PPG INDUSTRIES INC
Form 10-K/A
June 28, 2018

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K/A
Amendment No. 1
Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the fiscal year ended December 31, 2017
Commission File Number 1-1687

PPG INDUSTRIES, INC.
(Exact name of registrant as specified in its charter)

Pennsylvania	25-0730780
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
One PPG Place, Pittsburgh, Pennsylvania	15272
(Address of principal executive offices)	(Zip code)
Registrant’s telephone number, including area code:	412-434-3131

Securities Registered Pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock – Par Value $1.66 $^2/_3$	New York Stock Exchange
0.000% Notes due 2019	New York Stock Exchange
0.875% Notes due 2022	New York Stock Exchange
0.875% Notes due 2025	New York Stock Exchange
1.400% Notes due 2027	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 x 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 x
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, and (2) has been subject to such filing requirements for the past 90 days. YES x NO ¨
Indicate by checkmark whether the registrant has submitted electronically and posted on its corporate web site, if any, every Interactive Date File required to be submitted and posted 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 x NO ¨
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of Registrant’s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K/A or any amendment to this Form 10-K/A. x
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. (Check one):
Large accelerated filer x Accelerated filer ¨

Non-accelerated filer ¨	Smaller reporting company ¨
(Do not check if a 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 by Rule 12b-2 of the Act). YES o NO x

The aggregate market value of common stock held by non-affiliates as of June 30, 2017, was $28,173 million.

As of January 31, 2018, 249,880,613 shares of the Registrant's common stock, with a par value of 1.66^{2}/_{3}$ per share, were outstanding. As of that date, the aggregate market value of common stock held by non-affiliates was $29,638 million.

DOCUMENTS INCORPORATED BY REFERENCE

Document	Incorporated By Reference In Part No.
Portions of PPG Industries, Inc. Proxy Statement for its 2018 Annual Meeting of Shareholders	III

PPG INDUSTRIES, INC.
AND CONSOLIDATED SUBSIDIARIES

As used in this report, the terms “PPG,” “Company,” “Registrant,” “we,” “us” and “our” refer to PPG Industries, Inc., and its subsidiaries, taken as a whole, unless the context indicates otherwise.

EXPLANATORY NOTE

PPG is filing this Amendment No. 1 (this “Form 10-K/A”) to amend our Annual Report on Form 10-K for the year ended December 31, 2017 filed with the Securities and Exchange Commission (the “SEC”) on February 15, 2018 (the “Original Filing”) to restate our audited consolidated financial statements for the years ended December 31, 2017 and 2016 and to amend related disclosures, including those regarding our disclosure controls and procedures. We have also restated certain unaudited quarterly results related to the quarters ended December 31, 2016, March 31, 2017, June 30, 2017, September 30, 2017 and December 31, 2017. This Form 10-K/A also amends certain other items in the Original Filing, as listed in “Items Amended in this Filing” below.

Background of the Restatement

On April 16, 2018, we received a report through our internal reporting system alleging violations of our accounting policies and procedures regarding the failure to accrue certain specified expenses in the first quarter of 2018. Based on our initial review at that time, we identified approximately $1.4 million of expenses (including legal fees, property taxes and performance-based compensation) that should have been accrued in the first quarter of 2018 and that were then reflected in our earnings for the quarter ended March 31, 2018, released on April 19, 2018. In addition, the report alleged that there may have been other unspecified expenses, potentially up to $5 million in the aggregate, that were improperly not accrued in the first quarter.

The Audit Committee of the Board of Directors (the “Audit Committee”) oversaw an investigation of the matters set forth in the internal report with the assistance of outside counsel and forensic accountants. The investigation identified the following items with respect to the quarter ended March 31, 2018, in addition to the approximately $1.4 million of expenses described above: (1) failure to record amortization expense in the amount of $1.4 million to correct for amortization of an intangible asset that was inadvertently not recorded over a three-year period and discovered in March 2018; (2) understatement of a health insurance accrued liability in the amount of $0.5 million; and (3) failure to record an adjustment increasing the value of inventory in our Europe, Middle East and Africa region in the amount of $2.2 million due to inflation of raw materials costs which, when corrected, had a positive effect on income in the first quarter of 2018. These three items resulted in a net increase to income from continuing operations before income taxes of approximately $0.3 million.

The investigation also identified certain inadvertent errors with respect to the quarter ended March 31, 2018. Correction of such inadvertent errors, together with the matters discussed in the immediately preceding paragraph, resulted in a net decrease in income from continuing operations before income taxes of $5.7 million for the quarter ended March 31, 2018. The correction of these inadvertent errors also resulted in a net decrease in income from continuing operations before income taxes of $2.3 million for the year ended December 31, 2017.

The investigation identified the following items with respect to the year ended December 31, 2017: (1) improper reclassifications of gains from income from discontinued operations to income from continuing operations in total pre-tax amounts of $2.5 million in the quarter ended June 30, 2017 and $4.7 million in the quarter ended December 31, 2017; (2) improper shifting of pre-tax expenses between quarterly periods in 2017, including a total of $3.5 million in compensation expense recorded in the third and fourth quarters of 2017 that should have been recorded in the quarter ended June 30, 2017; an additional expense accrual for health care claims in the amount of $3.5 million recorded in the third quarter of 2017 that should have been recorded in the quarter ended June 30, 2017; additional expense for paid vacation in the amount of $2.2 million recorded in the quarter ended December 31, 2017 that should have been recorded in the second and third quarters of 2017; and additional pension expense in the amount of $1.0 million recorded in the fourth quarter of 2017 that should have been recorded in the quarter ended September 30, 2017.

On May 10, 2018, management, in consultation with the Audit Committee and our independent registered public accounting firm, PricewaterhouseCoopers LLP (“PwC”), concluded that our consolidated financial statements for the year ended December 31, 2017 included in the Original Filing and the related report of PwC, and for the quarterly and year-to-date periods in 2017, should no longer be relied upon because of certain misstatements contained in those financial statements.

The investigation identified the following items with respect to the year ended December 31, 2016: (1) improper classification in the consolidated statement of income of the release of a reserve related to the Company’s 2015 business restructuring program in the amount of $3.4 million and (2) an improper reduction in the payout assumption for certain performance-based restricted stock units that had the impact of recognizing a $6.8 million reduction in stock based compensation expense in the fourth quarter of 2016. In the first quarter of 2017, the payout assumption for these same performance-based restricted stock units was increased, resulting in $6.8 million of stock-based compensation expense in the first quarter of 2017 that would not have been recorded if the payout assumption had not been reduced in the fourth quarter of 2016.

On June 27, 2018, management, in consultation with the Audit Committee and PwC, concluded that our consolidated financial statements for the year ended December 31, 2016 included in the Original Filing and the related report of PwC, and for the final quarterly and year-to-date period in 2016, should no longer be relied upon because of certain misstatements contained in those financial statements.

On June 27, 2018, the Audit Committee determined that its investigation was complete, and authorized the filing of our restated audited consolidated financial statements for the years ended December 31, 2017 and 2016 and certain quarterly periods within those fiscal years in order to correct our previously issued financial statements.

Impact of the Restatement

Annual

As a result of the restatement, reported net income from continuing operations was decreased by $2 million, or $0.01 per diluted share, and income from discontinued operations, net of tax, was increased by $5 million, or $0.02 per diluted share, for the year ended December 31, 2017. Reported net income from continuing operations decreased by $4 million, or $0.01 per diluted share, and there was no impact to income from discontinued operations, net of tax, for the year ended December 31, 2016.

Quarterly

As a result of the restatement, reported net income from continuing operations and earnings per diluted share from continuing operations and income from discontinued operations, net of tax, and earnings per diluted share from discontinued operations were adjusted for the appropriate quarterly periods within 2016 and 2017 as follows:

- For the quarter ended December 31, 2016, net income from continuing operations decreased $4 million, or $0.01 per diluted share, and there was no impact to income from discontinued operations, net of tax.
- For the quarter ended March 31, 2017, net income from continuing operations increased $3 million, or $0.01 per diluted share, and there was no impact to income from discontinued operations, net of tax.
- For the quarter ended June 30, 2017, net income from continuing operations decreased $7 million, or $0.03 per diluted share, and income from discontinued operations, net of tax, increased by $2 million, or $0.01 per diluted share; and for the six months ended June 30, 2017, net income from continuing operations decreased $4 million, or $0.02 per diluted share and income from discontinued operations, net of tax, increased by $2 million, or $0.01 per diluted share.
- For the quarter ended September 30, 2017, net income from continuing operations increased $1 million, or zero cents per diluted share, and there was no impact to income from discontinued operations, net of tax; and for the nine months ended September 30, 2017, net income from continuing operations decreased $3 million, or $0.01 per diluted share, and income from discontinued operations, net of tax, increased by $2 million, or $0.01 per diluted share.
- For the quarter ended December 31, 2017, net income from continuing operations increased $1 million, or zero cents per diluted share, and income from discontinued operations, net of tax, increased by $3 million, or $0.01 per diluted share.

Internal Control Over Financial Reporting and Disclosure Controls and Procedures

Management has concluded that a material weakness existed in the Company’s internal control over financial reporting as of December 31, 2017 because the Company did not maintain effective controls within its financial close process. Specifically, the Company’s former Vice President and Controller directed his subordinates to improperly override the Company’s internal controls during the Company’s financial close process, which directions were followed and not disclosed to others in senior management, the Audit Committee or the Company’s independent registered public accounting firm and not otherwise detected by the Company’s internal controls. These actions often occurred after the end of a quarter and close to the end of the financial close process for the quarter and had the effect of positively impacting income from continuing operations reported for such quarter. This material weakness resulted in misstatements in the Company’s annual financial statements that were not prevented or detected on a timely basis and led to the restatement described above. Based on this evaluation, management has concluded that, as of December 31, 2017, the Company’s internal control over financial reporting was ineffective. Accordingly, management has restated its report on internal control over financial reporting. For more information, refer to Item 8. “Financial Statements and Supplementary Data—Management Report.”

