – The $61.2 million increase in total debt at December 31, 2019, as compared to December 31, 2018, primarily resulted from borrowings of $90.0 million under our Term Loan, partially offset by net repayments of our outstanding long-term borrowings under our Credit Facility, foreign currency rate fluctuations, and an increase in unamortized debt issuance costs.

Our sources of liquidity include our Credit Facility. At December 31, 2019, we had no outstanding borrowings under the Credit Facility, as we repaid the outstanding long-term borrowings denominated in Euro and Yen in November

and December 2019, respectively. There was no material gain or loss on the repayment under the Credit Facility. At December 31, 2019, the borrowing capacity available under the Credit Facility, including outstanding letters of credit of $2.5 million, was $297.5 million. We do not expect any significant limitations on our ability to access this source of funds. Please refer to Note 10, *Debt*, for further discussion of our Credit Facility.

Pursuant to the financial covenants in our debt agreements, we are required to maintain established interest coverage ratios and to not exceed established leverage ratios. In addition, the agreements contain other customary covenants, none of which we consider restrictive to our operations. At December 31, 2019, we were in compliance with all of our debt covenants, and we expect to continue to be in compliance with the terms of these agreements throughout 2020.

We believe that cash on hand and cash generated from operations, together with availability under our Credit Facility, will be adequate to address our foreseeable liquidity needs based on our current expectations of our business operations, capital expenditures and scheduled payments of debt obligations.

Commitments and Contractual Obligations

The following table summarizes our commitments and contractual obligations at December 31, 2019. These obligations are not expected to have a material impact on liquidity.

		Payments Due By Period			
($ in millions)	Total	Less than 1 year	1 - 3 years	3 - 5 years	More than 5 years
Purchase obligations [(1)]	$ 249.1	$ 61.3	$ 113.6	$ 62.0	$ 12.2
Debt (excluding unamortized debt issuance costs)	258.0	2.3	46.6	136.1	73.0
Interest on debt and interest rate swaps [(2)]	37.4	7.0	13.2	9.8	7.4
Operating lease obligations	88.0	12.1	19.0	15.1	41.8
Other long-term liabilities [(3)]	6.6	0.9	1.3	1.5	2.9
Total contractual obligations [(4)]	$ 639.1	$ 83.6	$ 193.7	$ 224.5	$ 137.3

(1) Our business creates a need to enter into various commitments with suppliers, including for the purchase of raw materials and finished goods. In accordance with U.S. GAAP, these purchase obligations are not reflected in the accompanying consolidated balance sheets. These purchase commitments do not exceed our projected requirements and are in the normal course of business.

(2) For fixed-rate long-term debt, interest was based on principal amounts and fixed coupon rates at year-end. Future interest payments on variable-rate debt were calculated using principal amounts and the applicable ending interest rate at year-end. Interest on fixed-rate derivative instruments was based on notional amounts and fixed interest rates contractually obligated at year-end.

(3) Represents acquisition-related contingencies. In connection with certain business acquisitions, we agreed to make payments to the sellers if and when certain operating milestones are achieved, such as sales and operating income targets.

(4) This table does not include obligations pertaining to pension and postretirement benefits because the actual amount and timing of future contributions may vary significantly depending upon plan asset performance, benefit payments, and other factors. Contributions to our plans are expected to be $1.4 million in 2020. Please refer to Note 15, *Benefit Plans*, for estimated benefit payments over the next ten years.

Reserves for uncertain tax positions - The table above does not include $5.0 million of total gross unrecognized tax benefits as of December 31, 2019. Due to the high degree of uncertainty regarding the timing of potential cash flows, we cannot reasonably estimate the settlement periods for amounts which may be paid.

Letters of credit - We have letters of credit totaling $2.5 million supporting the reimbursement of workers' compensation and other claims paid on our behalf by insurance carriers. Our accrual for insurance obligations was $3.2 million at December 31, 2019, of which $0.9 million is in excess of our deductible and, therefore, is reimbursable by the insurance company.

OFF-BALANCE SHEET ARRANGEMENTS

At December 31, 2019, we had no off-balance sheet financing arrangements other than unconditional purchase obligations incurred in the ordinary course of business and outstanding letters of credit related to various insurance programs.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Management's discussion and analysis addresses consolidated financial statements that are prepared in accordance with U.S. GAAP. The application of these principles requires management to make estimates and assumptions, some of which are subjective and complex, that affect the amounts reported in the consolidated financial statements. We believe the following accounting policies and estimates are critical to understanding and evaluating our results of operations and financial position:

Revenue Recognition: Our revenue results from the sale of goods or services and reflects the consideration to which we expect to be entitled in exchange for those goods or services. We record revenue based on a five-step model, in accordance with ASC Topic 606 ("ASC 606"). Following the identification of a contract with a customer, we identify the performance obligations (goods or services) in the contract, determine the transaction price, allocate the transaction price to the performance obligations in the contract, and recognize the revenue when (or as) we satisfy the performance obligations by transferring the promised goods or services to our customers. A good or service is transferred when (or as) the customer obtains control of that good or service.

We recognize the majority of our revenue, primarily relating to Proprietary Products product sales, at a point in time, following the transfer of control of our products to our customers, which typically occurs upon shipment or delivery, depending on the terms of the related agreements.

We recognize revenue relating to our Contract-Manufactured Products product sales and certain Proprietary Products product sales over time, as our performance does not create an asset with an alternative use to us and we have an enforceable right to payment for performance completed to date.

We recognize revenue relating to our development and tooling agreements over time, as our performance creates or enhances an asset that the customer controls as the asset is created or enhanced.

For revenue recognized over time, revenue is recognized by applying a method of measuring progress toward complete satisfaction of the related performance obligation. When selecting the method for measuring progress, we select the method that best depicts the transfer of control of goods or services promised to our customers.

Revenue for our Contract-Manufactured Products product sales, certain Proprietary Products product sales, and our development and tooling agreements is recorded under an input method, which recognizes revenue on the basis of our efforts or inputs to the satisfaction of a performance obligation (for example, resources consumed, labor hours expended, costs incurred, time elapsed, or machine hours used) relative to the total expected inputs to the satisfaction of that performance obligation. The input method that we use is based on costs incurred.

The majority of the performance obligations within our contracts are satisfied within one year or less. Performance obligations satisfied beyond one year include those relating to a nonrefundable customer payment of $20.0 million received in June 2013 in return for the exclusive use of the SmartDose® technology platform within a specific therapeutic area. As of December 31, 2019, there was $5.6 million of unearned income related to this payment, of which $0.9 million was included in other current liabilities and $4.7 million was included in other long-term

liabilities. The unearned income is being recognized as income on a straight-line basis over the remaining term of the agreement. The agreement does not include a future minimum purchase commitment from the customer.

Our revenue can be generated from contracts with multiple performance obligations. When a sales agreement involves multiple performance obligations, each obligation is separately identified and the transaction price is allocated based on the amount of consideration we expect to be entitled in exchange for transferring the promised good or service to the customer.

Some customers receive pricing rebates upon attaining established sales volumes. We record rebate costs when sales occur based on our assessment of the likelihood that the required volumes will be attained. We also maintain an allowance for product returns, as we believe that we are able to reasonably estimate the amount of returns based on our substantial historical experience.

Contract assets and liabilities result from transactions with revenue recorded over time. If the measure of remaining rights exceeds the measure of the remaining performance obligations, we record a contract asset. Contract assets are recorded on the consolidated balance sheet in accounts receivable, net, and other assets (current and noncurrent portions, respectively). Contract assets included in accounts receivable, net, relate to the unbilled amounts of our product sales for which we have recognized revenue over time. Contract assets included in other assets represent the remaining performance obligations of our development and tooling agreements. Conversely, if the measure of the remaining performance obligations exceeds the measure of the remaining rights, we record a contract liability. Contract liabilities are recorded on the consolidated balance sheet in other liabilities (current and noncurrent portions, respectively) and represent cash payments received in advance of our performance.

Impairment of Long-Lived Assets: Long-lived assets, including property, plant and equipment and operating lease right-of-use assets, are tested for impairment whenever circumstances indicate that the carrying value of these assets may not be recoverable. An asset is considered impaired if the carrying value of the asset exceeds the sum of the future expected undiscounted cash flows to be derived from the asset. Once an asset is considered impaired, an impairment loss is recorded within other (income) expense for the difference between the asset's carrying value and its fair value. For assets held and used in the business, management determines fair value using estimated future cash flows to be derived from the asset, discounted to a net present value using an appropriate discount rate. For assets held for sale or for investment purposes, management determines fair value by estimating the proceeds to be received upon sale of the asset, less disposition costs.

Impairment of Goodwill and Other Intangible Assets: Goodwill is tested for impairment at least annually, following the completion of our annual budget and long-range planning process, or whenever circumstances indicate that the carrying value of these assets may not be recoverable. Goodwill is tested for impairment at the reporting unit level, which is the same as, or one level below, our operating segments. A goodwill impairment charge represents the amount by which a reporting unit's carrying amount exceeds its fair value, not to exceed the total amount of goodwill allocated to that reporting unit. Considerable management judgment is necessary to estimate fair value. Amounts and assumptions used in our goodwill impairment test, such as future sales, future cash flows and long-term growth rates, are consistent with internal projections and operating plans. Amounts and assumptions used in our goodwill impairment test are also largely dependent on the continued sale of drug products delivered by injection and the packaging of drug products, as well as our timeliness and success in new-product innovation or the development and commercialization of proprietary multi-component systems. Changes in the estimate of fair value, including the estimate of future cash flows, could have a material impact on our future results of operations and financial position. Accounting guidance also allows entities to first assess qualitative factors, including macroeconomic conditions, industry and market considerations, cost factors, and overall financial performance, to determine whether it is necessary to perform the quantitative goodwill impairment test. We elected to follow this guidance for our 2017, 2018, and 2019 annual impairment tests. Based upon our assessment, we determined that it was not more likely than not that the fair value of each of our reporting units was less than its carrying amount and determined that it was not necessary to perform the quantitative goodwill impairment tests in 2017, 2018, and 2019.

Intangible assets with finite lives are amortized using the straight-line method over their estimated useful lives, and reviewed for impairment whenever circumstances indicate that the carrying value of these assets may not be recoverable.

Employee Benefits: We maintain funded and unfunded defined benefit pension plans in the U.S. and a number of other countries that cover employees who meet eligibility requirements. In addition, we sponsor postretirement benefit plans which provide healthcare benefits for eligible employees who retire or become disabled. Postretirement benefit plans are limited to only those active employees who met the eligibility requirements as of January 1, 2017. The measurement of annual cost and obligations under these defined benefit postretirement plans is subject to a number of assumptions, which are specific for each of our U.S. and foreign plans. The assumptions, which are reviewed at least annually, are relevant to both the plan assets (where applicable) and the obligation for benefits that will ultimately be provided to our employees. Two of the most critical assumptions in determining pension and retiree medical plan expense are the discount rate and expected long-term rate of return on plan assets. Other assumptions reflect demographic factors such as retirement age, rates of compensation increases, mortality and turnover and are evaluated periodically and updated to reflect our actual experience. For our funded plans, we consider the current and expected asset allocations of our plan assets, as well as historical and expected rates of return, in estimating the long-term rate of return on plan assets. Under U.S. GAAP, differences between actual and expected results are generally accumulated in other comprehensive income (loss) as actuarial gains or losses and subsequently amortized into earnings over future periods.

Changes in key assumptions could have a material impact on our future results of operations and financial position. We estimate that every 25-basis point reduction in our long-term rate of return assumption would increase pension expense by $0.4 million, and every 25-basis point reduction in our discount rate would decrease pension expense by $0.1 million. A decrease in the discount rate increases the present value of benefit obligations. Our net pension underfunded balance at December 31, 2019 was $43.8 million, compared to $52.5 million at December 31, 2018. Our underfunded balance for other postretirement benefits was $6.6 million at December 31, 2019, compared to $6.0 million at December 31, 2018.

Income Taxes: We estimate income taxes payable based upon current domestic and international tax legislation. In addition, deferred income taxes are recognized by applying enacted statutory tax rates to tax loss carryforwards and temporary differences between the tax basis and financial statement carrying values of our assets and liabilities. The enacted statutory tax rate applied is based on the rate expected to be applicable at the time of the forecasted utilization of the loss carryforward or reversal of the temporary difference. Valuation allowances on deferred tax assets are established when it is more likely than not that all or a portion of a deferred tax asset will not be realized. The realizability of deferred tax assets is subject to our estimates of future taxable income, generally at the respective subsidiary company and country level. Changes in tax legislation, business plans and other factors may affect the ultimate recoverability of tax assets or final tax payments, which could result in adjustments to tax expense in the period such change is determined.

When accounting for uncertainty in income taxes recognized in our financial statements, we apply a more-likely-than-not threshold for financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return.

Please refer to Note 1, *Summary of Significant Accounting Policies* and Note 2, *New Accounting Standards*, to our consolidated financial statements for additional information on our significant accounting policies, recently adopted accounting standards, and accounting standards issued but not yet adopted.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Our ongoing business operations expose us to various risks, such as fluctuating interest rates, foreign currency exchange rates and increasing commodity prices. These risk factors can impact our results of operations, cash flows and financial position. To manage these market risks, we periodically enter into derivative financial instruments, such as interest rate swaps, options and foreign exchange contracts for periods consistent with, and for notional amounts equal to or less than, the related underlying exposures. We do not purchase or hold any derivative financial

instruments for investment or trading purposes. All derivatives are recorded in our consolidated balance sheet at fair value.

Foreign Currency Exchange Risk

Sales outside of the U.S. accounted for 55.7% of our consolidated net sales in 2019. Virtually all of these sales and related operating costs are denominated in the currency of the local country and translated into USD for consolidated reporting purposes. Although the majority of the assets and liabilities of these subsidiaries are denominated in the functional currency of the subsidiary, they may also hold assets or liabilities denominated in other currencies. These items may give rise to foreign currency transaction gains and losses. As a result, our results of operations and financial position are exposed to changing currency exchange rates. We periodically use forward exchange contracts to hedge certain transactions or to manage month-end balance sheet exposures on cross-currency intercompany loans.

We have entered into forward exchange contracts, designated as fair value hedges, to manage our exposure to fluctuating foreign exchange rates on cross-currency intercompany loans. As of December 31, 2019, the total amount of these forward exchange contracts was SGD 601.5 million and $13.4 million. As of December 31, 2018, the total amount of these forward exchange contracts was €10.0 million, SGD 601.5 million and $13.4 million.

In addition, we have entered into several foreign currency contracts, designated as cash flow hedges, for periods of up to eighteen months, intended to hedge the currency risk associated with a portion of our forecasted transactions denominated in foreign currencies. As of December 31, 2019, we had outstanding foreign currency contracts to purchase and sell certain pairs of currencies, as follows:

(in millions)		Sell	
Currency	**Purchase**	**USD**	**Euro**
USD	38.4	—	33.6
Yen	6,550.4	37.8	20.6
SGD	29.4	16.5	4.6

In November and December 2019, in conjunction with the repayment of the outstanding long-term borrowings under our Credit Facility denominated in Euro and Yen, we de-designated these borrowings as hedges of our net investments in certain European subsidiaries and Daikyo. The amounts recorded as a cumulative translation adjustment in accumulated other comprehensive loss related to these borrowings (prior to de-designation) will remain in accumulated other comprehensive loss indefinitely, unless certain future events occur, such as the disposition of the operations for which the net investment hedges relate.

In December 2019, in conjunction with the repayment of the outstanding long-term borrowings under our Credit Facility denominated in Yen, we entered into a forward exchange contract, designated as a cash flow hedge, to manage our exposure to fluctuating foreign exchange rates. This forward exchange contract matured on December 30, 2019.

In December 2019, we entered into a five-year floating-to-floating forward-starting cross-currency swap (the "cross-currency swap") for $90 million, which we designated as a hedge of our net investment in Daikyo. The notional amount of the cross-currency swap is ¥9.8 billion ($90 million) and the swap termination date is December 31, 2024. Under the cross-currency swap, we receive floating interest rate payments based on three-month USD LIBOR plus a margin, in return for paying floating interest rate payments based on three-month Yen LIBOR plus a margin.

Interest Rate Risk

As a result of our normal borrowing activities, we have long-term debt with both fixed and variable interest rates. Long-term debt consists of our Term Loan and Series A, B and C notes.

The following table summarizes our interest rate risk-sensitive instruments (excluding unamortized debt issuance costs):

($ in millions)	2020	2021	2022	2023	2024	Thereafter	Carrying Value	Fair Value
Current Debt:								
U.S. dollar denominated	$ 2.3						$ 2.3	$ 2.3
Average interest rate - variable	2.8%							
Long-Term Debt:								
U.S. dollar denominated			42.0		53.0	73.0	168.0	176.3
Average interest rate - fixed			3.7%		3.8%	4.0%		
U.S. dollar denominated		2.3	2.3	2.3	80.8		87.7	87.7
Average interest rate - variable		2.8%	2.8%	2.8%	2.8%			

Commodity Price Risk

Many of our proprietary products are made from synthetic elastomers, which are derived from the petroleum refining process. We purchase the majority of our elastomers via long-term supply contracts, some of which contain clauses that provide for surcharges related to fluctuations in crude oil prices. In recent years, raw material costs have fluctuated due to crude oil price fluctuations. We expect this volatility to continue. We will continue to pursue pricing and hedging strategies, and ongoing cost control initiatives, to offset the effects on gross profit.

From November 2017 through October 2019, we purchased several series of call options for a total of 352,682 barrels of crude oil to mitigate our exposure to such oil-based surcharges and protect operating cash flows with regards to a portion of our forecasted elastomer purchases.

During 2019, the loss recorded in cost of goods and services sold related to these options was $0.4 million. During 2018, the gain recorded in cost of goods and services sold related to these options was $0.1 million.