In connection with the restatement described above, the Company’s principal executive officer and principal financial officer re-evaluated the effectiveness of our disclosure controls and procedures and have concluded that PPG’s disclosure controls

and procedures were not effective. For more information, refer to Item 9A. “Controls and Procedures—Evaluation of disclosure controls and procedures” and “Prior period disclosure controls and procedures and internal control over financial reporting” of this Form 10-K/A. In connection with the investigation described in this Explanatory Note, the Company has identified and implemented, and continues to identify and implement, actions to improve the effectiveness of its internal control over financial reporting and disclosure controls and procedures, including plans to enhance the Company’s resources and training with respect to financial reporting and disclosure responsibilities. For more information, refer to Item 9A. “Controls and Procedures—Remediation of material weakness” of this Form 10-K/A. Additionally, in connection with the restatement described above, the Company’s principal executive and principal financial officers have reassessed the effectiveness of the Company’s internal control over financial reporting as of December 31, 2016 and, due to the existence of the material weakness in internal control over financial reporting discussed under Item 8. “Financial Statements and Supplementary Data—Management Report” have determined that the Company’s internal control over financial reporting was not effective as of such date. For more information, refer to Item 9A. “Controls and Procedures.” Prior period disclosure controls and procedures and internal control over financial reporting” of this Form 10-K/A. Also, in connection with the restatement described above, the Company’s principal executive officer and principal financial officer reevaluated the effectiveness of our disclosure controls and procedures and have concluded that PPG’s disclosure controls and procedures were not effective as of December 31, 2016. For more information, refer to Item 9A. “Controls and Procedures—Prior period disclosure controls and procedures and internal control over financial reporting”
of this Form 10-K/A.

More Information

Note 2 titled “Restatement of Previously Reported Consolidated Annual Financial Statements” to the Company’s consolidated financial statements discloses the nature of the restatement matters and adjustments and shows the effect of the restatement matters on the Company’s consolidated financial statements for 2017 and 2016. Note 19 titled “Summary Quarterly Information (Unaudited)” to the Company’s consolidated financial statements discloses the nature of the restatement matters and adjustments and shows the effect of the restatement matters on the Company’s restated condensed consolidated financial statements and notes (unaudited) for the interim periods ended December 31, 2016, March 31, 2017, June 30, 2017, September 30, 2017 and December 31, 2017.

Items Amended in this Filing

For the convenience of the reader, this Form 10-K/A sets forth the Original Filing, in its entirety, as amended to reflect the restatement. No attempt has been made in this Form 10-K/A to update other disclosures presented in the Original Filing, except as required to reflect the effects of the restatement. The following items have been amended as a result of the restatement:

Financial Highlights
Part I, Item 1 - Business
Part I, Item 1 - Forward-Looking Statements
Part I, Item 1A - Risk Factors
Part I, Item 3 - Legal Proceedings
Part II, Item 6 - Selected Financial Data
Part II, Item 7 - Management’s Discussion and Analysis of Financial Condition and Results of Operations
Part II, Item 8 - Financial Statements and Supplementary Data
Part II, Item 9A - Controls and Procedures
Part IV, Item 15 - Exhibits, Financial Statement Schedules

The Company’s Principal Executive Officer and Principal Financial Officer are providing currently dated certifications in connection with this Form 10-K/A. These certifications are filed as Exhibits 31.1, 31.2, 32.1 and 32.2.

PPG INDUSTRIES, INC.
AND CONSOLIDATED SUBSIDIARIES

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Note on Incorporation by Reference
Throughout this report, various information and data are incorporated by reference from the Company’s 2017 Annual Report (hereinafter referred to as “the Annual Report”). Any reference in this report to disclosures in the Annual Report shall constitute incorporation by reference only of that specific information and data into this Form 10-K/A.

FINANCIAL HIGHLIGHTS (As Restated)

Below are our key financial results from continuing operations for the fiscal year ended December 31, 2017:

- Net sales were $14.7 billion, up 3% from the prior year, driven primarily by higher sales volumes and acquisition-related sales.
- Cost of sales, exclusive of depreciation and amortization increased 7% to $8.2 billion, driven primarily by raw material cost inflation, higher sales volumes and higher cost of sales from acquired businesses.
- Selling, general and administrative expenses of $3.6 billion were slightly lower compared to the prior year.
- Income before income taxes was $2,005 million, up $1.2 billion year-over-year, due to the absence of pension settlement charges related to the purchase of group annuity contracts and a business restructuring charge.
- Net income from continuing operations was $1,369 million and earnings per diluted share was $5.31.
- Adjusted net income from continuing operations was $1,511 million and adjusted earnings per diluted share was $5.86.
- Cash and short-term investments were approximately $1.5 billion at year-end.
- Cash from operating activities - continuing operations was $1,551 million.
- Capital expenditures for modernization, productivity and regulatory improvements was $360 million.
- Cash used for business acquisitions (net of cash acquired), was $325 million.
- The Company raised the per-share dividend by 13%, paid approximately $434 million in dividends and also repurchased $813 million of its outstanding common stock.
- The Company expects to deploy at least $3.5 billion for acquisitions and share repurchases during 2017 and 2018 combined, with $1.1 billion deployed in 2017.
- The 2017 effective tax rate was 30.7%, which includes a $134 million net charge related to the enactment of the U.S. Tax Cuts and Jobs Act. This net charge is $37 million higher than the net charge included in PPG’s fourth quarter earnings release and Form 8-K furnished on January 18, 2018, primarily due to new IRS regulations issued and refinements of the Company’s estimates. While the Company has made a preliminary assessment of the new legislation’s impact on PPG, U.S. regulatory agencies will be issuing further regulations and clarifying interpretations over 2018 which could alter the Company’s conclusions regarding the impact of the new law. Further, PPG may continue to refine its estimates to incorporate new or better information as it comes available. The Company’s adjusted effective tax rate was 24.3%.

For further information and a full discussion and analysis of business performance for the years ended December 31, 2017, 2016, and 2015 and a reconciliation of non-GAAP financial measures, see Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations” of this Form 10-K/A.

Part I

Item 1. Business

PPG Industries, Inc., manufactures and distributes a broad range of paints, coatings and specialty materials. PPG was incorporated in Pennsylvania in 1883. PPG’s vision is to be the world’s leading coatings company by consistently delivering high-quality, innovative and sustainable solutions that customers trust to protect and beautify their products and surroundings. PPG’s business is comprised of two reportable business segments: Performance Coatings and Industrial Coatings.

In September 2017, PPG completed the sale of its North American fiber glass business, which represents the culmination of a multi-year strategic shift in the Company's business portfolio, resulting in the exit of all glass operations. Accordingly, all historical information has been recast to present the Glass segment as discontinued operations and assets held for sale. Refer to Note 3, “Acquisitions and Divestitures” under Item 8 of this Form 10-K/A for further information relating to this transaction.

Performance Coatings and Industrial Coatings

PPG is a major global supplier of coatings. The Performance Coatings and Industrial Coatings reportable business segments supply coatings and specialty materials to customers in a wide array of end-use markets, including industrial equipment and components, packaging material; aircraft and marine equipment; automotive original equipment (“automotive OEM”); automotive refinish; as well as for other industrial and consumer products. PPG also serves commercial and residential new build and maintenance markets by supplying coatings to painting and maintenance contractors and directly to consumers for decoration and maintenance. The coatings industry is highly competitive and consists of several large firms with global presence and many smaller firms serving local or regional markets. PPG competes in its primary markets with the world’s largest coatings companies, most of which have global operations, and many smaller regional coatings companies.

PERFORMANCE COATINGS

Strategic Business Unit	Products	Primary End-use Markets	Main Distribution Methods	Brands
Refinish Coatings	Coatings, solvents, adhesives, sundries, software	Automotive and commercial transport/fleet repair and refurbishing, light industrial coatings and specialty coatings for signs.	Independent distributors and direct to customers	PPG®
Aerospace Coatings	Coatings, sealants, transparencies, transparent armor, packaging and chemical management services for the aerospace industry	Commercial, military, regional jet and general aviation aircraft	Direct to customers and company-owned distribution network	PPG®
Protective and Marine Coatings	Coatings and finishes for the protection of metals and structures	Metal fabricators, heavy duty maintenance contractors and manufacturers of ships, bridges and rail cars	Company-owned architectural coatings stores, independent distributors, concessionaires and direct to customers	PPG®
Architectural Coatings Americas and Asia Pacific	Coatings and purchased sundries	Painting and maintenance contractors and consumers for decoration and maintenance of residential and commercial building structures	Company-owned stores, home centers and other regional or national consumer retail outlets, paint dealers, concessionaires, independent distributors and direct to customers	PPG®, GLIDDEN®, COMEX®, OLYMPIC®, DULUX® (in Canada), SIKKENS®, PPG PITTSBURGH PAINTS®, MULCO®, FLOOD®, LIQUID NAILS®, SICO®, CIL®, RENNER®, TAUBMANS®, WHITE KNIGHT®, BRISTOL®, HOMAX® among others.
Architectural Coatings Europe, Middle East and Africa (EMEA)				SIGMA®, HISTOR®, SEIGNEURIE®, GUITTET®, PEINTURES GAUTHIER®, RIPOLIN®, JOHNSTONE'S®, LEYLAND®, PRIMALEX®, DEKORAL®, TRILAK®, PROMINENT PAINTS®, GORI®, BONDEX®, and DANKE!® among others.