As of December 31, 2019, we had outstanding contracts to purchase 135,967 barrels of crude oil from January 2020 to June 2021, at a weighted-average strike price of $70.71 per barrel.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

CONSOLIDATED STATEMENTS OF INCOME

West Pharmaceutical Services, Inc. and Subsidiaries for the years ended December 31, 2019, 2018 and 2017
(in millions, except per share data)

	2019	2018	2017
Net sales	$ 1,839.9	$ 1,717.4	$ 1,599.1
Cost of goods and services sold	1,234.2	1,172.0	1,086.2
Gross profit	605.7	545.4	512.9
Research and development	38.9	40.3	39.1
Selling, general and administrative expenses	272.7	262.9	246.0
Other (income) expense (Note 16)	(2.5)	1.9	2.0
Operating profit	296.6	240.3	225.8
Interest expense	8.5	8.4	7.8
Interest income	(3.8)	(2.1)	(1.3)
Other nonoperating expense (income)	0.1	(6.7)	(3.1)
Income before income taxes	291.8	240.7	222.4
Income tax expense	59.0	41.4	80.9
Equity in net income of affiliated companies	(8.9)	(7.6)	(9.2)
Net income	$ 241.7	$ 206.9	$ 150.7
Net income per share:			
Basic	$ 3.27	$ 2.80	$ 2.04
Diluted	$ 3.21	$ 2.74	$ 1.99
Weighted average shares outstanding:			
Basic	74.0	73.9	73.9
Diluted	75.4	75.4	75.8

The accompanying notes are an integral part of the consolidated financial statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

West Pharmaceutical Services, Inc. and Subsidiaries for the years ended December 31, 2019, 2018 and 2017
(in millions)

	2019	2018	2017
Net income	$ 241.7	$ 206.9	$ 150.7
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	4.9	(39.2)	68.8
Defined benefit pension and other postretirement plans:			
Prior service cost arising during period, net of tax of $0	—	(0.3)	—
Net actuarial (loss) gain arising during period, net of tax of $(0.3), $(0.2) and $1.3	(1.9)	(0.7)	6.3
Settlement effects arising during period, net of tax of $0.8	2.7	—	—
Less: amortization of actuarial (gain) loss, net of tax of $0, $0.3 and $0.5	(0.2)	1.1	3.6
Less: amortization of prior service credit, net of tax of $(0.1), $(0.5) and $(0.5)	(0.5)	(1.5)	(3.5)
Net loss on investment securities, net of tax of $0, $(0.1) and $(2.5)	—	(0.1)	(4.7)
Net (loss) gain on derivatives, net of tax of $(0.2), $1.5 and $(0.1)	(0.4)	3.8	(1.0)
Other comprehensive income (loss), net of tax	4.6	(36.9)	69.5
Comprehensive income	$ 246.3	$ 170.0	$ 220.2

The accompanying notes are an integral part of the consolidated financial statements.

CONSOLIDATED BALANCE SHEETS
West Pharmaceutical Services, Inc. and Subsidiaries at December 31, 2019 and 2018
(in millions, except per share data)

	2019	2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 439.1	$ 337.4
Accounts receivable, net	319.3	288.2
Inventories	235.7	214.5
Other current assets	64.6	54.3
Total current assets	1,058.7	894.4
Property, plant and equipment	1,820.1	1,752.7
Less: accumulated depreciation and amortization	980.8	930.7
Property, plant and equipment, net	839.3	822.0
Operating lease right-of-use assets	70.1	—
Investments in affiliated companies	192.7	91.2
Goodwill	107.8	105.8
Deferred income taxes	14.0	24.7
Intangible assets, net	29.8	20.3
Pension and other postretirement benefits	4.3	—
Other noncurrent assets	24.7	20.5
Total Assets	$ 2,341.4	$ 1,978.9
LIABILITIES AND EQUITY		
Current liabilities:		
Notes payable and other current debt	$ 2.3	$ 0.1
Accounts payable	156.8	130.4
Pension and other postretirement benefits	2.2	2.3
Accrued salaries, wages and benefits	73.0	64.5
Income taxes payable	6.4	9.8
Operating lease liabilities	9.6	—
Other current liabilities	91.3	76.6
Total current liabilities	341.6	283.7
Long-term debt	255.0	196.0
Deferred income taxes	15.5	13.1
Pension and other postretirement benefits	52.5	56.2
Operating lease liabilities	62.4	—
Other long-term liabilities	41.2	33.6
Total Liabilities	768.2	582.6
Commitments and contingencies (Note 18)		
Equity:		
Preferred stock, 3.0 million shares authorized; 0 shares issued and outstanding in 2019 and 2018	—	—
Common stock, par value $.25 per share; 100.0 million shares authorized; shares issued: 75.3 million and 75.3 million in 2019 and 2018; shares outstanding: 74.1 million and 74.1 million in 2019 and 2018	18.8	18.8
Capital in excess of par value	272.7	282.0
Retained earnings	1,549.4	1,353.4
Accumulated other comprehensive loss	(149.6)	(154.2)
Treasury stock, at cost (1.2 million and 1.2 million shares in 2019 and 2018)	(118.1)	(103.7)
Total Equity	1,573.2	1,396.3
Total Liabilities and Equity	$ 2,341.4	$ 1,978.9

The accompanying notes are an integral part of the consolidated financial statements.

CONSOLIDATED STATEMENT OF EQUITY

West Pharmaceutical Services, Inc. and Subsidiaries for the years ended December 31, 2019, 2018 and 2017
(in millions)

	Common Shares Issued	Common Stock	Capital in Excess of Par Value	Number of Treasury Shares	Treasury Stock	Retained earnings	Accumulated other comprehensive loss	Total
Balance, December 31, 2016	73.7	$ 18.4	$ 260.4	0.6	$ (46.1)	$ 1,071.6	$ (186.8)	$ 1,117.5
Effect of modified retrospective application of a new accounting standard	—	—	—	—	—	(4.1)	—	(4.1)
Net income	—	—	—	—	—	150.7	—	150.7
Activity related to stock-based compensation	1.5	0.4	44.1	(0.1)	11.4	—	—	55.9
Shares purchased under share repurchase program	—	—	—	0.8	(74.4)	—	—	(74.4)
Dividends declared ($0.54 per share)	—	—	—	—	—	(40.0)	—	(40.0)
Other adjustments to capital in excess of par value	—	—	4.8	—	—	—	—	4.8
Other comprehensive income, net of tax	—	—	—	—	—	—	69.5	69.5
Balance, December 31, 2017	75.2	18.8	309.3	1.3	(109.1)	1,178.2	(117.3)	1,279.9
Effect of modified retrospective application of a new accounting standard (see Note 3)	—	—	—	—	—	11.4	—	11.4
Net income	—	—	—	—	—	206.9	—	206.9
Activity related to stock-based compensation	0.1	—	(27.3)	(0.9)	76.2	—	—	48.9
Shares purchased under share repurchase program	—	—	—	0.8	(70.8)	—	—	(70.8)
Dividends declared ($0.58 per share)	—	—	—	—	—	(43.1)	—	(43.1)
Other comprehensive loss, net of tax	—	—	—	—	—	—	(36.9)	(36.9)
Balance, December 31, 2018	75.3	18.8	282.0	1.2	(103.7)	1,353.4	(154.2)	1,396.3
Net income	—	—	—	—	—	241.7	—	241.7
Activity related to stock-based compensation	—	—	(11.1)	(0.8)	65.6	—	—	54.5
Shares purchased under share repurchase program	—	—	—	0.8	(83.1)	—	—	(83.1)
Purchase of investment in affiliated companies	—	—	1.8	—	3.1	—	—	4.9
Dividends declared ($0.62 per share)	—	—	—	—	—	(45.7)	—	(45.7)
Other comprehensive income, net of tax	—	—	—	—	—	—	4.6	4.6
Balance, December 31, 2019	75.3	$ 18.8	$ 272.7	1.2	$ (118.1)	$ 1,549.4	$ (149.6)	$ 1,573.2

The accompanying notes are an integral part of the consolidated financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS

West Pharmaceutical Services, Inc. and Subsidiaries for the years ended December 31, 2019, 2018 and 2017
(in millions)

	2019	2018	2017
Cash flows from operating activities:			
Net income	$ 241.7	$ 206.9	$ 150.7
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	100.0	101.7	94.3
Amortization	3.4	2.7	2.4
Stock-based compensation	24.4	15.1	16.1
Non-cash restructuring charges	2.3	2.2	0.7
Pension settlement charge	3.5	—	—
Venezuela deconsolidation	—	—	11.1
Contingent consideration payments in excess of acquisition-date liability	(0.5)	(0.6)	—
Loss on sales of equipment	0.8	1.8	1.6
Deferred income taxes	15.3	0.9	41.7
Pension and other retirement plans, net	(2.6)	(7.9)	(6.9)
Equity in undistributed earnings of affiliates, net of dividends	(6.7)	(5.9)	(7.0)
Changes in assets and liabilities:			
Increase in accounts receivable	(33.3)	(43.8)	(39.7)
Increase in inventories	(18.6)	(7.0)	(3.6)
Decrease (increase) in other current assets	2.6	(6.2)	0.3
Increase in accounts payable	25.3	0.4	12.6
Changes in other assets and liabilities	9.6	28.3	(11.0)
Net cash provided by operating activities	367.2	288.6	263.3
Cash flows from investing activities:			
Capital expenditures	(126.4)	(104.7)	(130.8)
Purchase of investment in affiliated companies	(85.1)	—	—
Acquisition of business	(18.9)	—	—
Cash related to deconsolidated Venezuelan subsidiary	—	—	(6.0)
Other, net	2.4	3.9	3.2
Net cash used in investing activities	(228.0)	(100.8)	(133.6)
Cash flows from financing activities:			
Borrowings under revolving credit agreements	108.5	—	—
Repayments under revolving credit agreements	(136.3)	—	—
Issuance of long-term debt	90.0	—	—
Repayments of long-term debt	(0.1)	(0.1)	(34.9)
Debt issuance costs	(1.2)	—	—
Dividend payments	(45.1)	(42.1)	(39.1)
Contingent consideration payments up to amount of acquisition-date liability	—	—	(0.7)
Proceeds from stock-based compensation awards	25.1	27.4	35.7
Employee stock purchase plan contributions	5.4	4.9	4.4
Shares purchased under share repurchase programs	(83.1)	(70.8)	(74.4)
Net cash used in financing activities	(36.8)	(80.7)	(109.0)
Effect of exchange rates on cash	(0.7)	(5.6)	12.2
Net increase in cash and cash equivalents	101.7	101.5	32.9
Cash, including cash equivalents at beginning of period	337.4	235.9	203.0
Cash, including cash equivalents at end of period	$ 439.1	$ 337.4	$ 235.9
Supplemental cash flow information:			
Interest paid, net of amounts capitalized	$ 8.6	$ 8.4	$ 8.0
Income taxes paid, net	$ 47.5	$ 42.0	$ 31.0
Accrued capital expenditures	$ 17.0	$ 15.0	$ 20.1
Dividends declared, not paid	$ 11.8	$ 11.3	$ 10.4
Purchase of investment in affiliated companies, treasury stock	$ 4.9	$ —	$ —

The accompanying notes are an integral part of the consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1: Summary of Significant Accounting Policies

Principles of Consolidation: The consolidated financial statements include the accounts of West after the elimination of intercompany transactions. We have no participation or other rights in variable interest entities.

In April 2019, we acquired the business of our distributor in South Korea for $18.9 million. As a result of the acquisition, we recorded inventories, property, plant and equipment, goodwill and a customer relationships intangible asset of $4.5 million, $0.6 million, $2.6 million and $11.2 million, respectively. The goodwill was recorded within our Proprietary Products reportable segment. The results of this acquisition have been included in our consolidated financial statements since the acquisition date.

As of April 1, 2017, our consolidated financial statements exclude the results of our Venezuelan subsidiary. Please refer to Note 16, *Other (Income) Expense*, for further discussion.

Use of Estimates: The financial statements are prepared in conformity with U.S. GAAP. These principles require management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingencies in the financial statements. Actual amounts realized may differ from these estimates.

Cash and Cash Equivalents: Cash equivalents include time deposits, certificates of deposit and all highly liquid debt instruments with maturities of three months or less at the time of purchase.

Accounts Receivable: Our accounts receivable balance was net of an allowance for doubtful accounts of $0.5 million and $2.0 million at December 31, 2019 and 2018, respectively. We record the allowance based on a specific identification methodology.

Inventories: Inventories are valued at the lower of cost (on a first-in, first-out basis) and net realizable value. The following is a summary of inventories at December 31:

($ in millions)	2019	2018
Raw materials	$ 100.9	$ 90.4
Work in process	37.4	42.2
Finished goods	97.4	81.9
	$ 235.7	$ 214.5

Property, Plant and Equipment: Property, plant and equipment assets are carried at cost. Maintenance and minor repairs and renewals are charged to expense as incurred. Costs incurred for computer software developed or obtained for internal use are capitalized for application development activities and immediately expensed for preliminary project activities or post-implementation activities. Upon sale or retirement of depreciable assets, costs and related accumulated depreciation are eliminated, and gains or losses are recognized in other (income) expense. Depreciation and amortization are computed principally using the straight-line method over the estimated useful lives of the assets, or the remaining term of the lease, if shorter.

Leases: Operating lease right-of-use assets are initially measured at cost, which comprises the initial amount of the lease liability adjusted for lease payments made at or before the lease commencement date, plus any initial direct costs incurred less any lease incentives received. Operating lease right-of-use assets are subsequently measured throughout the lease term at the carrying amount of the lease liability, plus initial direct costs, plus (minus) any prepaid (accrued) lease payments, less the unamortized balance of lease incentives received. Lease expense for lease payments is recognized on a straight-line basis over the lease term. Operating lease liabilities are initially measured

at the present value of the unpaid lease payments at the lease commencement date. We had no finance leases as of December 31, 2019. Please refer to Note 6, *Leases*, for additional information.

Impairment of Long-Lived Assets: Long-lived assets, including property, plant and equipment and operating lease right-of-use assets, are tested for impairment whenever circumstances indicate that the carrying value of these assets may not be recoverable. An asset is considered impaired if the carrying value of the asset exceeds the sum of the future expected undiscounted cash flows to be derived from the asset. Once an asset is considered impaired, an impairment loss is recorded within other (income) expense for the difference between the asset's carrying value and its fair value. For assets held and used in the business, management determines fair value using estimated future cash flows to be derived from the asset, discounted to a net present value using an appropriate discount rate. For assets held for sale or for investment purposes, management determines fair value by estimating the proceeds to be received upon sale of the asset, less disposition costs.

Impairment of Goodwill and Other Intangible Assets: Goodwill is tested for impairment at least annually, following the completion of our annual budget and long-range planning process, or whenever circumstances indicate that the carrying value of these assets may not be recoverable. Goodwill is tested for impairment at the reporting unit level, which is the same as, or one level below, our operating segments. A goodwill impairment charge represents the amount by which a reporting unit's carrying amount exceeds its fair value, not to exceed the total amount of goodwill allocated to that reporting unit. Accounting guidance also allows entities to first assess qualitative factors, including macroeconomic conditions, industry and market considerations, cost factors, and overall financial performance, to determine whether it is necessary to perform the quantitative goodwill impairment test. We elected to follow this guidance for our 2017, 2018, and 2019 annual impairment tests. Based upon our assessment, we determined that it was not more likely than not that the fair value of each of our reporting units was less than its carrying amount and determined that it was not necessary to perform the quantitative goodwill impairment tests in 2017, 2018, and 2019.

Intangible assets with finite lives are amortized using the straight-line method over their estimated useful lives of 5 to 25 years, and reviewed for impairment whenever circumstances indicate that the carrying value of these assets may not be recoverable.

Employee Benefits: The measurement of the obligations under our defined benefit pension and postretirement medical plans are subject to a number of assumptions. These include the rate of return on plan assets (for funded plans) and the rate at which the future obligations are discounted to present value. For our funded plans, we consider the current and expected asset allocations of our plan assets, as well as historical and expected rates of return, in estimating the long-term rate of return on plan assets. U.S. GAAP requires the recognition of an asset or liability for the funded status of a defined benefit postretirement plan, as measured by the difference between the fair value of plan assets, if any, and the benefit obligation. For a pension plan, the benefit obligation is the projected benefit obligation; for any other postretirement plan, such as a retiree health plan, the benefit obligation is the accumulated postretirement benefit obligation. Please refer to Note 15, *Benefit Plans*, for a more detailed discussion of our pension and other retirement plans.

Financial Instruments: All derivatives are recognized as either assets or liabilities in the balance sheet and recorded at their fair value. For a derivative designated as hedging the exposure to variable cash flows of a forecasted transaction (referred to as a cash flow hedge), the effective portion of the derivative's gain or loss is initially reported as a component of other comprehensive income ("OCI"), net of tax, and subsequently reclassified into earnings when the forecasted transaction affects earnings. For a derivative designated as hedging the exposure to changes in the fair value of a recognized asset or liability or a firm commitment (referred to as a fair value hedge), the derivative's gain or loss is recognized in earnings in the period of change together with the offsetting loss or gain on the hedged item. For a derivative designated as hedging the foreign currency exposure of a net investment in a foreign operation, the gain or loss is reported in OCI, net of tax, as part of the cumulative translation adjustment. The ineffective portion of any derivative used in a hedging transaction is recognized immediately into earnings. Derivative financial instruments that are not designated as hedges are also recorded at fair value, with the change in fair value recognized immediately into earnings. We do not purchase or hold any derivative financial instrument for investment or trading purposes.

Foreign Currency Translation: Foreign currency transaction gains and losses are recognized in the determination of net income. Foreign currency translation adjustments of subsidiaries and affiliates operating outside of the U.S. are accumulated in other comprehensive loss, a separate component of equity.

Revenue Recognition: Our revenue results from the sale of goods or services and reflects the consideration to which we expect to be entitled in exchange for those goods or services. We record revenue based on a five-step model, in accordance with ASC 606. Following the identification of a contract with a customer, we identify the performance obligations (goods or services) in the contract, determine the transaction price, allocate the transaction price to the performance obligations in the contract, and recognize the revenue when (or as) we satisfy the performance obligations by transferring the promised goods or services to our customers. A good or service is transferred when (or as) the customer obtains control of that good or service. Some customers receive pricing rebates upon attaining established sales volumes. We record rebate costs when sales occur based on our assessment of the likelihood that the required volumes will be attained. We also maintain an allowance for product returns, as we believe that we are able to reasonably estimate the amount of returns based on our substantial historical experience. Please refer to Note 3, *Revenue*, for additional information.

Shipping and Handling Costs: Shipping and handling costs are included in cost of goods and services sold. Shipping and handling costs billed to customers in connection with the sale are included in net sales.

Research and Development: Research and development expenditures are for the creation, engineering and application of new or improved products and processes. Expenditures include primarily salaries and outside services for those directly involved in research and development activities and are expensed as incurred.

Environmental Remediation and Compliance Costs: Environmental remediation costs are accrued when such costs are probable and reasonable estimates are determinable. Cost estimates include investigation, cleanup and monitoring activities; such estimates are adjusted, if necessary, based on additional findings. Environmental compliance costs are expensed as incurred as part of normal operations.

Litigation: From time to time, we are involved in legal proceedings, investigations and claims generally incidental to our normal business activities. In accordance with U.S. GAAP, we accrue for loss contingencies when it is probable that a liability has been incurred and the amount of the loss can be reasonably estimated. These estimates are based on an analysis made by internal and external legal counsel considering information known at the time. Legal costs in connection with loss contingencies are expensed as incurred.