Major Competitive Factors	Product performance, technology, quality, technical and customer service, price, customer productivity, distribution, and brand recognition
Global Competitors	Akzo Nobel N.V., Axalta Coating Systems Ltd., BASF Corporation, Benjamin Moore, Hempel A/S, the Jotun Group, Masco Corporation, Materis Paints, Nippon Paint; RPM International

	Inc, the Sherwin-Williams Company and Tikkurila Oyj
Average Number of Employees in 2017	28,200
Principal Manufacturing and Distribution Facilities	Amsterdam, Netherlands; Birstall, United Kingdom; Budapest, Hungary; Clayton, Australia; Delaware, Ohio; Dover, Del.; Gonfreville, France; Huntsville, Ala.; Huron, Ohio; Kunshan, China; Little Rock, Ark.; Mexico City, Mexico; Milan, Italy; Mojave, Calif.; Moreuil, France; Shildon, United Kingdom; Sylmar, Calif.; Soborg, Denmark; Stowmarket, United Kingdom; Tepexpan, Mexico and Wroclaw, Poland.

INDUSTRIAL COATINGS

Strategic Business Unit	Products	Primary End-use Markets	Main Distribution Methods	Brands
Automotive OEM Coatings	Specifically formulated coatings, adhesives and sealants and metal pretreaments	Automotive original equipment manufacturer (OEM)	Direct to manufacturing companies and various coatings applicators	PPG®
Industrial Coatings		Appliances, agricultural and construction equipment, consumer electronics, automotive parts and accessories, building products (including residential and commercial construction), transportation vehicles and numerous other finished products.		PPG®
Packaging Coatings	Specifically formulated coatings	Widely used for the protection, performance and decoration of metal cans, closures, plastic tubes, industrial packaging, and promotional and specialty packaging.		PPG®
Specialty Coatings and Materials	Amorphous precipitated silicas, TESLIN® substrate, Organic Light Emitting Diode (OLED) materials, optical lens materials and photochromic dyes	SILICA - Tire, battery separator and other end-use markets; TESLIN - used in applications such as radio frequency identification (RFID) tags and labels, e-passports, drivers' licenses and identification cards; OLED - for use in displays and lighting; Lens materials - for optical lenses and color-change products.		PPG®
Coatings Services[(a)]	Services and coatings application	On-site coatings services within several customer manufacturing locations as well as at regional service centers. Customers ship parts to service centers where they are treated to enhance paint adhesion and painted with electrocoat, powder or liquid coatings. Coated parts are then shipped to the customer's next stage of assembly.	On site at customer locations or at our company-owned service centers	PPG®

(a) Effective January 1, 2018, the coating services business unit has been merged into the industrial coatings business unit to achieve operational efficiencies and to realign management teams and operations to better deliver our total value proposition and provide optimal solutions to our customers.

Technology / Alliances	PPG's automotive OEM coatings business was the first to introduce breakthrough automotive coating technologies such as cathodic electrocoat, powder clearcoat, compact paint systems and factory-applied spray-in bedliners, and the Company has a continued focus on innovation leadership. PPG has established alliances with Kansai Paints to serve Japanese-based automotive OEM customers in North America and Europe and Asian Paints Ltd. to serve certain aftermarket customers and automotive OEM customers in India.
Major Competitive Factors	Product performance, technology, quality, technical and customer service, price, customer productivity and distribution.
Global Competitors	Akzo Nobel N.V., Axalta Coating Systems Ltd., BASF Corporation, Kansai Paints, Nippon Paint and the Sherwin-Williams Company
2017 Strategic Acquisitions	The Crown Group (Crown) - Refer to Note 3, "Acquisitions and Divestitures" under Item 8 of this Form 10-K/A for more information.
Average Number of Employees in 2017	14,800

Principal Manufacturing and Distribution Facilities	Barberton, Ohio; Busan, South Korea; Cieszyn, Poland; Cleveland, Ohio; Lake Charles, La.; Oak Creek, Wis.; Quattordio, Italy; San Juan del Rio, Mexico; Sumaré, Brazil; Tianjin, China, and Zhangjiagang, China

Research and Development

($ in millions)	2017	2016	2015
Research and development costs, including depreciation of research facilities	$474	$479	$484
% of annual net sales	3.2 %	3.4 %	3.4 %

Technology innovation has been a hallmark of PPG's success throughout its history. The Company seeks to optimize its investment in research and development to create new products to drive profitable growth. We align our product development with the macro trends in the end-use markets we serve and leverage core technology platforms to develop products for unmet market needs. Our history of successful technology introductions is based on a commitment to an efficient and effective innovation process and disciplined portfolio management. We have obtained government funding for a small portion of the Company's research efforts, and we will continue to pursue government funding where appropriate.

PPG owns and operates several facilities to conduct research and development for new and improved products and processes. In addition to the Company's centralized principal research and development centers (See Item 2. "Properties" of this Form 10-K/A), operating segments manage their development through centers of excellence. As part of our ongoing efforts to manage our formulations and raw material costs effectively, we operate a global competitive sourcing laboratory in China. Because of the Company's broad array of products and customers, PPG is not materially dependent upon any single technology platform.

Raw Materials and Energy

The effective management of raw materials and energy is important to PPG's continued success. The Company's most significant raw materials are epoxy and other resins, titanium dioxide and other pigments, and solvents in the coatings businesses and sand and soda ash for the specialty coatings and materials business. Coatings raw materials, which include both organic, primarily petroleum based, materials and inorganic materials, including titanium dioxide, comprise between 70% and 80% of the Company's cost of sales, excluding depreciation and amortization, in most coatings formulations and represent PPG's single largest production cost component.

Most of the raw materials and energy used in production are purchased from outside sources, and the Company has made, and plans to continue to make, supply arrangements to meet the planned operating requirements for the future. Supply of critical raw materials and energy is managed by establishing contracts, multiple sources, and identifying alternative materials or technology whenever possible. Our products use both petroleum-derived and bio-based materials as part of a product renewal strategy. While prices for these raw materials typically fluctuate with energy prices, such fluctuations are impacted by the fact that the manufacture of our raw materials is several steps downstream from crude oil and natural gas.

The Company is continuing its aggressive sourcing initiatives to broaden our supply of high quality raw materials. These initiatives include qualifying multiple and local sources of supply, including suppliers from Asia and other lower cost regions of the world, adding on-site resin production at certain manufacturing locations and a reduction in the amount of titanium dioxide used in our product formulations.

Our global efforts to reduce titanium dioxide consumption have been successful to date and are expected to continue. Titanium dioxide is a raw material widely used in the paint and coatings industry as a pigment to provide hiding, durability and whiteness characteristics. PPG purchases both sulfate-grade and chloride-grade titanium dioxide from suppliers for use in coatings formulations. The Company has undertaken a strategic initiative to secure and enhance PPG's supply of titanium dioxide, as well as to minimize PPG's use of this raw material. PPG possesses intellectual property and expertise in the production and finishing of titanium dioxide pigment. PPG intends to continue to leverage this technology and intends to develop innovative supply solutions through technical collaborations, joint ventures and licensing arrangements with other interested parties.

We are subject to existing and evolving standards relating to the registration of chemicals which could potentially impact the availability and viability of some of the raw materials we use in our production processes. Our ongoing global product stewardship efforts are directed at maintaining our compliance with these standards.

Changes to chemical registration regulations have been proposed or implemented in the EU and many other countries, including China, Canada, the United States (U.S.), and Korea. Because implementation of many of these programs has not been finalized, the financial impact cannot be estimated at this time. We anticipate that the number of chemical registration regulations will continue to increase globally, and we have implemented programs to track and comply

with these regulations.
Given the recent volatility in certain energy-based input costs and foreign currencies, the Company is not able to predict with certainty the 2018 full year impact of related changes in raw material pricing; however, PPG currently expects overall coatings raw material costs to increase a mid-single-digit percentage in the first half of 2018, with impacts varied by region and commodity. Further, given the distribution nature of many of our businesses, logistics and distribution costs are sizable, as are wages and benefits but to a lesser degree. PPG typically experiences fluctuating prices for energy and raw materials

driven by various factors, including changes in supplier feedstock costs and inventories, global industry activity levels, foreign currency exchange rates, government regulation, and global supply and demand factors. In aggregate, average raw material cost inflation rose by a mid-single-digit percentage in 2017 versus 2016, driven mostly by supply related factors including an unusually high number of supplier force majeure events in Europe, Chinese environmental regulation enforcement and severe hurricanes in the U.S. In addition, oil prices moved much higher in the second half of 2017 also contributing to raw material inflation.

Patents

($ in millions)	2017	2016	2015
Revenue earned from royalties and the sale of technical know-how	$11	$12	$15

PPG considers patent protection to be important; however, the Company’s operating segments are not materially dependent upon any single patent or group of related patents.

Backlog

In general, PPG does not manufacture its products against a backlog of orders. Production and inventory levels are geared primarily to projections of future demand and the level of incoming orders.

Global Operations

PPG has a significant investment in non-U.S. operations. This broad geographic footprint serves to lessen the significance of economic impacts occurring in any one region on PPG’s total net sales and income from continuing operations. As a result of our expansion outside the U.S., we are subject to certain inherent risks, including economic and political conditions in international markets and fluctuations in foreign currency exchange rates. During 2017, favorable foreign currency translation increased net sales by approximately $55 million and decreased income from continuing operations by $7 million.