Income Taxes: Deferred income taxes are recognized by applying enacted statutory tax rates to tax loss carryforwards and temporary differences between the tax basis and financial statement carrying values of our assets and liabilities. The enacted statutory tax rate applied is based on the rate expected to be applicable at the time of the forecasted utilization of the loss carryforward or reversal of the temporary difference. Valuation allowances on deferred tax assets are established when it is more likely than not that all or a portion of a deferred tax asset will not be realized. The realizability of deferred tax assets is subject to our estimates of future taxable income, generally at the respective subsidiary company and the country level. In response to the 2017 Tax Act, we reevaluated our position regarding permanent reinvestment of foreign subsidiary earnings and profits through 2017 (with the exception of China and Mexico) and decided that those profits were no longer permanently reinvested. As of January 1, 2018, we reasserted indefinite reinvestment related to all post-2017 unremitted earnings in all of our foreign subsidiaries. Please refer to Note 17, *Income Taxes*, for additional information. We recognize interest costs related to income taxes in interest expense and penalties within other (income) expense. The tax law ordering approach is used for purposes of determining whether an excess tax benefit has been realized during the year.

Stock-Based Compensation: Under the fair value provisions of U.S. GAAP, stock-based compensation cost is measured at the grant date based on the value of the award and is recognized as expense over the vesting period. In order to determine the fair value of stock options on the grant date, we use the Black-Scholes valuation model. Please refer to Note 14, *Stock-Based Compensation*, for a more detailed discussion of our stock-based compensation plans.

Net Income Per Share: Basic net income per share is computed by dividing net income attributable to common shareholders by the weighted average number of shares of common stock outstanding during each period. Net income per share assuming dilution considers the dilutive effect of outstanding stock options and other stock awards based on the treasury stock method. The treasury stock method assumes the use of exercise proceeds to repurchase common stock at the average fair market value in the period.

Note 2: New Accounting Standards

Recently Adopted Standards

In July 2019, the FASB issued guidance which clarifies or improves a variety of ASC disclosure and presentation requirements by aligning them with the SEC's regulations, thereby eliminating redundancies and making the codification easier to apply. This guidance was effective upon issuance. The adoption did not have a material impact on our financial statements.

In June 2018, the FASB issued guidance which expands the scope of accounting for share-based payment arrangements to include share-based payment transactions for acquiring goods and services from nonemployees. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2018. Early adoption was permitted. We adopted this guidance as of January 1, 2019, on a prospective basis. The adoption did not have a material impact on our financial statements.

In February 2018, the FASB issued guidance to address a specific consequence of the 2017 Tax Act by allowing a reclassification from accumulated other comprehensive income (loss) to retained earnings for stranded tax effects resulting from the 2017 Tax Act's reduction of the U.S. federal corporate income tax rate. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2018. Early adoption was permitted. We adopted this guidance as of January 1, 2019, on a prospective basis, but elected to not reclassify from accumulated other comprehensive income (loss) to retained earnings the stranded tax effects resulting from the 2017 Tax Act's reduction of the U.S. federal corporate income tax rate.

In August 2017, the FASB issued guidance which expands and refines hedge accounting for both nonfinancial and financial risk components and aligns the recognition and presentation of the effects of the hedging instrument and the hedged item in the financial statements. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2018. Early adoption was permitted. We adopted this guidance as of January 1, 2019, on a prospective basis. The adoption did not have a material impact on our financial statements.

In February 2016, the FASB issued guidance on the accounting for leases, ASC 842. This guidance requires lessees to recognize lease assets and lease liabilities on the balance sheet and to expand disclosures about leasing arrangements, both qualitative and quantitative. In terms of transition, the guidance requires adoption based upon a modified retrospective approach. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2018. Early adoption was permitted. We adopted this guidance as of January 1, 2019, using the modified retrospective approach that allows companies to apply ASC 842 as of the effective date and on a prospective basis. Please refer to Note 6, *Leases*, for additional information.

Standards Issued Not Yet Adopted

In December 2019, the FASB issued guidance which simplifies the accounting for income taxes by removing certain exceptions to the general principles in ASC Topic 740 ("ASC 740") and by clarifying and amending existing ASC 740 guidance. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2020. Early adoption is permitted. We are currently evaluating our adoption timing and the impact that this guidance may have on our financial statements.

In April 2019, the FASB issued guidance which clarifies and improves areas of guidance related to the new credit losses, hedging, and recognition and measurement standards. This guidance is effective for the same fiscal years in which the original standards are effective or, if already implemented, annual periods beginning after the issuance of

this guidance. Early adoption is permitted. We believe that the adoption of this guidance will not have a material impact on our financial statements.

In August 2018, the FASB issued guidance to align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by this update. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2019. Early adoption is permitted, including adoption in any interim period. We believe that the adoption of this guidance will not have a material impact on our financial statements.

In August 2018, the FASB issued guidance which modifies the disclosure requirements for defined benefit pension plans and other postretirement plans. The guidance removes disclosures that no longer are considered cost beneficial, clarifies the specific requirements of disclosures, and adds disclosure requirements identified as relevant. This guidance is effective for fiscal years ending after December 15, 2020. Early adoption is permitted. We believe that the adoption of this guidance will not have a material impact on our financial statements.

In August 2018, the FASB issued guidance which modifies the disclosure requirements on fair value measurements by removing, modifying, or adding certain disclosures. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2019. Early adoption is permitted. We believe that the adoption of this guidance will not have a material impact on our financial statements.

In June 2016, the FASB issued guidance which provides financial statement users with more decision-useful information about the expected credit losses on financial instruments and other commitments held by a reporting entity, including accounts receivable, at each reporting date. Under current guidance, an entity reflects credit losses on financial assets measured on an amortized cost basis only when it is probable that losses have been incurred, generally considering only past events and current conditions in determining incurred loss. The new guidance requires the recognition of an allowance that reflects the current estimate of credit losses expected to be incurred over the life of the financial asset, based not only on historical experience and current conditions, but also on reasonable and supportable forecasts. This guidance is effective for fiscal years, and interim periods within those years, beginning after December 15, 2019. Early adoption is permitted. We believe that the adoption of this guidance will not have a material impact on our financial statements, primarily as we have not historically had a material amount of accounts receivable write-offs.

Note 3: Revenue

Adoption of ASC 606

On January 1, 2018, we adopted ASC 606, on a modified retrospective basis, applied to those contracts which were not completed as of January 1, 2018. As a result of our adoption, we recorded a cumulative-effect adjustment of $11.4 million within retained earnings in our consolidated balance sheet as of January 1, 2018, to reflect a change in the timing of revenue recognition under ASC 606, from point in time to over time, on our Contract-Manufactured Products product sales, certain Proprietary Products product sales, development and tooling agreements, as well as an acceleration on a portion of the remaining unearned income from a nonrefundable customer payment.

Results for reporting periods beginning after January 1, 2018 are presented under ASC 606, while prior period amounts are not adjusted and continue to be reported under the accounting standards in effect for those periods.

Revenue Recognition

Our revenue results from the sale of goods or services and reflects the consideration to which we expect to be entitled in exchange for those goods or services. We record revenue based on a five-step model, in accordance with ASC 606. Following the identification of a contract with a customer, we identify the performance obligations (goods or services) in the contract, determine the transaction price, allocate the transaction price to the performance

obligations in the contract, and recognize the revenue when (or as) we satisfy the performance obligations by transferring the promised goods or services to our customers. A good or service is transferred when (or as) the customer obtains control of that good or service.

We recognize the majority of our revenue, primarily relating to Proprietary Products product sales, at a point in time, following the transfer of control of our products to our customers, which typically occurs upon shipment or delivery, depending on the terms of the related agreements.

We recognize revenue relating to our Contract-Manufactured Products product sales and certain Proprietary Products product sales over time, as our performance does not create an asset with an alternative use to us and we have an enforceable right to payment for performance completed to date.

We recognize revenue relating to our development and tooling agreements over time, as our performance creates or enhances an asset that the customer controls as the asset is created or enhanced.

For revenue recognized over time, revenue is recognized by applying a method of measuring progress toward complete satisfaction of the related performance obligation. When selecting the method for measuring progress, we select the method that best depicts the transfer of control of goods or services promised to our customers.

Revenue for our Contract-Manufactured Products product sales, certain Proprietary Products product sales, and our development and tooling agreements is recorded under an input method, which recognizes revenue on the basis of our efforts or inputs to the satisfaction of a performance obligation (for example, resources consumed, labor hours expended, costs incurred, time elapsed, or machine hours used) relative to the total expected inputs to the satisfaction of that performance obligation. The input method that we use is based on costs incurred.

The majority of the performance obligations within our contracts are satisfied within one year or less. Performance obligations satisfied beyond one year include those relating to a nonrefundable customer payment of $20.0 million received in June 2013 in return for the exclusive use of the SmartDose technology platform within a specific therapeutic area. As of December 31, 2019, there was $5.6 million of unearned income related to this payment, of which $0.9 million was included in other current liabilities and $4.7 million was included in other long-term liabilities. The unearned income is being recognized as income on a straight-line basis over the remaining term of the agreement. The agreement does not include a future minimum purchase commitment from the customer.

Our revenue can be generated from contracts with multiple performance obligations. When a sales agreement involves multiple performance obligations, each obligation is separately identified and the transaction price is allocated based on the amount of consideration we expect to be entitled in exchange for transferring the promised good or service to the customer.

Some customers receive pricing rebates upon attaining established sales volumes. We record rebate costs when sales occur based on our assessment of the likelihood that the required volumes will be attained. We also maintain an allowance for product returns, as we believe that we are able to reasonably estimate the amount of returns based on our substantial historical experience.

The following table presents the approximate percentage of our net sales by market group:

	2019	2018
Biologics	25%	21%
Generics	20%	21%
Pharma	31%	34%
Contract-Manufactured Products	24%	24%
	100%	100%

The following table presents the approximate percentage of our net sales by product category:

	2019	2018
High-Value Components	42%	41%
Standard Packaging	29%	32%
Delivery Devices	5%	3%
Contract-Manufactured Products	24%	24%
	100%	100%

The following table presents the approximate percentage of our net sales by geographic location:

	2019	2018
Americas	48%	48%
Europe, Middle East, Africa	44%	44%
Asia Pacific	8%	8%
	100%	100%

Contract Assets and Liabilities

Contract assets and liabilities result from transactions with revenue recorded over time. If the measure of remaining rights exceeds the measure of the remaining performance obligations, we record a contract asset. Contract assets are recorded on the consolidated balance sheet in accounts receivable, net, and other assets (current and noncurrent portions, respectively). Contract assets included in accounts receivable, net, relate to the unbilled amounts of our product sales for which we have recognized revenue over time. Contract assets included in other assets represent the remaining performance obligations of our development and tooling agreements. Conversely, if the measure of the remaining performance obligations exceeds the measure of the remaining rights, we record a contract liability. Contract liabilities are recorded on the consolidated balance sheet in other liabilities (current and noncurrent portions, respectively) and represent cash payments received in advance of our performance.

The following table summarizes our contract assets and liabilities, excluding contract assets included in accounts receivable, net:

	($ in millions)
Contract assets, December 31, 2018	$ 9.1
Contract assets, December 31, 2019	9.8
Change in contract assets - increase (decrease)	$ 0.7
Deferred income, December 31, 2018	$ (33.4)
Deferred income, December 31, 2019	(34.9)
Change in deferred income - (increase) decrease	$ (1.5)

The increase in deferred income during 2019 was primarily due to additional cash payments of $114.4 million received in advance of satisfying future performance obligations, partially offset by the recognition of revenue of $110.4 million, including $20.8 million of revenue that was included in deferred income at the beginning of the year, and $2.5 million in other adjustments.

Practical Expedients and Exemptions

We have elected to disregard the effects of a significant financing component, as we expect, at the inception of our contracts, that the period between when we transfer a promised good or service to the customer and when the customer pays for that good or service will be one year or less.

In addition, we have elected to omit the disclosure of the majority of our remaining performance obligations, which are satisfied within one year or less.

Supply Chain Financing

We have entered into supply chain financing agreements with certain banks, pursuant to which we offer for sale certain accounts receivable to such banks from time to time, subject to the terms of the applicable agreements. These transactions result in a reduction in accounts receivable, as the agreements transfer effective control over, and credit risk related to, the receivables to the banks. These agreements do not allow for recourse in the event of uncollectibility, and we do not retain any interest in the underlying accounts receivable once sold. As of December 31, 2019 and 2018, we derecognized accounts receivable of $10.1 million and $5.7 million, respectively, under these agreements. Discount fees related to the sale of such accounts receivable on our consolidated income statements for 2019 and 2018 were not material.

Voluntary Recall

On January 24, 2019, we issued a voluntary recall of our Vial2Bag product line due to reports of potential unpredictable or variable dosing under certain conditions. Our fourth quarter 2018 results included an $11.3 million provision for product returns, recorded as a reduction of sales, partially offset by a reduction in cost of goods sold reflecting our inventory balance for these devices at December 31, 2018. During 2019, we recorded a net provision of $5.4 million for inventory returns from our customers and related in-house inventory, partially offset by a reduction in our provision for product returns. We continue to work to get the products back on the market.

Note 4: Net Income Per Share

The following table reconciles the shares used in the calculation of basic net income per share to those used for diluted net income per share:

(in millions)	2019	2018	2017
Net income	$ 241.7	$ 206.9	$ 150.7
Weighted average common shares outstanding	74.0	73.9	73.9
Dilutive effect of equity awards, based on the treasury stock method	1.4	1.5	1.9
Weighted average shares assuming dilution	75.4	75.4	75.8

During 2019, 2018 and 2017, there were 0.1 million, 0.4 million, and 0.4 million shares, respectively, from stock-based compensation plans not included in the computation of diluted net income per share because their impact was antidilutive.

In February 2019, we announced a share repurchase program for calendar-year 2019 authorizing the repurchase of up to 800,000 shares of our common stock from time to time on the open market or in privately-negotiated transactions as permitted under Exchange Act Rule 10b-18. The number of shares repurchased and the timing of such transactions depended on a variety of factors, including market conditions. During 2019, we purchased 800,000 shares of our common stock under the now-completed program at a cost of $83.1 million, or an average price of $103.89 per share.

In December 2019, we announced a share repurchase program for calendar-year 2020 authorizing the repurchase of up to 848,000 shares of our common stock from time to time on the open market or in privately-negotiated

transactions as permitted under Exchange Act Rule 10b-18. The number of shares to be repurchased and the timing of such transactions will depend on a variety of factors, including market conditions. This share repurchase program is expected to be completed by December 31, 2020.

Note 5: Property, Plant and Equipment

A summary of gross property, plant and equipment at December 31 is presented in the following table:

($ in millions)	Expected useful lives (years)	2019	2018
Land		$ 22.1	$ 20.9
Buildings and improvements	15-35	572.9	569.1
Machinery and equipment	5-12	817.0	806.7
Molds and dies	4-7	123.8	115.8
Computer hardware and software	3-10	155.6	151.1
Construction in progress		128.7	89.1
		$ 1,820.1	$ 1,752.7

Depreciation expense for the years ended December 31, 2019, 2018 and 2017 was $100.0 million, $101.7 million and $94.3 million, respectively.

There were no capitalized leases included in buildings and improvements and machinery and equipment at December 31, 2019 and 2018.

We capitalize interest on borrowings during the active construction period of major capital projects. Capitalized interest is added to the cost of the underlying assets and is amortized over the useful lives of the assets. Capitalized interest for the years ended December 31, 2019, 2018 and 2017 was $1.0 million, $0.9 million and $2.7 million, respectively.

During 2019 and 2018, as part of our 2018 restructuring plan, we recorded within other (income) expense $0.3 million and $2.2 million, respectively, for non-cash asset write-downs associated with the discontinued use of certain equipment. During 2019 and 2018, as part of our restructuring plans, we recorded within other (income) expense $1.9 million and $1.1 million, respectively, for gains on the sale of fixed assets.

Note 6: Leases

Adoption of ASC 842

On January 1, 2019, we adopted ASC 842, using the modified retrospective approach that allows companies to apply ASC 842 as of the effective date and on a prospective basis. As a result, we were not required to adjust our comparative period financial information for effects of ASC 842 or present the new required lease disclosures for periods prior to the date of adoption. As of December 31, 2019, we had operating leases primarily related to land, buildings, and machinery and equipment, with lease terms through 2047. Certain of our operating leases include options to extend the lease term for up to five years, and certain of our operating leases include options to terminate the leases within one year. We had no finance leases as of December 31, 2019.

As a result of our adoption of ASC 842, we recorded operating lease right-of-use assets of $71.0 million and operating lease liabilities of $73.1 million for operating leases where we are the lessee in our consolidated balance sheet as of January 1, 2019. The operating lease right-of-use assets are initially measured at cost, which comprises the initial amount of the lease liability adjusted for lease payments made at or before the lease commencement date, plus any initial direct costs incurred less any lease incentives received. The operating lease right-of-use assets are subsequently measured throughout the lease term at the carrying amount of the lease liability, plus initial direct

costs, plus (minus) any prepaid (accrued) lease payments, less the unamortized balance of lease incentives received. Lease expense for lease payments is recognized on a straight-line basis over the lease term. The operating lease liabilities are initially measured at the present value of the unpaid lease payments at the lease commencement date.

Judgments used in applying ASC 842 include determining: i) whether a contract is, or contains, a lease; ii) the discount rate to be used to discount the unpaid lease payments to present value; iii) the lease term; and iv) the lease payments. We determine if a contract is, or contains, a lease at contract inception. A lease exists when a contract conveys to the customer the right to control the use of identified property, plant, or equipment for a period of time in exchange for consideration. The definition of a lease embodies two conditions: 1) there is an identified asset in the contract that is land or a depreciable asset (i.e., property, plant, and equipment); and 2) the customer has the right to control the use of the identified asset. ASC 842 requires a lessee to discount its unpaid lease payments using the interest rate implicit in the lease or, if that rate cannot be readily determined, its incremental borrowing rate. As all of our operating 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. Our incremental borrowing rate for a lease is the rate of interest we would have to pay on a collateralized basis to borrow an amount equal to the lease payments under similar terms. The lease term for all of our operating leases includes the noncancellable period of the lease plus any additional periods covered by either a lessee option to extend (or not to terminate) the lease that the lessee is reasonably certain to exercise, or an option to extend (or not to terminate) the lease controlled by the lessor. Lease payments included in the measurement of the operating lease right-of-use assets and lease liabilities are comprised of fixed payments (including in-substance fixed payments), variable payments that depend on an index or rate, and the exercise price of a lessee option to purchase the underlying asset if the lessee is reasonably certain to exercise.

The components of lease expense were as follows:

($ in millions)	2019
Operating lease cost	$ 12.9
Short-term lease cost	0.8
Variable lease cost	3.3
Total lease cost	$ 17.0

Lease expense for 2018 and 2017 was $14.5 million and $13.3 million, respectively.