Our net sales in the developed and emerging regions of the world for the years ended December 31st are summarized below:

($ in millions)	2017	2016	2015
Net Sales	As Restated		
United States, Canada, Western Europe	$9,911	$9,773	$9,692
Latin America, Central and Eastern Europe, Middle East, Africa, Asia Pacific	4,837	4,497	4,549
Total	$14,748	$14,270	$14,241

Refer to Note 20, “Reportable Business Segment Information” under Item 8 of this Form 10-K/A for geographic information related to PPG’s property, plant and equipment, and for additional geographic information pertaining to sales.

Seasonality

PPG’s income from continuing operations has typically been greater in the second and third quarters and cash from operating activities has been greatest in the fourth quarter due to end-use market seasonality, primarily in PPG’s architectural coatings businesses. Demand for PPG’s architectural coatings products is typically the strongest in the second and third quarters due to higher home improvement, maintenance and construction activity during the spring and summer months in the U.S., Canada and Europe. The Latin America paint season is the strongest in the fourth quarter. These cyclical activity levels result in the collection of outstanding receivables and lower inventory on hand in the fourth quarter generating higher cash from operating activities.

Employee Relations

The average number of people employed worldwide by PPG during 2017 was about 47,200. The Company has numerous collective bargaining agreements throughout the world. We observe local customs, laws and practices in labor relations when negotiating collective bargaining agreements. There were no significant work stoppages in 2017. While we have experienced occasional work stoppages as a result of the collective bargaining process and may experience some work stoppages in the future, we believe that we will be able to negotiate all labor agreements on satisfactory terms. To date, these work stoppages have not had a significant impact on PPG’s results of operations. Overall, the Company believes it has good relationships with its employees.

Environmental Matters

PPG is committed to operating in a sustainable manner and to helping our customers meet their sustainability goals. Our sustainability efforts are led by the Technology and Environment Committee of our Board of Directors and our Sustainability Committee, which is comprised of members of PPG's senior management team. The Sustainability Committee establishes policies, programs, procedures and goals to address sustainability in our business practices, including resource management, climate change, innovation, communications, purchasing, manufacturing and employee wellness.

Our dedication to innovation is intertwined with sustainability. Once again in 2017, we increased the percent of our sales from sustainable products. We are marketing an ever-growing variety of products and services that provide environmental, safety and other benefits to our customers. Our products contribute to lighter, more fuel-efficient vehicles, airplanes and ships, and they help our customers reduce their energy consumption, conserve water and reduce waste. These products include a compact automotive paint process that saves energy and reduces water usage; sustainable, waterborne coatings formulations; lightweight sealants and coatings for aircraft; coatings that cool surfaces; and solutions for autonomous and battery-powered vehicles.

Public and governmental concerns related to climate change continue to grow, leading to efforts to limit the greenhouse gas ("GHG") emissions believed to be responsible. While PPG has operations in many countries, a substantial portion of PPG's GHG emissions are generated by locations in the U.S. where considerable legislative and regulatory activity has been taking place. PPG has, and will continue to, annually report our global GHG emissions to the voluntary Carbon Disclosure project.

PPG participates in both the U.S. Department of Energy, BETTER BUILDINGS®, BETTER PLANTS® program, formerly the SAVE ENERGY NOW® Leadership program, and the Environmental Protection Agency ENERGY STAR® Industrial Partnership program, both reinforcing the company's voluntary efforts to significantly reduce its industrial energy intensity. These programs include developing and implementing energy management processes and setting energy savings targets while providing a suite of educational, training, and technical resources to help meet those targets. Recognizing the continuing importance of this matter, PPG has a senior management group with a mandate to guide the Company's progress in this area.

Our commitment to sustainability continues to yield tangible results. In 2017, we again made significant progress reducing our energy intensity, greenhouse gas emissions intensity, water usage intensity and waste intensity. More information about PPG's sustainability values, efforts, goals and data and our community and employee engagement programs can be found in our Sustainability Report and on our sustainability website at http://sustainability.ppg.com and on the Carbon Disclosure Project's website at www.cdp.net.

PPG is subject to existing and evolving standards relating to protection of the environment. In management's opinion, the Company operates in an environmentally sound manner and is well positioned, relative to environmental matters, within the industries in which it operates. PPG is negotiating with various government agencies concerning 126 current and former manufacturing sites and offsite waste disposal locations, including 24 sites on the National Priority List. While PPG is not generally a major contributor of wastes to these offsite waste disposal locations, each potentially responsible party may face governmental agency assertions of joint and several liability. Generally, however, a final allocation of costs is made based on relative contributions of wastes to the site. There is a wide range of cost estimates for cleanup of these sites, due largely to uncertainties as to the nature and extent of their condition and the methods that may have to be employed for their remediation. The Company has established reserves for onsite and offsite remediation of those sites where it is probable that a liability has been incurred and the amount of loss can be reasonably estimated.

The Company's experience to date regarding environmental matters leads it to believe that it will have continuing expenditures for compliance with provisions regulating the protection of the environment and for present and future remediation efforts at waste and plant sites. Management anticipates that such expenditures will occur over an extended period of time.

In addition to the $258 million currently reserved for environmental remediation efforts, we may be subject to loss contingencies related to environmental matters estimated to be approximately $100 million to $200 million. These reasonably possible unreserved losses relate to environmental matters at a number of sites, none of which are individually significant. The loss contingencies related to these sites include significant unresolved issues such as the nature and extent of contamination at these sites and the methods that may have to be employed to remediate them.

($ in millions)	2017	2016	2015
Capital expenditures for environmental control projects	$7	$18	$15

It is expected that expenditures for such projects in 2018 will be in the range of $10 million to $20 million. Although future capital expenditures are difficult to estimate accurately because of constantly changing regulatory standards and policies, it can be anticipated that environmental control standards will become increasingly stringent and the cost of compliance will increase.

Management believes that the outcome of these environmental contingencies will not have a material adverse effect on PPG's financial position or liquidity; however, any such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. See Note 14, "Commitments and Contingent Liabilities," under Item 8 of this Form 10-K/A for additional information related to environmental matters and our accrued liability for estimated environmental remediation costs.

Available Information

The Company's website address is www.ppg.com. The Company posts, and shareholders may access without charge, the Company's recent filings and any amendments thereto of its annual reports on Form 10-K/A, quarterly reports on Form 10-Q and its proxy statements as soon as reasonably practicable after such reports are filed with the Securities and Exchange Commission ("SEC"). The Company also posts all financial press releases, including earnings releases, to its website. All other reports filed or furnished to the SEC, including reports on Form 8-K, are available via direct link on PPG's website to the SEC's website, www.sec.gov. Reference to the Company's and the SEC's websites herein does not incorporate by reference any information contained on those websites and such information should not be considered part of this Form 10-K/A.

Item 1A. Risk Factors

As a global manufacturer of paints, coatings and specialty materials, we operate in a business environment that includes risks. These risks are not unlike the risks we have faced in the recent past nor are they unlike risks faced by our competitors. Each of the risks described in this section could adversely affect our results of operations, financial position and liquidity. While the factors listed here are considered to be the more significant factors, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles which may adversely affect our businesses and our results of operations.

Increases in prices and declines in the availability of raw materials could negatively impact our financial results.

Our financial results are significantly affected by the cost of raw materials. Coatings raw materials, which include both organic, primarily petroleum based, materials and inorganic materials, including titanium dioxide, comprise between 70% and 80% of the Company's cost of sales, exclusive of depreciation and amortization, sold in most coatings formulations and represent PPG's single largest production cost component.

While not our customary practice, we also import raw materials and intermediates, particularly for use at our manufacturing facilities in the emerging regions of the world. In most cases, those imports are priced in the currency of the supplier and, therefore, if that currency strengthens against the currency of our manufacturing facility, our margins may be lower.

Most of our raw materials are purchased from outside sources, and the Company has made, and plans to continue to make, supply arrangements to meet the planned operating requirements for the future. Adequate supply of critical raw materials is managed by establishing contracts, procuring from multiple sources, and identifying alternative materials or technology whenever possible. The Company is continuing its aggressive sourcing initiatives to effectively broaden our supply of high quality raw materials. These initiatives include qualifying multiple and local sources of supply, including suppliers from Asia and other lower cost regions of the world, adding on-site resin production at certain manufacturing locations, and a reduction in the amount of titanium dioxide and other raw materials used in our product formulations. Our products use both petroleum-derived and bio-based materials as part of a product renewal strategy.

An inability to obtain critical raw materials would adversely impact our ability to produce products. Increases in the cost of raw materials may have an adverse effect on our income from continuing operations or cash from operating activities in the event we are unable to offset these higher costs in a timely manner.

Refer to Item 1. "Raw Materials and Energy" of this Form 10-K/A for a discussion of the current year trends and outlook in raw material and energy costs.

The pace of economic growth and level of uncertainty could have a negative impact on our results of operations and cash flows.

During 2017, economic conditions improved in all of our major geographical regions while remaining mixed by end-use market. PPG provides products and services to a variety of end-use markets in many geographies. This broad end-use market exposure and expanded geographic presence lessens the significance of any individual decrease in activity levels; nonetheless, lower demand levels may result in lower sales, which would result in reduced income from continuing operations and cash from operating activities.

Refer to Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations” of this Form 10-K/A for discussion of the economic conditions in 2017 and our outlook on certain economic conditions in 2018.

We are subject to existing and evolving standards relating to the protection of the environment.