Supplemental information related to leases was as follows:

($ in millions)	2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$ 12.5
Right-of-use assets obtained in exchange for new operating lease liabilities	9.1

As of December 31, 2019, the weighted average remaining lease term for operating leases was 11.7 years and the weighted average discount rate was 3.76%.

Maturities of lease liabilities as of December 31, 2019 were as follows:

($ in millions)	Operating
Year	Leases
2020	$ 12.1
2021	10.4
2022	8.6
2023	7.8
2024	7.3
Thereafter	41.8
	88.0
Less: imputed lease interest	(16.0)
Total lease liabilities	$ 72.0

Maturities of future minimum rental payments under non-cancelable operating leases as of December 31, 2018 were as follows:

($ in millions)	Operating
Year	Leases
2019	$ 13.0
2020	10.5
2021	7.8
2022	6.9
2023	5.5
Thereafter	37.8
Total	$ 81.5

Practical Expedients and Exemptions

We have elected to adopt the leasing package of practical expedients, which allows us to not retroactively reassess: i) any expired or existing contracts containing leases under the new definition of a lease; ii) the lease classification for any expired or existing leases; and iii) initial direct costs for any expired or existing leases. We have also elected to adopt practical expedients around land easements, the combination of lease and non-lease components, and the portfolio approach relating to discount rates. These practical expedients were applied consistently to all leases.

We have elected not to recognize operating lease right-of-use assets and operating lease liabilities for all short-term leases (leases with an initial lease term of 12 months or less). We recognize the lease payments associated with our short-term leases as an expense over the lease term.

Note 7: Affiliated Companies

At December 31, 2019, the following affiliated companies were accounted for under the equity method:

	Location	Ownership interest
The West Company Mexico, S.A. de C.V.	Mexico	49%
Aluplast S.A. de C.V.	Mexico	49%
Pharma Tap S.A. de C.V.	Mexico	49%
Pharma Rubber S.A. de C.V.	Mexico	49%
I&W Pharma Group LLC	United States	49%
Daikyo	Japan	49%

On November 1, 2019, in connection with the amendment of certain commercial agreements with Daikyo, we increased our ownership interest from 25% to 49% in Daikyo in exchange for $85.1 million in cash and $4.9 million in shares of our treasury stock to certain stockholders of Daikyo. We believe that the increase in ownership interest will not have a material impact on our financial statements.

Unremitted income of affiliated companies included in consolidated retained earnings amounted to $82.4 million, $75.8 million and $69.9 million at December 31, 2019, 2018 and 2017, respectively. Dividends received from affiliated companies were $2.2 million in 2019, $1.7 million in 2018 and $2.2 million in 2017.

Our equity in net unrealized gains of Daikyo's investment securities and derivative instruments, as well as pension adjustments, included in accumulated other comprehensive loss was $0.4 million, $0.4 million and $0.5 million at December 31, 2019, 2018 and 2017, respectively.

Our purchases from, and royalty payments made to, affiliates totaled $115.1 million, $86.3 million and $86.7 million, respectively, in 2019, 2018 and 2017, of which $20.8 million and $12.9 million was due and payable as of December 31, 2019 and 2018, respectively. The majority of these transactions related to a distributorship agreement with Daikyo that allows us to purchase and re-sell Daikyo products. Sales to affiliates were $9.2 million, $9.6 million and $8.1 million, respectively, in 2019, 2018 and 2017, of which $1.9 million and $1.6 million was receivable as of December 31, 2019 and 2018, respectively.

At December 31, 2019 and 2018, the aggregate carrying amount of our investment in affiliated companies that are accounted for under the equity method was $179.3 million and $77.8 million, respectively, and the aggregate carrying amount of our investment in affiliated companies that are not accounted for under the equity method was $13.4 million at both period-ends. We have elected to record these investments, for which fair value was not readily determinable, at cost, less impairment, adjusted for subsequent observable price changes. We test these investments for impairment whenever circumstances indicate that the carrying value of the investments may not be recoverable.

Note 8: Goodwill and Intangible Assets

The changes in the carrying amount of goodwill by reportable segment were as follows:

($ in millions)	Proprietary Products	Contract-Manufactured Products	Total
Balance, December 31, 2017	$ 77.6	$ 30.1	$ 107.7
Foreign currency translation	(1.6)	(0.3)	(1.9)
Balance, December 31, 2018	76.0	29.8	105.8
Goodwill recorded due to acquisition	2.6	—	2.6
Foreign currency translation	(0.5)	(0.1)	(0.6)
Balance, December 31, 2019	$ 78.1	$ 29.7	$ 107.8

In April 2019, we acquired the business of our distributor in South Korea. As a result of the acquisition, we recorded goodwill of $2.6 million. The goodwill was recorded within our Proprietary Products reportable segment.

As of December 31, 2019, we had no accumulated goodwill impairment losses.

Intangible assets and accumulated amortization as of December 31 were as follows:

	2019			2018		
($ in millions)	Cost	Accumulated Amortization	Net	Cost	Accumulated Amortization	Net
Patents and licensing	$ 21.5	$ (16.0)	$ 5.5	$ 19.6	$ (15.1)	$ 4.5
Technology	3.3	(1.5)	1.8	3.3	(1.2)	2.1
Trademarks	2.0	(1.8)	0.2	2.0	(1.8)	0.2
Customer relationships	40.3	(21.6)	18.7	29.3	(20.0)	9.3
Customer contracts	11.0	(7.4)	3.6	11.0	(6.8)	4.2
	$ 78.1	$ (48.3)	$ 29.8	$ 65.2	$ (44.9)	$ 20.3

In April 2019, we acquired the business of our distributor in South Korea. As a result of the acquisition, we recorded a customer relationships intangible asset of $11.2 million, which is being amortized over ten years.

The cost basis of intangible assets includes a foreign currency translation loss of $0.3 million and a foreign currency translation loss of $0.3 million for the years ended December 31, 2019 and 2018, respectively. Amortization expense for the years ended December 31, 2019, 2018 and 2017 was $3.4 million, $2.7 million and $2.4 million, respectively. Estimated annual amortization expense for the next five years is as follows: 2020 - $4.0 million, 2021 - $3.5 million, 2022 - $3.5 million, 2023 - $2.9 million and 2024 - $2.6 million.

Note 9: Other Current Liabilities

Other current liabilities as of December 31 included the following:

($ in millions)	2019	2018
Deferred income	$ 27.5	$ 25.5
Dividends payable	11.8	11.3
Accrued commissions, rebates and royalties	9.7	5.7
Accrued retirement plans (excluding pension)	7.9	2.3
Accrued taxes other than income	6.5	5.5
Accrued professional services	5.9	4.9
Accrued interest	3.3	3.4
Restructuring obligations	1.5	3.3
Other	17.2	14.7
Total other current liabilities	$ 91.3	$ 76.6

Note 10: Debt

The following table summarizes our long-term debt obligations, net of unamortized debt issuance costs and current maturities, at December 31. The interest rates shown in parentheses are as of December 31, 2019.

($ in millions)	2019	2018
Note payable, due December 31, 2019	$ —	$ 0.1
Credit Facility, due October 15, 2020	—	28.6
Term Loan, due December 31, 2024 (2.78%)	90.0	—
Series A notes, due July 5, 2022 (3.67%)	42.0	42.0
Series B notes, due July 5, 2024 (3.82%)	53.0	53.0
Series C notes, due July 5, 2027 (4.02%)	73.0	73.0
	258.0	196.7
Less: unamortized debt issuance costs	0.7	0.6
Total debt	257.3	196.1
Less: current portion of long-term debt	2.3	0.1
Long-term debt, net	$ 255.0	$ 196.0

Credit Agreement - Credit Facility

In March 2019, we entered into the Credit Agreement that replaced our prior revolving credit facility, which was scheduled to expire in October 2020. The Credit Agreement, which expires in March 2024, contains the Credit Facility of $300.0 million, with sublimits of up to $30.0 million for swing line loans for domestic borrowers in USD and a $20.0 million swing line loan for our German Holding Company and up to $30.0 million for the issuance of standby letters of credit, which Credit Facility may be increased from time-to-time by the greater of $350.0 million and earnings before interest, taxes, depreciation and amortization (“EBITDA”) for the preceding twelve month period in the aggregate through an increase in the Credit Facility, subject to the satisfaction of certain conditions. Borrowings under the Credit Facility bear interest at either the base rate (the per annum interest rate of the highest of the Prime Rate, the Federal Funds Rate plus 50 basis points or the daily LIBOR, plus 1.00%) or at the applicable LIBOR rate, plus a tiered margin based on the ratio of our net consolidated debt to our modified EBITDA, ranging from 0 to 37.5 basis points for base rate loans and 87.5 to 137.5 basis points for LIBOR rate loans. The Credit

Agreement contains financial covenants providing that we shall not permit the ratio of our net consolidated debt to our modified EBITDA to be greater than 3.5 to 1; provided that, no more than three times during the term of the Credit Agreement, upon the occurrence of a qualified acquisition for each of our four fiscal quarters immediately following such qualified acquisition, the ratio shall be increased to 4.0 to 1. The Credit Agreement also contains customary limitations on liens securing our indebtedness, fundamental changes (mergers, consolidations, liquidations and dissolutions), asset sales, distributions and acquisitions. As of December 31, 2019 and 2018, total unamortized debt issuance costs of $1.1 million and $0.6 million, respectively, were recorded in other noncurrent assets and are being amortized as additional interest expense over the term of the Credit Facility. A portion of these costs relate to our prior revolving credit facility.

At December 31, 2019, we had no outstanding borrowings under the Credit Facility, as we repaid the outstanding long-term borrowings denominated in Euro and Yen in November and December 2019, respectively. There was no material gain or loss on the repayment under the Credit Facility. At December 31, 2019, the borrowing capacity available under the Credit Facility, including outstanding letters of credit of $2.5 million, was $297.5 million. Please refer to Note 11, *Derivative Financial Instruments*, for a discussion of the foreign currency hedges that had been associated with this facility.

Credit Agreement Amendment - Term Loan

In December 2019, we entered into a First Amendment and Incremental Facility Amendment (the "First Amendment") to the Credit Agreement. Pursuant to the First Amendment and the Credit Agreement, we established the Term Loan in the amount of $90.0 million, which is due on December 31, 2024. Borrowings under the Term Loan bear interest at the three-month LIBOR plus 87.5 basis points. As of December 31, 2019, there were unamortized debt issuance costs remaining of $0.2 million, which are being amortized as additional interest expense over the term of the Term Loan.

At December 31, 2019, we had $90.0 million in borrowings under the Term Loan, of which $2.3 million was classified as current and $87.7 million was classified as long-term. Please refer to Note 11, *Derivative Financial Instruments*, for a discussion of the foreign currency hedge associated with the Term Loan.

Private Placement

In 2012, we concluded a private placement issuance of $168.0 million in senior unsecured notes. The total amount of the private placement issuance was divided into three tranches - $42.0 million 3.67% Series A Notes due July 5, 2022, $53.0 million 3.82% Series B Notes due July 5, 2024, and $73.0 million 4.02% Series C Notes due July 5, 2027 (the "Notes"). The Notes rank pari passu with our other senior unsecured debt. The weighted average of the coupon interest rates on the Notes is 3.87%. As of December 31, 2019 and 2018, there were unamortized debt issuance costs remaining of $0.5 million and $0.6 million, respectively, which are being amortized as additional interest expense over the term of the Notes.

Covenants

Pursuant to the financial covenants in our debt agreements, we are required to maintain established interest coverage ratios and to not exceed established leverage ratios. In addition, the agreements contain other customary covenants, none of which we consider restrictive to our operations. At December 31, 2019, we were in compliance with all of our debt covenants, and we expect to continue to be in compliance with the terms of these agreements throughout 2020.

Interest costs incurred during 2019, 2018 and 2017 were $9.4 million, $9.3 million and $10.5 million, respectively. The aggregate annual maturities of long-term debt, excluding unamortized debt issuance costs, were as follows: $2.3 million in 2020 and 2021, 2022 - $44.3 million, 2023 - $2.3 million, 2024 - $133.8 million, and thereafter - $73.0 million.

Note 11: Derivative Financial Instruments

Our ongoing business operations expose us to various risks, such as fluctuating interest rates, foreign currency exchange rates and increasing commodity prices. To manage these market risks, we periodically enter into derivative financial instruments, such as interest rate swaps, options and foreign exchange contracts for periods consistent with, and for notional amounts equal to or less than, the related underlying exposures. We do not purchase or hold any derivative financial instruments for investment or trading purposes. All derivatives are recorded in our consolidated balance sheet at fair value.

Foreign Currency Exchange Rate Risk

We have entered into forward exchange contracts, designated as fair value hedges, to manage our exposure to fluctuating foreign exchange rates on cross-currency intercompany loans. As of December 31, 2019, the total amount of these forward exchange contracts was SGD 601.5 million and $13.4 million. As of December 31, 2018, the total amount of these forward exchange contracts was €10.0 million, SGD 601.5 million and $13.4 million.

In addition, we have entered into several foreign currency contracts, designated as cash flow hedges, for periods of up to eighteen months, intended to hedge the currency risk associated with a portion of our forecasted transactions denominated in foreign currencies. As of December 31, 2019, we had outstanding foreign currency contracts to purchase and sell certain pairs of currencies, as follows:

(in millions)		Sell	
Currency	**Purchase**	**USD**	**Euro**
USD	38.4	—	33.6
Yen	6,550.4	37.8	20.6
SGD	29.4	16.5	4.6

In November and December 2019, in conjunction with the repayment of the outstanding long-term borrowings under our Credit Facility denominated in Euro and Yen, we de-designated these borrowings as hedges of our net investments in certain European subsidiaries and Daikyo. The amounts recorded as cumulative translation adjustments within accumulated other comprehensive loss related to these borrowings (prior to de-designation) will remain in accumulated other comprehensive loss indefinitely, unless certain future events occur, such as the disposition of the operations for which the net investment hedges relate.

In December 2019, in conjunction with the repayment of the outstanding long-term borrowings under our Credit Facility denominated in Yen, we entered into a forward exchange contract, designated as a cash flow hedge, to manage our exposure to fluctuating foreign exchange rates. This forward exchange contract matured on December 30, 2019.

In December 2019, we entered into the cross-currency swap for $90 million, which we designated as a hedge of our net investment in Daikyo. The notional amount of the cross-currency swap is ¥9.8 billion ($90 million) and the swap termination date is December 31, 2024. Under the cross-currency swap, we receive floating interest rate payments based on three-month USD LIBOR plus a margin, in return for paying floating interest rate payments based on three-month Yen LIBOR plus a margin.

Commodity Price Risk

Many of our proprietary products are made from synthetic elastomers, which are derived from the petroleum refining process. We purchase the majority of our elastomers via long-term supply contracts, some of which contain clauses that provide for surcharges related to fluctuations in crude oil prices. The following economic hedges did not qualify for hedge accounting treatment since they did not meet the highly effective requirement at inception.

From November 2017 through October 2019, we purchased several series of call options for a total of 352,682 barrels of crude oil to mitigate our exposure to such oil-based surcharges and protect operating cash flows with regards to a portion of our forecasted elastomer purchases.

As of December 31, 2019, we had outstanding contracts to purchase 135,967 barrels of crude oil from January 2020 to June 2021 at a weighted-average strike price of $70.71 per barrel.

Effects of Derivative Instruments on Financial Position and Results of Operations

Please refer to Note 12, *Fair Value Measurements*, for the balance sheet location and fair values of our derivative instruments as of December 31, 2019 and 2018.

The following table summarizes the effects of derivative instruments designated as fair value hedges in our consolidated statements of income for the years ended December 31:

	Amount of Gain Recognized in Income		Location on Statement of Income
($ in millions)	2019	2018	
Fair Value Hedges:			
Foreign currency hedge contracts	$ (6.9)	$ (6.3)	Other (income) expense
Total	$ (6.9)	$ (6.3)	

We recognize in earnings the initial value of forward point components on a straight-line basis over the life of the fair value hedge. The amounts recognized in earnings, pre-tax, for forward point components for the years ended December 31, 2019 and 2018 were $8.7 million and $3.7 million, respectively. We expect to recognize $5.6 million in earnings, pre-tax, for forward point components in 2020.

The following table summarizes the effects of derivative instruments designated as fair value, cash flow, and net investment hedges on OCI and earnings, net of tax, for the years ended December 31:

	Amount of Gain (Loss) Recognized in OCI		Amount of (Gain) Loss Reclassified from Accumulated OCI into Income		Location of (Gain) Loss Reclassified from Accumulated OCI into Income
($ in millions)	2019	2018	2019	2018	
Fair Value Hedges:					
Foreign currency hedge contracts	$ 4.8	$ —	$ (4.6)	$ —	Other (income) expense
Total	$ 4.8	$ —	$ (4.6)	$ —	
Cash Flow Hedges:					
Foreign currency hedge contracts	$ 0.8	$ 0.4	$ (0.9)	$ 0.6	Net sales
Foreign currency hedge contracts	(0.2)	2.2	(0.6)	0.3	Cost of goods and services sold
Forward treasury locks	—	—	0.3	0.3	Interest expense
Total	$ 0.6	$ 2.6	$ (1.2)	$ 1.2	
Net Investment Hedges:					
Foreign currency-denominated debt	$ 0.6	$ 0.8	$ —	$ —	Other (income) expense
Cross-currency swap	(1.1)	—	—	—	Other (income) expense
Total	$ (0.5)	$ 0.8	$ —	$ —	

The following table summarizes the effects of derivative instruments designated as fair value, cash flow, and net investment hedges by line item in our consolidated statements of income for the years ended December 31:

($ in millions)	2019	2018
Net sales	$ (0.9)	$ 0.6
Cost of goods and services sold	(0.6)	0.3
Other (income) expense	(4.6)	—
Interest expense	0.3	0.3

The following table summarizes the effects of derivative instruments not designated as hedges in our consolidated statements of income for the years ended December 31:

	Amount of Loss (Gain) Recognized in Income		Location on Statement of Income
($ in millions)	2019	2018	
Commodity call options	$ 0.4	$ (0.1)	Cost of goods and services sold
Total	$ 0.4	$ (0.1)	

During 2019 and 2018, there was no material ineffectiveness related to our hedges.

Note 12: Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The following fair value hierarchy classifies the inputs to valuation techniques used to measure fair value into one of three levels:

- Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities.
- Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.
- Level 3: Unobservable inputs that reflect the reporting entity's own assumptions.