Environmental laws and regulations control, among other things, the discharge of pollutants into the air and water, the handling, use, treatment, storage and clean-up of hazardous and non-hazardous waste, the investigation and remediation of soil and groundwater affected by hazardous substances, and regulate various health and safety matters. The environmental laws and regulations we are subject to impose liability for the costs of, and damages resulting from, cleaning up current sites, past spills, disposals and other releases of hazardous substances. Violations of these laws and regulations can also result in fines and penalties. Future environmental laws and regulations may require substantial capital expenditures or may require or cause us to modify or curtail our operations, which may have a material adverse impact on our business, financial condition and results of operations.

As described in Note 14, “Commitments and Contingent Liabilities,” under Item 8 of this Form 10-K/A, we are currently undertaking environmental remediation activities at a number of our current and former facilities and properties, the cost of which is substantial. In addition to the amounts currently reserved, we may be subject to loss contingencies related to environmental matters estimated to be as much as $100 million to $200 million. Such unreserved losses are reasonably possible but are not currently considered to be probable of occurrence.

We are involved in a number of lawsuits and claims, and we may be involved in future lawsuits and claims, in which substantial monetary damages are sought.

PPG is involved in a number of lawsuits and claims, both actual and potential, in which substantial monetary damages are sought. Those lawsuits and claims relate to contract, patent, environmental, product liability, asbestos exposure, antitrust, employment, securities and other matters arising out of the conduct of PPG’s current and past business activities. Any such claims, whether with or without merit, could be time consuming, expensive to defend and could divert management’s attention and resources. We maintain insurance against some, but not all, of these potential claims, and the levels of insurance we do maintain may not be adequate to fully cover any and all losses. We believe that, in the aggregate, the outcome of all current lawsuits and claims involving PPG, including those described in Note 14, “Commitments and Contingent Liabilities” under Item 8 of this Form 10-K/A, will not have a material effect on PPG’s consolidated financial position or liquidity; however, such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. Nonetheless, the results of any future litigation or claims are inherently unpredictable, and such outcomes could have a material adverse effect on our results of operations, cash from operating activities or financial condition.

Fluctuations in foreign currency exchange rates could affect our financial results.

We earn revenues, pay expenses, own assets and incur liabilities in countries using currencies other than the U.S. dollar. Because our consolidated financial statements are presented in U.S. dollars, we must translate revenues and expenses into U.S. dollars at the average exchange rate during each reporting period, as well as assets and liabilities into U.S. dollars at exchange rates in effect at the end of each reporting period. Therefore, increases or decreases in the value of the U.S. dollar against other currencies will affect our net sales, net income and the value of balance sheet items denominated in foreign currencies. We may use derivative financial instruments to reduce our net exposure to currency exchange rate fluctuations related to foreign currency transactions. However, fluctuations in foreign currency exchange rates, particularly the strengthening or weakening of the U.S. dollar against major currencies, could adversely or positively affect our financial condition and results of operations expressed in U.S. dollars. In 2017, changes in the U.S. dollar versus our mix of currencies had a favorable impact on full year net sales and an unfavorable impact on income before income taxes from the translation of foreign earnings into U.S. dollars of approximately $55 million and $7 million, respectively.

We are subject to a variety of complex U.S. and non-U.S. laws and regulations which could increase our compliance costs.

We are subject to a wide variety of complex U.S. and non-U.S. laws and regulations, and legal compliance risks, including securities laws, tax laws, environmental laws, employment and pension-related laws, competition laws, U.S. and foreign export and trading laws, and laws governing improper business practices, including bribery. We are affected by new laws and regulations and changes to existing laws and regulations, as well as interpretations by courts and regulators. These laws and regulations effectively expand our compliance obligations and potential enforcement actions by governmental authorities or litigation related to them.

New laws and regulations or changes in existing laws or regulations or their interpretation could increase our compliance costs. For example, regulations concerning the composition, use and transport of chemical products continue to evolve. Developments concerning these regulations could potentially impact the availability or viability of some of the raw materials we use in our product formulations and/or our ability to supply certain products to some customers or markets. Import/export regulations also continue to evolve and could result in increased compliance costs, slower product movements or additional complexity in our supply chains.

Our international operations expose us to additional risks and uncertainties that could affect our financial results.

PPG has a significant investment in global operations. This broad geographic footprint serves to lessen the significance of economic impacts occurring in any one region. Notwithstanding the benefits of geographic diversification, our ability to achieve and maintain profitable growth in international markets is subject to risks related to the differing legal, political, social and regulatory requirements and economic conditions of many countries. As a result of our operations outside the U.S., we are subject to certain inherent risks, including political and economic uncertainty, inflation rates, exchange rates, trade protection measures, local labor conditions and laws, restrictions on foreign investments and repatriation of earnings, and weak intellectual property protection. Our percentage of sales generated in 2017 by products sold outside the U.S. was approximately 62%.

Changes in the tax regimes and related government policies and regulations in the countries in which we operate could adversely affect our results and our effective tax rate.

As a multinational corporation, we are subject to various taxes in both the U.S. and non-U.S. jurisdictions. Due to economic and political conditions, tax rates in these various jurisdictions may be subject to significant change. Our future effective income tax rate could be affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets or changes in tax laws or their interpretation. In December 2017, the U.S. enacted the U.S. Tax Cuts and Job Act. While the Company has made a preliminary assessment of the new legislation's impact on PPG, U.S. regulatory agencies will be issuing further regulations and clarifying interpretations over the next year which could alter the Company's conclusions regarding the impact of the new law. Further, PPG may continue to refine its estimates to incorporate new or better information as it comes available. Recent developments, including the European Commission's investigations on illegal state aid as well as the Organisation for Economic Co-operation and Development project on Base Erosion and Profit Shifting may result in changes to long-standing tax principles, which could adversely affect our effective tax rate or result in higher cash tax liabilities. If our effective income tax rate was to increase, our cash from operating activities, financial condition and results of operations would be adversely affected.

Although we believe that our tax filing positions are appropriate, the final determination of tax audits or tax disputes may be different from what is reflected in our historical income tax provisions and accruals. If future audits find that additional taxes are due, we may be subject to incremental tax liabilities, possibly including interest and penalties, which could have a material adverse effect on our cash from operating activities, financial condition and results of operations.

Business disruptions could have a negative impact on our results of operations and financial condition.

Unexpected events, including supply disruptions, temporary plant and/or power outages, work stoppages, natural disasters and severe weather events, computer system disruptions, fires, war or terrorist activities, could increase the cost of doing business or otherwise harm the operations of PPG, our customers and our suppliers. It is not possible for us to predict the occurrence or consequence of any such events. However, such events could reduce our ability to supply products, reduce demand for our products or make it difficult or impossible for us to receive raw materials from suppliers or to deliver products to customers.

Integrating acquired businesses into our existing operations.

Part of the Company's strategy is growth through acquisitions. Over the last decade, we have successfully completed more than 50 acquisitions and we will likely acquire additional businesses and enter into additional joint ventures in the future. Growth through acquisitions and the formation of joint ventures involve risks, including:

- difficulties in assimilating acquired companies and products into our existing business;
- delays in realizing the benefits from the acquired companies or products;
- diversion of our management's time and attention from other business concerns;
- difficulties due to lack of or limited prior experience in any new markets we may enter;
- unforeseen claims and liabilities, including unexpected environmental exposures or product liability;
- unexpected losses of customers or suppliers of the acquired or existing business;
- difficulty in conforming the acquired business' standards, processes, procedures and controls to those of our operations; and
- difficulties in retaining key employees of the acquired businesses.

These risks or other problems encountered in connection with our past or future acquisitions and joint ventures could cause delays in realizing the anticipated benefits of such acquisitions or joint ventures and could adversely affect our results of operations, cash from operating activities or financial condition.

Our ability to understand our customers' specific preferences and requirements, and to innovate, develop, produce and market products that meet customer demand is critical to our business results.

Our business relies on continued global demand for our brands and products. To achieve business goals, we must develop and sell products that appeal to customers. This is dependent on a number of factors, including our ability to produce products that meet the quality, performance and price expectations of our customers and our ability to develop effective sales, advertising and marketing programs.

We believe the automotive industry will experience significant and continued change in the coming years. Vehicle manufacturers continue to develop new safety features such as collision avoidance technology and self-driving vehicles that may reduce vehicle collisions in the future, potentially lowering demand for our refinish coatings. In addition, through the introduction of new technologies, new business models or new methods of travel, such as ridesharing, the number of automotive OEM new-builds may decline, potentially reducing demand for our automotive OEM coatings.

Our future growth will depend on our ability to continue to innovate our existing products and to develop and introduce new products. If we fail to keep pace with product innovation on a competitive basis or to predict market demands for our products, our businesses, financial condition and results of operations could be adversely affected.

The industries in which we operate are highly competitive.

With each of our businesses, an increase in competition may cause us to lose market share, lose a large regional or global customer, or compel us to reduce prices to remain competitive, which could result in reduced margins for our products. Competitive pressures may not only reduce our margins but may also impact our revenues and our growth which could adversely affect our results of operations.

The security of our information technology systems could be compromised, which could adversely affect our ability to operate.

Increased global information technology security requirements, threats and sophisticated and targeted computer crime pose a risk to the security of our systems, networks and the confidentiality, availability and integrity of our data. Despite our efforts to protect sensitive information and confidential and personal data, our facilities and systems may be vulnerable to security breaches. This could lead to negative publicity, theft, modification or destruction of proprietary information or key information, manufacture of defective products, production downtimes and operational disruptions, which could adversely affect our reputation, competitiveness and results of operations.

We have concluded that certain of our previously issued financial statements should not be relied upon and have restated certain of our previously issued financial statements, which may lead to, among other things, shareholder litigation, loss of investor confidence, negative impact on our stock price and certain other risks.

As discussed in the Explanatory Note, Note 2, “Restatement of Previously Reported Consolidated Annual Financial Statements” and in Note 19, “Quarterly Financial Information (unaudited)” under Item 8 of this Form 10-K/A, we have concluded that our previously issued financial statements as of December 31, 2017 and 2016, and for each of the quarterly and year-to-date periods in 2017, and the final quarterly and year-to-date period in 2016, should no longer be relied upon. The determination that the applicable financial statements should no longer be relied upon and that certain financial statements would be restated was made following the identification of misstatements. As a result of these misstatements, we have become subject to a number of additional risks and uncertainties, including unanticipated costs for accounting and legal fees in connection with or related to the restatement, shareholder litigation and government investigations. Any such proceeding could result in substantial defense costs regardless of the outcome of the litigation or investigation. If we do not prevail in any such litigation, we could be required to pay substantial damages or settlement costs.

We are remediating certain internal controls and procedures, which, if not successful, could result in additional misstatements in our financial statements negatively affecting our results of operations.

We are in the process of implementing certain remediation actions. See Item 9A. “Controls and Procedures” of this Form 10-K/A for a description of these remediation measures. To the extent these steps are not successful, not sufficient to correct our material weakness in internal control over financial reporting or are not completed in a timely manner, future financial statements may contain material misstatements and we could be required to restate our financial results. Any of these matters could adversely affect our business, reputation, revenues, results of operations, financial condition and stock price and limit our ability to access the capital markets through equity or debt issuances.

We are involved in governmental investigations, which are costly to conduct and may result in substantial financial and other penalties, as well as adverse effects on our business and financial condition.

Prior to filing the Current Report on Form 8-K disclosing our receipt of the internal report on April 19, 2018, we self-reported these issues to the SEC. We are cooperating with the SEC in its investigation of this matter. The SEC investigation is continuing, and we are currently unable to predict its duration, scope or results or whether the SEC will commence any legal action. If we are found to have violated securities laws or other federal statutes, we may be subject to criminal and civil penalties and other remedial measures, including, but not limited to, injunctive relief, disgorgement, civil and criminal fines and penalties, modifications of compliance programs and the retention of a monitor to oversee compliance. The imposition of any of these sanctions or remedial measures could have a material adverse impact on our business, reputation, revenues, results of operations and financial condition.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

The Company's corporate headquarters is located in Pittsburgh, Pa. The Company's manufacturing facilities, sales offices, research and development centers and distribution centers are located throughout the world. As of February 15, 2018, the Company operated 133 manufacturing facilities in 39 countries. See Item 1. "Business" of this Form 10-K/A for the principal manufacturing and distribution facilities by reportable segment.

The Company has manufacturing facilities in the following geographic areas:

United States and Canada:	39 facilities.	EMEA:	54 facilities in 23 countries.
Latin America:	14 facilities in 5 countries.	Asia Pacific:	26 facilities in 9 countries.

The Company's principal research and development centers are located in Allison Park, Pa.; Monroeville, Pa.; Burbank, Calif.; Tianjin, China; Amsterdam, Netherlands and Tepexpan, Mexico.

The Company's headquarters, certain distribution centers and substantially all company-owned paint stores are located in facilities that are leased while the Company's other facilities are generally owned. Our facilities are considered to be suitable and adequate for the purposes for which they are intended and overall have sufficient capacity to conduct business in the upcoming year.

Item 3. Legal Proceedings

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. These lawsuits and claims may relate to contract, patent, environmental, product liability, asbestos exposure, antitrust, employment, securities and other matters arising out of the conduct of PPG’s current and past business activities. To the extent that these lawsuits and claims involve personal injury and property damage, PPG believes it has adequate insurance; however, certain of PPG’s insurers are contesting coverage with respect to some of these claims, and other insurers may contest coverage. PPG’s lawsuits and claims against others include claims against insurers and other third parties with respect to actual and contingent losses related to environmental, asbestos and other matters.

The Company has self-reported to the SEC information concerning the internal investigation of accounting matters described in the Explanatory Note and in Note 2, “Restatement of Previously Reported Consolidated Annual Financial Statements” under Item 8 of this Form 10-K/A. The Company’s cooperation with the SEC’s investigation is continuing.

On May 20, 2018, a putative securities class action lawsuit was filed in the U.S. District Court for the District for the Central District of California against the Company and certain of its current or former officers. This action, captioned Trevor Mild v. PPG Industries, Inc., Michael H. McGarry, Vincent J. Morales, and Mark C. Kelly, asserts securities fraud claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 on behalf of putative classes of persons who purchased or otherwise acquired stock of the Company during various time periods between April 24, 2017 and May 10, 2018. The allegations relate to, among other things, allegedly false and misleading statements and/or failures to disclose information about the Company’s business, operations and prospects. This action remains pending. The Company believes this action is without merit and intends to defend itself vigorously.

For many years, PPG has been a defendant in lawsuits involving claims alleging personal injury from exposure to asbestos. For a description of asbestos litigation affecting the Company, see Note 14, “Commitments and Contingent Liabilities” under Item 8 of this Form 10-K/A.

In the past, the Company and others have been named as defendants in several cases in various jurisdictions claiming damages related to exposure to lead and remediation of lead-based coatings applications. PPG has been dismissed as a defendant from most of these lawsuits and has never been found liable in any of these cases.

In March 2016, the Natural Resource Trustees for the Calcasieu River Estuary (the United States Department of the Interior, acting through the United States Fish and Wildlife Service, the National Oceanic and Atmospheric Administration of the United States Department of Commerce, the Louisiana Department of Environmental Quality and the Louisiana Department of Wildlife and Fisheries) reached an agreement in principle with PPG and two other potentially responsible parties to resolve the Trustees’ claims for natural resource damages alleged to have been caused by the release of hazardous substances into the Estuary. In the fourth quarter of 2017, PPG signed a consent decree prepared by the US Department of Justice for settlement of potential natural resource damage claims at the Calcasieu River Estuary. PPG’s share of this settlement is $3.6 million. Payment of PPG’s share of the settlement is required to be made into an escrow account within 30 days of filing the agreement with the court and is expected to occur in the first quarter of 2018.

Executive Officers of the Company

Set forth below is information related to the Company's executive officers as of June 28, 2018.

Name	Age	Title
Michael H. McGarry [(a)]	59	Chairman and Chief Executive Officer since September 2016
Glenn E. Bost II [(b)]	65	Senior Vice President and General Counsel since July 2010
Jean-Marie Greindl [(c)]	55	Senior Vice President, Architectural Coatings and President PPG EMEA since March 2016
Timothy M. Knavish [(d)]	52	Senior Vice President, Industrial Coatings since October 2017
Ramaparasad Vadlamannati [(e)]	55	Senior Vice President, Protective and Marine Coatings since March 2016
Vincent J. Morales [(f)]	52	Senior Vice President and Chief Financial Officer since March 2017

(a) Mr. McGarry served as President and Chief Executive Officer from September 2015 through August 2016, President and Chief Operating Officer from March 2015 through August 2015; Chief Operating Officer from August 2014 through February 2015; Executive Vice President from September 2012 through July 2014; and Senior Vice President, Commodity Chemicals from July 2008 through August 2012.

(b) Mr. Bost served as Vice President and Associate General Counsel from July 2006 through June 2010.

(c) Mr. Greindl served as Vice President, Automotive Coatings, EMEA and President, PPG EMEA from February 2013 through February 2016, Vice President, Automotive Coatings, EMEA from January 2011 through January 2013 and Vice President, Automotive Coatings, Europe from October 2010 through December 2010.

(d) Mr. Knavish served as Senior Vice President, Automotive Coatings from March 2016 through September 2017, Vice President, Protective and Marine Coatings from August 2012 through February 2016 and Vice President, Automotive Coatings, Americas from March 2010 through July 2012.

(e) Mr. Vadlamannati served as Vice President, Architectural Coatings, EMEA and Asia/Pacific from August 2014 through February 2016, Vice President, Architectural Coatings, EMEA from February 2012 through July 2014, Vice President, Architectural Coatings, EMEA for Region Western Europe from March 2011 through January 2012 and Vice President, Automotive Refinish, EMEA from September 2010 through February 2011.

(f) Mr. Morales served as Vice President, Finance from June 2016 through February 2017. From June 2015 through June 2016, he served as Vice President Investor Relations and Treasurer and from October 2007 through May 2015 he served as Vice President, Investor Relations.

Item 4. Mine Safety Disclosures

Not Applicable.

Part II

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

The information required by Item 5 regarding market information, including stock exchange listings and quarterly stock market prices, dividends and holders of common stock is included in Exhibit 13.1 filed with this Form 10-K/A and is incorporated herein by reference. This information is also included in the PPG Shareholder Information on page 4 of the Annual Report to shareholders.

Directors who are not also officers of the Company may receive common stock equivalents pursuant to the PPG Industries, Inc. Deferred Compensation Plan for Directors (“PPG Deferred Compensation Plan for Directors”). Common stock equivalents are hypothetical shares of common stock having a value on any given date equal to the value of a share of common stock. Common stock equivalents earn dividend equivalents that are converted into additional common stock equivalents but carry no voting rights or other rights afforded to a holder of common stock. The common stock equivalents credited to directors under this plan are exempt from registration under Section 4(a)(2) of the Securities Act of 1933 as private offerings made only to directors of the Company in accordance with the provisions of the plan.