The following tables present the assets and liabilities recorded at fair value on a recurring basis:

($ in millions)	Balance at December 31, 2019	Basis of Fair Value Measurements		
		Level 1	Level 2	Level 3
Assets:				
Deferred compensation assets	$ 11.3	$ 11.3	$ —	$ —
Foreign currency contracts	7.7	—	7.7	—
Commodity call options	0.1	—	0.1	—
	$ 19.1	$ 11.3	$ 7.8	$ —
Liabilities:				
Contingent consideration	$ 3.3	$ —	$ —	$ 3.3
Deferred compensation liabilities	12.8	12.8	—	—
Cross-currency swap	1.4	—	1.4	—
Foreign currency contracts	0.3	—	0.3	—
	$ 17.8	$ 12.8	$ 1.7	$ 3.3

($ in millions)	Balance at December 31, 2018	Basis of Fair Value Measurements		
		Level 1	Level 2	Level 3
Assets:				
Deferred compensation assets	$ 8.7	$ 8.7	$ —	$ —
Foreign currency contracts	6.5	—	6.5	—
	$ 15.2	$ 8.7	$ 6.5	$ —
Liabilities:				
Contingent consideration	$ 1.7	$ —	$ —	$ 1.7
Deferred compensation liabilities	9.8	9.8	—	—
Foreign currency contracts	0.2	—	0.2	—
	$ 11.7	$ 9.8	$ 0.2	$ 1.7

Deferred compensation assets are included within other noncurrent assets and are valued using a market approach based on quoted market prices in an active market. The fair value of our foreign currency contracts, included within other current and other noncurrent assets, as well as other current and other long-term liabilities, is valued using an income approach based on quoted forward foreign exchange rates and spot rates at the reporting date. The fair value of our commodity call options, included within other current and other noncurrent assets, is valued using a market approach. The fair value of our contingent consideration, included within other current and other long-term liabilities, is discussed further in the section related to Level 3 fair value measurements. The fair value of deferred compensation liabilities is based on quoted prices of the underlying employees' investment selections and is included within other long-term liabilities. The fair value of the cross-currency swap, included within other long-term liabilities, is valued using a market approach. Please refer to Note 11, *Derivative Financial Instruments*, for further discussion of our derivatives.

Level 3 Fair Value Measurements

The fair value of the contingent consideration liability related to the SmartDose technology platform (the "SmartDose contingent consideration") was initially determined using a probability-weighted income approach, and is revalued at each reporting date or more frequently if circumstances dictate. Changes in the fair value of this

obligation are recorded as income or expense within other (income) expense in our consolidated statements of income. The significant unobservable inputs used in the fair value measurement of the SmartDose contingent consideration are the sales projections, the probability of success factors, and the discount rate. Significant increases or decreases in any of those inputs in isolation would result in a significantly lower or higher fair value measurement. As development and commercialization of the SmartDose technology platform progresses, we may need to update the sales projections, the probability of success factors, and the discount rate used. This could result in a material increase or decrease to the SmartDose contingent consideration.

The following table provides a summary of changes in our Level 3 fair value measurements:

	($ in millions)
Balance, December 31, 2017	$ 4.9
Decrease in fair value recorded in earnings	(2.6)
Payments	(0.6)
Balance, December 31, 2018	1.7
Increase in fair value recorded in earnings	2.1
Payments	(0.5)
Balance, December 31, 2019	$ 3.3

Other Financial Instruments

We believe that the carrying amounts of our cash and cash equivalents and accounts receivable approximate their fair values due to their near-term maturities.

The estimated fair value of long-term debt is based on quoted market prices for debt issuances with similar terms and maturities and is classified as Level 2 within the fair value hierarchy. At December 31, 2019, the estimated fair value of long-term debt was $263.3 million compared to a carrying amount of $255.0 million. At December 31, 2018, the estimated fair value of long-term debt was $192.6 million and the carrying amount was $196.0 million.

Note 13: Accumulated Other Comprehensive Loss

The following table presents the changes in the components of accumulated other comprehensive loss, net of tax:

($ in millions)	(Losses) gains on derivatives	Unrealized gains on investment securities	Defined benefit pension and other postretirement plans	Foreign currency translation	Total
Balance, December 31, 2017	$ (4.2)	$ 0.5	$ (39.0)	$ (74.6)	$ (117.3)
Other comprehensive income (loss) before reclassifications	2.6	(0.1)	(1.0)	(39.2)	(37.7)
Amounts reclassified out	1.2	—	(0.4)	—	0.8
Other comprehensive income (loss), net of tax	3.8	(0.1)	(1.4)	(39.2)	(36.9)
Balance, December 31, 2018	(0.4)	0.4	(40.4)	(113.8)	(154.2)
Other comprehensive income (loss) before reclassifications	5.4	—	(1.9)	4.9	8.4
Amounts reclassified out	(5.8)	—	2.0	—	(3.8)
Other comprehensive (loss) income, net of tax	(0.4)	—	0.1	4.9	4.6
Balance, December 31, 2019	$ (0.8)	$ 0.4	$ (40.3)	$ (108.9)	$ (149.6)

A summary of the reclassifications out of accumulated other comprehensive loss is presented in the following table ($ in millions):

Detail of components	2019	2018	Location on Statement of Income
Gains (losses) on derivatives:			
Foreign currency contracts	$ 1.0	$ (0.7)	Net sales
Foreign currency contracts	1.0	(0.5)	Cost of goods and services sold
Foreign currency contracts	6.9	—	Other expense
Forward treasury locks	(0.5)	(0.4)	Interest expense
Total before tax	8.4	(1.6)	
Tax expense	(2.6)	0.4	
Net of tax	$ 5.8	$ (1.2)	
Amortization of defined benefit pension and other postretirement plans:			
Prior service credit	0.6	2.0	(a)
Actuarial gains (losses)	0.2	(1.4)	(a)
Settlements	(3.5)	—	(a)
Total before tax	(2.7)	0.6	
Tax expense	0.7	(0.2)	
Net of tax	$ (2.0)	$ 0.4	
Total reclassifications for the period, net of tax	$ 3.8	$ (0.8)	

(a) These components are included in the computation of net periodic benefit cost. Please refer to Note 15, *Benefit Plans*, for additional details.

Note 14: Stock-Based Compensation

The West Pharmaceutical Services, Inc. 2016 Omnibus Incentive Compensation Plan (the "2016 Plan") provides for the granting of stock options, stock appreciation rights, restricted stock awards and performance awards to employees and non-employee directors. A committee of the Board of Directors determines the terms and conditions of awards to be granted. Vesting requirements vary by award. At December 31, 2019, there were 3,119,314 shares remaining in the 2016 Plan for future grants.

Stock options and stock appreciation rights reduce the number of shares available by one share for each award granted. All other awards under the 2016 Plan will reduce the total number of shares available for grant by an amount equal to 2.5 times the number of shares awarded. If awards made under previous plans would entitle a plan participant to an amount of West stock in excess of the target amount, the additional shares (up to a maximum threshold amount) will be distributed under the 2016 Plan.

The following table summarizes our stock-based compensation expense recorded within selling, general and administrative expenses for the years ended December 31:

($ in millions)	2019	2018	2017
Stock option and appreciation rights	$ 9.1	$ 8.6	$ 7.8
Performance share units, stock-settled	9.5	2.5	4.1
Performance share units, cash-settled	0.1	—	0.1
Performance share units, dividend equivalents	0.2	0.1	0.1
Employee stock purchase plan	0.9	0.9	0.8
Deferred compensation plans and restricted share awards	4.6	3.0	3.2
Total stock-based compensation expense	$ 24.4	$ 15.1	$ 16.1

The amount of unrecognized compensation expense for all non-vested awards as of December 31, 2019 was approximately $21.2 million, which is expected to be recognized over a weighted average period of 1.6 years.

Stock Options

Stock options granted to employees vest in equal increments. All awards expire 10 years from the date of grant. Upon the exercise of stock options, shares are issued in exchange for the exercise price of the options.

The following table summarizes changes in outstanding options:

(in millions, except per share data)	2019	2018	2017
Options outstanding, January 1	3.0	3.5	4.5
Granted	0.3	0.5	0.5
Exercised	(0.6)	(1.0)	(1.5)
Forfeited	—	—	—
Options outstanding, December 31	2.7	3.0	3.5
Options exercisable, December 31	1.6	1.7	1.9

Weighted Average Exercise Price	2019	2018	2017
Options outstanding, January 1	$ 58.93	$ 48.76	$ 38.11
Granted	103.40	90.36	84.09
Exercised	46.42	35.95	26.15
Forfeited	92.71	75.32	60.92
Options outstanding, December 31	$ 67.02	$ 58.93	$ 48.76
Options exercisable, December 31	$ 53.12	$ 45.32	$ 35.44

As of December 31, 2019, the weighted average remaining contractual life of options outstanding and of options exercisable was 6.1 years and 5.0 years, respectively.

As of December 31, 2019, the aggregate intrinsic value of total options outstanding was $227.8 million, of which $158.6 million represented vested options.

The fair value of the options was estimated on the date of grant using a Black-Scholes option valuation model that used the following weighted average assumptions in 2019, 2018 and 2017: a risk-free interest rate of 2.3%, 2.7%, and 2.0%, respectively; stock volatility of 22.5%, 19.8%, and 19.9%, respectively; and dividend yields of 0.7%, 0.7%, and 0.7%, respectively. Stock volatility is estimated based on historical data and the impact from expected

future trends. Expected lives, which are based on prior experience, averaged 6 years for 2019, 2018 and 2017. The weighted average grant date fair value of options granted in 2019, 2018 and 2017 was $24.72, $20.16 and $18.08, respectively. Stock option expense is recognized over the vesting period, net of forfeitures.

For the years ended December 31, 2019, 2018 and 2017, the intrinsic value of options exercised was $46.9 million, $61.3 million and $91.7 million, respectively. The grant date fair value of options vested during those same periods was $7.5 million, $8.3 million and $6.7 million, respectively.

Stock Appreciation Rights

Stock appreciation rights ("SARs") granted to eligible international employees vest in equal annual increments over 4 years of continuous service. All awards expire 10 years from the date of grant. The fair value of each cash-settled SAR is adjusted at the end of each reporting period, with the resulting change reflected in expense. As of December 31, 2019, SARs outstanding were 35,993, of which 23,833 were cash-settled and 12,160 were stock-settled. Upon exercise of a cash-settled SAR, the employee receives cash for the difference between the grant date price and the fair market value of the Company's stock on the date of exercise. As a result of the cash settlement feature, cash-settled SARs are recorded within other long-term liabilities. Upon exercise of a stock-settled SAR, shares are issued in exchange for the exercise price of the stock-settled SAR. As a result of the stock settlement feature, stock-settled SARs are recorded within equity.

The following table summarizes changes in outstanding SARs:

	2019	2018	2017
SARs outstanding, January 1	39,819	51,368	116,087
Granted	3,364	3,480	2,792
Exercised	(6,790)	(14,629)	(67,511)
Forfeited	(400)	(400)	—
SARs outstanding, December 31	35,993	39,819	51,368
SARs exercisable, December 31	27,781	30,285	39,769

Weighted Average Exercise Price	2019	2018	2017
SARs outstanding, January 1	$ 46.48	$ 38.55	$ 31.13
Granted	102.51	89.64	83.47
Exercised	42.08	28.45	27.65
Forfeited	63.43	63.43	—
SARs outstanding, December 31	$ 52.36	$ 46.48	$ 38.55
SARs exercisable, December 31	$ 40.73	$ 36.91	$ 30.77

Performance Awards

In addition to stock options and SAR awards, we grant performance share unit ("PSU") awards to eligible employees. These awards are earned based on the Company's performance against pre-established targets, including annual growth rate of revenue and return on invested capital, over a specified performance period. Depending on the achievement of the targets, recipients of stock-settled PSU awards are entitled to receive a certain number of shares of common stock, whereas recipients of cash-settled PSU awards are entitled to receive a payment in cash per unit based on the fair market value of a share of our common stock at the end of the performance period.

The following table summarizes changes in our outstanding stock-settled PSU awards:

	2019	2018	2017
Non-vested stock-settled PSU awards, January 1	296,037	341,944	378,062
Granted at target level	84,309	102,307	92,045
Adjustments above/(below) target	(50,556)	(2,284)	(11,369)
Vested and converted	(48,964)	(121,984)	(116,684)
Forfeited	(16,204)	(23,946)	(110)
Non-vested stock-settled PSU awards, December 31	264,622	296,037	341,944

Weighted Average Grant Date Fair Value	2019	2018	2017
Non-vested stock-settled PSU awards, January 1	$ 76.84	$ 64.38	$ 54.47
Granted at target level	103.40	90.45	84.01
Adjustments above/(below) target	83.89	33.86	42.85
Vested and converted	102.51	93.00	50.06
Forfeited	69.09	68.65	73.64
Non-vested stock-settled PSU awards, December 31	$ 66.03	$ 76.84	$ 64.38

Shares earned under PSU awards may vary from 0% to 200% of an employee's targeted award. The fair value of stock-settled PSU awards is based on the market price of our stock at the grant date and is recognized as expense over the performance period, adjusted for estimated target outcomes and net of forfeitures. The weighted average grant date fair value of stock-settled PSU awards granted during the years 2019, 2018 and 2017 was $103.40, $90.45 and $84.01, respectively. Including forfeiture and below-target achievement expectations, we expect that the stock-settled PSU awards will convert to 84,670 shares to be issued over an average remaining term of one year.

The fair value of cash-settled PSU awards is also based on the market price of our stock at the grant date. These awards are revalued at the end of each quarter based on changes in our stock price. As a result of the cash settlement feature, cash-settled PSU awards are recorded within other long-term liabilities.

The following table summarizes changes in our outstanding cash-settled PSU awards:

	2019	2018	2017
Non-vested cash-settled PSU awards, January 1	1,592	1,972	2,451
Granted at target level	806	560	598
Adjustments above/(below) target	(206)	(30)	(107)
Vested and converted	(211)	(910)	(970)
Forfeited	—	—	—
Non-vested cash-settled PSU awards, December 31	1,981	1,592	1,972

Weighted Average Grant Date Fair Value	2019	2018	2017
Non-vested cash-settled PSU awards, January 1	$ 79.48	$ 92.25	$ 25.28
Granted at target level	102.51	89.64	83.47
Adjustments above/(below) target	56.95	41.53	66.61
Vested and converted	102.51	93.00	86.93
Forfeited	—	—	—
Non-vested cash-settled PSU awards, December 31	$ 150.33	$ 79.48	$ 92.25

Employee Stock Purchase Plan

We also offer an Employee Stock Purchase Plan ("ESPP"), which provides for the sale of our common stock to eligible employees at 85% of the current market price on the last trading day of each quarterly offering period. Payroll deductions are limited to 25% of the employee's base salary, not to exceed $25,000 in any one calendar year. In addition, employees may not buy more than 2,000 shares during any offering period (8,000 shares per year). Purchases under the ESPP were 51,391 shares, 55,669 shares and 56,218 shares for the years 2019, 2018 and 2017, respectively. At December 31, 2019, there were approximately 3.8 million shares available for issuance under the ESPP.

Deferred Compensation Plans and Restricted Share Awards

Our deferred compensation plans include a Non-Qualified Deferred Compensation Plan for Non-Employee Directors, under which non-employee directors may defer all or part of their annual cash retainers. The deferred fees may be credited to a stock-equivalent account. Amounts credited to this account are converted into deferred stock units based on the fair market value of one share of our common stock on the last day of the quarter. For deferred stock units ultimately paid in cash, a liability is calculated at an amount determined by multiplying the number of units by the fair market value of our common stock at the end of each reporting period. In addition, deferred stock awards are granted on the date of our annual meeting, and are distributed in shares of common stock. In 2019, we granted 14,579 deferred stock awards, with a grant date fair value of $121.40. Similarly, a non-qualified deferred compensation plan for eligible employees provides for the conversion of compensation into deferred stock units. As of December 31, 2019, the two deferred compensation plans held a total of 366,159 deferred stock units, including 6,274 units to be paid in cash.

In addition, during 2019, we granted 13,308 restricted share awards at a weighted grant-date fair value of $116.39 per share to employees under the 2016 Plan. During 2018, we granted 15,942 restricted share awards at a weighted grant-date fair value of $96.77 per share to employees under the 2016 Plan. There were no grants of restricted share awards in 2017. The fair value of these awards is based on the market price of our stock at the grant date and is recognized as expense over the vesting period.

Annual Incentive Plan

Under our annual incentive plan, participants are paid bonuses on the attainment of certain financial goals, which they can elect to receive in either cash or shares of our common stock. If the employee elects payment in shares, they are also given a restricted incentive stock award equal to one share for each four bonus shares issued. The incentive stock awards vest at the end of four years provided that the participant has not made a disqualifying disposition of their bonus shares. Incentive stock award grants were 1,300 shares, 1,500 shares and 1,800 shares in 2019, 2018 and 2017, respectively. There were no incentive stock forfeitures in 2019. Incentive stock forfeitures of 200 shares and 800 shares occurred in 2018 and 2017, respectively. Compensation expense is recognized over the vesting period based on the fair market value of common stock on the award date: $106.14 per share granted in 2019, $93.00 per share granted in 2018 and $86.93 per share granted in 2017.

Note 15: Benefit Plans

Certain of our U.S. and international subsidiaries sponsor defined benefit pension plans. In addition, we provide minimal death benefits for certain U.S. retirees and pay a portion of healthcare costs for retired U.S. salaried employees and their dependents. Benefits for participants are coordinated with Medicare when possible. We also sponsor a defined contribution plan for certain salaried and hourly U.S. employees. Our 401(k) plan contributions were $15.6 million for 2019, $6.5 million for 2018 and $5.7 million for 2017. The increase in 401(k) plan contributions in 2019 was in response to the cessation of our U.S. qualified and non-qualified defined benefit pension plans as of January 1, 2019 (except for interest crediting).