Under the PPG Deferred Compensation Plan for Directors, each director may elect to defer the receipt of all or any portion of the compensation paid to such director for serving as a PPG director. All deferred payments are held in the form of common stock equivalents. Payments out of the deferred accounts are made in the form of common stock of the Company (and cash as to any fractional common stock equivalent). The directors, as a group, were credited with 14,007; 17,807; and 15,445 common stock equivalents in 2017, 2016 and 2015, respectively, under this plan. The values of the common stock equivalents, when credited, ranged from $95.25 to $115.89 in 2017; $95.63 to $116.07 in 2016, and $90.13 to $98.73 in 2015.

Issuer Purchases of Equity Securities - Fourth Quarter, 2017

Month	Total Number of Shares Purchased	Avg. Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Programs	Max. Number of Shares That May Yet Be Purchased Under the Programs[1]
October 2017				
Repurchase program	1,221,668	$114.35	1,221,668	11,327,456
November 2017				
Repurchase program	1,152,976	$115.64	1,152,976	10,127,329
December 2017				
Repurchase program	1,091,300	$116.36	1,091,300	30,443,353
Total quarter ended December 31, 2017				
Repurchase program	3,465,944	$115.41	3,465,944	30,443,353

(1) In December 2017, PPG's board of directors approved a $2.5 billion share repurchase program. This program is in addition to the company’s existing share repurchase authorization, which was approved in October 2016. The remaining shares yet to be purchased under the programs have been calculated using PPG’s closing stock price on the last business day of the respective month. These repurchase programs have no expiration date.

No shares were withheld in satisfaction of the exercise price and/or tax withholding obligation by holders of employee stock options who exercised options granted under the Company’s equity compensation plans in the fourth quarter of 2017.

Item 6. Selected Financial Data (As Restated)

The information required by Item 6 regarding the selected financial data for the five years ended December 31, 2017 is included in Exhibit 13.2 filed with this Form 10-K/A and is incorporated herein by reference.

Management and the Audit Committee have concluded that our financial statements as of December 31, 2017 and 2016, and for each of the quarterly and year-to-date periods in 2017 and the final quarterly and year-to-date period in 2016 should not be relied upon. In this Form 10-K/A, we have restated our audited consolidated financial statements as of December 31, 2017 and 2016, and certain unaudited consolidated financial information for each of the quarterly and year-to-date periods in 2017 and the final quarterly and year-to-date period in 2016. The selected statement of operations data presented in Exhibit 13.2 and incorporated by reference herein for each of the three years in the period ended December 31, 2017 and the balance sheet data as of December 31, 2017 and 2016 have been derived from the audited consolidated financial statements included in this Form 10-K/A. The selected statement of operations data for the years ended December 31, 2014 and 2013 and the balance sheet data as of December 31, 2015, 2014 and 2013 have been derived from consolidated financial information not included in this Form 10-K/A.

For more information on this restatement, see the Explanatory Note immediately preceding the Table of Contents, Note 2, “Restatement of Previously Reported Consolidated Annual Financial Statements” and Note 19, “Quarterly Financial Information (unaudited)” under Item 8 of this Form 10-K/A. The selected financial data reflect the restatement described in the Explanatory Note.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations (As Restated)
As described in Note 2, "Restatement of Previously Reported Consolidated Annual Financial Statements" under Item 8 of this Form 10-K/A, we restated our audited financial statements as of December 31, 2017 and 2016 and for the years ended December 31, 2017 and 2016. The impact of the restatement is reflected in Management's Discussion and Analysis ("MD&A") of Financial Condition and Results of Operations below. We have also restated certain unaudited quarterly results related to the three months ended December 31, 2016, March 31, 2017, June 30, 2017 (and six months ended), September 30, 2017 (and nine months ended) and December 31, 2017. The impact of the restatement to the quarterly 2017 financial statements does not result in material changes to the MD&A included in the previously filed Forms 10-Q. As such, these disclosures have not been included in this Form 10-K/A.
Performance Overview
Net Sales

($ in millions, except percentages)	2017 As Restated	2016	2015	% Change 2017 vs. 2016	% Change 2016 vs. 2015
United States and Canada	$6,307	$6,254	$6,232	0.8%	0.4%
Europe, Middle East and Africa (EMEA)	4,389	4,164	4,103	5.4%	1.5%
Asia Pacific	2,523	2,431	2,433	3.8%	(0.1)%
Latin America	1,529	1,421	1,473	7.6%	(3.5)%
Total	$14,748	$14,270	$14,241	3.3%	0.2%

2017 vs. 2016
Net sales increased $478 million due to the following:
- Acquisition-related sales (+1%)
- Higher sales volumes (+1%)
- Slightly favorable foreign currency translation
- Slightly higher selling prices

Net sales from acquired businesses, net of divestitures, added over $200 million of sales in 2017, primarily MetoKote, DEUTEK, Univer and The Crown Group.
U.S. and Canada sales volumes declined slightly year-over-year, with mixed demand by business and end-use market segment. Sales volumes in architectural coatings U.S. company-owned stores grew by a mid-single-digit percentage, but were more than offset by sales volumes declines in the independent dealer networks and national retail (DIY) customer accounts in aggregate. Automotive OEM coatings sales volumes declined year-over-year and lagged industry demand levels due to a customer-driven market-share shift away from PPG that was offset in other regions of the world. These decreases in sales volumes were partially offset by higher sales volumes in specialty coatings and materials, automotive refinish coatings, general industrial coatings, aerospace coatings and packaging coatings.
EMEA sales volumes increased a low-single-digit percentage versus the prior year. Sales volumes in our automotive OEM coatings and aerospace coatings businesses each grew by a mid-single-digit percentage. Specialty coatings and materials sales volumes grew by a double-digit percentage, driven by strong silica demand. Protective coatings volumes also grew year-over-year. These increases in sales volumes were partially offset by lower demand in architectural coatings.
Asia Pacific sales volumes expanded by a mid-single-digit percentage year-over-year led by growth in each business within the Industrial Coatings segment along with sales volume growth in the architectural coatings business. These increases in sales volumes were partially offset by lower demand in marine coatings year-over-year. From a country and sub-region perspective, sales volumes grew in India, China, and Southeast Asia versus the prior year. Korea sales volumes continued to decline year-over-year primarily due to continued weakness in new shipbuilding.
Latin America sales volumes expanded by a mid-single-digit percentage versus the prior year primarily due to above market growth in our automotive OEM coatings and general industrial coatings businesses. The automotive OEM coatings growth was driven by industry production expansion with the opening of new assembly facilities in Mexico. Regional sales volumes were lower in architectural coatings versus the prior year primarily due to lower sales volumes in Brazil and in Mexico due to the impact of the natural disasters during the third quarter.

2016 vs. 2015
Net sales increased $29 million due to the following:
- Acquisition-related sales (+2%)
- Higher sales volumes (+1%)

Partially offset by:
- Unfavorable foreign currency translation (-3%)

Acquired businesses added approximately $310 million of sales in 2016, primarily due to the partial year sales from businesses acquired in 2015, including Revocoat, IVC Industrial Coatings, Le Joint Francais and Cuming Microwave, as well as the 2016 acquisitions of MetoKote and Univer.
Sales volume growth, excluding acquisition related sales, grew 1% led by growth in Asia Pacific and EMEA, while U.S. and Canada sales volumes as a percentage of sales, declined modestly.
U.S. and Canada sales volumes declined a low-single-digit percentage year-over-year, with mixed demand by business and end-use market segment. Sales volumes in architectural coatings company-owned stores grew by a mid-single-digit percentage, but were more than offset by sales volumes declines in the independent dealer networks and several national retail (DIY) customer accounts. Automotive OEM coatings sales volumes declined year-over-year, in large-part due to lower industry production. These decreases in sales volumes were partially offset by higher sales volumes in automotive refinish coatings and packaging coatings.
EMEA sales volumes increased a low-single-digit percentage versus the prior year. Sales volumes in our automotive OEM coatings and general industrial coatings businesses each grew by a mid-single-digit percentage, above market. Specialty coatings and materials sales volumes grew by a mid-single-digit percentage, driven by silica demand. These increases in sales volumes were partially offset by modestly lower demand in architectural coatings.
Asia Pacific sales volumes expanded by a mid-single-digit percentage year-over-year led by growth in each business within the Industrial Coatings segment. These increases in sales volumes were partially offset by lower demand in marine coatings year-over-year. From a country and sub-region perspective, sales volumes grew in India, China, and Southeast Asia versus the prior year. Korea sales volumes declined year-over-year primarily due to continued weakness in new shipbuilding.
Latin America sales volumes expanded by a low-to-mid-single-digit percentage versus the prior year primarily due to above market growth in our architectural coatings, automotive OEM coatings and general industrial coatings businesses.
Unfavorable foreign currency translation reduced net sales by approximately $385 million as the U.S. dollar strengthened against most foreign currencies year-over-year, notably the British pound, the Mexican peso, and the Chinese yuan.
Cost of sales, exclusive of depreciation and amortization

($ in millions, except percentages)	2017 As Restated	2016	2015	% Change 2017 vs. 2016	% Change 2016 vs. 2015
Cost of sales, exclusive of depreciation and amortization	$8,207	$7,693	$7,786	6.7%	(1.2)%
Cost of sales as a % of net sales	55.6 %	53.9 %	54.7 %	1.7%	(0.8)%

2017 vs. 2016
Cost of sales, exclusive of depreciation and amortization, increased $514 million (+7%) due to the following:
- Raw material cost inflation
- Higher sales volumes
- Cost of sales attributable to acquired businesses
- Foreign currency translation