Pension and Other Retirement Benefits

The components of net periodic benefit cost and other amounts recognized in OCI were as follows:

	Pension benefits			Other retirement benefits		
($ in millions)	2019	2018	2017	2019	2018	2017
Net periodic benefit cost:						
Service cost	$ 1.4	$ 10.8	$ 10.4	$ —	$ —	$ —
Interest cost	9.2	9.4	9.8	0.2	0.2	0.3
Expected return on assets	(12.0)	(15.7)	(13.5)	—	—	—
Amortization of prior service credit	0.1	(1.3)	(1.3)	(0.7)	(0.7)	(0.7)
Amortization of actuarial loss (gain)	2.1	3.8	4.9	(2.3)	(2.4)	(2.6)
Settlement effects	3.5	—	—	—	—	—
Net periodic benefit cost	$ 4.3	$ 7.0	$ 10.3	$ (2.8)	$ (2.9)	$ (3.0)
Other changes in plan assets and benefit obligations recognized in OCI, pre-tax:						
Net loss (gain) arising during period	$ 1.5	$ 3.5	$ (9.0)	$ 0.1	$ (1.4)	$ (1.1)
Prior service credit arising during period	—	0.3	—	—	—	—
Amortization of prior service credit	(0.1)	1.3	1.3	0.7	0.7	0.7
Amortization of actuarial (loss) gain	(2.1)	(3.8)	(4.9)	2.3	2.4	2.6
Settlement effects	(3.5)	—	—	—	—	—
Foreign currency translation	0.6	(1.2)	2.6	—	—	—
Total recognized in OCI	$ (3.6)	$ 0.1	$ (10.0)	$ 3.1	$ 1.7	$ 2.2
Total recognized in net periodic benefit cost and OCI	$ 0.7	$ 7.1	$ 0.3	$ 0.3	$ (1.2)	$ (0.8)

Net periodic benefit cost by geographic location is as follows:

	Pension benefits			Other retirement benefits		
($ in millions)	2019	2018	2017	2019	2018	2017
U.S. plans	$ 2.4	$ 4.8	$ 7.3	$ (2.8)	$ (2.9)	$ (3.0)
International plans	1.9	2.2	3.0	—	—	—
Net periodic benefit cost	$ 4.3	$ 7.0	$ 10.3	$ (2.8)	$ (2.9)	$ (3.0)

During 2019, we recorded a $3.5 million pension settlement charge within other nonoperating expense (income), as we determined that normal-course lump-sum payments for each of our U.S. qualified and non-qualified defined benefit pension plans exceeded the threshold for settlement accounting under U.S. GAAP for the year. Effective January 1, 2019, except for interest crediting, benefit accruals under these defined benefit pension plans ceased.

During 2019, we contributed $2.6 million to our U.S. qualified defined benefit pension plan.

The following table presents the changes in the benefit obligation and the fair value of plan assets, as well as the funded status of the plans:

	Pension benefits		Other retirement benefits	
($ in millions)	2019	2018	2019	2018
Change in benefit obligation:				
Benefit obligation, January 1	$ (267.0)	$ (288.0)	$ (6.0)	$ (7.1)
Service cost	(1.4)	(10.8)	—	—
Interest cost	(9.2)	(9.4)	(0.2)	(0.2)
Participants' contributions	(0.3)	(0.6)	(0.7)	(0.6)
Actuarial (loss) gain	(30.8)	20.4	(0.2)	1.4
Amendments/transfers in	—	(0.3)	—	—
Benefits/expenses paid	6.8	18.0	0.5	0.5
Settlement effects	15.0	—	—	—
Foreign currency translation	(1.0)	3.7	—	—
Benefit obligation, December 31	$ (287.9)	$ (267.0)	$ (6.6)	$ (6.0)
Change in plan assets:				
Fair value of assets, January 1	$ 214.5	$ 239.5	$ —	$ —
Actual return on assets	41.3	(8.3)	—	—
Employer contribution	8.0	2.7	(0.2)	(0.1)
Participants' contributions	0.3	0.6	0.7	0.6
Benefits/expenses paid	(6.3)	(18.0)	(0.5)	(0.5)
Settlement effects	(15.0)	—	—	—
Foreign currency translation	1.3	(2.0)	—	—
Fair value of assets, December 31	$ 244.1	$ 214.5	$ —	$ —
Funded status at end of year	$ (43.8)	$ (52.5)	$ (6.6)	$ (6.0)

International pension plan assets, at fair value, included in the preceding table were $39.4 million and $33.4 million at December 31, 2019 and 2018, respectively.

Amounts recognized in the balance sheet were as follows:

	Pension benefits		Other retirement benefits	
($ in millions)	2019	2018	2019	2018
Noncurrent assets	$ 4.3	$ —	$ —	$ —
Current liabilities	(1.5)	(1.6)	(0.7)	(0.7)
Noncurrent liabilities	(46.6)	(50.9)	(5.9)	(5.3)
	$ (43.8)	$ (52.5)	$ (6.6)	$ (6.0)

The amounts in accumulated other comprehensive loss, pre-tax, consisted of:

	Pension benefits		Other retirement benefits	
($ in millions)	2019	2018	2019	2018
Net actuarial loss (gain)	$ 69.4	$ 73.0	$ (7.0)	$ (9.4)
Prior service cost (credit)	0.8	0.9	(1.0)	(1.7)
Total	$ 70.2	$ 73.9	$ (8.0)	$ (11.1)

The net actuarial loss and prior service credit for the defined benefit pension plans that will be amortized from accumulated other comprehensive loss into net periodic benefit cost over the next fiscal year are $1.8 million and $0.1 million, respectively. The net actuarial gain and prior service credit for the other retirement benefits plan that will be amortized from accumulated other comprehensive loss into net periodic benefit cost over the next fiscal year is $1.6 million and $0.7 million.

The accumulated benefit obligation for all defined benefit pension plans was $283.9 million and $263.0 million at December 31, 2019 and 2018, respectively, including $73.9 million and $64.0 million, respectively, for international pension plans.

As of December 31, 2019, our U.S. qualified defined benefit pension plan had plan assets in excess of its obligations. As of December 31, 2019, our other defined benefit pension plans had projected benefit obligations and accumulated benefit obligations in excess of plan assets.

All of the defined benefit pension plans had projected benefit obligations and accumulated benefit obligations in excess of plan assets as of December 31, 2018.

Benefit payments expected to be paid under our defined benefit pension and other retirement benefit plans in the next ten years are as follows:

($ in millions)	Domestic	International	Total
2020	$ 21.0	$ 1.3	$ 22.3
2021	13.5	1.3	14.8
2022	15.0	2.0	17.0
2023	13.7	1.5	15.2
2024	13.5	1.9	15.4
2025 to 2029	60.5	13.3	73.8
	$ 137.2	$ 21.3	$ 158.5

In 2020, we expect to contribute $0.7 million to pension plans, none of which is for international plans. In addition, we expect to contribute $0.7 million for other retirement benefits in 2020. We periodically consider additional, voluntary contributions depending on the investment returns generated by pension plan assets, changes in benefit obligation projections and other factors.

Weighted average assumptions used to determine net periodic benefit cost were as follows:

	Pension benefits			Other retirement benefits		
	2019	2018	2017	2019	2018	2017
Discount rate	2.70%	2.91%	3.48%	4.20%	3.45%	3.90%
Rate of compensation increase	2.41%	4.00%	4.01%	—	—	—
Long-term rate of return on assets	5.54%	6.71%	6.47%	—	—	—

Weighted average assumptions used to determine the benefit obligations were as follows:

	Pension benefits		Other retirement benefits	
	2019	2018	2019	2018
Discount rate	2.79%	3.76%	3.20%	4.20%
Rate of compensation increase	2.49%	4.01%	—	—

The discount rate used to determine the benefit obligations for U.S. pension plans was 3.35% and 4.30% as of December 31, 2019 and 2018, respectively. The weighted average discount rate used to determine the benefit obligations for all international plans was 1.28% and 2.19% as of December 31, 2019 and 2018, respectively. The rate of compensation increase for U.S. plans was 4.25% for 2018, while the weighted average rate for all international plans was 2.49% for 2019 and 2.60% for 2018. Other retirement benefits were only available to U.S. employees. The expected long-term rate of return for U.S. plans, which accounts for 83.86% of global plan assets, was 5.60% for 2019, 7.00% for 2018 and 7.00% for 2017.

The assumed healthcare cost trend rate used to determine benefit obligations was 6.25% for all participants in 2019, decreasing to 5.00% by 2024. A change in the assumed healthcare cost trend rate by one percentage point would have an immaterial impact in the postretirement obligation. The assumed healthcare cost trend rate used to determine net periodic benefit cost was 6.25% for all participants in 2019, decreasing to 5.00% by 2024. The effect of a one percentage point increase or decrease in the rate would have an immaterial impact in the aggregate service and interest cost components.

The weighted average asset allocations by asset category for our pension plans, at December 31, were as follows:

	2019	2018
Equity securities	33%	23%
Debt securities	65%	74%
Other	2%	3%
	100%	100%

Our U.S. pension plan is managed as a balanced portfolio comprised of two components: equity and fixed income debt securities. Equity investments are used to maximize the long-term real growth of fund assets, while fixed income investments are used to generate current income, provide for a more stable periodic return and provide some protection against a prolonged decline in the market value of equity investments. Temporary funds may be held as cash. We maintain a long-term strategic asset allocation policy which provides guidelines for ensuring that the fund's investments are managed with the short-term and long-term financial goals of the fund, while allowing the flexibility to react to unexpected changes in capital markets.

Diversification across and within asset classes is the primary means by which we mitigate risk. We maintain guidelines for all asset and sub-asset categories in order to avoid excessive investment concentrations. Fund assets are monitored on a regular basis. If at any time the fund asset allocation is not within the acceptable allocation range, funds will be reallocated. We also review the fund on a regular basis to ensure that the investment returns received are consistent with the short-term and long-term goals of the fund and with comparable market returns. We are prohibited from pledging fund securities and from investing pension fund assets in our own stock, securities on margin or derivative securities.

During the three months ended December 31, 2018, in anticipation of benefit accruals under our U.S. qualified and non-qualified defined benefit pension plans ceasing effective January 1, 2019, except for interest crediting, we changed the U.S. target asset allocations from 65% equity securities and 35% debt securities to 30% equity securities and 70% debt securities.

The following are the U.S. target asset allocations and acceptable allocation ranges:

	Target allocation	Allocation range
Equity securities	30%	27% - 33%
Debt securities	70%	67% - 73%
Other	—%	0% - 3%

The following tables present the fair value of our pension plan assets, utilizing the fair value hierarchy discussed in Note 12, *Fair Value Measurements*. In accordance with U.S. GAAP, certain pension plan assets measured at net asset value ("NAV") have not been classified in the fair value hierarchy.

	Balance at December 31,	Basis of Fair Value Measurements		
($ in millions)	2019	Level 1	Level 2	Level 3
Cash	$ 2.2	$ 2.2	$ —	$ —
Equity securities:				
International mutual funds	15.5	1.3	14.2	—
Fixed income securities:				
Mutual funds	21.7	3.8	17.9	—
Pension plan assets in the fair value hierarchy	$ 39.4	$ 7.3	$ 32.1	$ —
Pension plan assets measured at NAV	204.7			
Pension plan assets at fair value	$ 244.1			

	Balance at December 31,	Basis of Fair Value Measurements		
($ in millions)	2018	Level 1	Level 2	Level 3
Cash	$ 1.7	$ 1.7	$ —	$ —
Equity securities:				
International mutual funds	17.7	17.7	—	—
Fixed income securities:				
Mutual funds	13.9	13.9	—	—
Pension plan assets in the fair value hierarchy	$ 33.3	$ 33.3	$ —	$ —
Pension plan assets measured at NAV	181.2			
Pension plan assets at fair value	$ 214.5			

Note 16: Other (Income) Expense

Other (income) expense consisted of:

($ in millions)	2019	2018	2017
Restructuring and related charges:			
Severance and post-employment benefits	$ 2.6	$ 3.1	$ —
Asset-related charges	0.3	2.2	—
Other charges	2.0	3.8	—
Total restructuring and related charges	$ 4.9	$ 9.1	$ —
Argentina currency devaluation	1.0	1.1	—
Tax recovery	(4.7)	—	—
Venezuela deconsolidation	—	—	11.1
Development and licensing income	(0.9)	(0.9)	(10.6)
Contingent consideration	2.1	(2.6)	(2.4)
Other items	(4.9)	(4.8)	3.9
Total other (income) expense	$ (2.5)	$ 1.9	$ 2.0

Restructuring and Related Charges

In February 2018, our Board of Directors approved a restructuring plan designed to realign our manufacturing capacity with demand. These changes were expected to be implemented over a period of up to twenty-four months from the date of the approval. The plan was expected to require restructuring and related charges of approximately $16.0 million. Since its approval, we recorded $13.7 million in restructuring and related charges associated with this plan. The plan is now considered complete.

During 2019, we recorded $4.9 million in restructuring and related charges associated with this plan, consisting of $2.6 million for severance charges, $0.3 million for non-cash asset write-downs associated with the discontinued use of certain equipment, and $2.0 million for other non-cash charges.

During 2018, we recorded $8.8 million in restructuring and related charges associated with this plan, consisting of $3.1 million for severance charges, $2.2 million for non-cash asset write-downs associated with the discontinued use of certain equipment, and $3.5 million for other non-cash charges.

The following table presents activity related to our restructuring obligations related to our 2018 restructuring plan:

($ in millions)	Severance and benefits	Asset-related charges	Other charges	Total
Balance, December 31, 2017	$ —	$ —	$ —	$ —
Charges	3.1	2.2	3.5	8.8
Cash payments	(0.8)	—	—	(0.8)
Non-cash asset write-downs	—	(2.2)	(3.5)	(5.7)
Balance, December 31, 2018	$ 2.3	$ —	$ —	$ 2.3
Charges	2.6	0.3	2.0	4.9
Cash payments	(3.5)	—	—	(3.5)
Non-cash asset write-downs	—	(0.3)	(2.0)	(2.3)
Balance, December 31, 2019	$ 1.4	$ —	$ —	$ 1.4

On February 15, 2016, our Board of Directors approved a restructuring plan designed to repurpose several of our production facilities in support of growing high-value proprietary products and to realign operational and commercial activities to meet the needs of our new market-focused commercial organization. During 2018, we recorded $0.3 million in additional charges related to this restructuring plan. Our remaining restructuring obligations related to our 2016 restructuring plan as of December 31, 2019 were $0.1 million.

Other Items

During 2019, we recorded a charge of $1.0 million as a result of the continued devaluation of Argentina's currency. During 2018, we recorded a charge of $1.1 million related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018.

During 2019, we recognized a tax recovery of $4.7 million related to previously-paid international excise taxes, following a favorable court ruling.

On February 17, 2016, the Venezuelan government announced a devaluation of the Bolivar, from the previously-prevailing official exchange rate of 6.3 Bolivars to USD to 10.0 Bolivars to USD, and streamlined the previous three-tiered currency exchange mechanism into a dual currency exchange mechanism. In 2017, as a result of the continued deterioration of conditions in Venezuela as well as our continued reduced access to USD settlement controlled by the Venezuelan government, we recorded a charge of $11.1 million related to the deconsolidation of our Venezuelan subsidiary, following our determination that we no longer met the U.S. GAAP criteria for control of that subsidiary. This charge included the derecognition of the carrying amounts of our Venezuelan subsidiary's assets and liabilities, as well as the write-off of our investment in our Venezuelan subsidiary, related unrealized translation adjustments and the elimination of intercompany accounts. As of April 1, 2017, our consolidated financial statements exclude the results of our Venezuelan subsidiary.

During 2019, 2018 and 2017, we recorded development income of $0.9 million, $0.9 million and $1.5 million, respectively, related to a nonrefundable customer payment of $20.0 million received in June 2013 in return for the exclusive use of the SmartDose technology platform within a specific therapeutic area. Please refer to Note 3, *Revenue*, for additional information. In addition, during 2017, we recorded income of $9.1 million attributable to the reimbursement of certain costs related to a technology that we subsequently licensed to a third party. The license of technology to the third party may result in additional income in the future, contingent on commercialization of the related product.

Contingent consideration represents changes in the fair value of the SmartDose contingent consideration. Please refer to Note 12, *Fair Value Measurements*, for additional details.

Other items consist of foreign exchange transaction gains and losses, gains and losses on the sale of fixed assets, and miscellaneous income and charges. Other items primarily changed in 2019 as a result of foreign exchange transaction gains of $5.6 million in 2019 and a $1.9 million gain on the sale of fixed assets as a result of our restructuring plan, as compared to foreign exchange transaction gains of $5.5 million in 2018 and a $1.1 million gain on the sale of fixed assets as a result of our restructuring plans.

Note 17: Income Taxes

As a global organization, we and our subsidiaries file income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. During 2019, the statute of limitations for the 2015 U.S. federal tax year lapsed, leaving tax years 2016 through 2019 open to examination. For U.S. state and local jurisdictions, tax years 2015 through 2019 are open to examination. We are also subject to examination in various foreign jurisdictions for tax years 2012 through 2019.

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

($ in millions)	2019	2018
Balance at January 1	$ 3.9	$ 3.2
Increase due to current year position	1.6	0.8
Increase due to prior year position	—	0.4
Reduction for expiration of statute of limitations/audits	(0.5)	(0.5)
Balance at December 31	$ 5.0	$ 3.9

In addition, we had balances in accrued liabilities for interest and penalties of $0.2 million at both December 31, 2019 and 2018. As of December 31, 2019, we had $5.0 million of total gross unrecognized tax benefits, which, if recognized, would favorably impact the effective income tax rate. It is reasonably possible that, due to the expiration of statutes and the closing of tax audits, the amount of gross unrecognized tax benefits may be reduced by approximately $0.5 million during the next twelve months, which would favorably impact our effective tax rate.

The components of income before income taxes are:

($ in millions)	2019	2018	2017
U.S. operations	$ 161.2	$ 132.9	$ 96.5
International operations	130.6	107.8	125.9
Total income before income taxes	$ 291.8	$ 240.7	$ 222.4

The related provision for income taxes consists of:

($ in millions)	2019	2018	2017
Current:			
Federal	$ 10.8	$ 2.1	$ 2.1
State	2.4	3.3	0.1
International	30.5	35.1	37.0
Current income tax provision	43.7	40.5	39.2
Deferred:			
Federal and state	10.3	1.4	41.8
International	5.0	(0.5)	(0.1)
Deferred income tax provision	15.3	0.9	41.7
Income tax expense	$ 59.0	$ 41.4	$ 80.9

Deferred income taxes result from temporary differences between the amount of assets and liabilities recognized for financial reporting and tax purposes.

The significant components of our deferred tax assets and liabilities at December 31 are:

($ in millions)	2019	2018
Deferred tax assets		
Net operating loss carryforwards	$ 21.9	$ 18.4
Tax credit carryforwards	2.8	10.5
Pension and deferred compensation	25.6	27.2
Other	9.2	11.4
Valuation allowance	(15.9)	(16.0)
Total deferred tax assets	43.6	51.5
Deferred tax liabilities:		
Accelerated depreciation	37.9	31.3
Tax on undistributed earnings of subsidiaries	6.3	6.6
Other	0.9	2.0
Total deferred tax liabilities	45.1	39.9
Net deferred tax (liability) asset	$ (1.5)	$ 11.6

A reconciliation of the U.S. federal corporate tax rate to our effective consolidated tax rate on income before income taxes follows:

	2019	2018	2017
U.S. federal corporate tax rate	21.0%	21.0%	35.0%
Tax on international operations other than U.S. tax rate	2.7	4.8	(4.5)
Reversal of prior valuation allowance	—	—	(0.5)
Adjustments to reserves for unrecognized tax benefits	0.4	0.2	(0.2)
U.S. tax on international earnings, net of foreign tax credits	0.4	(0.2)	0.1
State income taxes, net of federal tax effect	1.4	2.3	0.2
U.S. research and development credits	(1.0)	(0.9)	(0.8)
Excess tax benefits on share-based payments	(3.5)	(6.0)	(14.1)
Impact of 2017 Tax Act	—	(2.9)	15.9
Tax on undistributed earnings of subsidiaries	(0.2)	(1.3)	4.4
Venezuela deconsolidation	—	—	1.7
Other business credits and Section 199 Deduction	—	—	(0.6)
Other	(1.0)	0.2	(0.2)
Effective tax rate	20.2%	17.2%	36.4%

During 2019, we recorded a tax benefit of $0.3 million due to the impact of federal law changes enacted during the year, as well as a tax benefit of $10.3 million associated with stock-based compensation.

During 2018, we recorded a net tax benefit of $2.5 million for the estimated impact of the 2017 Tax Act and a tax benefit of $14.3 million associated with stock-based compensation.

During 2017, we recorded a discrete tax charge of $48.8 million related to the 2017 Tax Act and the impact of changes in enacted international tax rates on previously-recorded deferred tax asset and liability balances, as well as a tax benefit of $33.1 million associated with stock-based compensation.

The 2017 Tax Act, which was signed into law on December 22, 2017, has resulted in significant changes to the U.S. corporate income tax system. These changes include, but are not limited to, a federal statutory rate reduction from 35.0% to 21.0% effective for tax years beginning after December 31, 2017. Changes in tax rates and tax laws are accounted for in the period of enactment. As a result, during the year ended December 31, 2017, we recorded a discrete charge based upon our understanding of the 2017 Tax Act and the guidance available as of the date of that filing. A significant portion of the discrete tax liability was attributable to a one-time mandatory deemed repatriation tax of post-1986 undistributed foreign subsidiary earnings and profits (the "Transition Toll Tax") of $27.9 million. Additionally, due to the reduction of the federal statutory rate, we revalued our deferred assets and liabilities and recorded a provisional $11.4 million federal tax expense, net of state tax impact, during the year ended December 31, 2017.

On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the 2017 Tax Act. We recognized the provisional tax impacts related to deemed repatriated earnings and the revaluation of deferred tax assets and liabilities and included these amounts in our consolidated financial statements for the year ended December 31, 2017. As of December 31, 2018, we finalized our calculations and tax positions used in our analysis of the impact of the 2017 Tax Act in consideration of proposed regulations and other guidance issued during 2018. As a result, we recorded a $7.5 million tax benefit related to a reduction of the Transition Toll Tax and an incremental tax expense of $4.0 million related to other adjustments. The final measurement reduced the Transition Toll Tax expense to $20.4 million from $27.9 million. The net impact of these adjustments resulted in a benefit of 1.45% to the 2018 effective tax rate.

The 2017 Tax Act created a provision known as global intangible low-tax income ("GILTI") that imposes a U.S. tax on certain earnings of controlled foreign subsidiaries. We made an accounting policy election to reflect GILTI taxes, if any, as a current income tax expense in the period incurred.

As of December 31, 2019, we have fully utilized all of our U.S. federal net operating loss carryforwards. State operating loss carryforwards of $226.9 million created a deferred tax asset of $15.5 million, while foreign operating loss carryforwards of $49.4 million created a deferred tax asset of $6.4 million. Management estimates that certain state and foreign operating loss carryforwards are unlikely to be utilized and the associated deferred tax assets have been fully reserved. State loss carryforwards expire as follows: $15.4 million in 2020 and $211.5 million thereafter. Foreign loss carryforwards will begin to expire in 2027, while $48.7 million of the total $49.4 million will not expire.

As of December 31, 2019, we have utilized all available foreign tax credit carryforwards against the Transition Toll Tax. During 2019, we utilized all of our remaining U.S. federal research and development credit carryforwards. The $2.0 million of state research and development credits expire as follows: $0.5 million expire in 2023, $0.5 million expire in 2024, and $1.0 million expire after 2024.

In response to the 2017 Tax Act, we reevaluated our position regarding permanent reinvestment of foreign subsidiary earnings and profits through 2017 (with the exception of China and Mexico) and decided that those profits were no longer permanently reinvested. As of January 1, 2018, we reasserted indefinite reinvestment related to all post-2017 unremitted earnings in all of our foreign subsidiaries. In general, it is our practice and intention to permanently reinvest the earnings of our foreign subsidiaries and repatriate earnings only when the tax impact is de minimis, and that position has not changed subsequent to the one-time transition tax under the 2017 Tax Act, except as noted above. Accordingly, no deferred taxes have been provided for withholding taxes or other taxes that would result upon repatriation of approximately $214.2 million of undistributed earnings from foreign subsidiaries to the U.S., as those earnings continue to be permanently reinvested. Further, it is impracticable for us to estimate any future tax costs for any unrecognized deferred tax liabilities associated with our indefinite reinvestment assertion, because the actual tax liability, if any, would be dependent on complex analysis and calculations considering various tax laws, exchange rates, circumstances existing when there is a repatriation, sale or liquidation, or other factors.

Note 18: Commitments and Contingencies

At December 31, 2019, we were obligated under various operating lease agreements. Please refer to Note 6, *Leases*, for additional details.

At December 31, 2019, we were obligated under various defined benefit pension plans in the U.S. and other countries that cover employees who meet eligibility requirements. Please refer to Note 15, *Benefit Plans*, for additional details.

At December 31, 2019, our outstanding unconditional contractual commitments, including for the purchase of raw materials and finished goods, amounted to $249.1 million, of which $61.3 million is due to be paid in 2020.

We have letters of credit totaling $2.5 million supporting the reimbursement of workers' compensation and other claims paid on our behalf by insurance carriers. Our accrual for insurance obligations was $3.2 million at December 31, 2019, of which $0.9 million is in excess of our deductible and, therefore, is reimbursable by the insurance company.

Our SmartDose contingent consideration is payable to the selling shareholders based upon a percentage of product sales over the life of the underlying product patent, with no cap on total payments. Given the length of the earnout period and the uncertainty in forecasted product sales, we do not believe it is meaningful to estimate the upper end of the range over the entire period. However, our estimated probable range which could become payable over the next five years is between zero and $3.7 million.

Note 19: Segment Information

Our business operations are organized into two reportable segments, Proprietary Products and Contract-Manufactured Products. Our Proprietary Products reportable segment offers proprietary packaging, containment and drug delivery products, along with analytical lab services and integrated solutions, primarily to biologic, generic and pharmaceutical drug customers. Our Contract-Manufactured Products reportable segment serves as a fully integrated business, focused on the design, manufacture, and automated assembly of complex devices, primarily for pharmaceutical, diagnostic, and medical device customers.

We evaluate the performance of our segments based upon, among other things, segment net sales and operating profit. Segment operating profit excludes general corporate costs, which include executive and director compensation, stock-based compensation, adjustments to annual incentive plan expense for over- or under-attainment of targets, certain pension and other retirement benefit costs, and other corporate facilities and administrative expenses not allocated to the segments. Also excluded are items that we consider not representative of ongoing operations. Such items are referred to as other unallocated items and generally include restructuring and related charges, certain asset impairments and other specifically-identified income or expense items.

The following table presents information about our reportable segments, reconciled to consolidated totals:

($ in millions)	2019	2018	2017
Net sales:			
Proprietary Products	$ 1,398.6	$ 1,308.6	$ 1,236.9
Contract-Manufactured Products	441.5	409.1	362.5
Intersegment sales elimination	(0.2)	(0.3)	(0.3)
Consolidated net sales	$ 1,839.9	$ 1,717.4	$ 1,599.1

The intersegment sales elimination, which is required for the presentation of consolidated net sales, represents the elimination of components sold between our segments.

We do not have any customers accounting for greater than 10% of consolidated net sales.

The following table presents net sales and property, plant and equipment, net, by the country in which the legal subsidiary is domiciled and assets are located:

	Net Sales			Property, Plant and Equipment, Net		
($ in millions)	2019	2018	2017	2019	2018	2017
United States	$ 814.7	$ 766.1	$ 734.6	$ 337.1	$ 315.3	$ 323.8
Germany	236.3	235.9	226.4	95.4	99.3	108.8
Ireland	173.8	138.1	100.5	162.0	165.4	173.2
France	150.6	145.0	142.6	53.3	50.1	51.6
Other European countries	251.1	230.5	201.0	59.1	59.5	63.2
Other	213.4	201.8	194.0	132.4	132.4	134.4
	$ 1,839.9	$ 1,717.4	$ 1,599.1	$ 839.3	$ 822.0	$ 855.0

The following tables provide summarized financial information for our segments:

($ in millions)	Proprietary Products	Contract-Manufactured Products	Corporate/ Elimination/ Unallocated Items	Consolidated
2019				
Net sales	$ 1,398.6	$ 441.5	$ (0.2)	$ 1,839.9
Operating profit	$ 313.6	$ 49.1	$ (66.1)	$ 296.6
Interest expense	—	—	8.5	8.5
Interest income	—	—	(3.8)	(3.8)
Other nonoperating expense (income)	—	—	0.1	0.1
Income before income taxes	$ 313.6	$ 49.1	$ (70.9)	$ 291.8
Segment assets	$ 1,480.6	$ 386.0	$ 474.8	$ 2,341.4
Capital expenditures	91.2	37.2	(2.0)	126.4
Depreciation and amortization expense	82.2	17.9	3.3	103.4
2018				
Net sales	$ 1,308.6	$ 409.1	$ (0.3)	$ 1,717.4
Operating profit	$ 266.4	$ 44.3	$ (70.4)	$ 240.3
Interest expense	—	—	8.4	8.4
Interest income	—	—	(2.1)	(2.1)
Other nonoperating income	—	—	(6.7)	(6.7)
Income before income taxes	$ 266.4	$ 44.3	$ (70.0)	$ 240.7
Segment assets	$ 1,342.3	$ 301.4	$ 335.2	$ 1,978.9
Capital expenditures	77.0	20.7	7.0	104.7
Depreciation and amortization expense	83.9	17.2	3.3	104.4
2017				
Net sales	$ 1,236.9	$ 362.5	$ (0.3)	$ 1,599.1
Operating profit	$ 243.8	$ 48.3	$ (66.3)	$ 225.8
Interest expense	—	—	7.8	7.8
Interest income	—	—	(1.3)	(1.3)
Other nonoperating income	—	—	(3.1)	(3.1)
Income before income taxes	$ 243.8	$ 48.3	$ (69.7)	$ 222.4
Segment assets	$ 1,321.3	$ 286.4	$ 255.1	$ 1,862.8
Capital expenditures	107.2	18.6	5.0	130.8
Depreciation and amortization expense	77.1	16.4	3.2	96.7

Please refer to Note 16, *Other (Income) Expense*, for a discussion of unallocated items.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of West Pharmaceutical Services, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of West Pharmaceutical Services, Inc. and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of income, comprehensive income, equity and cash flows for each of the three years in the period ended December 31, 2019, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2019 appearing under Item 15(a)(2) (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 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019, and as discussed in Note 3 to the consolidated financial statements, the Company changed the manner in which it accounts for revenues 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 Management's Report on Internal Control over Financial Reporting appearing under Item 9A. 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 matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates 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 matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Income Taxes

As described in Notes 1 and 17 to the consolidated financial statements, the Company's consolidated deferred tax assets were $43.6 million, net of a valuation allowance of $15.9 million, as of December 31, 2019, and income tax expense was $59.0 million for the year ended December 31, 2019. As a global organization, the Company files income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. Management estimates income tax payable based upon current domestic and international tax legislation. Deferred income taxes are recognized by applying enacted statutory tax rates to tax loss carryforwards and temporary differences between the tax basis and financial statement carrying values of assets and liabilities. The enacted statutory tax rate applied is based on the rate expected to be applicable at the time of the forecasted utilization of the loss carryforward or reversal of the temporary difference. Valuation allowances on deferred tax assets are established when it is more likely than not that all or a portion of a deferred tax asset will not be realized. The realizability of deferred tax assets is subject to estimates of future taxable income, generally at the respective subsidiary company and the country level.

The principal considerations for our determination that performing procedures relating to income taxes is a critical audit matter are that there was significant judgment by management in determining the income tax provision due to the Company's global footprint and the complexity in the various tax laws applicable in determining the Company's effective tax rate and in assessing the realizability of deferred tax assets. This in turn led to a high degree of auditor judgment, effort, and subjectivity in performing procedures and in evaluating audit evidence related to the income tax provision and significant assumptions used in management's assessment of the realizability of deferred tax assets, including projections of future taxable income. Also, our audit effort involved the use of professionals with specialized skill and knowledge to assist in performing procedures and evaluating the audit evidence obtained from these procedures.

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 income taxes, including controls over the determination of the income tax provision and the realizability of deferred tax assets. These procedures also included, among others, (i) testing the income tax provision, including performing procedures over the Company's rate reconciliation, return to provision adjustments, permanent and temporary differences, and financial data used in the income tax provision calculation, (ii) testing the accuracy of the income tax rates utilized in the provision, and (iii) evaluating management's assessment of the realizability of deferred tax assets, which included evaluating the reasonableness of assumptions underlying management's projections of future taxable income. Evaluating the reasonableness of the assumptions related to projected future taxable income involved evaluating whether the assumptions used by management were reasonable considering the current and past performance of the Company and evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in evaluating the appropriateness of management's application of relevant income tax law in certain jurisdictions.

/s/ PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 21, 2020

We have served as the Company's auditor since 1963.

Quarterly Operating and Per Share Data (Unaudited)

($ in millions, except per share data)	First Quarter (1)	Second Quarter (2)	Third Quarter (3)	Fourth Quarter (4)	Full Year
2019					
Net sales	$ 443.5	$ 469.7	$ 456.1	$ 470.6	$ 1,839.9
Gross profit	146.8	157.9	147.8	153.2	605.7
Net income	55.4	66.1	56.3	63.9	241.7
Net income per share:					
Basic	$ 0.75	$ 0.90	$ 0.76	$ 0.86	$ 3.27
Diluted	$ 0.73	$ 0.88	$ 0.75	$ 0.84	$ 3.21
2018					
Net sales	$ 415.7	$ 447.5	$ 431.7	$ 422.5	$ 1,717.4
Gross profit	134.4	142.2	135.6	133.2	545.4
Net income	43.6	56.1	55.2	52.0	206.9
Net income per share:					
Basic	$ 0.59	$ 0.76	$ 0.75	$ 0.70	$ 2.80
Diluted	$ 0.58	$ 0.75	$ 0.73	$ 0.69	$ 2.74

The sum of the quarterly amounts may not equal full year due to rounding.

Factors affecting the comparability of the information reflected in the quarterly data:

(1) Net income for the first quarter of 2019 included the impact of restructuring and related charges of $0.4 million ($0.01 per diluted share) and a tax benefit of $1.4 million ($0.02 per diluted share) associated with stock-based compensation. Net income for the first quarter of 2018 included the impact of restructuring and related charges of $2.7 million ($0.03 per diluted share), a net tax charge of $0.3 million ($0.01 per diluted share) for the estimated impact of the 2017 Tax Act, and a tax benefit of $2.1 million ($0.03 per diluted share) associated with stock-based compensation.

(2) Second quarter 2019 net income included the impact of restructuring and related charges of $1.1 million ($0.01 per diluted share) and a tax benefit of $3.8 million ($0.05 per diluted share) associated with stock-based compensation. Second quarter 2018 net income included the impact of restructuring and related charges of $1.6 million ($0.01 per diluted share), a net tax benefit of $4.8 million ($0.06 per diluted share) for the estimated impact of the 2017 Tax Act, and a tax benefit of $3.4 million ($0.04 per diluted share) associated with stock-based compensation.

(3) Net income for the third quarter of 2019 included the impact of restructuring and related charges of $1.4 million ($0.01 per diluted share), a pension settlement charge of $2.1 million ($0.03 per diluted share), a charge of $0.7 million ($0.01 per diluted share) related to the continued devaluation of Argentina's currency, a tax benefit of $1.0 million ($0.01 per diluted share) related to the impact of federal law changes enacted during the quarter, and a tax benefit of $4.0 million ($0.05 per diluted share) associated with stock-based compensation. Net income for the third quarter of 2018 included the impact of restructuring and related charges of $0.9 million ($0.01 per diluted share), a net tax charge of $0.4 million for the estimated impact of the 2017 Tax Act, a tax benefit of $7.7 million ($0.10 per diluted share) associated with stock-based compensation, and a charge of $1.1 million ($0.02 per diluted share) related to the classification of Argentina's economy as highly inflationary under U.S. GAAP as of July 1, 2018.

(4) Fourth quarter 2019 net income included the impact of restructuring and related charges of $0.8 million ($0.02 per diluted share), a gain on the sale of fixed assets as a result of our restructuring plan of $1.3 million ($0.02 per diluted share), a pension settlement charge of $0.6 million ($0.01 per diluted share), a tax recovery related to previously-paid international excise taxes of $2.9 million ($0.04 per diluted share), a tax charge of $0.7 million ($0.01 per diluted share) related to the impact of federal law changes enacted during the quarter, and a tax benefit of $1.1 million ($0.02 per diluted share) associated with stock-based compensation. Fourth quarter 2018 net income included the impact of restructuring and related charges of $2.1 million ($0.02 per diluted share), a gain on the sale of fixed assets as a result of our restructuring plans of $0.9 million ($0.01 per diluted share), a net tax charge of $1.6 million ($0.03 per diluted share) for the estimated impact of the 2017 Tax Act, and a tax benefit of $1.1 million ($0.02 per diluted share) associated with stock-based compensation.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure controls are controls and procedures designed to reasonably ensure that information required to be disclosed in our reports filed under the Exchange Act, such as this annual report, is recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms. Disclosure controls include, without limitation, controls and procedures designed to ensure that information required to be disclosed in our reports filed under the Securities Exchange Act of 1934, as amended, is accumulated and communicated to our management, including our CEO and Chief Financial Officer ("CFO"), or persons performing similar functions, as appropriate, to allow timely decisions regarding required disclosure. Our disclosure controls include some, but not all, components of our internal control over financial reporting.

Evaluation of Disclosure Controls and Procedures
An evaluation was performed under the supervision and with the participation of our management, including our CEO and CFO, of the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934), as of the end of the period covered by this Form 10-K. Based on this evaluation, our CEO and CFO have concluded that, as of December 31, 2019, our disclosure controls and procedures are effective.

Management's Report on Internal Control over Financial Reporting
Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934. Our internal control over financial reporting is a process designed under the supervision of our CEO and CFO to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles.