Partially offset by:
- Lower manufacturing costs

2016 vs. 2015
Cost of sales, exclusive of depreciation and amortization, decreased $93 million (-1%) due to the following:
- Foreign currency translation

- Lower manufacturing costs

Partially offset by:

- Cost of sales from acquired businesses
- Higher sales volumes

Selling, general and administrative expenses

($ in millions, except percentages)	2017	2016	2015	% Change 2017 vs. 2016	2016 vs. 2015
	As Restated	As Restated			
Selling, general and administrative expenses	$3,564	$3,588	$3,584	(0.7)%	0.1%
Selling, general and administrative expenses as a % of net sales	24.2 %	25.1 %	25.2 %	(0.9)%	(0.1)%

2017 vs. 2016

Selling, general and administrative expenses decreased $24 million (-1%) primarily due to:

- Lower net periodic pension and other postretirement benefit costs
- Lower selling and advertising costs
- Restructuring cost savings

Partially offset by:

- Wage and other cost inflation
- Selling, general and administrative expenses from acquired businesses
- Foreign currency translation

2016 vs. 2015

Selling, general and administrative expenses increased $4 million (0%) due to the following:

- Foreign currency translation
- Restructuring cost savings

Partially offset by:

- Selling, general and administrative expenses from acquired businesses
- Overhead cost inflation

Other charges and other income

($ in millions, except percentages)	2017	2016	2015	% Change 2017 vs. 2016	2016 vs. 2015
	As Restated	As Restated			
Interest expense, net of Interest income	$85	$99	$86	(14.1)%	15.1%
Business restructuring (As Restated)	$—	$191	$136	(100.0)%	40.4%
Pension settlements	$60	$968	$—	(93.8)%	N/A
Other charges	$64	$175	$90	(63.4)%	94.4%
Other income	($150)	($127)	($110)	18.1%	15.5%

Interest expense, net of Interest income

Interest expense, net of interest income decreased $14 million in 2017 versus 2016 primarily due to lower interest rate debt outstanding during 2017. Interest expense, net of Interest income increased $13 million in 2016 versus 2015 as interest income decreased year-over-year due to lower interest rates and lower average cash deposits on hand.

Business restructuring

In 2016, PPG recorded a pre-tax business restructuring charge of $191 million (as restated). During 2017, PPG realized approximately $50 million of cost savings related to restructuring actions. Once fully implemented, the total annual savings run rate is expected to be approximately $125 million. Refer to Note 8, "Business Restructuring" in Item 8 of this Form 10-K/A for additional information.

In 2015, PPG recorded a pre-tax restructuring charge of $136 million, of which about 85% represented employee severance and other cash charges. As of December 31, 2016, substantially all actions have been completed.

Pension settlements

During 2017, PPG made lump-sum payments to certain retirees who had participated in PPG's U.S. qualified and non-qualified pension plans totaling approximately $127 million. As the lump-sum payments were in excess of the expected 2017 service and interest costs for the affected plans, PPG remeasured the periodic benefit obligation of these plans in the period payments were made and recorded settlement charges totaling $60 million ($38 million after-tax) during 2017.

During 2016, PPG permanently transferred approximately $1.8 billion of its U.S. and Canadian pension obligations and assets to several highly rated insurance companies. These actions triggered remeasurement and partial settlement of certain of the Company's defined benefit pension plans. PPG recognized a $968 million pre-tax settlement charge in connection with these transactions. Refer to Note 13, "Employee Benefit Plans" in Item 8 of this Form 10-K/A for additional information.

Other charges

Other charges in 2017 were lower than 2016 due to the absence of environmental charges and certain asset write-downs. In 2016, Other charges were higher than in 2015 due to environmental charges of $82 million. These charges were principally for environmental remediation at a former chromium manufacturing plant and associated sites in New Jersey.

Other income

Other income was higher in 2017 than in 2016 primarily due to the gain from the sale of the Mexican Plaka business of $25 million. Other income in 2016 was higher than in 2015 due to gains totaling $46 million resulting from the sale of a PPG legacy U.S. automotive glass and services business and a U.S. business affiliate, higher equity earnings from a 2017 acquisition of a 40% interest in a joint venture and was partially offset by the absence of certain business transaction-related gains.

Effective tax rate and earnings per diluted share, continuing operations

($ in millions, except percentages)	2017 As Restated	2016 As Restated	2015	% Change 2017 vs. 2016	% Change 2016 vs. 2015
Income tax expense	$615	$214	$413	187.4%	(48.2)%
Effective tax rate	30.7 %	27.5 %	23.7 %	3.2%	3.8%
Adjusted effective tax rate*	24.3 %	24.5 %	23.9 %	(0.2)%	0.6%
Earnings per diluted share	$5.31	$2.04	$4.79	160.3%	(57.4)%
Adjusted earnings per diluted share*	$5.86	$5.64	$5.33	3.9%	5.8%

*See the Regulation G reconciliations - results of operations

The effective tax rate for the year-ended December 31, 2017 was 30.7% and increased 3.2% from the prior year primarily due to recording the net charge triggered by the enactment of the U.S. Tax Cuts and Jobs Act. This charge is approximately $37 million higher than the net charge included in PPG's fourth quarter earnings release and Form 8-K furnished on January 18, 2018, primarily due to new IRS regulations issued and refinements of management estimates.

As reported, earnings per diluted share from continuing operations for the year ended December 31, 2017 increased year-over-year, primarily due to the absence of the pension settlement charge of $616 million after-tax recorded in 2016. Refer to the Regulation G Reconciliations - Results of Operations for additional information. The Company's earnings per diluted share and adjusted earnings per diluted share both benefited from the 7.4 million, 10.7 million and 7.0 million shares of stock repurchased in 2017, 2016 and 2015, respectively.

Regulation G Reconciliations - Results of Operations

PPG Industries believes investors' understanding of the company's operating performance is enhanced by the disclosure of net income, earnings per diluted share and the effective tax rate adjusted for certain charges. PPG's management considers this information useful in providing insight into the company's ongoing operating performance because it excludes the impact of items that cannot reasonably be expected to recur on a quarterly basis or that are not attributable to our primary operations. Net income and earnings per diluted share adjusted for these items are not recognized financial measures determined in accordance with U.S. generally accepted accounting principles (GAAP) and should not be considered a substitute for net income or earnings per diluted share or other financial measures as computed in accordance with U.S. GAAP. In addition, adjusted net income, earnings per diluted share and the effective tax rate may not be comparable to similarly titled measures as reported by other companies.

Income before income taxes from continuing operations is reconciled to adjusted income before income taxes, the effective tax rate from continuing operations is reconciled to the adjusted effective tax rate from continuing operations and net income (attributable to PPG) and earnings per share – assuming dilution (attributable to PPG) are reconciled to adjusted net income (attributable to PPG) and adjusted earnings per share – assuming dilution below:

Year-ended December 31, 2017 (As Restated)

($ in millions, except percentages and per share amounts)	Income Before Income Taxes	Tax Expense	Effective Tax Rate	Net income from continuing operations (attributable to PPG)	Earnings per diluted share
As reported, continuing operations	$2,005	$615	30.7 %	$1,369	$5.31
Includes:					
Net tax charge related to U.S. Tax Cuts and Jobs Act	—	(134)	N/A	134	0.52
Charges related to transaction-related costs[1]	9	3	37.9 %	6	0.02
Charges related to pension settlements	60	22	37.9 %	38	0.14
Gain from sale of business	(25)	(1)	3.2 %	(24)	(0.09)
Gain from a legal settlement	(18)	(7)	37.9 %	(11)	(0.04)
Gain from sale of a non-operating asset	(13)	(5)	37.9 %	(8)	(0.03)
Charges related to asset write-downs	7	—	— %	7	0.03
Adjusted, continuing operations, excluding certain charges	$2,025	$493	24.3 %	$1,511	$5.86

Year-ended December 31, 2016 (As Restated)

($ in millions, except percentages and per share amounts)	Income Before Income Taxes	Tax Expense	Effective Tax Rate	Net income from continuing operations (attributable to PPG)	Earnings per diluted share
As reported, continuing operations	$779	$214	27.5 %	$543	$2.04
Includes:					
Charges related to transaction-related costs[1]	8	3	37.6 %	5	0.03
Charges related to pension settlements	968	352	36.4 %	616	2.31
Charge related to business restructuring	191	50	26.2 %	141	0.53
Charge related to environmental remediation	82	31	37.6 %	51	0.20
Net gain from disposals of ownership interests in business affiliates	(46)	(16)	34.8 %	(30)	(0.12)
Net tax effect of asbestos settlement funding	—	(151)	N/A	151	0.57
Charge related to early retirement of debt	8	3	37.6 %	5	0.02
Charges related to asset write-downs	23	7	30.4 %	17	0.06
Adjusted, continuing operations, excluding certain charges	$2,013	$493	24.5 %	$1,499	$5.64

Year-ended December 31, 2015

($ in millions, except percentages and per share amounts)	Income Before Income Taxes	Tax Expense	Effective Tax Rate	Net income from continuing operations (attributable	Earnings per diluted share

				to PPG)	
As reported, continuing operations	$1,745	$413	23.7 %	$1,311	$4.79
Includes:					
Charges related to transaction-related costs[1]	44	14	33.3 %	30	0.10
Charge related to business restructuring	136	31	22.8 %	105	0.39
Charge related to pension settlement	7	2	28.6 %	5	0.02
Charge related to equity affiliate debt refinancing	11	4	37.6 %	7	