Management assessed the effectiveness of our internal control over financial reporting as of December 31, 2019 based on the framework established in "Internal Control-Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management has determined that our internal control over financial reporting was effective as of December 31, 2019.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. No evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within West have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Also projections of any evaluation of effectiveness to future periods are subject to the risks that controls

may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

The effectiveness of our 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.

Changes in Internal Controls

During the fourth quarter ended December 31, 2019, there have been no changes to our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

On January 1, 2019, we adopted ASC 842. Although our adoption of ASC 842 resulted in no change to our internal control over financial reporting that materially affected, or is reasonably likely to materially affect, our internal control over financial reporting, we did implement changes to our internal controls relating to leases. These changes included the development of new policies, enhanced contract review requirements, and other ongoing monitoring activities. These controls were designed to provide assurance at a reasonable level of the fair presentation of our consolidated financial statements and related disclosures.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Information is incorporated by reference from the discussion under the heading *Proposal 1 - Election of Directors*; *Corporate Governance Documents and Policies - Ethics and Our Code of Business Conduct*; *Voting and Other Information - 2021 Shareholder Proposals or Nominations;* and *Board and Director Information and Policies - Committees - Audit Committee* in our 2020 Proxy Statement. The balance of the information required by this item is contained in the discussion entitled *Information About Our Executive Officers* in Part I of this Form 10-K.

ITEM 11. EXECUTIVE COMPENSATION

Information about director and executive compensation is incorporated by reference from the discussion under the headings *Director Compensation, Compensation Committee Report, Compensation Discussion and Analysis,* and *Compensation Tables* in our 2020 Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Information required by this Item is incorporated by reference from the discussion under the heading *Stock Ownership* in our 2020 Proxy Statement.

Equity Compensation Plan Information Table

The following table sets forth information about the grants of stock options, restricted stock or other rights under all of the Company's equity compensation plans as of the close of business on December 31, 2019. The table does not include information about tax-qualified plans such as the West 401(k) Plan or the West Contract Manufacturing Savings and Retirement Plan.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (a)	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights (b)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Columns (a)) (c)
Equity compensation plans approved by security holders	3,281,507 [1]	$ 67.05 [2]	7,226,236 [3]
Equity compensation plans not approved by security holders	—	—	—
Total	3,281,507	$ 67.05	7,226,236

[1] Includes 1,207,157 outstanding stock options, 264,691 restricted performance share units, 25,892 restricted retention share units, 64,544 deferred stock-equivalents units, and 494 restricted stock-equivalents units granted to directors under the 2016 Plan. Includes 1,462,578 outstanding stock options, 12,160 outstanding stock-settled stock appreciation rights, 13,459 restricted retention share units, and 108,074 deferred stock-equivalents units under the 2011 Plan (which was terminated in 2016). Includes 68,400 outstanding stock options and 54,058 deferred stock-equivalents units granted to directors under the Non-Qualified Deferred Compensation Plan for Non-Employee Directors under the 2007 Omnibus Incentive Compensation Plan (which was terminated in 2011). The average term of remaining options and stock-settled stock appreciation rights granted is 5.9 years. No future grants or awards may be made under the terminated plans. The total includes restricted performance share units at 100% of grant. The restricted performance share unit payouts were at 49.39%, 96.6%, and 89.8% in 2019, 2018 and 2017, respectively. The total does not include stock-equivalent units granted or credited to directors under the Non-Qualified Deferred Compensation Plan for Non-Employee Directors to be settled only in cash.

[2] Restricted performance share and deferred stock-equivalent units are excluded when determining the weighted-average exercise price of outstanding options.

[3] Represents 3,829,712 shares reserved under the Company's Employee Stock Purchase Plan and 3,119,314 shares remaining available for issuance under the 2016 Plan. The estimated number of shares that could be issued for 2019 from the Employee Stock Purchase Plan is 277,210. This number of shares is calculated by multiplying the 190 shares per offering period per participant limit by 1,459, the number of current participants in the plan.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Information called for by this Item is incorporated by reference from the discussion under the heading *Corporate Governance Documents and Policies - Related Person Transactions and Procedures* in our 2020 Proxy Statement. Information about director independence is incorporated by reference from the discussion under the heading *Corporate Governance Documents and Policies - Director Independence* in our 2020 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information is incorporated by reference from the discussion under the heading *Independent Auditors and Fees - Fees Paid to PricewaterhouseCoopers LLP* and *Independent Auditors and Fees - Audit Committee Policy on Pre-Approval of Audit and Permissible Non-Audit Services* in our 2020 Proxy Statement.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) 1. Financial Statements

The following documents are included in Part II, Item 8:

Consolidated Statements of Income for the years ended December 31, 2019, 2018 and 2017
Consolidated Statements of Comprehensive Income for the years ended December 31, 2019, 2018 and 2017
Consolidated Balance Sheets at December 31, 2019 and 2018
Consolidated Statement of Equity for the years ended December 31, 2019, 2018 and 2017
Consolidated Statements of Cash Flows for the years ended December 31, 2019, 2018 and 2017
Notes to Consolidated Financial Statements
Report of Independent Registered Public Accounting Firm

(a) 2. Financial Statement Schedules

Schedule II - Valuation and Qualifying Accounts

($ in millions)	Balance at beginning of period	Charged to costs and expenses	Deductions (1)	Balance at end of period
For the year ended December 31, 2019				
Allowances deducted from assets:				
Deferred tax asset valuation allowance	$ 16.0	$ —	$ (0.1)	$ 15.9
Allowance for doubtful accounts	2.0	0.1	(1.6)	0.5
Total allowances deducted from assets	$ 18.0	$ 0.1	$ (1.7)	$ 16.4
For the year ended December 31, 2018				
Allowances deducted from assets:				
Deferred tax asset valuation allowance	$ 20.9	$ (3.0)	$ (1.9)	$ 16.0
Allowance for doubtful accounts	0.5	0.7	0.8	2.0
Total allowances deducted from assets	$ 21.4	$ (2.3)	$ (1.1)	$ 18.0
For the year ended December 31, 2017				
Allowances deducted from assets:				
Deferred tax asset valuation allowance	$ 18.7	$ 2.5	$ (0.3)	$ 20.9
Allowance for doubtful accounts	0.4	(0.2)	0.3	0.5
Total allowances deducted from assets	$ 19.1	$ 2.3	$ —	$ 21.4

(1) Includes accounts receivable written off, the write-off or write-down of valuation allowances, and translation adjustments.

All other schedules are omitted because they are either not applicable, not required or because the information required is contained in the consolidated financial statements or notes thereto.

(a) 3. Exhibits - An index of the exhibits included in this Form 10-K is contained on pages F-1 through F-3 and is incorporated herein by reference.
(b) See subsection (a) 3. above.
(c) Financial Statements of affiliates are omitted because they do not meet the tests of a significant subsidiary at the 20% level.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, West Pharmaceutical Services, Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

WEST PHARMACEUTICAL SERVICES, INC.
(Registrant)

By: /s/ Bernard J. Birkett
Bernard J. Birkett
Senior Vice President and Chief Financial Officer

February 21, 2020

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of West Pharmaceutical Services, Inc. in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Eric M. Green Eric M. Green	Director, President and Chief Executive Officer (Principal Executive Officer)	February 21, 2020
/s/ Bernard J. Birkett Bernard J. Birkett	Senior Vice President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 21, 2020
/s/ Mark A. Buthman Mark A. Buthman	Director	February 18, 2020
/s/ William F. Feehery, Ph.D. William F. Feehery, Ph.D.	Director	February 18, 2020
/s/ Robert F. Friel Robert F. Friel	Director	February 18, 2020
/s/ Thomas W. Hofmann Thomas W. Hofmann	Director	February 18, 2020
/s/ Paula A. Johnson, M.D., MPH Paula A. Johnson, M.D., MPH	Director	February 18, 2020
/s/ Deborah L.V. Keller Deborah L.V. Keller	Director	February 18, 2020
/s/ Myla P. Lai-Goldman, M.D. Myla P. Lai-Goldman, M.D.	Director	February 18, 2020
/s/ Douglas A. Michels Douglas A. Michels	Director	February 18, 2020
/s/ Paolo Pucci Paolo Pucci	Director	February 18, 2020
/s/ Patrick J. Zenner Patrick J. Zenner	Director and Chairman of the Board	February 18, 2020

EXHIBIT INDEX

Exhibit Number	Description
3.1	Our Amended and Restated Articles of Incorporation are incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2015.
3.2	Our Bylaws, as amended through May 5, 2015, are incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2015.
4.1	Form of stock certificate for common stock is incorporated by reference from our 1998 Form 10-K.
4.2	Article 5, 6, 8(c) and 9 of our Amended and Restated Articles of Incorporation are incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2015.
4.3	Article I and V of our Bylaws, as amended through May 5, 2015, are incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2015.
4.4	Description of Registered Securities.
4.5 (1)	Instruments defining the rights of holders of long-term debt securities of West and its subsidiaries have been omitted.
10.1	Credit Agreement, dated as of March 28, 2019, between West, certain of its subsidiaries, the lenders party thereto from time to time, Bank of America, N.A., as Administrative Agent, Swing Line Lender and an Issuing Lender; Merrill Lynch, Pierce, Fenner & Smith Incorporated, Wells Fargo Securities, LLC, MUFG Bank, Ltd., and JPMorgan Chase Bank, N.A., as Joint Lead Arrangers and Joint Bookrunners, and Wells Fargo Bank, National Association, MUFG Bank, Ltd., and JPMorgan Chase Bank, N.A., as Co-Syndication Agents, is incorporated by reference from our Form 8-K dated April 1, 2019.
10.2	First Amendment and Incremental Facility Amendment, dated as of December 30, 2019, between West, each of the lenders party thereto from time to time, and Bank of America, N.A., as Administrative Agent.
10.3	Note Purchase Agreement, dated July 5, 2012, among the Company and the Purchasers named therein is incorporated by reference from our Form 8-K filed on July 10, 2012.
10.4 (2)	Employment Agreement, dated as of April 13, 2015, between us and Eric M. Green, is incorporated by reference from our Form 8-K dated April 15, 2015.
10.5 (2)	Indemnification Agreement, dated as of April 24, 2015, between us and Eric M. Green, is incorporated by reference from our Form 8-K dated April 30, 2015.
10.6 (2)	Sign-On Retention Award Notice, dated as of April 24, 2015, from us to Eric M. Green, is incorporated by reference from our Form 8-K dated April 30, 2015.
10.7 (2)	Employment Agreement, dated May 29, 2018, between us and Bernard J. Birkett, is incorporated by reference from our Form 8-K dated June 21, 2018.
10.8 (2)	Employment Agreement, dated August 28, 2016, between David Montecalvo and us, incorporated by reference from our Form 10-Q report for the quarter ended September 30, 2016.
10.9 (2)	Supplemental Employees' Retirement Plan, as amended and restated effective January 1, 2008, is incorporated by reference from our 2008 Form 10-K report.
10.10 (2)	Non-Qualified Deferred Compensation Plan for Designated Employees, as amended and restated effective December 1, 2018, is incorporated by reference from our 2018 Form 10-K report.
10.11 (2)	Deferred Compensation Plan for Outside Directors, as amended and restated effective June 30, 2013, is incorporated by reference from our 2013 Form 10-K report.
10.12 (2)	2016 Omnibus Incentive Compensation Plan is incorporated by reference from our Form S-8 filed on May 3, 2016.
10.13 (2)	2011 Omnibus Incentive Compensation Plan is incorporated by reference from our Form 8-K filed on May 6, 2011.
10.14 (2)	2007 Omnibus Incentive Compensation Plan effective as of May 1, 2007, is incorporated by reference to Exhibit 99.1 of the Company's Form 8-K dated May 4, 2007.
10.15 (2)	Form of Executive 2006 Non-Qualified Stock Option Award is incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2006.
10.16 (2)	Form of Director 2006 Non-Qualified Stock Option Award Notice is incorporated by reference from our Form 10-Q report for the quarter ended June 30, 2006.

Exhibit Number	Description
10.17 [2]	Form of Director 2006 Stock Unit Award Notice is incorporated by reference from our Form 10-Q report for the quarter ended June 30, 2006.
10.18 [2]	Form of Director 2007 Deferred Stock Award, issued pursuant to the 2007 Omnibus Incentive Compensation Plan, is incorporated by reference from our Form 10-Q report for the quarter ended June 30, 2007.
10.19 [2]	Form of 2008 Non-Qualified Stock Option and Performance-Vesting Share Unit Award, issued pursuant to the 2007 Omnibus Incentive Compensation Plan, is incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2008.
10.20 [2]	Form of Director 2008 Deferred Stock Award, issued pursuant to the 2007 Omnibus Incentive Compensation Plan, is incorporated by reference from our 2008 Form 10-K report.
10.21 [2]	Form of 2009 Supplemental Long-Term Incentive Award, is incorporated by reference from our Form 10-Q report for the quarter ended September 30, 2009.
10.22 [2]	Form of 2014 Long-Term Incentive Plan Award is incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2014.
10.23 [2]	Form of 2014 Stock-Settled Restricted Stock Unit Award is incorporated by reference from our Form 10-Q report for the quarter ended June 30, 2014.
10.24 [2]	Form of 2019 Performance Stock Unit (PSU) Award issued under the 2016 Omnibus Incentive Compensation Plan, is incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2019.
10.25 [2]	Form of 2019 Stock Option Award issued under the 2016 Omnibus Incentive Compensation Plan, is incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2019,
10.26	Indemnification agreements between us and each of our directors in the form of Exhibit 10.1 to our Form 8-K report dated January 6, 2009, which is incorporated by reference.
10.27 [2]	Form of Change-in-Control Agreement between us and certain of our executive officers, is incorporated by reference from our Form 10-Q report for the quarter ended September 30, 2017.
10.28 [3]	Agreement, effective as of January 1, 2005, between us and The Goodyear Tire & Rubber Company is incorporated by reference from our Form 10-Q report for the quarter ended June 30, 2005.
10.29 [3]	First Agreement, effective as of July 1, 2008, to amend Agreement between us and The Goodyear Tire & Rubber Company is incorporated by reference from our Form 10-Q report for the quarter ended March 31, 2009.
10.30 [3]	Second Agreement, dated August 16, 2016, to amend Agreement between us and The Goodyear Tire & Rubber Company and us, incorporated by reference from our Form 10-Q report for the quarter ended September 30, 2016.
10.31 [3]	Distributorship Agreement, dated and effective January 18, 2017, between Daikyo Seiko, Ltd. and us is incorporated by reference from our 2016 Form 10-K report.
10.32 [3]	Amended and Restated Technology Exchange and CrossLicense Agreement, dated and effective January 18, 2017, between Daikyo Seiko, Ltd. and us, incorporated by reference from our 2016 Form 10-K report.
10.33 [3]	Amended Agreement, dated and effective July 2, 2018, between Daikyo Seiko, Ltd. and us, is incorporated by reference from Form 10-Q report for the quarter ended June 30, 2018.
10.34 [4]	Amendment Agreement, dated as of October 15, 2019, between us and Daikyo Seiko, Ltd., is incorporated by reference from our Form 8-K dated October 16, 2019.
10.35 [4]	Global Master Supply Agreement by and between ExxonMobil Chemical Company and us, entered into on January 10, 2020, and effective January 1, 2019 through December 31, 2023 is incorporated by reference from our Form 8-K report filed on January 16, 2020.
21	Subsidiaries of the Company.
23	Consent of Independent Registered Public Accounting Firm.
31.1	Certification by the Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification by the Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

Exhibit Number	Description
32.1*	Certification by the Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2*	Certification by the Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	The instance document does not appear in the interactive data file because its XBRL tags are embedded within the inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
104**	Inline XBRL for the cover page of this Annual Report on Form 10-K, included in the Exhibit 101 Inline XBRL Document Set.

(1) We agree to furnish to the SEC, upon request, a copy of each instrument with respect to issuances of long-term debt of the Company and its subsidiaries.

(2) Management compensatory plan.

(3) Certain portions of this exhibit have been omitted and filed separately with the SEC pursuant to a confidential treatment order of the SEC.

(4) Portions of this exhibit (indicated therein by asterisks) have been omitted for confidential treatment.

* Furnished, not filed.

INDEPENDENT DIRECTORS

The Board of Directors has designated directors who are independent of Management as "Independent Directors." The Independent Directors' duties include annual evaluations of the Chief Executive Officer, his leadership succession plans and achievement of long-range strategic initiatives.

Written Affirmation

On May 16, 2019, Eric M. Green, West's President & Chief Executive Officer, submitted to the NYSE the Written Affirmation required by the rules of the NYSE certifying that he was not aware of any violations by the Company of NYSE Corporate Governance listing standards.

Section 302 and 906 Certifications

The certifications of Mr. Green and Bernard J. Birkett, West's Chief Financial Officer, made pursuant to Section 302 and Section 906 of the Sarbanes-Oxley Act of 2002 regarding the quality of the Company's public disclosures, have been filed as exhibits to West's 2019 Form 10-K.

Dividends

West Pharmaceutical Services has paid 197 consecutive quarterly common stock cash dividends since becoming a public company in 1970. Dividends usually are declared by the Board during the last month of each calendar quarter and, if approved, typically are paid on the first Wednesday of February, May, August and November to shareholders of record two weeks prior to the payment date.

Dividend Reinvestment Plan

The West Pharmaceutical Services Dividend Reinvestment Plan for all registered shareholders is a convenient and economical way for shareholders to increase their investment in West through the purchase of additional shares with dividends and voluntary cash payments. All brokerage commissions and costs of administering the plan are paid by West. For details of the plan and an enrollment form, please contact the Dividend Reinvestment Department of Broadridge Corporate Issuer Solutions (see Transfer Agent and Registrar).

Publications

To receive copies of press releases or quarterly and annual reports filed with the United States Securities and Exchange Commission, write to Investor Relations at global headquarters, call 888-594-3222, or send a message through West's website, www.westpharma.com.

Investor Online

http://investor.westpharma.com

Trademarks

West without Borders is not affiliated with Doctors Without Borders®, which is a registered service mark of Bureau International de Medecins San Frontieres.

INVESTOR INFORMATION

Stock Listing

NYSE symbol: WST

Shareholders of Record

As of December 31, 2019: 756

Average Daily Trading Volume 2019

First Quarter: 470,974 shares
Second Quarter: 299,856 shares
Third Quarter: 318,089 shares
Fourth Quarter: 419,340 shares

Global Headquarters

West Pharmaceutical Services, Inc.
530 Herman O. West Drive
Exton, PA 19341 | USA
610-594-2900
www.westpharma.com

Annual Meeting

Tuesday, May 5, 2020, 9:30 a.m. Exton, PA

Code of Business Conduct

Available at http://investor.westpharma.com

Investor Relations Contact

Quintin J. Lai, Ph.D
Vice President, Corporate Development, Strategy & Investor Relations
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Transfer Agent and Registrar

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